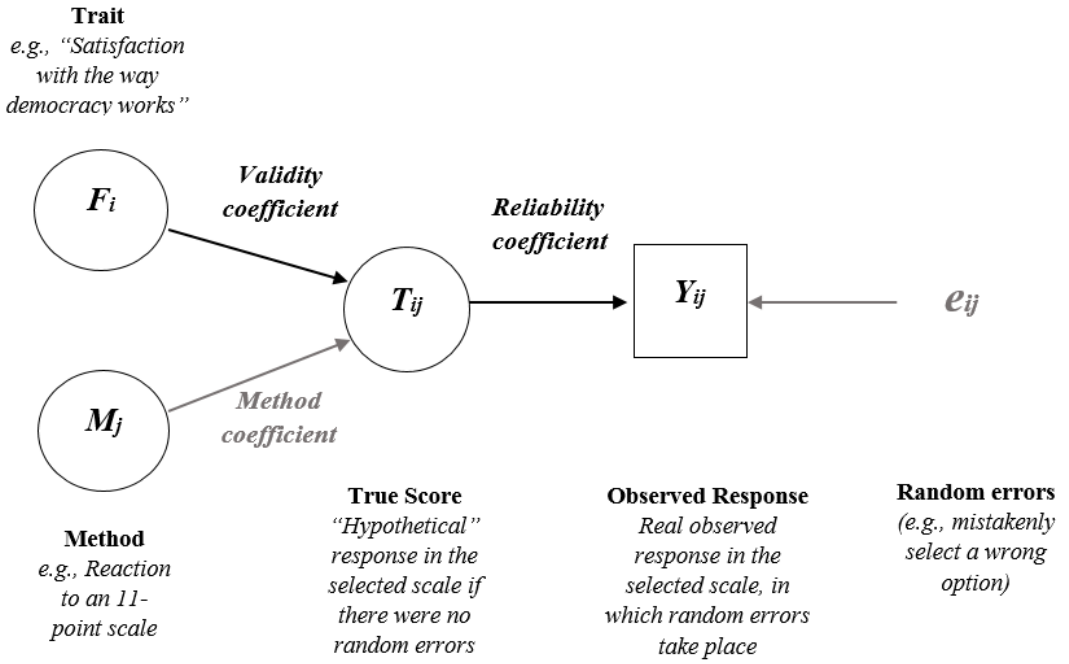
Online Appendices

Appendix 1. Pearson correlations between the variables "satisfaction with the way government is doing its job", "satisfaction with the present state of the economy" and the SWD indicator with both scales (UK, Round 4, using pairwise deletion)

	Satisfaction with the present state of the economy	Satisfaction with the way government is doing its job	SWD indicator (11-point, Dis/satisfied, end)
SWD indicator (11-point, Extremely Dis/Satisfied, beginning)	*.427*	*.591*	*.752**
SWD indicator (11-point, Dis/satisfied, end)	*.346*	*.543*	*1*

**This correlation should be 1 if both methods measured the concept perfectly.*

Appendix 2: Figure 1. Path Diagram of the True Score model



Appendix 3. Sample sizes in each country(-language) group and total sample in pooled data for split-ballot Group 1 (G1) and Group 2 (G2), per round

