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# Last update: Oct 3, 2021

rm(list = ls())

# =====
# INITIAL DATA FRAME USING ESS DATA (Citation below)
#
# library(readstata13)
# ess <- readstata13::read.dta13(file="ESSW19S.dta",
#                               convert.factors = FALSE)
# save(ess, file="ess.Rdata")
# -----
# PLEASE NOTE:
#
# "ESSW19S.dta" is based on two files from the website
# of europeansocialsurvey.org
#
# FILE 1: Cumulative Stata file ESS1-8e01.dta (edition 1)
# for Rounds 1 to 8 using the ESS Cumulative Data Wizard at
# https://www.europeansocialsurvey.org/downloadwizard/
# Download at November 06, 2020.
# Country selection:
# AT, BE, CH, CZ, DE, DK, EE, ES, FI, FR, GB, HU, IE, IT,
# LT, NL, NO, PL, PT, SE, SI, SK.
# Selection criteria:
# a) continuous availability (as far as possible)
# of data across the rounds and b) parallel availability of
# data for the latest round 9 (except for DK which is included
# despite missing data for round 9)

# variable selection:
# all variables except for rotating modules and
# cross-module replicated questions

# Citation of this data file:
# European Social Survey Cumulative File, ESS 1-8 (2018).
# Data file edition 1.0. NSD - Norwegian Centre for Research
# Data, Norway - Data Archive and distributor of ESS data for
# ESS ERIC. doi:10.21338/NSD-ESS-CUMULATIVE

# FILE 2: ESS9e02.dta (edition 2). Download at July 08, 2020.
# File is reduced to the same country selection as above.
# Then in both files the set of variables is reduced to
# the same thematically relevant subset, afterwards
# the file for round 9 was appended to the cumulative
# file for rounds 1 to 8 using Stata. The resulting file
# was finally sorted by country and round within country
# and converted to the above R data frame.
# N=302,079 (round 1-8) and 38,136 (round 9),
# overall 340,215 cases

# Reference:
# ESS Round 9: European Social Survey Round 9 Data (2018).
# Data file edition 2.0. NSD - Norwegian Centre for Research
# Data, Norway " Data Archive and distributor of ESS data for
# ESS ERIC. doi:10.21338/NSD-ESS9-2018.

# =====
# CODING FAR-RIGHT WING VOTING/CLOSENESS

# Primary coding source used:
# Lewis Davis and Sumit S. Deole (2017).
# Immigration and the Rise of Far-right Parties in Europe
# (ifo DICE Report 4/2017, December, volume 15).
# Technical Report January 2018. Downloaded from
# https://www.researchgate.net/publication/322732593_Immigration_and_the_Rise_of_Far-
# right_Parties_in_Europe
# (last access: November 27, 2020)

# Supplementary "BBC-SOURCE" source referred to below:
# "Europe and right-wing nationalism: A country-by-country guide
# (13 November 2019) https://www.bbc.com/news/world-europe-36130006
# (last access: November 27, 2020)

# Additional supplementary source occasionally cited below as "APP3":
# APPENDIX A3 POLITICAL PARTIES, ESS9 - 2018 ed.3.0 (published 10.12.2020)
# https://www.europeansocialsurvey.org/docs/round9/survey/ESS9_appendix_a3_e03_0.pdf

rm(list = ls())
load("ess.Rdata")

# IN AUSTRIA -----
# FPÄ- (Freiheitliche Partei Ä-sterreich # "right-wing populist" acc. to APP3
# und BZÄ- (BÄ%ndnis Zukunft Ä-sterreich)

ess$rwingtat <- ifelse(

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                (ess$cntry == "AT" & ess$vote == 1 &
                  (ess$prvtvat == 3 |
                    ess$prvtvat == 3 | ess$prvtvat == 4 |
                    ess$prvtvat == 3 )), 1, 0)
addmargins(table(ess$wingvat))

ess$wingclat <- ifelse(
  (ess$cntry == "AT" & ess$clsprty == 1 &
    (ess$prtcclat == 3 |
      ess$prtcclaat == 3 | ess$prtcclaat == 4 |
      ess$prtcclcat == 3 | ess$prtcclcat == 4 )), 1, 0)
addmargins(table(ess$wingclat))

# IN BELGIUM -----
# Vlaams Blok/Vlaams Belang (VB) , Front National
# BBC-SOURCE: N-VA Nieuw-Vlaamse Alliantie (New Flemish Alliance: codes == 3 and 4)
# Supposedly not far-right but declaredly nationalistic - excluded from this
# far-right coding version 'right', not "extreme right" acc. to. "APP3"
ess$wingvtbe <- ifelse(
  (ess$cntry == "BE" & ess$vote == 1 &
    (ess$prvtvtbe == 8 |  ess$prvtvtbe == 15 |
      ess$prvtvtbe == 7 |  ess$prvtvtbe == 11 | # ess$prvtvtbe == 3 | # 3 =N-VA
      ess$prvtvtbbe == 7 |  ess$prvtvtbbe == 11 |
      ess$prvtvtcbe == 7 |  ess$prvtvtcbe == 11 | # ess$prvtvtcbe == 3 | # 3 = N-VA
      ess$prvtvtdbe == 7 |  ess$prvtvtdbe == 11 | # | ess$prvtvtdbe == 3 | # 3 = N-VA
    )), 1, 0)
addmargins(table(ess$wingvtbe))

ess$wingclbe <- ifelse(
  (ess$cntry == "BE" & ess$clsprty == 1 &
    (ess$prtcclbe == 8 |  ess$prtcclbe == 15 | #  ess$prtcclbe == 4 | # 4 = N-VA
      ess$prtcclabe == 8 |  ess$prtcclabe == 12 | #  ess$prtcclabe == 3 | # 3 = N-VA
      ess$prtcclbbe == 8 |  ess$prtcclbbe == 12 | #  ess$prtcclbbe == 3 | # 3 = N-VA
      ess$prtcclcbe == 7 |  ess$prtcclcbe == 11 | #  ess$prtcclcbe == 3 | # 3 = N-VA
      ess$prtccldbe == 7 |  ess$prtccldbe == 11 | # | ess$prtccldbe == 3 | # 3 = N-VA
    )), 1, 0)
addmargins(table(ess$wingclbe))

# IN SWITZERLAND -----
# SVP Swiss People's Party # right-wing populist acc. to APP3
# PNOS Swiss Nationalist Party
# SD Swiss Democrats
ess$wingvtch <- ifelse(
  (ess$cntry == "CH" & ess$vote == 1 &
    (ess$prvtvtch == 4 |  ess$prvtvtch == 11 |
      ess$prvtvtach == 4 |  ess$prvtvtach == 11 |
      ess$prvtvtbch == 4 |  ess$prvtvtbch == 10 |
      ess$prvtvtcch == 4 |  ess$prvtvtcch == 10 |
      ess$prvtvtdch == 1 |  ess$prvtvtdch == 15 |
      ess$prvtvtech == 1 |
      ess$prvtvfch == 1 |
      ess$prvtvgch == 1 |
    )), 1, 0)
addmargins(table(ess$wingvtch))

ess$wingclch <- ifelse(
  (ess$cntry == "CH" & ess$clsprty == 1 &
    (ess$prtcclch == 4 |  ess$prtcclch == 11 |
      ess$prtcclach == 4 |  ess$prtcclach == 11 |
      ess$prtcclbch == 4 |  ess$prtcclbch == 10 |
      ess$prtcclcch == 4 |  ess$prtcclcch == 10 |
      ess$prtccldch == 1 |  ess$prtccldch == 15 |  ess$prtcldch == 17 |
      ess$prtclech == 1 |
      ess$prtcclfch == 1 |
      ess$prtcclgch == 1 |
    )), 1, 0)
addmargins(table(ess$wingclch))

# IN GERMANY -----
# NPD National Democratic Party of Germany # "right-wing extremist acc. to APP3
# REP Republicans # same as NPd, though not that extremist acc. to APP3

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# BBC-Source: AfD Alternative for Germany = included in this far-right
# coding version because it is supposed to be at least in part
# a far-right party (and the primary coding source's
# own reference for Germany goes back to the year 2006)
# AfD is described as "right-wing populist party" acc. to APP3

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ess$wingvtde <- ifelse(
  (ess$cntry == "DE" & ess$vote == 1 &
    (ess$prtvde1 == 6 |
      ess$prtvade1 == 6 | ess$prtvade1 == 7 |
      ess$prtvbde1 == 6 | ess$prtvbde1 == 7 |
      ess$prtvcd1 == 6 | ess$prtvcd1 == 7 |
      ess$prtvdde1 == 6 | ess$prtvdde1 == 7 |
      ess$prtved1 == 8 |
        ess$prtvde2 == 6 |
        ess$prtvade2 == 6 | ess$prtvade2 == 7 |
        ess$prtvbde2 == 6 | ess$prtvbde2 == 7 |
        ess$prtvcd2 == 6 | ess$prtvcd2 == 7 |
        ess$prtvdde2 == 6 | ess$prtvdde2 == 7 |
        ess$prtved2 == 8 |
          | ess$prtved2 == 6 # 6=AFD
    )), 1, 0)

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addmargins(table(ess$wingvtde))
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ess$wingclde <- ifelse(
  (ess$cntry == "DE" & ess$clsprty == 1 &
    (ess$prtclde == 6 |
      ess$prtclade == 6 | ess$prtclade == 7 |
      ess$prtclbde == 6 | ess$prtclbde == 7 |
      ess$prtclcde == 6 | ess$prtclcde == 7 |
      ess$prtcldde == 6 | ess$prtcldde == 7 |
      ess$prtclede == 8 |
        | ess$prtclede == 6 # 6=AFD
    )), 1, 0)

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addmargins(table(ess$wingclde))
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# IN DENMARK -----
# DF Danish People's Party - Dansk Folkeparti # right-wing acc. to APP3
# FP Danish Progress Party - Fremskridtspartiet

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ess$wingvtdk <- ifelse(
  (ess$cntry == "DK" & ess$vote == 1 &
    (ess$prtvtdk == 6 | ess$prtvtdk == 9 |
      ess$prvtadk == 6 | ess$prvtadk == 9 |
      ess$prvtbdk == 5 |
      ess$prvtcdk == 5
    )), 1, 0)

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addmargins(table(ess$wingvtdk))
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ess$wingcldk <- ifelse(
  (ess$cntry == "DK" & ess$clsprty == 1 &
    (ess$prtcldk == 6 | ess$prtcldk == 9 |
      ess$prtcladk == 6 | ess$prtcladk == 9 |
      ess$prtclbdk == 5 |
      ess$prtclcdk == 5
    )), 1, 0)

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addmargins(table(ess$wingcldk))
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# IN FINLAND -----
# PS Finns Party (formerly the "True Finns Party") # "rightist populist" acc. to APP3
#   only the var label "true finns" appeared
#   (codes 4 and 5 below)
# SKS Finnish People's Blue-whites (code 8 below)

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ess$wingvtfi <- ifelse(
  (ess$cntry == "FI" & ess$vote == 1 &
    (ess$prtvtfi == 5 |
      ess$prtvtafi == 5 |
      ess$prvtbfi == 5 | ess$prvtbfi == 8 |
      ess$prvtcfi == 4 |
      ess$prvtdfi == 4
    )), 1, 0)

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addmargins(table(ess$wingvtfi))
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ess$wingclfi <- ifelse(
  (ess$cntry == "FI" & ess$clsprty == 1 &
    (ess$prtclfi == 5 |
      ess$prtclafi == 5 |

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        ess$prtblbfi == 5 |
        ess$prtblcfi == 4 |
        ess$prtbldfi == 4 |
        ess$prtblcfe == 4
    )), 1, 0)

addmargins(table(ess$rwingclfi))

# IN FRANCE -----
# FN Front National / RN Rassemblement National (National Rally) # "extreme right" acc. to APP3
# MNR National Republican Movement
# MPF Movement for France

ess$rwingvtfr <- ifelse(
  (ess$cntry == "FR" & ess$vote == 1 &
    (ess$prvtvfr == 3 | ess$prvtvfr == 7 | ess$prvtvfr == 8 |
    ess$prvtvtafr == 3 | ess$prvtvtafr == 7 | ess$prvtvtafr == 8 |
    ess$prvtvbfr == 2 | ess$prvtvbfr == 5 |
    ess$prvtvcfr == 2 | ess$prvtvcfr == 8 |
    ess$prvtvdf == 11
  )), 1, 0)

addmargins(table(ess$rwingvtfr))

# FN, MNR, MPF

ess$rwingclfr <- ifelse(
  (ess$cntry == "FR" & ess$clsprty == 1 &
    (ess$prtblfr == 3 | ess$prtblfr == 7 | ess$prtblfr == 8 |
    ess$prtblafr == 2 | ess$prtblafr == 6 | ess$prtblafr == 7 |
    ess$prtblbfr == 2 | ess$prtblbfr == 6 |
    ess$prtblcfr == 1 |
    ess$prtblcfr == 2 | ess$prtblcfr == 9 |
    ess$prtblcfr == 2 | ess$prtblcfr == 9 |
    ess$prtblcfr == 11
  )), 1, 0)

addmargins(table(ess$rwingclfr))

# IN UNITED KINGDOM (GB) -----
# UKIP United Kingdom Independence Party # "right-wing" acc. to APP3
# BNP British National Party

ess$rwingvtgb <- ifelse(
  (ess$cntry == "GB" & ess$vote == 1 &
    (ess$prvtvtagb == 7 | ess$prvtvtagb == 8 |
    ess$prvtvtbgb == 7 |
    ess$prvtvtcgb == 7
  )), 1, 0)

addmargins(table(ess$rwingvtgb))

ess$rwingclgb <- ifelse(
  (ess$cntry == "GB" & ess$clsprty == 1 &
    (ess$prtblagb == 7 | ess$prtblagb == 8 |
    ess$prtblbgb == 7 |
    ess$prtblcgb == 7
  )), 1, 0)

addmargins(table(ess$rwingclgb))

# IN HUNGARY (HU) -----
# MIEP Hungarian Justice and Life Party
# JOBBIK Movement for a better Hungary # "extreme right-wing" acc. to APP 3
#
# BBC SOURCE names - besides Jobbik - also Fidesz: excluded from
# this far-right voting
# (it appears as a very strongly frequented center/right party,
# perhaps including far-right elements/streams )
# Fidesz is describes as being considered as "national conservative" and
# recently as "far-right" acc. to APP 3

ess$rwingvthu <- ifelse(
  (ess$cntry == "HU" & ess$vote == 1 &
    (ess$prvtvtahu == 3 | # ess$prvtvtahu == 1 | # 1 = Fidesz
    ess$prvtvbhu == 3 | # ess$prvtvbhu == 1 | # 1 = Fidesz
    ess$prvtvthu == 11 | # ess$prvtvthu == 1 | # 1 = Fidesz
    ess$prvtvdhu == 4 | ess$prvtvdhu == 7 | # ess$prvtvdhu == 3 | # 3 = Fidesz
    ess$prvtvtehu == 2 | # ess$prvtvtehu == 1 | # 1 = Fidesz
    ess$prvtvfhu == 4 # | ess$prvtvfhu == 3 # 3 = Fidesz
  )), 1, 0)

addmargins(table(ess$rwingvthu))

