Supplementary material

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Introduction

This file shows the data analysis for the paper *"The psychology of sharing: Multigroup analysis among users and non-users of carsharing"* and the document is generated automatically with the analysis. It's ultimate goal is to facilitate replication, once that it can be fully reproduced.

Data description

Codebook

In this subsection, the assessment of all variables are described.

- U_BI: *"I will continue to use carsharing".* (users)
- NU_BI: *"I will become a member of a carsharing".* (non-users)
- BI: U_BI and NU_BI are combined in one single variable
- BehaviorInt: latent variable Behavior Intention assessed by the item BI
- H1: *"I feel strange travelling without a car".*
- H2: *"I use the car without planning ahead".*
- H3: *"It would require an effort for me not to use a car".*
- H4: *"Using a car is part of my daily routine".*
- H5: *"Using a car is something that I do automatically".*
- H6: *"I have been using a car for a long time".*
- H7: *"Driving a car saves time".*
- H8: *"Driving a car makes life easier".*
- Habit: Latent variable assessed by the items H1-H8
- EA1: *"It is urgent to do something against the ecological destruction caused by using the car".*
- EA2: *"I believe that using the car causes many environmental problems".*
- PN1: *"I feel morally obliged to reduce the environmental impact due to my travel patterns".*
- PN2: *"I would feel guilty if I did not reduce the environmental impact of my travel patterns".*
- CM: latent variable Climate Morality, assessed by the items EA1, EA2, PN1, PN2
- U_SN1: *"People who are important to me think that I should use carsharing instead of other modes of transportation".* (users)
- NU_SN1: *"People who are important to me think that I should use carsharing instead of other modes of transportation".* (non-users)
- SN1: U_SN1 and NU_SN1 are combined in one single variable
- U_SN2: *"People who are important to me like that I use carsharing".* (users)
- NU_SN2: *"People who are important to me would like that I use carsharing".* (non-users)
- SN2: U_SN2 and NU_SN2 are combined in one single variable

- U_SN3: *"People who are important to me agree with my use of carsharing".* (users)
- NU_SN3: *"People who are important to me would agree if I use carsharing".* (non-users)
- SN3: U_SN3 and NU_SN3 are combined in one single variable
- SN: latent variable Subjective Norms, assessed by SN1, SN2, SN3
- U_PBC1: *"It is possible for me to use carsharing for my regular trips".* (users)
- NU_PBC1: *"It would be possible for me to use carsharing for my regular trips".* (non-users)
- PBC1: U_PBC1 and NU_PBC1 are combined in one single variable
- U_PBC2: *"I am sure that I can choose the carsharing for my regular trips during the next week".* (users)
- NU_PBC2: *"I am sure that I can choose the carsharing for my regular trips during the next week".* (non-users)
- PBC2: U_PBC2 and NU_PBC2 are combined in one single variable
- U_EOU1: *"Learning how to use carsharing was easy for me".* (users)
- NU_EOU1: *"Learning how to use carsharing would be easy for me".* (non-users)
- EOU1: U_EOU1 and NU_EOU1 are combined in one single variable
- U_EOU2: *"I find carsharing easy to use".* (users)
- NU_EOU2: *"I would find carsharing easy to use".* (non-users)
- EOU2: U_EOU2 and NU_EOU2 are combined in one single variable
- U_PU1: *"Carsharing services is a useful mode of transport".* (users)
- NU_PU1: *"Using carsharing services would be a useful mode of transport".* (non-users)
- PU1: U_PU1 and NU_PU1 are combined in one single variable
- U_PU2: *"Carsharing helps me to accomplish activities that are important to me".* (users)
- NU_PU2: *"Using carsharing would help me to accomplish activities that are important to me".* (non-users)
- PU2: U_PU2 and NU_PU2 are combined in one single variable
- U_T1: *"Based on my previous experience with carsharing, I know that it provides a good service".* (users)
- NU_T1: *"Based on my knowledge about carsharing, I think that it provides a good service".* (non-users)
- T1: U_T1 and NU_T1 are combined in one single variable
- U_T2: *"Based on my previous experience with carsharing, I know that it is predictable".* (users)
- NU_T2: *"Based on my knowledge about carsharing, I think that it is predictable".* (non-users)
- T2: U_T2 and NU_T2 are combined in one single variable
- U_T3: *"Based on my previous experience with carsharing, I know that it is trustworthy".* (users)
- NU_T3: *"Based on my knowledge about carsharing, I think that it is trustworthy".* (non-users)
- T3: U_T3 and NU_T3 are combined in one single variable
- group: gr1: Italian non-users; gr2: Italian users; gr3: Swedish non-users; gr4: Swedish users
- country: country where the participant was leaving at the time of the application of the survey (15=Italy; 27=Sweden)
- age: year of birth
- sex: female (0) or male (1)
- edu: highest level of education completed 1 = "Not completed primary school" 2 = "Elementary school" 3 = "Upper secondary school or equivalent, shorter than 3 years" 4 = "Upper secondary school or equivalent, 3 years or more" 5 = "Post-secondary education, not college, less than 3 years" 6 = "Post-secondary education, not college, 3 years or more" 7 = "University / University, less than 3 years old" 8 = "University / University, 3 years or more" 9 = "Degree from postgraduate studies"
- income: montly income before taxes 1 = Less than 380 euros 2 = 380 – 849 euros 3 = 850 – 1249 euros 4 = 1250 – 1499 euros 5 = 1500 – 1799 euros 6 = 1800 – 2199 euros 7 = 2200 – 2499 euros 8 = 2500 – 2849 euros 9 = 2850 – 3499 euros 10 = 3500 – 4249 euros 11 = 4250 – 5999 euros 12 = More than 6000 euros 13 = I do not know/ I do not want to answer 14 = Other
- no_child: any children in the household (0/1)
- child_age_0to3: presence of children from 0 to 3 years old in the household (0/1)
- child_age_4to6: presence of children from 4 to 6 years old in the household (0/1)
- child_age_7to15: presence of children from 7 to 15 years old in the household (0/1)
- child_age_16: presence of children from 16 years or more in the household (0/1)