Country	Language	Round 1*		Round 2		Round 4	
		G1	G2	G1	G2	G1	G2
Austria	*German*	1,279	972	766	715		
Belgium	*Dutch*	316	315	345	340	352	341
Belgium	*French*			260	249	261	231
Bulgaria	*Bulgarian*					722	733
Croatia	*Croatian*					521	451
Cyprus	*Cyprus*					378	403
Czech Republic	*Czech*	657	622	1,108	626	669	666
Denmark	*Danish*	739	720	505	467	526	531
Estonia	*Estonian*			488	449	382	373
Estonia	*Russian*			175	168	159	150
Finland	*Finnish*	887	882	159	150	202	215
Finland	*Swedish*						
France	*French*	693	653	557	603	699	583
Germany	*German*	466	474	956	945	942	883
Great Britain	*English*	881	900	625	607	747	750
Greece	*Greek*	1,260	1,297	795	784	700	686
Ireland**	*English*	361	296	221	204		
Italy***	*Italian*			435	385		
Luxembourg	*French*			136	119		
Luxembourg	*Luxembourgish*			391	363		
Israel	*Arab*	429	388			100	90
Israel	*Hebrew*					640	627
Israel	*Russian*						
Latvia	*Latvian*					458	489
Latvia	*Russian*					181	175
Netherlands	*Dutch*	1,192	1,146	625	593	541	537
Norway	*Norwegian*	305	298	191	166	266	277
Poland	*Polish*	1,016	1,053	566	557	548	518
Portugal	*Portuguese*	246	241	742	723	860	733
Romania	*Romanian*					687	685
Russia	*Russian*					817	833
Slovakia	*Slovakian*			490	472	564	562
Slovenia	*Slovenian*	254	240	446	446	415	414
Spain	*Spanish*	289	287	483	494	547	1,285
Spain	*Catalan*						
Sweden	*Swedish*	865	830			187	169
Turkey	*Turkish*			595	598	809	775
Switzerland	*French*	339	313	177	147	126	122

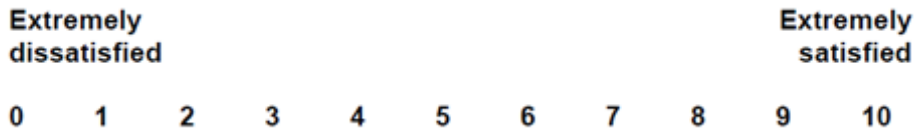
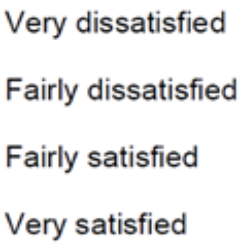
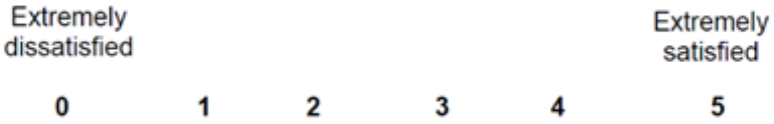
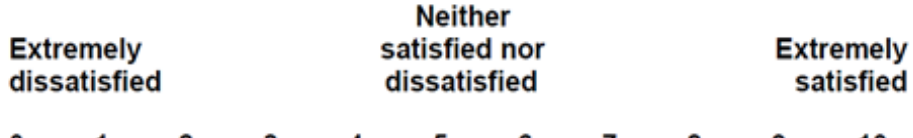
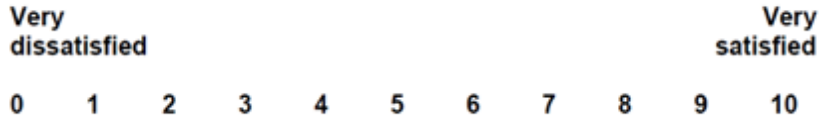
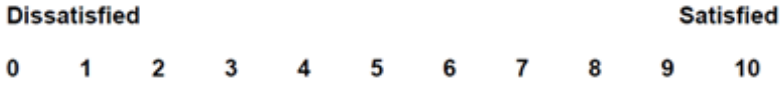
Switzerland	*German*			524	519	475	417
Switzerland	*Italian*						
Ukraine	*Russian*			369	350	313	311
Ukraine	*Ukrainian*			307	303	284	276
Pooled Data		12,474	11,927	13,437	12,542	16,079	16,291

** In round 1, several languages are sometimes analyzed together within a country group. In these cases, one sample size is presented for all languages together.*

***In round 1, Ireland was not individually analyzed because of problems in the data. It was still included in the pooled data because the expected impact of this inclusion is negligible.*

****Italy was excluded from round 1 because a split-ballot design was not implemented.*

Appendix 4. Showcards of the response scales for all methods

Method	Showcard
M1	
M2	
M3	
M4	
M5	
M6	

M7*	Agree strongly Agree Neither agree nor disagree Disagree Disagree strongly

***The statements were formulated positively (e.g., On the whole, I am satisfied with the way democracy works in [country]).