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# MIEP, JOBBIK, (# Fidesz)
ess$wingclhu <- ifelse(
  (ess$cntry == "HU" & ess$clsprty == 1 &
    (ess$prtclahu == 5 | ess$prtclahu == 9 | # ess$prtclahu == 3 | # 3 = Fidesz
    ess$prtclbhu == 3 | ess$prtclbhu == 11 | # ess$prtclbhu == 1 | # 1 = Fidesz
    ess$prtclchu == 11 | # ess$prtclchu == 1 | # 1 = Fidesz
    ess$prtcldhu == 7 | ess$prtcldhu == 12 | # ess$prtcldhu == 6 | # 6 = Fidesz
    ess$prtclehu == 4 | # ess$prtclehu == 3 | # 3 = Fidesz
    ess$prtclfhu == 4 | # ess$prtclfhu == 3 | # 3 = Fidesz
    ess$prtclghu == 4 | # | ess$prtclghu == 3 | # 3 = Fidesz
  )), 1, 0)
addmargins(table(ess$wingclhu))

# IN ITALY -----
# MS-FT Social Movement - Tricolour Flame (Fiamma Tricolore)
# LN Lega Nord # "right-wing regionalist party" acc. to APP 3

# Fratelli d'Italia "right-wing" (nationalism, conservatism,
# euroskepticism) acc. to APP3

# Casapound Italia "neo-fascist" (ultranationalism, hard euroskepticims,
# anti-immigration, ..)
ess$wingvtit <- ifelse(
  (ess$cntry == "IT" & ess$vote == 1 &
    (ess$prtvtit == 11 | ess$prtvtit == 16 |
    ess$prtvbit == 9 | ess$prtvbit == 10 |
    ess$prvtcit == 9 | ess$prvtcit == 10 | ess$prvtcit == 13
  )), 1, 0)
addmargins(table(ess$wingvtit))

ess$wingclit <- ifelse(
  (ess$cntry == "IT" & ess$clsprty == 1 &
    (ess$prtclit == 11 | ess$prtclit == 16 |
    ess$prtclbit == 9 | ess$prtclbit == 10 |
    ess$prtclcit == 3 | ess$prtclcit == 5 |
    ess$prtcldit == 9 | ess$prtcldit == 10 | ess$prtcldit == 13
  )), 1, 0)
addmargins(table(ess$wingclit))

# IN THE NETHERLANDS -----
# LPF Pim Fortuyn List
# PVV Party for Freedom (List wilders)
ess$wingvtnl <- ifelse(
  (ess$cntry == "NL" & ess$vote == 1 &
    (ess$prtvtnl == 4 |
    ess$prvtanl == 4 |
    ess$prvtbnl == 4 |
    ess$prvtcnl == 4 | ess$prvtcnl == 11 |
    ess$prvtndl == 3 |
    ess$prvtenl == 3 |
    ess$prvtfnl == 3 |
    ess$prvtgnl == 3
  )), 1, 0)
addmargins(table(ess$wingvtnl))

ess$wingclnl <- ifelse(
  (ess$cntry == "NL" & ess$clsprty == 1 &
    (ess$prtclnl == 4 |
    ess$prtclanl == 4 | ess$prtclanl == 12 |
    ess$prtclbnl == 4 | ess$prtclbnl == 11 |
    ess$prtclcnl == 3 |
    ess$prtclndl == 3 |
    ess$prtclenl == 3 |
    ess$prtclfnl == 3
  )), 1, 0)
addmargins(table(ess$wingclnl))

# IN NORWAY NO -----
# FRP Progress Party # "right-populist" acc. to APP 3
ess$wingvtno <- ifelse(
  (ess$cntry == "NO" & ess$vote == 1 &
    (ess$prtvtno == 8 |
    ess$prvtano == 8 |
    ess$prvtbno == 8
  )), 1, 0)

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    )), 1, 0)
addmargins(table(ess$rwingvtno))
ess$rwingclno <- ifelse(
  (ess$cntry == "NO" & ess$clsprty == 1 &
    (ess$prtclno == 8 |
     ess$prtclano == 8 |
     ess$prtclbno == 8
    )), 1, 0)
addmargins(table(ess$rwingclno))
# IN PORTUGAL PT -----
# PNR National Renovator Party
ess$rwingvtpt <- ifelse(
  (ess$cntry == "PT" & ess$vote == 1 &
    (ess$prvtapt == 8 |
     ess$prvtbpt == 8 |
     ess$prvtcpt == 11
    )), 1, 0)
addmargins(table(ess$rwingvtpt))
ess$rwingclpt <- ifelse(
  (ess$cntry == "PT" & ess$clsprty == 1 &
    (ess$prtclcpt == 8 |
     ess$prtclept == 11
    )), 1, 0)
addmargins(table(ess$rwingclpt))
# IN SWEDEN SE -----
# SD Swedish Democrats (Sverigedemokraterna) # "nationalist right wing" acc. to APP 3
ess$rwingvtse <- ifelse(
  (ess$cntry == "SE" & ess$vote == 1 &
    (ess$prvtase == 10 |
     ess$prvtbse == 10 |
     ess$prvtcse == 9
    )), 1, 0)
addmargins(table(ess$rwingvtse))
ess$rwingclse <- ifelse(
  (ess$cntry == "SE" & ess$clsprty == 1 &
    (ess$prtclase == 10 |
     ess$prtclbse == 10 |
     ess$prtclcse == 9
    )), 1, 0)
addmargins(table(ess$rwingclse))
# =====
# FOR THE FOLLOWING COUNTRIES ONLY THE ABOVE-CITED BBC-SOURCE PLUS |
# SUPPLEMENTARY CODING SOURCES AVAILABLE |
# =====
# In CZECHIA CZ -----
# BBC-SOURCE: Freedom & Direct Democracy (Svoboda a přímá demokracie,
# SPD) is described as a hard Euroskeptic, anti-immigration,
# pro-direct political party. Joins the far-right political group
# "Identity and Democracy" of the European Parliament, and hosted
# in 2017 a conference of the Movement for a Europe of Nations and
# Freedom in Prague, with parties such as the French Front National,
# Dutch Party for Freedom, Lega Nord, ..
# (acc. to https://en.wikipedia.org/wiki/Freedom_and_Direct_Democracy )
# "right-wing, anti-immigration, nationalist, anti-EI vision" acc. to APP 3
ess$rwingvtcz <- ifelse(
  (ess$cntry == "CZ" & ess$vote == 1 &
    (ess$prvttecz == 8
    )), 1, 0)
addmargins(table(ess$rwingvtcz))
ess$rwingclcz <- ifelse(
  (ess$cntry == "CZ" & ess$clsprty == 1 &
    (ess$prtcltecz == 8
    )), 1, 0)

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addmargins(table(ess$wingclcz))

# IN ESTONIA EE -----
# BBC-SOURCE:
# EKRE Eesti Konservatiivne Rahvaerakond =
# Conservative People's Party of Estonia -
# is described as a national-conservative and
# right-wing populist political party - which in the media
# mainstream would be seen as belonging to the far-right
# Estonian Independence Party (Eesti Iseseisvuspartei EIP)
# "far-right nationalist" party acc. to APP 3

ess$wingvtee <- ifelse(
  (ess$cntry == "EE" & ess$vote == 1 &
    (ess$prvtbee == 9 |
     ess$prvtcee == 8 |
     ess$prvtdee == 4 | ess$prvtdee == 8 |
     ess$prvttee == 6 | ess$prvttee == 9 |
     ess$prvtfee == 6 | ess$prvtfee == 9 |
     ess$prvtgee == 6 | ess$prvtgee == 9
    )), 1, 0)

addmargins(table(ess$wingvtee))

ess$wingclee <- ifelse(
  (ess$cntry == "EE" & ess$clsprty == 1 &
    (ess$prtclee == 9 |
     ess$prtclee == 8 |
     ess$prtclee == 4 | ess$prtclee == 8 |
     ess$prtclee == 6 | ess$prtclee == 9 |
     ess$prtclee == 6 |
     ess$prtclee == 6 | ess$prtclee == 9
    )), 1, 0)

addmargins(table(ess$wingclee))

# IN SPAIN ES -----
# BBC-SOURCE: VOX (described as far-right, national-conservative,
# populist party) # "far right/radical-right" acc. to APP 3

ess$wingvtes <- ifelse(
  (ess$cntry == "ES" & ess$vote == 1 &
    (ess$prvttees == 16
    )), 1, 0)

addmargins(table(ess$wingvtes))

ess$wingcles <- ifelse(
  (ess$cntry == "ES" & ess$clsprty == 1 &
    (ess$prtcles == 16
    )), 1, 0)

addmargins(table(ess$wingcles))

#
# IN SLOVENIA SI -----
# SNS Slovene National Party (Slovenska nacionalna stranka)
# is described as a "nationalist far-right political party in Slovenia
# acc. to: https://en.wikipedia.org/wiki/Slovenian\_National\_Party
# "far-right" acc. to APP 3

ess$wingvtsi <- ifelse(
  (ess$cntry == "SI" & ess$vote == 1 &
    (ess$prvtvtsi == 4 |
     ess$prvtvtsi == 6 |
     ess$prvtvtsi == 4 |
     ess$prvtvtsi == 7 |
     ess$prvtvtsi == 10 |
     ess$prvtvtsi == 11
    )), 1, 0)

addmargins(table(ess$wingvtsi))

ess$wingclsi <- ifelse(
  (ess$cntry == "SI" & ess$clsprty == 1 &
    (ess$prtclsi == 4 |

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    ess$prtcldsi == 6 |
    ess$prtcldbsi == 4 |
    ess$prtcldcsi == 7 |
    ess$prtcldsi == 10 |
    ess$prtcldfsi == 11
  )), 1, 0)
addmargins(table(ess$rwingclsi))

# POLAND PL -----
# BBC-Source: Confederation Liberty and Independence
# (Polish: Konfederacja WolnoÅ&#x2013; i NiepodlegÅ&#x2013;)
# frequently shortened to just Confederation (Polish: Konfederacja)
# far-right political party initially established in 2018 between
# KORWiN and the National Movement party. According to:
# https://en.wikipedia.org/wiki/Confederation_Liberty_and_Independence
# no explicit occurrence of the party in the survey data,
# however "KORWIN" and "National Movement party" occurs.
# KORWiN Coalition for the Renewal of the Republic - Liberty and Hope
# since 2016 known as Liberty (Polish: wolnosc)
# acc. to https://en.wikipedia.org/wiki/KORWiN_(Poland)
# RN National Movement (Polish: Ruch Narodowy)
# described as far-right and right-wing populist political movement
# acc. to https://en.wikipedia.org/wiki/National_Movement_(Poland)
# These two parties are coded.
ess$rwingvtp1 <- ifelse(
  (ess$cntry == "PL" & ess$vote == 1 &
    (ess$prtvtp1 == 8 |
     ess$prtvdp1 == 1
    )), 1, 0)
addmargins(table(ess$rwingvtp1))
ess$rwingclp1 <- ifelse(
  (ess$cntry == "PL" & ess$clsprty == 1 &
    (ess$prtc1bp1 == 9 |
     ess$prtc1fp1 == 6 |
     ess$prtc1gp1 == 1
    )), 1, 0)
addmargins(table(ess$rwingclp1))

# SLOVAKIA SK -----
# BBC-SOURCE: People's Party - Our Slovakia
# (Slovak: Å&#x2013;udovÅ&#x2013; strana Å&#x2013; NaÅ&#x2013; Slovensko, Å&#x2013;SNS)
# https://en.wikipedia.org/wiki/People%27s_Party_Our_Slovakia
# far-right neo-Nazi political party
#
# prvtvtdsk == 5 = LS Nase Slovensko (n=35)
# no explicit occurrence in the closeness variables # NOT INCLUDED
# =====
# FOR THE FOLLOWING COUNTRIES ONLY
# SUPPLEMENTARY CODING SOURCES AVAILABLE |
# =====

# IRELAND IE -----
# National Party (An PÅ&#x2013;irtÅ&#x2013; NÅ&#x2013;isiÅ&#x2013;nta) "minor far-right nationalist
# political party" according to:
# https://en.wikipedia.org/wiki/National_Party_(Ireland,_2016)
# no explicit occurrence in the survey data

# LITHUANIA LT -----
# CODING SOURCES: Å&#x2013;The extreme right in the Baltic States: LithuaniaÅ&#x2013;
# (09 June 2020) by MaÅ&#x2013;gorzata Kulbaczevska-Figat
# https://www.transform-network.net/focus/overview/article/radical-far-and-populist-right/the-
# extreme-right-in-the-baltic-states-lithuania/
# https://www.wikiwand.com/en/Lithuanian_Nationalist_and_Republican_Union
#
# LTS Lithuanian Nationalist and Republican Union (LTS or tautinnikai, nationalists)
# described as as nationalist right-wing party

# TVS Lithuanian Unity National Union
# JL Young Lithuania Party # Described as extremist groups
ess$rwingvlt <- ifelse(
  (ess$cntry == "LT" & ess$vote == 1 &

```



```

      (ess$prtvlt1 == 15 |
      ess$prtvalt1 == 15 |
      ess$prtvlt2 == 16 |
      ess$prtvalt2 == 18 | ess$prtvalt2 == 13 |
      ess$prtvblt2 == 4 | ess$prtvblt2 == 5 |
      ess$prtvlt3 == 16 |
      ess$prtvalt3 == 18 | ess$prtvalt3 == 13 |
      ess$prtvblt3 == 4 | ess$prtvblt3 == 5
    )), 1, 0)

addmargins(table(ess$rwingvlt))

ess$rwingc1lt <- ifelse(
  (ess$cntry == "LT" & ess$clsprty == 1 &
   (ess$prtcllt == 16 |
    ess$prtclalt == 18 | ess$prtclalt == 12 |
    ess$prtclblt == 15
   )), 1, 0)

addmargins(table(ess$rwingc1lt))

# =====
library(car)

ess$rwvt <- ifelse(
  (ess$rwingvtat == 1) |
  (ess$rwingvtbe == 1) |
  (ess$rwingvtch == 1) |
  (ess$rwingvtde == 1) |
  (ess$rwingvtdk == 1) |
  (ess$rwingvtfi == 1) |
  (ess$rwingvtfr == 1) |
  (ess$rwingvtgb == 1) |
  (ess$rwingvthu == 1) |
  (ess$rwingvtit == 1) |
  (ess$rwingvtnl == 1) |
  (ess$rwingvtno == 1) |
  (ess$rwingvtpt == 1) |
  (ess$rwingvtse == 1) |
  (ess$rwingvtcz == 1) |
  (ess$rwingvtee == 1) |
  (ess$rwingvtes == 1) |
  (ess$rwingvtst == 1) |
  (ess$rwingvtpl == 1) |
  (ess$rwingvlt == 1
  ), 1, 0)

ess$rwvtr <- car::recode(ess$rwvt,
  recodes = '1=1; 0=0; NA=0')

addmargins(table(ess$rwvtr)) # no NAs cat 1 = 11,003 (N=340,215)
addmargins(table(ess$rwvtr, ess$vote)) # Active NAs due to "vote"
addmargins(table(ess$vote))

ess$rwingvote <- ifelse(
  (ess$vote == 1 & ess$rwvtr == 1), 1,
  ifelse(
    (ess$vote == 1 & ess$rwvtr == 0), 2,
    ifelse(
      (ess$vote == 2 & ess$rwvtr == 0), 3,
      ifelse(
        (ess$vote == 3 & ess$rwvtr == 0), 4, NA )))

addmargins(table(ess$rwingvote))
addmargins(table(ess$rwingvote, ess$vote))
addmargins(table(ess$vote))

# -----
ess$rwcl <- ifelse(
  (ess$rwingclat == 1) |
  (ess$rwingclbe == 1) |
  (ess$rwingclch == 1) |
  (ess$rwingclde == 1) |
  (ess$rwingcldk == 1) |
  (ess$rwingclfi == 1) |
  (ess$rwingclfr == 1) |
  (ess$rwingclgb == 1) |
  (ess$rwingclhu == 1) |
  (ess$rwingclit == 1) |
  (ess$rwingclnl == 1) |
  (ess$rwingclno == 1) |
  (ess$rwingclpt == 1) |
  (ess$rwingclse == 1) |
  (ess$rwingclcz == 1) |
  (ess$rwingcllee == 1) |
  (ess$rwingcles == 1) |
  (ess$rwingclsi == 1)

```