Dataset

```
d<-read.csv("dataset_carsharing.csv")
```

Descriptive statistics

```
d_variables <- d %>% dplyr::select(group,
                                   BI,
                                   H1,
                                   H2,
                                   H3,
                                   H4,
                                   H5,
                                   H6,
                                   H7,
                                   H8,
                                   EA1,
                                   EA2,
                                   PN1,
                                   PN2,
                                   SN1,
                                   SN2,
                                   SN3,
                                   PBC1,
                                   PBC2,
                                   EOU1,
                                   EOU2,
                                   PU1,
                                   PU2,
                                   T1,
                                   T2,
                                   T3)
```

Code for the tables visualization (missing, mean and standard deviation)

```
  d_variables %>%
    dplyr::group_by(group) %>%
    summarise_all(list(~sum(is.na(.)))) %>%
    knitr::kable(caption = 'Number of missing per group', digits = 0) %>%
    kableExtra::landscape() %>%
    kableExtra::kable_styling(latex_options = "scale_down")

  d_variables %>%
    dplyr::group_by(group) %>%
    summarise_all(list(~mean(., na.rm = T))) %>%
    knitr::kable(caption = 'Mean value per group', digits = 2) %>%
    kableExtra::landscape() %>%
    kableExtra::kable_styling(latex_options = "scale_down")

    d_variables %>%
```

```
    dplyr::group_by(group) %>%
    summarise_all(list(~sd(., na.rm = T))) %>%
    knitr::kable(caption = 'Sd value per group', digits = 2) %>%
    kableExtra::landscape() %>%
      kableExtra::kable_styling(latex_options = "scale_down")
```

Table 1: Number of missing per group

group	BI	H1	H2	H3	H4	H5	H6	H7	H8	EA1	EA2	PN1	PN2	SN1	SN2	SN3	PBC1	PBC2	EOU1	EOU2	PU1	PU2	T1	T2	T3
itnon	1	77	78	77	77	77	77	77	77	0	0	0	1	1	1	1	0	1	0	0	0	0	18	39	22
ituser	445	20	22	20	19	20	21	20	19	3	3	3	3	5	6	6	1	1	1	1	1	2	5	129	20
senon	26	229	229	230	227	230	229	228	229	23	23	23	26	44	43	44	22	25	30	28	30	25	659	770	720
seuser	19	71	71	74	71	73	73	71	70	16	15	16	18	28	32	30	15	10	17	23	10	10	151	206	148

Table 2: Mean value per group

group	BI	H1	H2	H3	H4	H5	H6	H7	H8	EA1	EA2	PN1	PN2	SN1	SN2	SN3	PBC1	PBC2	EOU1	EOU2	PU1	PU2	T1	T2	T3
itnon	2.92	3.37	5.55	4.24	3.90	4.90	4.31	4.87	3.89	5.79	5.58	4.89	4.63	2.48	2.44	4.00	3.31	2.52	4.77	4.46	4.63	3.37	4.69	4.33	4.73
ituser	4.61	3.32	5.04	3.96	3.94	4.88	4.23	4.84	3.81	5.84	5.53	5.11	4.90	4.25	4.43	5.18	4.19	3.86	5.55	5.53	5.53	4.42	5.22	4.72	5.21
senon	1.34	2.98	3.50	4.17	3.78	3.41	5.44	5.35	5.54	5.09	5.19	3.98	3.39	2.11	3.35	3.90	2.58	2.25	4.45	3.90	3.40	2.52	4.47	4.20	4.36
seuser	4.02	2.07	2.73	3.16	2.74	2.43	4.69	4.60	4.82	5.63	5.72	4.58	3.92	3.48	4.46	4.80	3.26	3.59	5.63	5.35	4.94	4.07	5.38	5.02	5.33