Source:

https://www.europeansocialsurvey.org/methodology/ess_methodology/source_questionnaire/

Appendix 5. Examples of Lisrel input

a) *Pooled Data (Base Model)*

```
! Pooled data split-ballot group 1
da ng=2 ni=9 no=16079 ma=cm
km file=sb-group-1.corr
mean file=sb-group-1.mean
sd  file=sb-group-1.sd

model ny=9 ne=9 nk=6 ly=fu,fi te=di,fi ps=di,fi be=fu,fi ga=fu,fi ph=sy,fi
value 1 ly 1 1 ly 2 2 ly 3 3 ly 4 4 ly 5 5 ly 6 6
fr te 1 1 te 2 2 te 3 3 te 4 4 te 5 5 te 6 6
 value 1 te 7 7 te 8 8 te 9 9
value 0 ly 7 7 ly 8 8 ly 9 9
fr ga 4 1 ga 7 1 ga 5 2 ga 8 2 ga 6 3 ga 9 3
va 1 ga 1 1 ga 2 2 ga 3 3
fr ph 1 1 ph 2 2 ph 3 3 ph 4 4 ph 5 5 ph 6 6 ph 2 1 ph 3 1 ph 3 2
va 1 ga 1 4 ga 4 5 ga 7 6 ga 2 4 ga 5 5 ga 8 6 ga 3 4 ga 6 5 ga 9 6
out iter =2000 ns adm =off all sc mi

Split-ballot group 2
da  ni=9  no=16291  ma=cm
km file=sb-group-2.corr
mean file=sb-group-2.mean
sd  file=sb-group-2.sd

model  ny=9 ne=9  nk=6  ly=fu,fi  te=di,fi  ps=in  be=in  ga=in  ph=in
value  1  ly 1 1  ly 2 2  ly 3 3  ly 7 7  ly 8 8  ly 9 9
fr  te 7 7  te 8 8  te 9 9
eq  te 1  1 1  te 1 1
eq  te 1  2 2  te 2 2
eq  te 1  3 3  te 3 3
value 1  te 4 4  te 5 5  te 6 6
value 0  ly 4 4  ly 5 5  ly 6 6
pd
out  iter  =2000  ns  adm=off  all sc mi
```

b) *Country(-language) group analysis (Base Model)*

```
Analysis of split-ballot group 1 Belgium-French
Data ng=2  ni=9 no=699 ma=cm
km file=sb-group-1.corr
mean file=sb-group-1.mean
sd  file=sb-group-1.sd

model ny=9 ne=9 nk=6  ly=fu,fi te=di,fr ps=sy,fi be=fu,fi ga=fu,fi ph=sy,fi
value 1 ly 1 1 ly 2 2 ly 3 3 ly 4 4 ly 5 5 ly 6 6
fr te 1 1 te 2 2 te 3 3 te 4 4 te 5 5 te 6 6
value 1 te 7 7 te 8 8 te 9 9
value 0 ly 7 7 ly 8 8 ly 9 9
va 1 ga 1 1 ga 2 2 ga 3 3
fr ph 1 1 ph 2 2 ph 3 3 ph 4 4  ph 5 5 ph 6 6 ph 2 1 ph 3 1 ph 3 2
value 1 ga 1 4 ga 3 4 ga 4 5 ga 6 5 ga 7 6 ga 9 6

!fix gammas traits using pooled data estimates
va 1.11 ga 4 1
va 1.01 ga 5 2
va 0.98 ga 6 3
va -0.42 ga 7 1
va -0.39 ga 8 2
va -0.35 ga 9 3
va 1.31 ga 2 4
va 1.31 ga 5 5
va 1.31 ga 8 6
out iter= 2000 adm=off sc ec mi

Analysis of split-ballot group 2 Belgium-French
Data  ni=9 no=583  ma=cm
km file=sb-group-2.corr
mean file=sb-group-2.mean
sd  file=sb-group-2.sd

model ny=9 ne=9 nk=6  ly=fu,fi te=di,fr ps=in be=in ga=in ph=in

value 1  ly 1 1 ly 2 2 ly 3 3 ly 7 7 ly 8 8 ly 9 9
free te 7 7 te 8 8 te 9 9
eq te 1 1 1 te 1 1
eq te 1 2 2 te 2 2
eq te 1 3 3 te 3 3
value 1 te 4 4 te 5 5 te 6 6
value 0 ly 4 4 ly 5 5 ly 6 6
pd
out iter= 2000 adm=off sc ec mi
```