```

      (ess$wingclp1 == 1) |
      (ess$wingcllt == 1
      ), 1, 0)
ess$rwclr <- car::recode(ess$rwcl,
                       recodes = '1=1; 0=0; NA=0')

addmargins(table(ess$rwclr)) # no NAs cat 1 = 9,677 (N=340,215)
addmargins(table(ess$rwclr, ess$clsprty)) # Active NAs due to "clsprty"
addmargins(table(ess$clsprty))

ess$wingclose <- ifelse(
  (ess$clsprty == 1 & ess$rwclr == 1), 1,
  ifelse(
    (ess$clsprty == 1 & ess$rwclr == 0), 2,
    ifelse(
      (ess$clsprty == 2 & ess$rwclr == 0), 3, NA )))

addmargins(table(ess$wingclose))
addmargins(table(ess$wingclose, ess$clsprty))
addmargins(table(ess$clsprty))

# =====

save(ess, file="ess.Rdata") # Data Frame saved using R version 4.0.3

# =====
rm(list = ls())
load("ess.Rdata")

# The following code excludes from the file all country-specific voting
# and closeness variables employed above from the data frame and keeps
# only the two resulting index variables rwingvote and rwingclose
# This reduces the number of variables from k=420 to k=124

# variable names are identical to the original ESS data sources.
# Use the official ESS sources:
# https://www.europeansocialsurvey.org/docs/cumulative/ESS_cumulative_variable_list.pdf
# https://www.europeansocialsurvey.org/data/round-index.html

# Please note: when downloading the cumulative ESS dataset
# using the Cumulative Data Wizard from
# https://www.europeansocialsurvey.org/downloadwizard/
# as, for instance a CSV or Stata file, the ESS system
# creates automatically a corresponding codebook.

ess19 <-
subset(ess, select = c(
  round, cntry, essround, dweight, pspwght, pweight, region, regunit,
  domicil, hhmb, gndr, agea, eduyrs, hinctnta, hincfel, pdwrk, edctn,
  uempl, uempli, dsbld, rtrd, cmsrv, hswrk, dngoth, dngdk, dngref,
  dngna, emplrel, wrkctra, estsz, tporgwk, mbtru, rlgblg, rlgdm,
  rlgdgr, rlgatnd, pray, dscrgrp, dscrce, dscrntn, dscrllg, dscrllng,
  dscrtcn, dscrage, dscrngd, dscrsex, dscrdsb, dscroth, dscrdrk, dscrref,
  dscrnap, dscrna, ctzcntr, blgetmg, happy, stflife, sclmeet, inprdsc,
  sclact, crmvct, aesfdrk, health, hlthhmp, stfeco, stfgov, stfdem,
  stfedu, stfhlth, ppltrst, pplfair, pplhlp, trstprl, trstlgl, trstplc,
  trstplt, trstprt, trstep, trstun, gincdif, freehms, ipcrtiv, imprich,
  ipeopt, ipshabt, impsafe, impdiff, ipfrule, ipudrst, ipmodst, ipgdtim,
  impfree, iphlpl, ipsuces, ipstrgv, ipadvnt, ipbhprp, iprspot, iplylfr,
  impenv, imptrad, impfun, eufft, imsmetn, imdfetn, impcntr, imbgeco,
  imueclt, imwbcnt, polintr, lrscalc, pspsgva, actrolga, pspipla,
  cptppola, prtyban, scnsenv, netuse, netusoft, pstplonl,
  vote, clsprty, prtgdcl, rwingvote, rwingclose))

# rwingvote
# 1 = voted last election far-right
# 2 = voted last election but not far-right
# 3 = did not vote
# 4 = Not eligible to vote
# rwingclose
# 1 = feel closer to far-right party
# 2 = feel closer but not to far-right
# 3 = feel not closer to a particular political party

# save(ess19, file="ess19.Rdata")

# =====

rm(list = ls())
load("ess19.Rdata")
#
# ESS sampling weight
ess19$anweight <- ess19$pspwght * ess19$pweight

# index construction: far-right

addmargins(table(ess19$lrscale))

```

```

ess19$rw1 <- ifelse(ess19$lrscale == 10, 1, 0)
addmargins(table(ess19$rw1)) # 3.1% far-right

ess19$rw2 <- ifelse(
  (ess19$wingvote == 1 & ess19$wingclose == 1), 1,
  ifelse(
    (ess19$wingvote == 1 & ess19$wingclose == 2)|
    (ess19$wingvote == 1 & ess19$wingclose == 3)|
    (ess19$wingvote == 2 & ess19$wingclose == 1)|
    (ess19$wingvote == 2 & ess19$wingclose == 2)|
    (ess19$wingvote == 2 & ess19$wingclose == 3)|
    (ess19$wingvote == 3 & ess19$wingclose == 1)|
    (ess19$wingvote == 3 & ess19$wingclose == 2)|
    (ess19$wingvote == 3 & ess19$wingclose == 3)|
    (ess19$wingvote == 4 & ess19$wingclose == 1)|
    (ess19$wingvote == 4 & ess19$wingclose == 2), 0, 0))
addmargins(table(ess19$rw2)) # 100 * (5670 / 329929) = 1.7%

addmargins(table(ess19$wingvote))
addmargins(table(ess19$wingclose))
addmargins(table(ess19$wingvote, ess19$wingclose))

addmargins(table(ess19$rw1, ess19$rw2))

ess19$rw <- ifelse(
  (ess19$rw1 == 0 & ess19$rw2 == 0), 0,
  ifelse(
    (ess19$rw1 == 0 & ess19$rw2 == 1)|
    (ess19$rw1 == 1 & ess19$rw2 == 0), 1, 1))
addmargins(table(ess19$rw)) # 100 * (13900 / 292483) = 4.8%

# =====
# save(ess19, file="ess19.Rdata")
# =====

rm(list = ls())
load("ess19.Rdata")

# far-right prevalence: sample-weighted
library(survey)
ess19dvw <- survey::svydesign(id = ~1, strata=~cntry, weights=~anweight, data = ess19)

tab1 <- survey::svytable(~ess19$rw1, ess19dvw, round=TRUE)
tab2 <- survey::svytable(~ess19$rw2, ess19dvw, round=TRUE)
tab3 <- survey::svytable(~ess19$rw, ess19dvw, round=TRUE)
tab1 # rw1 (0, 1, sum): 277428 8865 286293 ( 3.1% ) (= "10" on left-right)
tab2 # rw2 (0, 1, sum): 309946 4210 314156 ( 1.3% ) (=close/vote)
tab3 # rw (0, 1, sum): 267507 12131 279638 ( 4.3% ) (combined by logical "or")

# 8865/286293=0.03096478
# 4210/314156=0.01340099
# 12131/279638=0.04338109

rwindex <- survey::svyglm(rw1 ~ rw2, design = ess19dvw, family=gaussian())
summary(rwindex)

# Assessing model fit
# Significance of Multiple R (Pearson correlation between observed and predicted Y)
cor.test(fitted(rwindex), (residuals(rwindex)+fitted(rwindex))) # r=0.09181877

# =====
#
# Measurement of authoritarian, prejudice, and trust: Building separate factor-score scales
#
# ===== MEASUREMENT MODEL 1 (authoritarian personality (proxy)) =====
#
rm(list = ls())
load("ess19.Rdata")
#
ess19$LNR <- seq_len(340215)
vdaten <- subset(ess19, select = c(LNR,
  impSAFE, ipstrgv, ipbhprp,
  ipfrule, imptrad,
  anweight ))

vdaten <- na.omit(vdaten)

# scale direction reversed for value items
library(car)

vdaten$impSAFEr <- car::recode(vdaten$impSAFE, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
vdaten$ipstrgvr <- car::recode(vdaten$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
vdaten$ipbhprpr <- car::recode(vdaten$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
vdaten$ipfruler <- car::recode(vdaten$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
vdaten$imptradr <- car::recode(vdaten$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

```

```

library(lavaan)
# authoritarian values
value.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
'
value.fit <- cfa(value.model, data=vdaten, sampling.weights="anweight",
                 meanstructure = TRUE)
summary(value.fit, header = TRUE, fit.measures = TRUE,
         estimates = TRUE, standardized = TRUE, rsquare=TRUE,
         modindices = FALSE)

factor.scores <- lavaan::predict(value.fit,
                                 newdata = vdaten )
factor.scores

facscores <- data.frame(vdaten, factor.scores)

head(facscores, 4)
ess19 <- merge(ess19, facscores, by = "LNR",
              all.x = TRUE,
              all.y = TRUE)
# edit(data.frame(ess19))
save(ess19, file="ess19.Rdata")

# ===== MEASUREMENT MODEL 2 (prejudice) =====

rm(list = ls())
load("ess19.Rdata")

ess19$LNR <- seq_len(340215)
pdaten <- subset(ess19, select = c(LNR,
                                 imsmetn, imdfetn, impcntr,
                                 anweight.x ))

pdaten <- na.omit(pdaten)

library(lavaan)
# prejudice
prejudice.model <- '
prejudice =~ imsmetn + imdfetn + impcntr
'
prejudice.fit <- cfa(prejudice.model, data=pdaten, sampling.weights="anweight.x",
                    ordered=c("imsmetn", "imdfetn", "impcntr"),
                    meanstructure = TRUE)

summary(prejudice.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)

factor.scores <- lavaan::predict(prejudice.fit,
                                 newdata = pdaten )
factor.scores

facscores <- data.frame(pdaten, factor.scores)

head(facscores, 4)
ess19 <- merge(ess19, facscores, by = "LNR",
              all.x = TRUE,
              all.y = TRUE)
# edit(data.frame(ess19))
save(ess19, file="ess19.Rdata")

# ===== MEASUREMENT MODEL 3 (trust) =====

rm(list = ls())
load("ess19.Rdata")

ess19$LNR <- seq_len(340215)
tdaten <- subset(ess19, select = c(LNR,
                                 ppltrst, pplfair, pplhlp,
                                 anweight.x.x ))

tdaten <- na.omit(tdaten)

library(lavaan)
# trust in humans
trust.model <- '
trust =~ ppltrst + pplfair + pplhlp

```

```

'
trust.fit <- cfa(trust.model, data=tdaten, sampling.weights="anweight.x.x",
               meanstructure = TRUE)

summary(trust.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)

factor.scores <- lavaan::predict(trust.fit,
                                newdata = tdaten )
factor.scores

facscores <- data.frame(tdaten, factor.scores)

head(facscores, 4)
ess19 <- merge(ess19, facscores, by = "LNR",
              all.x = TRUE,
              all.y = TRUE)
# edit(data.frame(ess19))
save(ess19, file="ess19.Rdata")

# =====

rm(list = ls())
load("ess19.Rdata")

addmargins(table(ess19$impsafe.x))
addmargins(table(ess19$ipstrgv.x))
addmargins(table(ess19$ipbhprp.x))
addmargins(table(ess19$ipfrule.x))
addmargins(table(ess19$imptrad.x))
addmargins(table(ess19$imsmetn.x))
addmargins(table(ess19$imdfetn.x))
addmargins(table(ess19$impcntr.x))
addmargins(table(ess19$pp1trst.x))
addmargins(table(ess19$pp1fair.x))
addmargins(table(ess19$pp1hlp.x))

addmargins(table(ess19$rw1)) # n=299377
addmargins(table(ess19$rw2)) # n=329929
addmargins(table(ess19$rw)) # n=292483

summary(ess19$authoritarian)
summary(ess19$prejudice)
summary(ess19$trust)

# #####
# Testing block 1: Cross-validation using library "boot" and function cv.glm()
# run sequentially # MSE as criterion

rm(list = ls())
load("ess19.Rdata")

# rw

library(boot)

sset1 <- subset(ess19, select = c(authoritarian, rw, anweight.x.x.y )) # n=276,217
sset1 <- na.omit(sset1)

# as linear model

m1 <- glm(rw ~ authoritarian, weights = anweight.x.x.y,
         family=gaussian, data = sset1)

summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()

# cross-validation of linear model
set.seed(145)
(cv.mse1a <- cv.glm(sset1, m1, k=10)$delta) # using default
#
cost1 <- function(rw, pi=0) {mean((rw-pi)^2)}
set.seed(145)
(cv.mse1b <- cv.glm(sset1, m1, cost1, k=10)$delta) # formulating default explicitly

# as probit model

```

```

m2 <- glm(rw ~ authoritarian, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          data = sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()

# cross-validation of probit model

set.seed(321)
(cv.mse2a <- cv.glm(sset1, m2, k=10)$delta) # using default
#
cost2 <- function(rw, pi=0) {mean((rw-pi)^2)}
set.seed(321)
(cv.mse2b <- cv.glm(sset1, m2, cost2, k=10)$delta) # formulating default explicitly
#

# -----

rm(list = ls())
load("ess19.Rdata")
library(boot)

sset1 <- subset(ess19, select = c(authoritarian, prejudice, rw, anweight.x.x.y )) # n=268234
sset1 <- na.omit(sset1)

# as linear model

m1 <- glm(rw ~ authoritarian+prejudice, weights = anweight.x.x.y,
          family=gaussian, data = sset1)

summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()

# cross-validation of linear model
set.seed(145)
(cv.mse1a <- cv.glm(sset1, m1, k=10)$delta) # using default
#
cost1 <- function(rw, pi=0) {mean((rw-pi)^2)}
set.seed(145)
(cv.mse1b <- cv.glm(sset1, m1, cost1, k=10)$delta) # formulating default explicitly

# as probit model

m2 <- glm(rw ~ authoritarian+prejudice, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          data = sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()

# cross-validation of probit model

set.seed(321)
(cv.mse2a <- cv.glm(sset1, m2, k=10)$delta) # using default
#
cost2 <- function(rw, pi=0) {mean((rw-pi)^2)}
set.seed(321)
(cv.mse2b <- cv.glm(sset1, m2, cost2, k=10)$delta) # formulating default explicitly
#

# -----

rm(list = ls())
load("ess19.Rdata")
library(boot)

```

```

sset1 <- subset(ess19, select = c(authoritarian, prejudice, trust, rw, anweight.x.x.y )) #
n=268234
sset1 <- na.omit(sset1)

# as linear model

m1 <- glm(rw ~ authoritarian+prejudice+trust, weights = anweight.x.x.y,
          family=gaussian, data = sset1)

summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()

# cross-validation of linear model
set.seed(145)
(cv.mse1a <- cv.glm(sset1, m1, k=10)$delta) # using default
#
cost1 <- function(rw, pi=0) {mean((rw-pi)^2)}
set.seed(145)
(cv.mse1b <- cv.glm(sset1, m1, cost1, k=10)$delta) # formulating default explicitly

# as probit model

m2 <- glm(rw ~ authoritarian+prejudice+trust, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          data = sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()

# cross-validation of probit model

set.seed(321)
(cv.mse2a <- cv.glm(sset1, m2, k=10)$delta) # using default
#
cost2 <- function(rw, pi=0) {mean((rw-pi)^2)}
set.seed(321)
(cv.mse2b <- cv.glm(sset1, m2, cost2, k=10)$delta) # formulating default explicitly
#
# -----

rm(list = ls())
load("ess19.Rdata")

library(boot)

sset1 <- subset(ess19, select = c(authoritarian, prejudice, anweight.x.x.y ))
sset1 <- na.omit(sset1)

# as linear model

m1 <- glm(prejudice ~ authoritarian, weights = anweight.x.x.y,
          family=gaussian, data = sset1)

summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()