Table 3: Sd value per group

group	BI	H1	H2	H3	H4	H5	H6	H7	H8	EA1	EA2	PN1	PN2	SN1	SN2	SN3	PBC1	PBC2	EOU1	EOU2	PU1	PU2	T1	T2	T3
itnon	1.51	1.94	1.90	2.20	2.01	1.78	2.02	1.75	2.03	1.45	1.48	1.68	1.74	1.62	1.60	1.93	1.72	1.66	1.68	1.65	1.62	1.70	1.32	1.24	1.32
ituser	1.71	2.01	1.95	2.18	2.01	1.70	2.06	1.71	2.01	1.51	1.59	1.67	1.72	1.80	1.74	1.51	1.81	1.88	1.46	1.41	1.43	1.70	1.34	1.34	1.26
senon	0.84	2.15	2.28	2.33	2.47	2.27	2.18	1.82	1.77	2.03	1.91	2.27	2.18	1.51	1.96	2.07	1.87	1.79	2.21	2.07	2.00	1.81	1.55	1.50	1.53
seuser	2.55	1.75	2.13	2.23	2.21	1.96	2.33	1.90	1.90	1.83	1.73	2.25	2.25	1.99	1.84	1.79	2.18	2.32	1.58	1.73	1.79	2.18	1.44	1.47	1.37

Analysis

The following packages were used for the analysis:

```
library("lavaan")
library("piecewiseSEM")
library("semPlot")
library("tidyverse")
library("semTools")
library("sjPlot")
library("psych")
library("Lambda4")
library("semTable")
set.seed(1) #to always obtain the same values
```