Appendix 6. Final Models for the Pooled Data Analyses

Round	Final PDM
1	BM + Free Ga 3 4 + Equal Ga 3 4 Ga 6 5 Ga 9 6
2	BM + Free Ga 2 4 + Equal Ga 2 4 Ga 5 5 Ga 8 6
4	BM + Free Ga 2 4 + Equal Ga 2 4 Ga 5 5 Ga 8 6 + Free Ph 5 4

Note: BM=Base Model

Appendix 7. Final Model in each country(-language) group per round

Round 1

COUNTRY	FINAL MODEL
Austria	BM
Belgium	BM + fr ga 5 5 ga 9 6 + va 0 te 5 5
Czech Republic	BM + fr ga 6 5 ga 4 1 ga 5 2 ga 6 3
Denmark	BM
Finland	BM + fr ga 5 5 ga 6 5 ga 8 6 ga 9 6
France	BM + fr ga 3 4 ga 4 1 ga 5 2 ga 6 3
Germany	BM + fr ga 3 4 ga 9 6 ga 7 1
Great Britain	BM + fr ga 3 4
Greece	BM
Israel	BM + fr ga 5 5 ga 9 6
Netherlands	BM + fr ga 3 4
Norway	BM + fr ga 1 1 ga 2 2
Poland	BM + fr ga 6 5 ga 8 6
Portugal	BM + fr ga 3 4 ga 7 6
Slovenia	BM + fr ga 7 6 ga 9 3
Spain	BM + fr ga 3 4 ga 4 1
Sweden	BM + fr ga 5 5 ga 6 5 ga 7 6 ga 8 6 ga 4 1 ga 5 2
Switzerland	BM + fr ga 3 4 ga 6 3 ga 9 3 ga 5 2

Note: BM=Base Model

Round 2

COUNTRY	LANGUAGE	FINAL MODEL
Austria	*German*	BM + fr ga 6 5 ga 8 6 ga 1 1 ga 4 1
Belgium	*Dutch*	BM + fr ga 9 3
	French	BM+ fr ga 7 6 ga 2 2 ga 3 3 ga 4 1 ga 5 2
Czech Republic	*Czech*	BM
Denmark	*Danish*	BM + fr ga 2 2 ga 4 1 ga 8 2
Estonia	*Estonian*	BM + fr ga 5 5 ga 1 1 ga 2 2 ga 3 3 ga 4 1 ga 5 2 ga 6 3
	Russian	BM + fr ga 5 5 ga 7 6 ga 2 2 ga 3 3 ga 5 2 + va 0 te 7 7
Finland	*Finish*	BM + fr ga 7 1
France	*French*	BM
Germany	*German*	BM + fr ga 2 4 ga 6 3 ga 9 3
Great Britain	*English*	BM + fr ga 8 6 ga 2 2 ga 3 3
Greece	*Greek*	No satisfactory proper solution for this country
Ireland	*English*	BM + eq ph 4 4 ph 5 5 ph 6 6 + fr ga 8 6
Italy	*Italian*	BM + fr ga 8 6 ga 5 5 ga 6 5 ga 3 3
Luxembourg	*French*	BM + fr ga 8 6 ga 1 1 ga 2 2 ga 4 1 ga 5 2 ga 9 3
	Luxembourgish	BM + fr ga 3 4
Netherlands	*Dutch*	BM + fr ga 3 4 ga 9 3
Norway	*Norwegian*	BM
Poland	*Polish*	BM + fr ga 1 1 ga 3 3
Portugal	*Portuguese*	BM + fr ga 5 5 ga 7 6
Slovakia	*Slovakian*	BM
Slovenia	*Slovenian*	BM + fr ga 1 1 ga 2 2
Spain	*Spanish*	BM + fr ga 3 4
Switzerland	*French*	BM + fr ga 8 6 ga 7 1
	German	BM + fr ga 1 1 ga 3 3 ga 6 3
Turkey	*Turkish*	BM + fr ga 6 5 ga 1 1 ga 2 2
Ukraine	*Russian*	BM + fr ga 3 4 ga 6 5 ga 5 2 ga 6 3
	Ukrainian	BM + fr ga 2 4 ga 5 2