# cross-validation of linear model
set.seed(145)
(cv.mse1a <- cv.glm(sset1, m1, k=10)$delta) # using default
#

```

```

cost1 <- function(rw, pi=0) {mean((rw-pi)^2)}
set.seed(145)
(cv.mse1b <- cv.glm(sset1, m1, cost1, k=10)$delta) # formulating default explicitly

# -----

rm(list = ls())
load("ess19.Rdata")

library(boot)

sset1 <- subset(ess19, select = c(prejudice, trust, anweight.x.x.y ))
sset1 <- na.omit(sset1)

# as linear model

m1 <- glm(trust ~ prejudice, weights = anweight.x.x.y,
          family=gaussian, data = sset1)

summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()

# cross-validation of linear model
set.seed(145)
(cv.mse1a <- cv.glm(sset1, m1, k=10)$delta) # using default
#
cost1 <- function(rw, pi=0) {mean((rw-pi)^2)}
set.seed(145)
(cv.mse1b <- cv.glm(sset1, m1, cost1, k=10)$delta) # formulating default explicitly

# -----

# rw1

rm(list = ls())
load("ess19.Rdata")

library(boot)

sset1 <- subset(ess19, select = c(authoritarian, rw1, anweight.x.x.y )) #
sset1 <- na.omit(sset1)

# as linear model

m1 <- glm(rw1 ~ authoritarian, weights = anweight.x.x.y,
          family=gaussian, data = sset1)

summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()

# cross-validation of linear model
set.seed(145)
(cv.mse1a <- cv.glm(sset1, m1, k=10)$delta) # using default
#
cost1 <- function(rw1, pi=0) {mean((rw1-pi)^2)}
set.seed(145)
(cv.mse1b <- cv.glm(sset1, m1, cost1, k=10)$delta) # formulating default explicitly

# as probit model

m2 <- glm(rw1 ~ authoritarian, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          data = sset1)
summary(m2)

```



```

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()

# cross-validation of probit model

set.seed(321)
(cv.mse2a <- cv.glm(sset1, m2, k=10)$delta) # using default
#
cost2 <- function(rw1, pi=0) {mean((rw1-pi)^2)}
set.seed(321)
(cv.mse2b <- cv.glm(sset1, m2, cost2, k=10)$delta) # formulating default explicitly
#

# -----

rm(list = ls())
load("ess19.Rdata")
library(boot)

sset1 <- subset(ess19, select = c(authoritarian, prejudice, rw1, anweight.x.x.y ))
sset1 <- na.omit(sset1)

# as linear model

m1 <- glm(rw1 ~ authoritarian+prejudice, weights = anweight.x.x.y,
          family=gaussian, data = sset1)

summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()

# cross-validation of linear model
set.seed(145)
(cv.mse1a <- cv.glm(sset1, m1, k=10)$delta) # using default
#
cost1 <- function(rw1, pi=0) {mean((rw1-pi)^2)}
set.seed(145)
(cv.mse1b <- cv.glm(sset1, m1, cost1, k=10)$delta) # formulating default explicitly

# as probit model

m2 <- glm(rw1 ~ authoritarian+prejudice, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          data = sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()

# cross-validation of probit model

set.seed(321)
(cv.mse2a <- cv.glm(sset1, m2, k=10)$delta) # using default
#
cost2 <- function(rw1, pi=0) {mean((rw1-pi)^2)}
set.seed(321)
(cv.mse2b <- cv.glm(sset1, m2, cost2, k=10)$delta) # formulating default explicitly
#

# -----

rm(list = ls())
load("ess19.Rdata")
library(boot)

sset1 <- subset(ess19, select = c(authoritarian, prejudice, trust, rw1, anweight.x.x.y )) #
sset1 <- na.omit(sset1)

# as linear model

```

```

m1 <- glm(rw1 ~ authoritarian+prejudice+trust, weights = anweight.x.x.y,
          family=gaussian, data = sset1)

summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()

# cross-validation of linear model
set.seed(145)
(cv.mse1a <- cv.glm(sset1, m1, k=10)$delta) # using default
#
cost1 <- function(rw1, pi=0) {mean((rw1-pi)^2)}
set.seed(145)
(cv.mse1b <- cv.glm(sset1, m1, cost1, k=10)$delta) # formulating default explicitly

# as probit model

m2 <- glm(rw1 ~ authoritarian+prejudice+trust, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          data = sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()

# cross-validation of probit model

set.seed(321)
(cv.mse2a <- cv.glm(sset1, m2, k=10)$delta) # using default
#
cost2 <- function(rw1, pi=0) {mean((rw1-pi)^2)}
set.seed(321)
(cv.mse2b <- cv.glm(sset1, m2, cost2, k=10)$delta) # formulating default explicitly
#
# -----
# rw2

rm(list = ls())
load("ess19.Rdata")

library(boot)

sset1 <- subset(ess19, select = c(authoritarian, rw2, anweight.x.x.y )) #
sset1 <- na.omit(sset1)

# as linear model

m1 <- glm(rw2 ~ authoritarian, weights = anweight.x.x.y,
          family=gaussian, data = sset1)

summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()

# cross-validation of linear model
set.seed(145)
(cv.mse1a <- cv.glm(sset1, m1, k=10)$delta) # using default
#
cost1 <- function(rw2, pi=0) {mean((rw2-pi)^2)}
set.seed(145)
(cv.mse1b <- cv.glm(sset1, m1, cost1, k=10)$delta) # formulating default explicitly

```

```

# as probit model
m2 <- glm(rw2 ~ authoritarian, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          data = sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()

# cross-validation of probit model
set.seed(321)
(cv.mse2a <- cv.glm(sset1, m2, k=10)$delta) # using default
#
cost2 <- function(rw2, pi=0) {mean((rw2-pi)^2)}
set.seed(321)
(cv.mse2b <- cv.glm(sset1, m2, cost2, k=10)$delta) # formulating default explicitly
#
# -----

rm(list = ls())
load("ess19.Rdata")
library(boot)

sset1 <- subset(ess19, select = c(authoritarian, prejudice, rw2, anweight.x.x.y ))
sset1 <- na.omit(sset1)

# as linear model
m1 <- glm(rw2 ~ authoritarian+prejudice, weights = anweight.x.x.y,
          family=gaussian, data = sset1)

summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()

# cross-validation of linear model
set.seed(145)
(cv.mse1a <- cv.glm(sset1, m1, k=10)$delta) # using default
#
cost1 <- function(rw2, pi=0) {mean((rw2-pi)^2)}
set.seed(145)
(cv.mse1b <- cv.glm(sset1, m1, cost1, k=10)$delta) # formulating default explicitly

# as probit model
m2 <- glm(rw2 ~ authoritarian+prejudice, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          data = sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()

# cross-validation of probit model
set.seed(321)
(cv.mse2a <- cv.glm(sset1, m2, k=10)$delta) # using default
#
cost2 <- function(rw2, pi=0) {mean((rw2-pi)^2)}
set.seed(321)
(cv.mse2b <- cv.glm(sset1, m2, cost2, k=10)$delta) # formulating default explicitly
#
# -----

rm(list = ls())
load("ess19.Rdata")
library(boot)

```

```

sset1 <- subset(ess19, select = c(authoritarian, prejudice, trust, rw2, anweight.x.x.y )) #
sset1 <- na.omit(sset1)

# as linear model

m1 <- glm(rw2 ~ authoritarian+prejudice+trust, weights = anweight.x.x.y,
          family=gaussian, data = sset1)

summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()

# cross-validation of linear model
set.seed(145)
(cv.mse1a <- cv.glm(sset1, m1, k=10)$delta) # using default
#
cost1 <- function(rw2, pi=0) {mean((rw2-pi)^2)}
set.seed(145)
(cv.mse1b <- cv.glm(sset1, m1, cost1, k=10)$delta) # formulating default explicitly

# as probit model

m2 <- glm(rw2 ~ authoritarian+prejudice+trust, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          data = sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()

# cross-validation of probit model

set.seed(321)
(cv.mse2a <- cv.glm(sset1, m2, k=10)$delta) # using default
#
cost2 <- function(rw2, pi=0) {mean((rw2-pi)^2)}
set.seed(321)
(cv.mse2b <- cv.glm(sset1, m2, cost2, k=10)$delta) # formulating default explicitly

# #####

# Testing block 2: Validation set design
# run sequentially # MSE as criterion

# ----- VALIDATION SET DESIGN -----
#
#
rm(list = ls())
load("ess19.Rdata")

sset1 <- subset(ess19, select = c(authoritarian, rw, anweight.x.x.y ))
sset1 <- na.omit(sset1) # 276,217

set.seed(123)
train <- sample(276217, 193352) # 276217 * 0.7 = 193,352

# Linear model

m1 <- glm(rw ~ authoritarian, weights = anweight.x.x.y,
          family=gaussian,
          subset = train, data=sset1)
summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)

```

```

{mean((m1$y - m1$fitted.values)^2)}
MSE1()
mean((sset1$rw-predict(m1, sset1))[-train]^2)

# probit model

m2 <- glm(rw ~ authoritarian, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          subset = train, data=sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()
mean((sset1$rw-predict(m2, type="response", sset1))[-train]^2)

# -----

rm(list = ls())
load("ess19.Rdata")

sset1 <- subset(ess19, select = c(authoritarian, prejudice, rw, anweight.x.x.y ))
sset1 <- na.omit(sset1) # 268,234

set.seed(123)
train <- sample(268234, 187764) # 268234 * 0.7 = 187,764

# Linear model

m1 <- glm(rw ~ authoritarian+prejudice, weights = anweight.x.x.y,
          family=gaussian,
          subset = train, data=sset1)
summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()
mean((sset1$rw-predict(m1, sset1))[-train]^2)

# probit model

m2 <- glm(rw ~ authoritarian+prejudice, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          subset = train, data=sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()
mean((sset1$rw-predict(m2, type="response", sset1))[-train]^2)

# -----

rm(list = ls())
load("ess19.Rdata")

sset1 <- subset(ess19, select = c(authoritarian, prejudice, trust, rw, anweight.x.x.y ))
sset1 <- na.omit(sset1) # 268,234

set.seed(123)
train <- sample(268234, 187764) # 268234 * 0.7 = 187,764

# Linear model

m1 <- glm(rw ~ authoritarian+prejudice+trust, weights = anweight.x.x.y,
          family=gaussian,
          subset = train, data=sset1)
summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

```

```

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()
mean((sset1$rw-predict(m1, sset1))[-train]^2)

# probit model

m2 <- glm(rw ~ authoritarian+prejudice+trust, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          subset = train, data=sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()
mean((sset1$rw-predict(m2, type="response", sset1))[-train]^2)

# -----

rm(list = ls())
load("ess19.Rdata")

sset1 <- subset(ess19, select = c(authoritarian, prejudice, anweight.x.x.y ))
sset1 <- na.omit(sset1) # 305,492

set.seed(123)
train <- sample(305492, 213844) # 305492 * 0.7 = 213,844

# Linear model

m1 <- glm(prejudice ~ authoritarian, weights = anweight.x.x.y,
          family=gaussian,
          subset = train, data=sset1)
summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)}
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()
mean((sset1$prejudice-predict(m1, sset1))[-train]^2)

# -----

rm(list = ls())
load("ess19.Rdata")

sset1 <- subset(ess19, select = c(trust, prejudice, anweight.x.x.y ))
sset1 <- na.omit(sset1) # 322,020

set.seed(123)
train <- sample(322020, 225414) # 322,020 * 0.7 = 225,414

# Linear model

m1 <- glm(trust ~ prejudice, weights = anweight.x.x.y,
          family=gaussian,
          subset = train, data=sset1)
summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)}
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()
mean((sset1$trust-predict(m1, sset1))[-train]^2)

# =====

```

```

rm(list = ls())
load("ess19.Rdata")

sset1 <- subset(ess19, select = c(authoritarian, rw1, anweight.x.x.y ))
sset1 <- na.omit(sset1) # 282,343

set.seed(123)
train <- sample(282343, 197640) # 282343 * 0.7 = 197640

# Linear model
m1 <- glm(rw1 ~ authoritarian, weights = anweight.x.x.y,
          family=gaussian,
          subset = train, data=sset1)
summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()
mean((sset1$rw1-predict(m1, sset1))[-train]^2)

# probit model
m2 <- glm(rw1 ~ authoritarian, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          subset = train, data=sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()
mean((sset1$rw1-predict(m2, type="response", sset1))[-train]^2)

# -----

rm(list = ls())
load("ess19.Rdata")

sset1 <- subset(ess19, select = c(authoritarian, prejudice, rw1, anweight.x.x.y ))
sset1 <- na.omit(sset1) # 273,776

set.seed(123)
train <- sample(273776, 191643) # 273776 * 0.7 = 191,643

# Linear model
m1 <- glm(rw1 ~ authoritarian+prejudice, weights = anweight.x.x.y,
          family=gaussian,
          subset = train, data=sset1)
summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()
mean((sset1$rw1-predict(m1, sset1))[-train]^2)

# probit model
m2 <- glm(rw1 ~ authoritarian+prejudice, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          subset = train, data=sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

```

```

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()
mean((sset1$rw1-predict(m2, type="response", sset1))[-train]^2)

# -----

rm(list = ls())
load("ess19.Rdata")

sset1 <- subset(ess19, select = c(authoritarian, prejudice, trust, rw1, anweight.x.x.y ))
sset1 <- na.omit(sset1) # 273,776

set.seed(123)
train <- sample(273776, 191643) # 273776 * 0.7 = 191,643

# Linear model

m1 <- glm(rw1 ~ authoritarian+prejudice+trust, weights = anweight.x.x.y,
         family=gaussian,
         subset = train, data=sset1)
summary(m1)

Rsquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)}
rsq}
Rsquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()
mean((sset1$rw1-predict(m1, sset1))[-train]^2)

# probit model

m2 <- glm(rw1 ~ authoritarian+prejudice+trust, weights = anweight.x.x.y,
         family=quasibinomial(link=probit),
         subset = train, data=sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()
mean((sset1$rw1-predict(m2, type="response", sset1))[-train]^2)

# MODELS for rw2

rm(list = ls())
load("ess19.Rdata")

sset1 <- subset(ess19, select = c(authoritarian, rw2, anweight.x.x.y ))
sset1 <- na.omit(sset1) # 308,861

set.seed(123)
train <- sample(308861, 216203) # 308,861 * 0.7 = 216,203

# Linear model

m1 <- glm(rw2 ~ authoritarian, weights = anweight.x.x.y,
         family=gaussian,
         subset = train, data=sset1)
summary(m1)

Rsquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)}
rsq}
Rsquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()
mean((sset1$rw2-predict(m1, sset1))[-train]^2)

# probit model

m2 <- glm(rw2 ~ authoritarian, weights = anweight.x.x.y,

```



```

        family=quasibinomial(link=probit),
        subset = train, data=sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()
mean((sset1$rw2-predict(m2, type="response", sset1))[-train]^2)

# -----

rm(list = ls())
load("ess19.Rdata")

sset1 <- subset(ess19, select = c(authoritarian, prejudice, rw2, anweight.x.x.y ))
sset1 <- na.omit(sset1) # 297,771

set.seed(123)
train <- sample(297771, 208440) # 297771 * 0.7 = 208440

# Linear model

m1 <- glm(rw2 ~ authoritarian+prejudice, weights = anweight.x.x.y,
        family=gaussian,
        subset = train, data=sset1)
summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)}
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()
mean((sset1$rw2-predict(m1, sset1))[-train]^2)

# probit model

m2 <- glm(rw2 ~ authoritarian+prejudice, weights = anweight.x.x.y,
        family=quasibinomial(link=probit),
        subset = train, data=sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()
mean((sset1$rw2-predict(m2, type="response", sset1))[-train]^2)

# -----

rm(list = ls())
load("ess19.Rdata")

sset1 <- subset(ess19, select = c(authoritarian, prejudice, trust, rw2, anweight.x.x.y ))
sset1 <- na.omit(sset1) # 297,771

set.seed(123)
train <- sample(297771, 208440) # 297771 * 0.7 = 208440

# Linear model

m1 <- glm(rw2 ~ authoritarian+prejudice+trust, weights = anweight.x.x.y,
        family=gaussian,
        subset = train, data=sset1)
summary(m1)

RSquare <- function(x = m1$y, y = m1$fitted.values)
{rsq <- c(cor(m1$y, m1$fitted.values)^2)}
rsq}
RSquare()

Adj.Dispersion <- var(m1$residuals) *(m1$df.residual/m1$df.null)
Adj.Dispersion

# MSE related to N
MSE1 <- function(x = m1$y, y = m1$fitted.values)
{mean((m1$y - m1$fitted.values)^2)}
MSE1()

```

```

mean((sset1$rw2-predict(m1, sset1))[-train]^2)
# probit model
m2 <- glm(rw2 ~ authoritarian+prejudice+trust, weights = anweight.x.x.y,
          family=quasibinomial(link=probit),
          subset = train, data=sset1)
summary(m2)

MCF <- 1 - (m2$deviance/m2$null.deviance) # McFadden Pseudo-R2
MCF

MSE2 <- function(x = m2$y, y = m2$fitted.values)
{mean((m2$y - m2$fitted.values)^2)}
MSE2()
mean((sset1$rw2-predict(m2, type="response", sset1))[-train]^2)

# #####
#
# Testing block 3: Validation set design, structural equation models
# run sequentially # SRMR as criterion
#
# ----- SEM in VALIDATION SET DESIGN -----
#
# -----Target variable rw -----
#
#
# MODEL 1 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, select = c(LNR, cntry,
                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                ipfrule.x, imptrad.x,
                                imsmetn.x, imdfetn.x, impcntr.x,
                                ppltrst.x, pplfair.x, pplhlp.x,
                                rw, anweight.x.x.x ))

#
sset1 <- na.omit(sset1) # results in 268234/340215 # 78.84% of initial sample size
#
set.seed(123)
#
tr <- sample(268234, 187764)
traindata <- sset1[tr, ] # results in 187,764 cases
testdata <- sset1[-tr, ] # results in 80,470 cases
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'

rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)

```

```

r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
#
x <- unlist(rw.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rwt.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
xt <- unlist(rwt.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/21)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rws.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

```

```

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)

fitmeasures(rws.fit, fit.measures = c("ecvi"))

#
# =====
#
# MODEL 2 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, select = c(LNR, cntry,
                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                ipfrule.x, imptrad.x,
                                imsmetn.x, imdfetn.x, impcntr.x,
                                ppltrst.x, pplfair.x, pplhlp.x,
                                rw, anweight.x.x.x ))

#
sset1 <- na.omit(sset1) # results in 268234/340215 # 78.84% of initial sample size
#
set.seed(123)
#
tr <- sample(268234, 187764)
traindata <- sset1[tr, ] # results in 187,764 cases
testdata <- sset1[-tr, ] # results in 80,470 cases
#
#
library(lavaan)
#
rw.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
# prejudice ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'
rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01
#
x <- as.data.frame(rw.fit@sampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw.fit@implied$cov)
implied <- y * m01
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix
#
rwt.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

```

```

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'

rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
xt <- as.data.frame(rwt.fit@SampleStats@cov)
observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rws.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'

rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
fitmeasures(rws.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, select = c(LNR, cntry,
                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                ipfrule.x, imptradr.x,
                                imsmetn.x, imdfetn.x, impcntr.x,
                                ppltrst.x, pplfair.x, pplhlp.x,
                                rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 268234/340215 # 78.84% of initial sample size
set.seed(123)

tr <- sample(268234, 187764)
traindata <- sset1[tr, ] # results in 187,764 cases
testdata <- sset1[-tr, ] # results in 80,470 cases
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptradr, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#

```

```

rw.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
# rw ~ prejudice

rw ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'

rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)

#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)

#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptradr, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rwt.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
# rw ~ prejudice

rw ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'

rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)

#
xt <- unlist(rwt.fit@SampleStats@cov)
obst <- xt * m01

```

```

observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rws.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
# rw ~ prejudice
rw ~ authoritarian + prejudice
prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)

fitmeasures(rws.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, select = c(LNR, cntry,
                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                ipfrule.x, imptrad.x,
                                imsmetn.x, imdfetn.x, impcntr.x,
                                ppltrst.x, pplfair.x, pplhlp.x,
                                rw, anweight.x.x.x))

sset1 <- na.omit(sset1) # results in 268234/340215 # 78.84% of initial sample size
set.seed(123)

tr <- sample(268234, 187764)
traindata <- sset1[tr, ] # results in 187,764 cases
testdata <- sset1[-tr, ] # results in 80,470 cases
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
# rw ~ prejudice
# rw ~ authoritarian + prejudice

```

```

# prejudice ~ authoritarian
rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
       estimates = TRUE, standardized = TRUE, rsquare=TRUE,
       modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/78)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rwt.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impctr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw"),
             meanstructure = TRUE)
#
xt <- unlist(rwt.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#

```



```

# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rws.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'

rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)

fitmeasures(rws.fit, fit.measures = c("ecvi"))

# =====
# -----Target variable rw1 -----
#
# MODEL 1 FOR rw1
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, select = c(LNR, cntry,
                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                ipfrule.x, imptrad.x,
                                imsmetn.x, imdfetn.x, impcntr.x,
                                ppltrst.x, pplfair.x, pplhlp.x,
                                rw1, anweight.x.x.x ))

#
sset1 <- na.omit(sset1) # results in 273,776/340215 # 80.47% of initial sample size
# 273776 * 0.7 =191,643

set.seed(123)
#
tr <- sample(273776, 191643) # 273,776 * 0.7 = 191,643
traindata <- sset1[tr, ] # results in 191,643 cases
testdata <- sset1[-tr, ] # results in 82,133 cases
#
# -----
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian

```

```

# trust ~ prejudice
#
rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetrn.x", "imdfetrn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)
#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
#
x <- unlist(rw1.fit@samplestats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingsSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgv <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptradr, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1t.model <- '

authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr

# prejudice =~ imsmetrn.x + imdfetrn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetrn.x", "imdfetrn.x", "impcntr.x", "rw1t"),
              meanstructure = TRUE)
#
xt <- unlist(rw1t.fit@samplestats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/21)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgv <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptradr, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

```

```

rwls.model <- '
authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw1 ~ authoritarian
# rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rwls.fit <- sem(rwls.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)

fitmeasures(rwls.fit, fit.measures = c("ecvi"))

#
# =====
#
# MODEL 2 FOR rw1
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, select = c(LNR, cntry,
                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                ipfrule.x, imptrad.x,
                                imsmetn.x, imdfetn.x, impcntr.x,
                                ppltrst.x, pplfair.x, pplhlp.x,
                                rw1, anweight.x.x.x ))

#
sset1 <- na.omit(sset1) # results in 273,776/340215 # 80.47% of initial sample size
# 273776 * 0.7 =191,643

set.seed(123)
#
tr <- sample(273776, 191643) # 273,776 * 0.7 = 191,643
traindata <- sset1[tr, ] # results in 191,643 cases
testdata <- sset1[-tr, ] # results in 82,133 cases
#
# -----
#
#
library(lavaan)
#
rw1.model <- '
# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'
rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01

```

```

#
x <- as.data.frame(rw1.fit@SampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw1.fit@implied$cov)
implied <- y * m01
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingsSRMR
#
# same model for testdata to get its observed covariance matrix
#
rw1t.model <- '
# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
xt <- as.data.frame(rw1t.fit@SampleStats@cov)
observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#           from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rw1s.model <- '
# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw1s.fit <- sem(rw1s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
fitmeasures(rw1s.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw1
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, select = c(LNR, cntry,
                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                ipfrule.x, imptrad.x,
                                imsmetn.x, imdfetn.x, impcntr.x,
                                ppltrst.x, pplfair.x, pplhlp.x,
                                rw1, anweight.x.x.x ))
#
sset1 <- na.omit(sset1) # results in 273,776/340215 # 80.47% of initial sample size
# 273776 * 0.7 =191,643

```

```

set.seed(123)
#
tr <- sample(273776, 191643) # 273,776 * 0.7 = 191,643
traindata <- sset1[tr, ] # results in 191,643 cases
testdata <- sset1[-tr, ] # results in 82,133 cases
#
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
# rw1 ~ prejudice
rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)
#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw1.fit@samplestats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

```

```

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'
rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
xt <- unlist(rw1t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw1s.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'
rw1s.fit <- sem(rw1s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)

fitmeasures(rw1s.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw1
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, select = c(LNR, cntry,
                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                ipfrule.x, imptrad.x,
                                imsmetn.x, imdfetn.x, impcntr.x,
                                ppltrst.x, pplfair.x, pplhlp.x,
                                rw1, anweight.x.x.x ))
#
sset1 <- na.omit(sset1) # results in 273,776/340215 # 80.47% of initial sample size
# 273776 * 0.7 =191,643

set.seed(123)
#
tr <- sample(273776, 191643) # 273,776 * 0.7 = 191,643
traindata <- sset1[tr, ] # results in 191,643 cases
testdata <- sset1[-tr, ] # results in 82,133 cases
#
# -----

```

```

#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)
#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0)
r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw1.fit@samplestats$cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/78)
TrainingsSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian

```

```

# rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetrn.x", "imdfetrn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
xt <- unlist(rw1t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#          from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgv <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprp <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptradr, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw1s.model <- '
authoritarian =~ impsafer + ipstrgv + ipbhprp + ipfruler + imptradr
prejudice =~ imsmetrn.x + imdfetrn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rw1s.fit <- sem(rw1s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetrn.x", "imdfetrn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)

fitmeasures(rw1s.fit, fit.measures = c("ecvi"))

# =====
# -----Target variable rw2 -----
#
# MODEL 1 FOR rw2
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, select = c(LNR, cntry,
                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                ipfrule.x, imptradr.x,
                                imsmetrn.x, imdfetrn.x, impcntr.x,
                                ppltrst.x, pplfair.x, pplhlp.x,
                                rw2, anweight.x.x.x ))
#
sset1 <- na.omit(sset1) # results in 297,771/340,215 # 87.52% of initial sample size
set.seed(123)
#
tr <- sample(297771, 208440) # 297771 * 0.7 = 208440
traindata <- sset1[tr, ] # results in 208,440 cases
testdata <- sset1[-tr, ] # results in 89,331 cases
#
# -----
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

```



```

traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw2.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw2 ~ authoritarian
# rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
x <- unlist(rw2.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw2 ~ authoritarian
# rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#

```

```

rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- unlist(rw2t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/21)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#          from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgv <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprp <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptrad <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw2s.model <- '
authoritarian =~ impsafer + ipstrgv + ipbhprp + ipfruler + imptrad
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw2 ~ authoritarian
# rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)

fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

#
# =====
#
# MODEL 2 FOR rw2
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, select = c(LNR, cntry,
                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                ipfrule.x, imptrad.x,
                                imsmetn.x, imdfetn.x, impcntr.x,
                                ppltrst.x, pplfair.x, pplhlp.x,
                                rw2, anweight.x.x.x ))
#
sset1 <- na.omit(sset1) # results in 297,771/340,215 # 87.52% of initial sample size
set.seed(123)
#
tr <- sample(297771, 208440) # 297771 * 0.7 = 208440
traindata <- sset1[tr, ] # results in 208,440 cases
testdata <- sset1[-tr, ] # results in 89,331 cases
#
# -----
#
#
library(lavaan)
#
rw2.model <- '
# authoritarian =~ impsafer + ipstrgv + ipbhprp + ipfruler + imptrad
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

```

```

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01
#
x <- as.data.frame(rw2.fit@SampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw2.fit@implied$cov)
implied <- y * m01
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingsSRMR
#
# same model for testdata to get its observed covariance matrix
#
rw2t.model <- '
# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
xt <- as.data.frame(rw2t.fit@SampleStats@cov)
observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#           from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rw2s.model <- '
# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
#
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),

```

```

                meanstructure = TRUE)
#
fitmeasures(rw2s.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw2
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, select = c(LNR, cntry,
                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                ipfrule.x, imptrad.x,
                                imsmetn.x, imdfetn.x, impcntr.x,
                                ppltrst.x, pplfair.x, pplhlp.x,
                                rw2, anweight.x.x.x ))
#
sset1 <- na.omit(sset1) # results in 297,771/340,215 # 87.52% of initial sample size
set.seed(123)
#
tr <- sample(297771, 208440) # 297771 * 0.7 = 208440
traindata <- sset1[tr, ] # results in 208,440 cases
testdata <- sset1[-tr, ] # results in 89,331 cases
#
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw2.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice
rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw2.fit@samplestats$cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#

```

```

TrainingSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgv <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '

authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- unlist(rw2t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgv <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw2s.model <- '

authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)

fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw2
#
# -----
rm(list = ls())

```

```

load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, select = c(LNR, cntry,
                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                ipfrule.x, imptrad.x,
                                imsmetn.x, imdfetn.x, impcntr.x,
                                ppltrst.x, pplfair.x, pplhlp.x,
                                rw2, anweight.x.x.x ))

#
sset1 <- na.omit(sset1) # results in 297,771/340,215 # 87.52% of initial sample size
set.seed(123)
#
tr <- sample(297771, 208440) # 297771 * 0.7 = 208440
traindata <- sset1[tr, ] # results in 208,440 cases
testdata <- sset1[-tr, ] # results in 89,331 cases
#
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw2.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0)
r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw2.fit@samplestats$cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/78)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#

```

```

#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- unlist(rw2t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#         from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2s.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

# ENDE TESTING BLOCK 3
#
# #####
#
# Testing block 4: Temporal validation set design, structural equation models
# run sequentially # SRMR as criterion
#
# ----- SEM in LONGITUDINAL VALIDATION SET DESIGN -----
#
# -----Target variable rw -----
# PERIOD A

```

```

#
# MODEL 1 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround <= 4, select = c(LNR, cntry, essround,
        impsafe.x, ipstrgv.x, ipbhprp.x,
        ipfrule.x, imptrad.x,
        imsmetn.x, imdfetn.x, impcctr.x,
        ppltrst.x, pplfair.x, pplhlp.x,
        rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 112,133 cases overall
# (=training + test sample)
traindata <-subset(sset1, essround <= 3) # results in 83,071 cases in rounds 1 to 3.
testdata <-subset(sset1, essround == 4) # results in 29,062 in round 4

# addmargins(table(traindata$essround))
# addmargins(table(testdata$essround))

#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcctr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
        ordered=c("imsmetn.x", "imdfetn.x", "impcctr.x", "rw"),
        meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
#
x <- unlist(rw.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#

```





```

                                rw, anweight.x.x.x ))
sset1 <- na.omit(sset1)                                # results in 112,133 cases overall
#                                                    (=training + test sample)
traindata <-subset(sset1, essround <= 3)              # results in 83,071 cases in rounds 1 to 3.
testdata <-subset(sset1, essround == 4)              # results in 29,062 in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
library(lavaan)
#
rw.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01
#
x <- as.data.frame(rw.fit@SampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw.fit@implied$cov)
implied <- y * m01
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix
#
rwt.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
xt <- as.data.frame(rwt.fit@SampleStats@cov)
observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#
from testdata

```