Note: BM=Base Model

Round 4

COUNTRY	LANGUAGE	FINAL MODEL
Belgium	*Dutch*	BM + fr ga 3 3
	French	BM + fr ga 3 4
Bulgaria	*Bulgarian*	BM + fr ga 1 1 ga 7 1 ga 9 3
Croatia	*Croatian*	BM + fr ph 5 4 + fr ga 3 4 ga 8 6
Cyprus	*Greek*	BM + fr ga 2 4 ga 3 4 ga 8 6 ga 9 6 ga 6 3
Czech Republic	*Czech*	BM + fr ph 5 4 + fr ga 2 4 ga 5 5 ga 6 5 ga 9 3
Denmark	*Danish*	BM + fr ga 2 4 ga 8 2
Estonia	*Estonian*	BM + fr ga 6 5 ga 6 3
	Russian	BM + fr ga 9 6
Finland	*Finnish*	BM + fr ga 9 6 ga 8 2
France	*French*	BM + fr ph 5 4
Germany	*German*	BM + fr ph 5 4
Great Britain	*English*	BM + ph 5 4 + fr ga 6 5 ga 9 6
Greece	*Greek*	BM + fr ph 5 4 + fr ga 3 4 ga 8 6 ga 9 6 ga 7 1 ga 8 2
Israel	*Arabian*	BM + fr ph 5 4
Israel	*Hebrew*	BM + fr ga 3 4 ga 6 5 ga 9 6
Latvia	*Latvian*	BM + fr ph 5 4 + fr ga 3 4
	Russian	BM + fr ph 5 4 + va 0 te 5 5 va 0 te 2 2
Netherlands	*Dutch*	BM + fr ga 3 4 ga 1 1
Norway	*Norwegian*	BM + fr ga 8 6 ga 1 1
Poland	*Polish*	BM + fr ph 5 4
Portugal	*Portuguese*	BM + fr ga 2 4
Romania	*Romanian*	BM + fr ph 5 4
Russia	*Russian*	BM + fr ph 5 4 + fr ga 8 6 ga 9 6 ga 1 1
Slovakia	*Slovakian*	BM + fr ph 5 4
Slovenia	*Slovenian*	BM + fr ph 5 4 + fr ga 2 4 ga 6 5
Spain	*Spanish*	BM + fr ga 6 5 ga 9 6 ga 3 3 ga 9 3
Sweden	*Swedish*	BM + fr ga 6 3
Switzerland	*French*	BM + fr ga 3 3 + va 0 ph 6 6
	German	BM + fr ga 2 4 + fr ga 9 6
Turkey	*Turkish*	BM + fr ph 5 4+ fr ga 8 6
Ukraine	*Russian*	BM + fr ga 8 6
	Ukrainian	BM + fr ga 2 4 ga 3 4 ga 6 5

Note: BM=Base Model

Appendix 8: Correlations corrected for measurement errors.

Following Saris and Revilla (2016, 1007, Equation 2), the correlation corrected from measurement errors can be computed as follows when no common method variance is expected:

$$\mathbf{corr(f_1,f_2) = corr(y_1,y_2)/q_1q_2} \quad (1)$$

Where f_i represents the ith latent trait, y_i the observed survey answers corresponding to the ith latent trait and q_i the measurement quality coefficient (square root of the measurement quality q_i^2) for the ith trait.

In our example, f_1 is the latent trait "satisfaction with the way democracy works", and y_1 are the observed responses to the SWD indicator. According to Table 3, in the Netherlands, q_1=.85 when using M1 (square root of measurement quality, which is .73), whereas q_1=.63 when using M2 (square root of .40).

For the sake of simplicity, we assume that f_2 is a latent variable measured without errors, and y_2 are the responses to the question asked to measure this latent variable. Thus, $q_2 = 1$.

Now, let's assume that the observed correlation in the Netherlands between the SWD indicator and y_2 is .60 when using M1 and .44 when using M2.

Thus, the corrected correlation when using M1 is as follows:

$$\mathbf{corr(latent\ satisfaction, f_2) = .60/.85 = .70} \quad (2)$$

Similarly, the corrected correlation when using M2 is:

$$\mathbf{corr(latent\ satisfaction, f_2) = .44/.63 = .70} \quad (3)$$

In both cases, the observed correlations are lower than the correlation between the latent variables of interest. Moreover, even if the observed correlations are different, the correlation between the latent variables is the same.

Appendix 9. R code for performing correction of measurement errors using the COSME package.

```
# Load required libraries ####
library(tidyverse)
library(cosme)
library(essurvey)
library(labelled)
library(lavaan)

# The analyses are replicated first for Czechia and then for Slovakia
# REPLICATION FOR CZECHIA ####
# Load data ####
# We import data using the essurvey package. Users need to register at
# the ESS webpage and then set their mails following the code below so they can
# download the data
set_email("your.mail@mail.com")

# Import data
czechia2 <- import_country(
  country = "Czechia",
  rounds = c(2)) %>%
  select(essround, stfdem, stfeco, trstprl, vote, hincfel, eisced, gndr,agea)

# Clean data as it was used in Vlachova (2019). This df only has the exact variables we use
czechia_clean <- czechia2 %>%
  mutate(voted = case_when(
    vote == 1 ~ 1,
    vote == 2 ~ 0),  # check 3
    income = case_when(
      hincfel == 1 ~ 1,
      hincfel == 2 ~ 1,
      hincfel == 3 ~ 0,
      hincfel == 4 ~ 0),
    gender = case_when(
      gndr == 1 ~ 0,
      gndr == 2 ~ 1),
    tertiary = if_else(condition = eisced %in% c(6, 7), 1, 0)) %>%
  select(-gndr, -eisced, -hincfel,-essround, -vote)
```

```
# Check item list used in Czech Republic
items_list_czechia <- labelled::look_for(czechia2)

# Start correction. Define the random measurement errors and the common method
# variance
model_definition <- "
#Correct for measurement error
~~ stfdem + stfeco + trstprl
# Correct for comon method variance
~ stfdem + stfeco"

# Create dataframe of reliabities, validities and qualities
me_data_czechia <-
  data.frame(question =
               c("stfdem", "stfeco", "trstprl"),
             reliability = c(0.87, 0.84, 0.93),
             validity = c(0.92,0.9, 0.93),
             quality = c(0.80,0.756, 0.865))

# Create me object
me_obj_czechia <- medesign(model_definition, czechia_clean, me_data_czechia)
# Create matrix corrected
corrected_covariance_czechia <-
  me_cmv_cov(me_obj_czechia)   %>%
  select(.$rowname) %>%
  as.matrix()


# Estimate model without correction ####
model = "stfdem ~ stfeco + trstprl + agea + voted + income +  gender  + tertiary"
est_czechia <- sem(model = model, data = czechia_clean, estimator = "ML")

summary(est_czechia, standardized = T, fit.measures = T)

# Estimate model corrected ####
est_corr_czechia <- sem(model = model,
                sample.cov = corrected_covariance_czechia, sample.nobs = 5174,
```

```
            estimator = "ML")
summary(est_corr_czechia, standardized = T)
# Retrieve estimates for Table 7
standardizedSolution(est_czechia,type = "std.all", ci = TRUE, level = 0.95, pvalue = TRUE) %>%
  filter(op == "~")
standardizedSolution(est_corr_czechia,type = "std.all", ci = TRUE, level = 0.95, pvalue = TRUE) %>%
  filter(op == "~")

## REPLICATION FOR SLOVAKIA #####
# Load data ####
slovakia2 <- import_country(
  country = "Slovakia",
  rounds = c(2)) %>%
  select(essround, stfdem, stfeco, trstprl, vote, hincfel, eisced, gndr,agea)

# Clean data as it was used in Vlachova (2019). This df only has the exact variables we use
slovakia_clean <- slovakia2 %>%
  mutate(voted = case_when(
    vote == 1 ~ 1,
    vote == 2 ~ 0),  # check 3
    income = case_when(
      hincfel == 1 ~ 1,
      hincfel == 2 ~ 1,
      hincfel == 3 ~ 0,
      hincfel == 4 ~ 0),
    gender = case_when(
      gndr == 1 ~ 0,
      gndr == 2 ~ 1),
    tertiary = if_else(condition = eisced %in% c(6, 7), 1, 0)) %>%
  select(-gndr, -eisced, -hincfel,-essround, -vote)



# Start correction
model_definition <- "
#Correct for measurement error
~~ stfdem + stfeco + trstprl
# Correct for comon method variance
~ stfdem + stfeco"
```

```
# Create correction dataframe [using estimates for Slovakia]

me_data_slovakia <-
  data.frame(question =
               c("stfdem", "stfeco", "trstprl"),
             reliability = c(0.85, 0.83, 0.89),
             validity = c(0.95,0.94, 0.96),
             quality = c(0.808,0.780, 0.854))

# Create me object
me_obj_slovakia <- medesign(model_definition, slovakia_clean, me_data_slovakia)
# Create matrix corrected
corrected_covariance_slovakia <-
  me_cmv_cov(me_obj_slovakia)   %>%
  select(.$rowname) %>%
  as.matrix()

# Estimate model without correction ####
model = "stfdem ~ stfeco + trstprl + agea + voted + income +  gender  + tertiary"

est_slovakia <- sem(model = model, data = slovakia_clean, estimator = "ML") #

summary(est_slovakia, standardized = T, fit.measures = T)

# Estimate model corrected ####
est_corr_slovakia <- sem(model = model,
                sample.cov = corrected_covariance_slovakia, sample.nobs = 5174,
                estimator = "ML")
summary(est_corr_slovakia, standardized = T)

summary(est_slovakia, standardized = T)

# Retrieve estimates for Table 7
standardizedSolution(est_slovakia,type = "std.all", ci = TRUE, level = 0.95, pvalue = TRUE) %>%
  filter(op == "~")
standardizedSolution(est_corr_slovakia,type = "std.all", ci = TRUE, level = 0.95, pvalue = TRUE) %>%
  filter(op == "~")
```