```

#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rws.model <- '
# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
rw ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
# fitmeasures(rws.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround <= 4, select = c(LNR, cntry, essround,
                                              impsafe.x, ipstrgv.x, ipbhprp.x,
                                              ipfrule.x, imptrad.x,
                                              imsmetn.x, imdfetn.x, impcntr.x,
                                              ppltrst.x, pplfair.x, pplhlp.x,
                                              rw, anweight.x.x.x))

sset1 <- na.omit(sset1) # results in 112,133 cases overall
# (=training + test sample)
traindata <-subset(sset1, essround <= 3) # results in 83,071 cases in rounds 1 to 3.
testdata <-subset(sset1, essround == 4) # results in 29,062 in round 4

# addmargins(table(traindata$essround))
# addmargins(table(testdata$essround))
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgv <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptrad <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '
authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
# rw ~ prejudice
# rw ~ authoritarian + prejudice
prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)

```

```

#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw.fit@sampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingsSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rwt.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

rw ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
xt <- unlist(rwt.fit@sampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rws.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

```

```

# rw ~ authoritarian
# rw ~ prejudice

rw ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)

fitmeasures(rws.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround <= 4, select = c(LNR, cntry, essround,
                                              impsafe.x, ipstrgv.x, ipbhprp.x,
                                              ipfrule.x, imptrad.x,
                                              imsmetn.x, imdfetn.x, impcntr.x,
                                              ppltrst.x, pplfair.x, pplhlp.x,
                                              rw, anweight.x.x.x))

sset1 <- na.omit(sset1) # results in 112,133 cases overall
                        (=training + test sample)
traindata <-subset(sset1, essround <= 3) # results in 83,071 cases in rounds 1 to 3.
testdata <-subset(sset1, essround == 4) # results in 29,062 in round 4

# addmargins(table(traindata$essround))
# addmargins(table(testdata$essround))
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'

rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)

#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)

#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0)

```

```

r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/78)
TrainingsSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rwt.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'

rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
xt <- unlist(rwt.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#                                               from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rws.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

```

```

,
rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)

fitmeasures(rws.fit, fit.measures = c("ecvi"))

# =====
# -----Target variable rw1 -----
#
# MODEL 1 FOR rw1
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround <= 4, select = c(LNR, cntry, essround,
                                              impsafe.x, ipstrgv.x, ipbhprp.x,
                                              ipfrule.x, imptrad.x,
                                              imsmetn.x, imdfetn.x, impcntr.x,
                                              ppltrst.x, pplfair.x, pplhlp.x,
                                              rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 114,667 cases overall
# (=training + test sample)
traindata <-subset(sset1, essround <= 3) # results in 85,035 cases in rounds 1 to 3.
testdata <-subset(sset1, essround == 4) # results in 29,632 in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
,
rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)

#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)

#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
#
x <- unlist(rw1.fit@Samplestats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#

```

```

y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingsSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1t.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

# prejudice =~ imsmetr.x + imdfetr.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetr.x", "imdfetr.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)

#
xt <- unlist(rw1t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/21)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#                                               from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw1s.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

# prejudice =~ imsmetr.x + imdfetr.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rw1s.fit <- sem(rw1s.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetr.x", "imdfetr.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)

fitmeasures(rw1s.fit, fit.measures = c("ecvi"))

#

```



```

# =====
#
# MODEL 2 FOR rw1
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround <= 4, select = c(LNR, cntry, essround,
                                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                                ipfrule.x, imptrad.x,
                                                imsmetn.x, imdfetn.x, impcntr.x,
                                                ppltrst.x, pplfair.x, pplhlp.x,
                                                rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 114,667 cases overall
# (=training + test sample)
traindata <-subset(sset1, essround <= 3) # results in 85,035 cases in rounds 1 to 3.
testdata <-subset(sset1, essround == 4) # results in 29,632 in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
#
library(lavaan)
#
rw1.model <- '

# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)
#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01
#
x <- as.data.frame(rw1.fit@sampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw1.fit@implied$cov)
implied <- y * m01
implied
#
TrainingsRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingsRMR
#
# same model for testdata to get its observed covariance matrix
#
rw1t.model <- '

# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust

```

```

# prejudice ~ authoritarian
# trust ~ prejudice
,
rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
xt <- as.data.frame(rw1t.fit@SampleStats@cov)
observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#         from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rw1s.model <- '
# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
,
rw1s.fit <- sem(rw1s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
fitmeasures(rw1s.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw1
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround <= 4, select = c(LNR, cntry, essround,
                                               impsafe.x, ipstrgv.x, ipbhprp.x,
                                               ipfrule.x, imptradr.x,
                                               imsmetn.x, imdfetn.x, impcntr.x,
                                               ppltrst.x, pplfair.x, pplhlp.x,
                                               rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 114,667 cases overall
# (=training + test sample)
traindata <-subset(sset1, essround <= 3) # results in 85,035 cases in rounds 1 to 3.
testdata <-subset(sset1, essround == 4) # results in 29,632 in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgv <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptradr, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '
#
# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
#
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
#
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
#
# rw1 ~ authoritarian

```

```

# rw1 ~ prejudice
rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
,
rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw1"),
              meanstructure = TRUE)
#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw1.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impctr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
,
rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw1"),
              meanstructure = TRUE)
#
xt <- unlist(rw1t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#

```

```

# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw1s.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
# rw1 ~ prejudice

rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'

rw1s.fit <- sem(rw1s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)

fitmeasures(rw1s.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw1
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround <= 4, select = c(LNR, cntry, essround,
        impsafe.x, ipstrgv.x, ipbhprp.x,
        ipfrule.x, imptrad.x,
        imsmetn.x, imdfetn.x, impcntr.x,
        ppltrst.x, pplfair.x, pplhlp.x,
        rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 114,667 cases overall
# (=training + test sample)
traindata <-subset(sset1, essround <= 3) # results in 85,035 cases in rounds 1 to 3.
testdata <-subset(sset1, essround == 4) # results in 29,632 in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'

```

```

rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)
#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw1.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/78)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1t.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'

rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1t"),
              meanstructure = TRUE)
#
xt <- unlist(rw1t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

```

```

sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
rw1s.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'
rw1s.fit <- sem(rw1s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)

fitmeasures(rw1s.fit, fit.measures = c("ecvi"))

# =====
# -----Target variable rw2 -----
#
# MODEL 1 FOR rw2
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround <= 4, select = c(LNR, cntry, essround,
                                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                                ipfrule.x, imptrad.x,
                                                imsmetn.x, imdfetn.x, impcntr.x,
                                                ppltrst.x, pplfair.x, pplhlp.x,
                                                rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 124,726 cases overall
# (=training + test sample)
traindata <-subset(sset1, essround <= 3) # results in 92,474 cases in rounds 1 to 3.
testdata <-subset(sset1, essround == 4) # results in 32,252 in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
# -----

# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw2.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'
rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,

```

```

        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
#
x <- unlist(rw2.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingsSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

# prejudice =~ imsmetr.x + imdfetr.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetr.x", "imdfetr.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- unlist(rw2t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/21)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw2s.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

# prejudice =~ imsmetr.x + imdfetr.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

```

```

rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)

fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

#
# =====
# MODEL 2 FOR rw2
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround <= 4, select = c(LNR, cntry, essround,
                                                impsafe.x, ipstrgv.x, ipbhprp.x,
                                                ipfrule.x, imptrad.x,
                                                imsmetn.x, imdfetn.x, impcntr.x,
                                                ppltrst.x, pplfair.x, pplhlp.x,
                                                rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 124,726 cases overall
# (=training + test sample)
traindata <-subset(sset1, essround <= 3) # results in 92,474 cases in rounds 1 to 3.
testdata <-subset(sset1, essround == 4) # results in 32,252 in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
# library(lavaan)
#
rw2.model <- '

# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'

rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)

#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01
#
x <- as.data.frame(rw2.fit@SampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw2.fit@implied$cov)
implied <- y * m01
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingSRMR
#

```



```

# same model for testdata to get its observed covariance matrix
#
rw2t.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- as.data.frame(rw2t.fit@SampleStats@cov)
observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#         from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rw2s.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
fitmeasures(rw2s.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw2
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround <= 4, select = c(LNR, cntry, essround,
                                               impsafe.x, ipstrgv.x, ipbhprp.x,
                                               ipfrule.x, imptrad.x,
                                               imsmetn.x, imdfetn.x, impcntr.x,
                                               ppltrst.x, pplfair.x, pplhlp.x,
                                               rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 124,726 cases overall
# (=training + test sample)
traindata <-subset(sset1, essround <= 3) # results in 92,474 cases in rounds 1 to 3.
testdata <-subset(sset1, essround == 4) # results in 32,252 in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
# scale direction reversed for value items
#
library(car)

```

```

#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw2.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice
rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw2.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice
rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian

```

```

# trust ~ prejudice
'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- unlist(rw2t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#          from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw2s.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impctr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice

rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw2"),
               meanstructure = TRUE)

fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw2
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround <= 4, select = c(LNR, cntry, essround,
                                               impsafe.x, ipstrgv.x, ipbhprp.x,
                                               ipfrule.x, imptrad.x,
                                               imsmetn.x, imdfetn.x, impctr.x,
                                               ppltrst.x, pplfair.x, pplhlp.x,
                                               rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 124,726 cases overall
# (=training + test sample)
traindata <-subset(sset1, essround <= 3) # results in 92,474 cases in rounds 1 to 3.
testdata <-subset(sset1, essround == 4) # results in 32,252 in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#

```

```

rw2.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw2.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/78)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)

```

```

#
xt <- unlist(rw2t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#          from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgv <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw2s.model <- '
authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'

rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)

fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

# ENDE TESTING BLOCK 4
# =====
#
# Testing block 5: Temporal validation set design, structural equation models
# run sequentially # SRMR as criterion
#
# ----- SEM in LONGITUDINAL VALIDATION SET DESIGN -----
#
# -----Target variable rw -----
# PERIOD B
#
# MODEL 1 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 4 | essround == 5 | essround == 6 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 92,278 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 4 | essround == 5 )) # results in 59,183 cases in
rounds 4 and 5.
testdata <-subset(sset1, essround == 6) # results in 33,095 cases in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgv <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

```

```

traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw ~ authoritarian
# rw ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'
rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
x <- unlist(rw.fit@samplestats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingsSRMR
#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rwt.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw ~ authoritarian
# rw ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'
rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),

```

```

                meanstructure = TRUE)
#
xt <- unlist(rwt.fit@Samplestats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/21)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#          from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rws.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)

fitmeasures(rws.fit, fit.measures = c("ecvi"))

#
# =====
#
# MODEL 2 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 4 | essround == 5 | essround == 6 ),
              select = c(LNR, cntry, essround,
                        impsafe.x, ipstrgv.x, ipbhprp.x,
                        ipfrule.x, imptrad.x,
                        imsmetn.x, imdfetn.x, impcntr.x,
                        ppltrst.x, pplfair.x, pplhlp.x,
                        rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 92,278 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 4 | essround == 5 )) # results in 59,183 cases in
rounds 4 and 5.
testdata <-subset(sset1, essround == 6) # results in 33,095 cases in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
library(lavaan)
#
rw.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

```

```

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01
#
x <- as.data.frame(rw.fit@SampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw.fit@implied$cov)
implied <- y * m01
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix
#
rwt.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
rw ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
xt <- as.data.frame(rwt.fit@SampleStats@cov)
observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#           from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rws.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
rw ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)

```



```

#
fitmeasures(rws.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 4 | essround == 5 | essround == 6 ),
               select = c(LNR, cntry, essround,
                          impsafe.x, ipstrgv.x, ipbhprp.x,
                          ipfrule.x, imptrad.x,
                          imsmetn.x, imdfetn.x, impcntr.x,
                          ppltrst.x, pplfair.x, pplhlp.x,
                          rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 92,278 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 4 | essround == 5 )) # results in 59,183 cases in
rounds 4 and 5.
testdata <-subset(sset1, essround == 6) # results in 33,095 cases in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

rw ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'
rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#

```

```

TrainingSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rwt.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

rw ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'
rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
xt <- unlist(rwt.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rws.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

rw ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'
rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)

fitmeasures(rws.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw
#
rm(list = ls())
load("ess19.Rdata")

```

```

ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 4 | essround == 5 | essround == 6 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 92,278 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 4 | essround == 5 )) # results in 59,183 cases in
rounds 4 and 5.
testdata <-subset(sset1, essround == 6) # results in 33,095 cases in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'
rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0)
r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/78)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#

```

```

#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rwt.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
# rw ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian
rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
xt <- unlist(rwt.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#         from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rws.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
# rw ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian
rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
fitmeasures(rws.fit, fit.measures = c("ecvi"))
# =====
# -----Target variable rw1 -----
#
# MODEL 1 FOR rw1
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 4 | essround == 5 | essround == 6),
              select = c("LNR", "cntry", "essround",
                        "impsafe.x", "ipstrgv.x", "ipbhprp.x",

```

```

        ipfrule.x, imptrad.x,
        imsmetn.x, imdfetn.x, impcntr.x,
        ppltrst.x, pplfair.x, pplhlp.x,
        rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 94,015 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 4 | essround == 5 )) # results in 60,307 cases in
rounds 4 and 5.
testdata <-subset(sset1, essround == 6) # results in 33,708 cases in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'

rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)
#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
#
x <- unlist(rw1.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

```

```

testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw1 ~ authoritarian
# rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
xt <- unlist(rw1t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/21)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#         from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1s.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw1 ~ authoritarian
# rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw1s.fit <- sem(rw1s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
fitmeasures(rw1s.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 2 FOR rw1
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 4 | essround == 5 | essround == 6 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw1, anweight.x.x.x ))
#
sset1 <- na.omit(sset1) # results in 94,015 cases overall (=training + test
sample)

```

```

#
traindata <-subset(sset1, (essround == 4 | essround == 5 )) # results in 60,307 cases in
rounds 4 and 5.
testdata <-subset(sset1, essround == 6) # results in 33,708 cases in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
#
library(lavaan)
#
rw1.model <- '

# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'

rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)

#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01
#
x <- as.data.frame(rw1.fit@SampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw1.fit@implied$cov)
implied <- y * m01
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix
#
rw1t.model <- '

# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'

rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1t"),
              meanstructure = TRUE)

#
xt <- as.data.frame(rw1t.fit@SampleStats@cov)
observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance

```

```

#                               from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rwls.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rwls.fit <- sem(rwls.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
fitmeasures(rwls.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw1
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 4 | essround == 5 | essround == 6 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 94,015 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 4 | essround == 5 )) # results in 60,307 cases in
rounds 4 and 5.
testdata <-subset(sset1, essround == 6) # results in 33,708 cases in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
# rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
#
rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",

```



```

        ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
        meanstructure = TRUE)
#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw1.fit@sampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingsSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1t.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
xt <- unlist(rw1t.fit@sampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw1s.model <- '

```

```

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
# rw1 ~ prejudice

rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rwls.fit <- sem(rwls.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)

fitmeasures(rwls.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw1
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 4 | essround == 5 | essround == 6 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 94,015 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 4 | essround == 5 )) # results in 60,307 cases in
rounds 4 and 5.
testdata <-subset(sset1, essround == 6) # results in 33,708 cases in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'
rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)

#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#

```

```

r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0)
r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw1.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/78)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1t.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'
rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
xt <- unlist(rw1t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw1s.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

```

```

trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'

rwls.fit <- sem(rwls.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)

fitmeasures(rwls.fit, fit.measures = c("ecvi"))