Appendix 10. Brief description about the variables included in Table 7

Variable	ESS label	Whole question text	Scale	Recoding (following Vlachová (2019))
Satisfaction with democracy	Stfdem	On the whole, how satisfied are you with the way democracy works?	0 – Extremely dissatisfied 10 – Extremely satisfied	Not recoded
Satisfaction with the economy	Stfeco	On the whole how satisfied are you with the present state of the economy in [country]?	0 – Extremely dissatisfied 10 – Extremely satisfied	Not recoded
Trust in the parliament	Trstprl	Please tell me on a score of 0-10 how much you personally trust each of the institutions I read out. 0 means you do not trust an institution at all, and 10 means you have complete trust. Firstly... ...[country]'s parliament?	0 – No trust at all 10 – Complete trust	Not recoded
Voted	Vote	Some people don't vote nowadays for one reason or another. Did you vote in the last [country] national election in [month/year]?	Yes, No, Not eligible to vote	Yes = 1, No = 0
Income	Hincfel	Which of the descriptions on this card comes closest to how you feel about your household's income nowadays?	Living comfortable on present income, coping on present income, difficult on present income, very difficult on present income	Living comfortably on present income, coping on present income = 1, difficult on present income, very difficult on present income = 0
Tertiary	Eisced	No question text	Not possible to harmonise, less	Tertiary = lower tertiary education,

			than lower secondary, lower secondary, lower tier upper secondary, upper tier upper secondary, advanced vocational, lower tertiary education, higher tertiary education	higher tertiary education. 0 = rest of the options
Woman	Gndr	No question text	Male, Female, No answer	Woman = 1, Male = 0
Age	Agea	No question text	Continuous scale	Not recoded