# =====
# -----Target variable rw2 -----
#
# MODEL 1 FOR rw2
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 4 | essround == 5 | essround == 6 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 102,694 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 4 | essround == 5 )) # results in 65,886 cases in
rounds 4 and 5.
testdata <-subset(sset1, essround == 6) # results in 36,808 cases in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
# -----

# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw2.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'

rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)

#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)

```

```

r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
#
x <- unlist(rw2.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)

#
xt <- unlist(rw2t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/21)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw2s.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

```

```

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw2"),
               meanstructure = TRUE)

fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

#
# =====
#
# MODEL 2 FOR rw2
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 4 | essround == 5 | essround == 6 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impctr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 102,694 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 4 | essround == 5 )) # results in 65,886 cases in
rounds 4 and 5.
testdata <-subset(sset1, essround == 6) # results in 36,808 cases in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
#
library(lavaan)
#
rw2.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impctr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw2"),
               meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01
#
x <- as.data.frame(rw2.fit@sampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw2.fit@implied$cov)
implied <- y * m01
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix

```

```

#
rw2t.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- as.data.frame(rw2t.fit@SampleStats@cov)
observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#         from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rw2s.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
fitmeasures(rw2s.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw2
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 4 | essround == 5 | essround == 6 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw2, anweight.x.x.x ))
sset1 <- na.omit(sset1) # results in 102,694 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 4 | essround == 5 )) # results in 65,886 cases in
rounds 4 and 5.
testdata <-subset(sset1, essround == 6) # results in 36,808 cases in round 4
addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
# scale direction reversed for value items

```

```

#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw2.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice
rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw2.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice
rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian

```



```

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- unlist(rw2t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw2s.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impctr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'

rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw2"),
               meanstructure = TRUE)

fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw2
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 4 | essround == 5 | essround == 6 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impctr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 102,694 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 4 | essround == 5 )) # results in 65,886 cases in
rounds 4 and 5.
testdata <-subset(sset1, essround == 6) # results in 36,808 cases in round 4

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

```

```

traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw2.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'

rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw2.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/78)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

```

```

'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- unlist(rw2t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#         from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw2s.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'

rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)

fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

# ENDE TESTING BLOCK 5
# =====
#
# Testing block 6: Temporal validation set design, structural equation models
# run sequentially # SRMR as criterion
#
# ----- SEM in LONGITUDINAL VALIDATION SET DESIGN -----
#
# -----Target variable rw -----
# PERIOD C
#
# MODEL 1 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 6 | essround == 7 | essround == 8 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 94,939 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 6 | essround == 7 )) # results in 63,660 cases in
rounds 6 and 7.
testdata <-subset(sset1, essround == 8) # results in 31,279 cases in round 8

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
#
# scale direction reversed for value items
#

```

```

library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw ~ authoritarian
# rw ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'
rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
x <- unlist(rw.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rwt.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw ~ authoritarian
# rw ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian

```

```

# trust ~ prejudice
'
rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
xt <- unlist(rwt.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/21)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgv <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rws.model <- '
authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw ~ authoritarian
# rw ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)

fitmeasures(rws.fit, fit.measures = c("ecvi"))

#
# =====
#
# MODEL 2 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 6 | essround == 7 | essround == 8 ),
              select = c(LNR, cntry, essround,
                        impsafe.x, ipstrgv.x, ipbhprp.x,
                        ipfrule.x, imptradr.x,
                        imsmetn.x, imdfetn.x, impcntr.x,
                        ppltrst.x, pplfair.x, pplhlp.x,
                        rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 94,939 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 6 | essround == 7 )) # results in 63,660 cases in
rounds 6 and 7.
testdata <-subset(sset1, essround == 8) # results in 31,279 cases in round 8

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
library(lavaan)
#
rw.model <- '
# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian

```

```

rw ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'
rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01
#
x <- as.data.frame(rw.fit@SampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw.fit@implied$cov)
implied <- y * m01
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix
#
rwt.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
xt <- as.data.frame(rwt.fit@SampleStats@cov)
observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#           from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rws.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

```

```

'
rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
fitmeasures(rws.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 6 | essround == 7 | essround == 8 ),
              select = c(LNR, cntry, essround,
                        impsafe.x, ipstrgv.x, ipbhprp.x,
                        ipfrule.x, imptrad.x,
                        imsmetn.x, imdfetn.x, impcntr.x,
                        ppltrst.x, pplfair.x, pplhlp.x,
                        rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 94,939 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 6 | essround == 7 )) # results in 63,660 cases in
rounds 6 and 7.
testdata <-subset(sset1, essround == 8) # results in 31,279 cases in round 8

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

rw ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'

rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#

```

```

y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingsSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rwt.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

rw ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)

#
xt <- unlist(rwt.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#                                               from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rws.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

rw ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)

fitmeasures(rws.fit, fit.measures = c("ecvi"))

# =====

```



```

#
# MODEL 4 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 6 | essround == 7 | essround == 8 ),
               select = c(LNR, cntry, essround,
                          impsafe.x, ipstrgv.x, ipbhprp.x,
                          ipfrule.x, imptrad.x,
                          imsmetn.x, imdfetn.x, impcntr.x,
                          ppltrst.x, pplfair.x, pplhlp.x,
                          rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 94,939 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 6 | essround == 7 )) # results in 63,660 cases in
rounds 6 and 7.
testdata <-subset(sset1, essround == 8) # results in 31,279 cases in round 8

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'

rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0)
r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw.fit@samplestats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/78)

```

```

TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rwt.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'

rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
xt <- unlist(rwt.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rws.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'

rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)

fitmeasures(rws.fit, fit.measures = c("ecvi"))

# =====
# -----Target variable rw1 -----
#
# MODEL 1 FOR rw1
#
# -----
rm(list = ls())

```

```

load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 6 | essround == 7 | essround == 8 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 96,787 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 6 | essround == 7 )) # results in 64,849 cases in
rounds 6 and 7.
testdata <-subset(sset1, essround == 8) # results in 31,938 cases in round 8

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
',
rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)
#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
#
x <- unlist(rw1.fit@samplestats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#

```



```

        ppltrst.x, pplfair.x, pplhlp.x,
        rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 96,787 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 6 | essround == 7 )) # results in 64,849 cases in
rounds 6 and 7.
testdata <-subset(sset1, essround == 8) # results in 31,938 cases in round 8

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
#
library(lavaan)
#
rw1.model <- '

# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'

rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)

#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01
#
x <- as.data.frame(rw1.fit@SampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw1.fit@implied$cov)
implied <- y * m01
implied
#
TrainingsRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingsRMR
#
# same model for testdata to get its observed covariance matrix
#
rw1t.model <- '

# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'

rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)
#
xt <- as.data.frame(rw1t.fit@SampleStats@cov)

```

```

observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rwls.model <- '
# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rwls.fit <- sem(rwls.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
fitmeasures(rwls.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw1
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 6 | essround == 7 | essround == 8 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptradr.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 96,787 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 6 | essround == 7 )) # results in 64,849 cases in
rounds 6 and 7.
testdata <-subset(sset1, essround == 8) # results in 31,938 cases in round 8

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgv <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptradr, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '
#
# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
#
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
#
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
#
# rw1 ~ authoritarian
# rw1 ~ prejudice
#
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian
#
# rw1 ~ authoritarian + prejudice + trust

```

```

# prejudice ~ authoritarian
# trust ~ prejudice
,
rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw1"),
              meanstructure = TRUE)
#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw1.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptradr, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impctr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
# rw1 ~ prejudice
rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
,
rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw1"),
              meanstructure = TRUE)
#
xt <- unlist(rw1t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

```

```

sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw1s.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
# rw1 ~ prejudice

rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'

rw1s.fit <- sem(rw1s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)

fitmeasures(rw1s.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw1
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 6 | essround == 7 | essround == 8 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 96,787 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 6 | essround == 7 )) # results in 64,849 cases in
rounds 6 and 7.
testdata <-subset(sset1, essround == 8) # results in 31,938 cases in round 8

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'

rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)

```



```

#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw1.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/78)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1t.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'

rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
xt <- unlist(rw1t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw1s.model <- '

```

```

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'
rw1s.fit <- sem(rw1s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)

fitmeasures(rw1s.fit, fit.measures = c("ecvi"))

# =====
# -----Target variable rw2 -----
#
# MODEL 1 FOR rw2
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 6 | essround == 7 | essround == 8 ),
               select = c(LNR, cntry, essround,
                           impsafer.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 105,184 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 6 | essround == 7 )) # results in 70,393 cases in
rounds 6 and 7.
testdata <-subset(sset1, essround == 8) # results in 34,791 cases in round 8

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
# -----

# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw2.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'

rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)

#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,

```

```

        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
#
x <- unlist(rw2.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingsSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetrn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetrn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- unlist(rw2t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/21)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw2s.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetrn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

```

```

rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)

fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

#
# =====
#
# MODEL 2 FOR rw2
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 6 | essround == 7 | essround == 8 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 105,184 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 6 | essround == 7 )) # results in 70,393 cases in
rounds 6 and 7.
testdata <-subset(sset1, essround == 8) # results in 34,791 cases in round 8

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
#
library(lavaan)
#
rw2.model <- '

# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'
rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)

#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)

#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01
#
x <- as.data.frame(rw2.fit@sampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw2.fit@implied$cov)
implied <- y * m01
implied

```

```

#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix
#
rw2t.model <- '
# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- as.data.frame(rw2t.fit@SampleStats@cov)
observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rw2s.model <- '
# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
fitmeasures(rw2s.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw2
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 6 | essround == 7 | essround == 8 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 105,184 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 6 | essround == 7 )) # results in 70,393 cases in
rounds 6 and 7.
testdata <-subset(sset1, essround == 8) # results in 34,791 cases in round 8
addmargins(table(traindata$essround))

```

```

addmargins(table(testdata$essround))
#
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw2.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'
rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw2.fit@samplestats$cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingsSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian

```

```

# rw2 ~ prejudice
rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- unlist(rw2t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#         from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw2s.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impctr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice

rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw2"),
               meanstructure = TRUE)

fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw2
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 6 | essround == 7 | essround == 8 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impctr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 105,184 cases overall (=training + test
sample)
#
traindata <-subset(sset1, (essround == 6 | essround == 7 )) # results in 70,393 cases in
rounds 6 and 7.
testdata <-subset(sset1, essround == 8) # results in 34,791 cases in round 8

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
# scale direction reversed for value items
#

```

```

library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw2.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0)
r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw2.fit@samplestats$cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/78)
TrainingsSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice

```



```

# prejudice ~ authoritarian

rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- unlist(rw2t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#         from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgv <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw2s.model <- '
authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impctr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw2"),
               meanstructure = TRUE)

fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

# ENDE TESTING BLOCK 6

# =====
#
# Testing block 7: Temporal validation set design, structural equation models
# run sequentially # SRMR as criterion
#
# ----- SEM in LONGITUDINAL VALIDATION SET DESIGN -----
#
# -----Target variable rw -----
# PERIOD D
#
# MODEL 1 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 8 | essround == 9 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impctr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 62,320 cases overall (=training + test
sample)
#
traindata <-subset(sset1, essround == 8 ) # results in 31,279 cases in round 8
testdata <-subset(sset1, essround == 9 ) # results in 31,041 cases in round 9

addmargins(table(traindata$essround))

```

```

addmargins(table(testdata$essround))
#
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw ~ authoritarian
# rw ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
#
x <- unlist(rw.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rwt.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw ~ authoritarian
# rw ~ prejudice

```

```

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'
rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw"),
              meanstructure = TRUE)
#
xt <- unlist(rwt.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/21)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rws.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impctr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'
rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw"),
              meanstructure = TRUE)

fitmeasures(rws.fit, fit.measures = c("ecvi"))

#
# =====
#
# MODEL 2 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 8 | essround == 9 ),
              select = c(LNR, cntry, essround,
                        impsafe.x, ipstrgv.x, ipbhprp.x,
                        ipfrule.x, imptrad.x,
                        imsmetn.x, imdfetn.x, impctr.x,
                        ppltrst.x, pplfair.x, pplhlp.x,
                        rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 62,320 cases overall (=training + test
sample)
#
traindata <-subset(sset1, essround == 8 ) # results in 31,279 cases in round 8
testdata <-subset(sset1, essround == 9 ) # results in 31,041 cases in round 9

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
library(lavaan)
#
rw.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impctr.x

```

```

# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01
#
x <- as.data.frame(rw.fit@SampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw.fit@implied$cov)
implied <- y * m01
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix
#
rwt.model <- '

# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
xt <- as.data.frame(rwt.fit@SampleStats@cov)
observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#           from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rws.model <- '

# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

```

```

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
# fitmeasures(rws.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 8 | essround == 9 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 62,320 cases overall (=training + test
sample)
#
traindata <-subset(sset1, essround == 8 ) # results in 31,279 cases in round 8
testdata <-subset(sset1, essround == 9 ) # results in 31,041 cases in round 9

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
# rw ~ prejudice
rw ~ authoritarian + prejudice
prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw.fit@SampleStats@cov)

```

```

obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingsSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rwt.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

rw ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
xt <- unlist(rwt.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#                                               from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rws.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

rw ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)

```

```

fitmeasures(rws.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 8 | essround == 9 ),
               select = c(LNR, cntry, essround,
                          impsafe.x, ipstrgv.x, ipbhprp.x,
                          ipfrule.x, imptrad.x,
                          imsmetn.x, imdfetn.x, impcntr.x,
                          ppltrst.x, pplfair.x, pplhlp.x,
                          rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 62,320 cases overall (=training + test
sample)
#
traindata <-subset(sset1, essround == 8 ) # results in 31,279 cases in round 8
testdata <-subset(sset1, essround == 9 ) # results in 31,041 cases in round 9

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'

rw.fit <- sem(rw.model, data=traindata, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw.fit@sampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied

```

```

#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/78)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rwt.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'
rwt.fit <- sem(rwt.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
xt <- unlist(rwt.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rws.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'
rws.fit <- sem(rws.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)

fitmeasures(rws.fit, fit.measures = c("ecvi"))

# =====
# -----Target variable rw1 -----
#
# MODEL 1 FOR rw1
#

```



```

# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 8 | essround == 9 ),
               select = c(LNR, cntry, essround,
                          impsafe.x, ipstrgv.x, ipbhprp.x,
                          ipfrule.x, imptrad.x,
                          imsmetn.x, imdfetn.x, impcntr.x,
                          ppltrst.x, pplfair.x, pplhlp.x,
                          rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 63,585 cases overall (=training + test
sample)
#
traindata <-subset(sset1, essround == 8 ) # results in 31,938 cases in round 8
testdata <-subset(sset1, essround == 9 ) # results in 31,647 cases in round 9

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----

# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgv <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprp <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptrad <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '

authoritarian =~ impsafer + ipstrgv + ipbhprp + ipfruler + imptrad

# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'

rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)

#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)

#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
#
x <- unlist(rw1.fit@samplestats$cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#

```

```

#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw1 ~ authoritarian
# rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
xt <- unlist(rw1t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/21)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#         from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1s.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw1 ~ authoritarian
# rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw1s.fit <- sem(rw1s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
fitmeasures(rw1s.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 2 FOR rw1
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 8 | essround == 9 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,

```

```

        imsmetn.x, imdfetn.x, impcntr.x,
        ppltrst.x, pplfair.x, pplhlp.x,
        rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 63,585 cases overall (=training + test
sample)
#
traindata <-subset(sset1, essround == 8 ) # results in 31,938 cases in round 8
testdata <-subset(sset1, essround == 9 ) # results in 31,647 cases in round 9

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
#
library(lavaan)
#
rw1.model <- '

# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)
#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01
#
x <- as.data.frame(rw1.fit@SampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw1.fit@implied$cov)
implied <- y * m01
implied
#
TrainingsRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingsRMR
#
# same model for testdata to get its observed covariance matrix
#
rw1t.model <- '

# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
              meanstructure = TRUE)
#
xt <- as.data.frame(rw1t.fit@SampleStats@cov)

```

```

observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rwls.model <- '
# authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rwls.fit <- sem(rwls.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
fitmeasures(rwls.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw1
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 8 | essround == 9 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 63,585 cases overall (=training + test
sample)
#
traindata <-subset(sset1, essround == 8 ) # results in 31,938 cases in round 8
testdata <-subset(sset1, essround == 9 ) # results in 31,647 cases in round 9

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgv <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '
authoritarian =~ impsafer + ipstrgv + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
# rw1 ~ prejudice
rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian
# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian

```

```

# trust ~ prejudice
'
rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw1"),
              meanstructure = TRUE)
#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw1.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1t.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impctr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw1t"),
              meanstructure = TRUE)
#
xt <- unlist(rw1t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

```

```

sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
rw1s.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
# rw1 ~ prejudice

rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'
rw1s.fit <- sem(rw1s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)

fitmeasures(rw1s.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw1
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 8 | essround == 9 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 63,585 cases overall (=training + test
sample)
#
traindata <-subset(sset1, essround == 8 ) # results in 31,938 cases in round 8
testdata <-subset(sset1, essround == 9 ) # results in 31,647 cases in round 9

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw1.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'
rw1.fit <- sem(rw1.model, data=traindata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
summary(rw1.fit, header = TRUE, fit.measures = TRUE,

```

```

        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw1.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw1.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/78)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw1t.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'
rw1t.fit <- sem(rw1t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)
#
xt <- unlist(rw1t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw1s.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

```

```

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw1 ~ authoritarian
# rw1 ~ prejudice
# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian
rw1 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rwls.fit <- sem(rwls.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
               meanstructure = TRUE)

fitmeasures(rwls.fit, fit.measures = c("ecvi"))

# =====
# -----Target variable rw2 -----
#
# MODEL 1 FOR rw2
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 8 | essround == 9 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 69,018 cases overall (=training + test
sample)
#
traindata <-subset(sset1, essround == 8 ) # results in 34,791 cases in round 8
testdata <-subset(sset1, essround == 9 ) # results in 34,227 cases in round 9

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
# -----

# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw2.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'
rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)

```



```

r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0)
r6 <- c(1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6)
m01
#
#
#
x <- unlist(rw2.fit@sampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingsSRMR <- sqrt(sum((observed - implied)^2)/21)
TrainingsSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- unlist(rw2t.fit@sampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/21)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw2s.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw2 ~ authoritarian
# rw2 ~ prejudice

```

```

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)

fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

#
# =====
#
# MODEL 2 FOR rw2
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 8 | essround == 9 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 69,018 cases overall (=training + test
sample)
#
traindata <-subset(sset1, essround == 8 ) # results in 34,791 cases in round 8
testdata <-subset(sset1, essround == 9 ) # results in 34,227 cases in round 9

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
#
library(lavaan)
#
rw2.model <- '

# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'

rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)

#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0)
#
m01 <- rbind(r1, r2, r3, r4)
m01
#
x <- as.data.frame(rw2.fit@SampleStats@cov)
observed <- x * m01
#
y <- as.data.frame(rw2.fit@implied$cov)
implied <- y * m01
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/10)
TrainingSRMR
#

```

```

# same model for testdata to get its observed covariance matrix
#
rw2t.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- as.data.frame(rw2t.fit@SampleStats@cov)
observedt <- xt * m01
observedt
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/10)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#         from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
rw2s.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
fitmeasures(rw2s.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw2
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 8 | essround == 9 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 69,018 cases overall (=training + test
sample)
#
traindata <-subset(sset1, essround == 8 ) # results in 34,791 cases in round 8
testdata <-subset(sset1, essround == 9 ) # results in 34,227 cases in round 9

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
# scale direction reversed for value items

```

```

#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw2.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice
rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian
# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1)
#
m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9)
m01
#
x <- unlist(rw2.fit@SampleStats@cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/45)
TrainingSRMR
#
# same model for testdata to get its observed covariance matrix
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice
rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian

```

```

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- unlist(rw2t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/45)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
# from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw2s.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impctr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'

rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impctr.x", "rw2"),
               meanstructure = TRUE)

fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw2
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, (essround == 8 | essround == 9 ),
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impctr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 69,018 cases overall (=training + test
sample)
#
traindata <-subset(sset1, essround == 8 ) # results in 34,791 cases in round 8
testdata <-subset(sset1, essround == 9 ) # results in 34,227 cases in round 9

addmargins(table(traindata$essround))
addmargins(table(testdata$essround))
#
# -----
#
# scale direction reversed for value items
#
library(car)
#
traindata$impsafer <- car::recode(traindata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipstrgvr <- car::recode(traindata$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipbhprpr <- car::recode(traindata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
traindata$ipfruler <- car::recode(traindata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

```

```

traindata$imptradr <- car::recode(traindata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw2.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'

rw2.fit <- sem(rw2.model, data=traindata, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
summary(rw2.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
#
r1 <- c(1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r2 <- c(1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r3 <- c(1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)
r4 <- c(1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
r5 <- c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
r6 <- c(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0)
r7 <- c(1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
r8 <- c(1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0)
r9 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0)
r10 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0)
r11 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0)
r12 <- c(1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

m01 <- rbind(r1, r2, r3, r4, r5, r6, r7, r8, r9, r10, r11, r12)
m01
#
x <- unlist(rw2.fit@samplestats$cov)
obs <- x * m01
observed <- cov2cor(obs)
#
y <- unlist(rw2.fit@implied$cov)
impl <- y * m01
implied <- cov2cor(impl)
implied
#
TrainingSRMR <- sqrt(sum((observed - implied)^2)/78)
TrainingSRMR

#
# same model for testdata to get its observed covariance matrix
#
#
library(car)
#
testdata$impsafer <- car::recode(testdata$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipstrgvr <- car::recode(testdata$ipstrgvr, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipbhprpr <- car::recode(testdata$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$ipfruler <- car::recode(testdata$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
testdata$imptradr <- car::recode(testdata$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
rw2t.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'

```

```

'
rw2t.fit <- sem(rw2t.model, data=testdata, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)
#
xt <- unlist(rw2t.fit@SampleStats@cov)
obst <- xt * m01
observedt <- cov2cor(obst)
observedt
#
#
TestSRMR <- sqrt(sum((observedt - implied)^2)/78)
TestSRMR # relates implied covariance matrix from traindata to observed covariance
#         from testdata
#
#
# same model for sset1 (=traindata + testdata combined) to compute ECVI
#
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')

rw2s.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'

rw2s.fit <- sem(rw2s.model, data=sset1, sampling.weights="anweight.x.x.x",
               ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
               meanstructure = TRUE)

fitmeasures(rw2s.fit, fit.measures = c("ecvi"))

# ENDE TESTING BLOCK 7
# =====
#
# Block 8: structural equation models
# run sequentially (without possibility of out-of-sample testing (last available round))
#
# -----Target variable rw -----
# PERIOD E
#
# MODEL 1 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround == 9,
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 31,041 cases
#
addmargins(table(sset1$essround))
#
# scale direction reversed for value items
#
library(car)
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)

```

```

#
rw.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
rw ~ authoritarian
# rw ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
rw.fit <- sem(rw.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
fitmeasures(rw.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 2 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround == 9 ,
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,
                           imsmetn.x, imdfetn.x, impcntr.x,
                           ppltrst.x, pplfair.x, pplhlp.x,
                           rw, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 31,041 cases
#
addmargins(table(sset1$essround))
#
library(lavaan)
#
rw.model <- '
# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw ~ authoritarian
rw ~ prejudice
# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian
# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
rw.fit <- sem(rw.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
              meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
fitmeasures(rw.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround == 9 ,
               select = c(LNR, cntry, essround,
                           impsafe.x, ipstrgv.x, ipbhprp.x,
                           ipfrule.x, imptrad.x,

```



```

        imsmetn.x, imdfetn.x, impcntr.x,
        ppltrst.x, pplfair.x, pplhlp.x,
        rw, anweight.x.x.x ))

sset1 <- na.omit(sset1)      # results in 31,041 cases
#
addmargins(table(sset1$essround))
#
# scale direction reversed for value items
#
library(car)
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

rw ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

'

rw.fit <- sem(rw.model, data=sset1, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
fitmeasures(rw.fit, fit.measures = c("ecvi"))

# =====
#
# MODEL 4 FOR rw
#
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround == 9 ,
              select = c(LNR, cntry, essround,
                        impsafe.x, ipstrgv.x, ipbhprp.x,
                        ipfrule.x, imptrad.x,
                        imsmetn.x, imdfetn.x, impcntr.x,
                        ppltrst.x, pplfair.x, pplhlp.x,
                        rw, anweight.x.x.x ))

sset1 <- na.omit(sset1)      # results in 31,041 cases
#
addmargins(table(sset1$essround))
#
# scale direction reversed for value items
#
library(car)
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw ~ authoritarian
# rw ~ prejudice

'

```

```

# rw ~ authoritarian + prejudice
# prejudice ~ authoritarian

rw ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice

'
rw.fit <- sem(rw.model, data=sset1, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
fitmeasures(rw.fit, fit.measures = c("ecvi"))

# =====
# -----Target variable rw1 -----
#
# MODEL 1 FOR rw1
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround == 9 ,
              select = c(LNR, cntry, essround,
                        impsafe.x, ipstrgv.x, ipbhprp.x,
                        ipfrule.x, imptrad.x,
                        imsmetn.x, imdfetn.x, impcntr.x,
                        ppltrst.x, pplfair.x, pplhlp.x,
                        rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 31,647 cases
#
addmargins(table(sset1$essround))
#
# scale direction reversed for value items
#
library(car)
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw1 ~ authoritarian
# rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'
rw.fit <- sem(rw.model, data=sset1, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
fitmeasures(rw.fit, fit.measures = c("ecvi"))

# =====
# -----
# MODEL 2 FOR rw1
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround == 9 ,
              select = c(LNR, cntry, essround,

```

```

        impsafe.x, ipstrgv.x, ipbhprp.x,
        ipfrule.x, imptrad.x,
        imsmetn.x, imdfetn.x, impcntr.x,
        ppltrst.x, pplfair.x, pplhlp.x,
        rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1)      # results in 31,647 cases
#
addmargins(table(sset1$essround))
#
library(lavaan)
#
rw.model <- '

# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
rw1 ~ prejudice

# rw1 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'

rw.fit <- sem(rw.model, data=sset1, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw1"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
fitmeasures(rw.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw1
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround == 9 ,
              select = c(LNR, cntry, essround,
                        impsafe.x, ipstrgv.x, ipbhprp.x,
                        ipfrule.x, imptrad.x,
                        imsmetn.x, imdfetn.x, impcntr.x,
                        ppltrst.x, pplfair.x, pplhlp.x,
                        rw1, anweight.x.x.x ))

sset1 <- na.omit(sset1)      # results in 31,647 cases
#
addmargins(table(sset1$essround))
#
# -----
#
# scale direction reversed for value items
#
library(car)
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw1 ~ authoritarian
# rw1 ~ prejudice

rw1 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw1 ~ authoritarian + prejudice + trust

```



```

                                rw2, anweight.x.x.x ))
sset1 <- na.omit(sset1)      # results in 34,227 cases
#
addmargins(table(sset1$essround))
# -----

# scale direction reversed for value items
#
library(car)
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '

authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

# prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
#
'

rw.fit <- sem(rw.model, data=sset1, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
             meanstructure = TRUE)

#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
fitmeasures(rw.fit, fit.measures = c("ecvi"))

#
# =====
#
# MODEL 2 FOR rw2
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround == 9 ,
              select = c(LNR, cntry, essround,
                        impsafe.x, ipstrgv.x, ipbhprp.x,
                        ipfrule.x, imptrad.x,
                        imsmetn.x, imdfetn.x, impcntr.x,
                        ppltrst.x, pplfair.x, pplhlp.x,
                        rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1)      # results in 34,227 cases
#
addmargins(table(sset1$essround))
# -----

#
#
library(lavaan)
#
rw.model <- '

# authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr

prejudice =~ imsmetn.x + imdfetn.x + impcntr.x

# trust =~ ppltrst.x + pplfair.x + pplhlp.x

# rw2 ~ authoritarian
# rw2 ~ prejudice

# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice

```

```

#
rw.fit <- sem(rw.model, data=sset1, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
fitmeasures(rw.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 3 FOR rw2
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround == 9 ,
              select = c(LNR, cntry, essround,
                        impsafe.x, ipstrgv.x, ipbhprp.x,
                        ipfrule.x, imptrad.x,
                        imsmetn.x, imdfetn.x, impcntr.x,
                        ppltrst.x, pplfair.x, pplhlp.x,
                        rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 34,227 cases
#
addmargins(table(sset1$essround))
#
# -----
#
# scale direction reversed for value items
#
library(car)
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
# trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice

rw2 ~ authoritarian + prejudice
prejudice ~ authoritarian

# rw2 ~ authoritarian + prejudice + trust
# prejudice ~ authoritarian
# trust ~ prejudice
'
#
rw.fit <- sem(rw.model, data=sset1, sampling.weights="anweight.x.x.x",
             ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
             meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
fitmeasures(rw.fit, fit.measures = c("ecvi"))
#
# =====
#
# MODEL 4 FOR rw2
#
# -----
rm(list = ls())
load("ess19.Rdata")
ess19$LNR <- seq_len(340215)
sset1 <- subset(ess19, essround == 9 ,
              select = c(LNR, cntry, essround,
                        impsafe.x, ipstrgv.x, ipbhprp.x,
                        ipfrule.x, imptrad.x,
                        imsmetn.x, imdfetn.x, impcntr.x,
                        ppltrst.x, pplfair.x, pplhlp.x,
                        rw2, anweight.x.x.x ))

sset1 <- na.omit(sset1) # results in 34,227 cases

```

```

#
addmargins(table(sset1$essround))
# -----
#
# scale direction reversed for value items
#
library(car)
#
sset1$impsafer <- car::recode(sset1$impsafe, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipstrgvr <- car::recode(sset1$ipstrgv, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipbhprpr <- car::recode(sset1$ipbhprp, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$ipfruler <- car::recode(sset1$ipfrule, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
sset1$imptradr <- car::recode(sset1$imptrad, recodes = '1=6;2=5;3=4;4=3;5=2;6=1')
#
library(lavaan)
#
rw.model <- '
authoritarian =~ impsafer + ipstrgvr + ipbhprpr + ipfruler + imptradr
prejudice =~ imsmetn.x + imdfetn.x + impcntr.x
trust =~ ppltrst.x + pplfair.x + pplhlp.x
# rw2 ~ authoritarian
# rw2 ~ prejudice
# rw2 ~ authoritarian + prejudice
# prejudice ~ authoritarian
rw2 ~ authoritarian + prejudice + trust
prejudice ~ authoritarian
trust ~ prejudice
'
rw.fit <- sem(rw.model, data=sset1, sampling.weights="anweight.x.x.x",
              ordered=c("imsmetn.x", "imdfetn.x", "impcntr.x", "rw2"),
              meanstructure = TRUE)
#
summary(rw.fit, header = TRUE, fit.measures = TRUE,
        estimates = TRUE, standardized = TRUE, rsquare=TRUE,
        modindices = FALSE)
fitmeasures(rw.fit, fit.measures = c("ecvi"))

# END BLOCK 8 for ROUND 9
# =====

```