Alpha (Lambda3) and Lambda2

Italy

```
print('Italy Users - habits')
```

```
## [1] "Italy Users - habits"
```

```
dlambda <- d  %>%
  dplyr::filter(group=='ituser') %>%
  dplyr::select(H1,H2,H3,H4,H5,H6,H7,H8)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.9
##
## Standardized
## 0.9
##
## Item Statistics
##     Mean    SD  Obs If.Dropped
## H1 3.319 2.012 1357      0.870
## H2 5.044 1.948 1355      0.886
## H3 3.957 2.178 1357      0.859
## H4 3.937 2.011 1358      0.862
## H5 4.884 1.705 1357      0.872
## H6 4.235 2.059 1356      0.858
## H7 4.840 1.705 1357      0.872
## H8 3.813 2.011 1358      0.870
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.897
```

```r
print('Italy Non-users - habits')
```

```
## [1] "Italy Non-users - habits"
```

```r
dlambda <- d  %>%
  dplyr::filter(group=='itnon') %>%
  dplyr::select(H1,H2,H3,H4,H5,H6,H7,H8)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.897
##
## Standardized
## 0.896
##
## Item Statistics
##     Mean    SD  Obs If.Dropped
## H1 3.370 1.945 1797      0.868
## H2 5.547 1.895 1796      0.883
## H3 4.243 2.200 1797      0.855
## H4 3.898 2.005 1797      0.862
## H5 4.898 1.782 1797      0.867
## H6 4.315 2.017 1797      0.854
## H7 4.865 1.745 1797      0.869
## H8 3.886 2.031 1797      0.865
```

```r
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.893
```

```r
print('Italy Users - CM')
```

```
## [1] "Italy Users - CM"
```

```r
dlambda <- d  %>%
  dplyr::filter(group=='ituser') %>%
  dplyr::select(EA1,EA2,PN1,PN2)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.865
##
## Standardized
## 0.866
##
```

```
## Item Statistics
##      Mean    SD  Obs If.Dropped
## EA1 5.840 1.506 1374      0.740
## EA2 5.528 1.588 1374      0.742
## PN1 5.107 1.674 1374      0.713
## PN2 4.900 1.721 1374      0.747
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.84
```

```
print('Italy Non-users - CM')
```

```
## [1] "Italy Non-users - CM"
```

```
dlambda <- d  %>%
  dplyr::filter(group=='itnon') %>%
  dplyr::select(EA1,EA2,PN1,PN2)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.87
##
## Standardized
## 0.872
##
## Item Statistics
##      Mean    SD  Obs If.Dropped
## EA1 5.787 1.453 1874      0.746
## EA2 5.576 1.482 1874      0.743
## PN1 4.889 1.678 1874      0.726
## PN2 4.629 1.739 1873      0.747
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.845
```

```
print('Italy Users - SN')
```

```
## [1] "Italy Users - SN"
```

```
dlambda <- d  %>%
  dplyr::filter(group=='ituser') %>%
  dplyr::select(U_SN1,U_SN2,U_SN3)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.876
##
## Standardized
## 0.88
##
## Item Statistics
##        Mean    SD Obs If.Dropped
## U_SN1 4.776 1.660 818      0.653
## U_SN2 5.070 1.469 817      0.569
## U_SN3 5.483 1.391 818      0.632
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.823
```

```
print('Italy Non-users - SN')
```

```
## [1] "Italy Non-users - SN"
```

```
dlambda <- d  %>%
  dplyr::filter(group=='itnon') %>%
  dplyr::select(NU_SN1,NU_SN2,NU_SN3)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.793
##
## Standardized
## 0.809
##
## Item Statistics
##         Mean    SD  Obs If.Dropped
## NU_SN1 2.477 1.616 1873      0.438
## NU_SN2 2.440 1.603 1873      0.445
## NU_SN3 3.999 1.931 1873      0.714
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.753
```

```
print('Italy Users - Control')
```

```
## [1] "Italy Users - Control"
```

```
dlambda <- d  %>%
  dplyr::filter(group=='ituser') %>%
  dplyr::select(U_PBC1,U_PBC2,U_EOU1,U_EOU2,U_PU1,U_PU2)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.798
##
## Standardized
## 0.801
##
## Item Statistics
##         Mean    SD  Obs If.Dropped
## U_PBC1 4.188 1.814 1376      0.727
## U_PBC2 3.864 1.883 1376      0.738
## U_EOU1 5.554 1.462 1376      0.747
## U_EOU2 5.529 1.407 1376      0.736
## U_PU1  5.533 1.426 1376      0.749
## U_PU2  4.420 1.698 1375      0.720
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.799
```

```
print('Italy Non-users - Control')
```

```
## [1] "Italy Non-users - Control"
```

```
dlambda <- d  %>%
  dplyr::filter(group=='itnon') %>%
  dplyr::select(NU_PBC1,NU_PBC2,NU_EOU1,NU_EOU2,NU_PU1,NU_PU2)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.809
##
## Standardized
## 0.808
##
## Item Statistics
##          Mean    SD  Obs If.Dropped
## NU_PBC1 3.311 1.723 1874      0.738
## NU_PBC2 2.519 1.655 1873      0.773
## NU_EOU1 4.767 1.681 1874      0.758
## NU_EOU2 4.459 1.653 1874      0.741
## NU_PU1  4.634 1.625 1874      0.746
## NU_PU2  3.368 1.699 1874      0.728
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.803
```

```
print('Italy Users - Trust')
```

```
## [1] "Italy Users - Trust"
```

```
dlambda <- d  %>%
  dplyr::filter(group=='ituser') %>%
  dplyr::select(U_T1,U_T2,U_T3)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.823
##
## Standardized
## 0.824
##
## Item Statistics
##       Mean    SD  Obs If.Dropped
## U_T1 5.224 1.339 1372      0.531
## U_T2 4.722 1.340 1248      0.626
## U_T3 5.214 1.264 1357      0.538
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.774
```

```
print('Italy Non-users - Trust')
```

```
## [1] "Italy Non-users - Trust"
```

```
dlambda <- d  %>%
  dplyr::filter(group=='itnon') %>%
  dplyr::select(NU_T1,NU_T2,NU_T3)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.881
##
## Standardized
## 0.88
```

```
##
## Item Statistics
##        Mean    SD  Obs If.Dropped
## NU_T1 4.693 1.316 1856      0.605
## NU_T2 4.334 1.244 1835      0.665
## NU_T3 4.731 1.319 1852      0.595
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.829
```

Sweden

```
print('Sweden Users - habits')
```

```
## [1] "Sweden Users - habits"
```

```
dlambda <- d  %>%
  dplyr::filter(group=='seuser') %>%
  dplyr::select(H1,H2,H3,H4,H5,H6,H7,H8)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.901
##
## Standardized
## 0.904
##
## Item Statistics
##     Mean    SD Obs If.Dropped
## H1 2.066 1.748 997      0.873
## H2 2.730 2.129 997      0.871
## H3 3.162 2.226 994      0.863
## H4 2.736 2.213 997      0.861
## H5 2.433 1.959 995      0.863
## H6 4.694 2.332 995      0.890
## H7 4.597 1.904 997      0.871
## H8 4.825 1.897 998      0.869
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.897
```

```
print('Sweden Non-users - habits')
```

```
## [1] "Sweden Non-users - habits"
```

```r
dlambda <- d  %>%
  dplyr::filter(group=='senon') %>%
  dplyr::select(H1,H2,H3,H4,H5,H6,H7,H8)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.917
##
## Standardized
## 0.919
##
## Item Statistics
##     Mean    SD  Obs If.Dropped
## H1 2.978 2.154 1524      0.891
## H2 3.500 2.284 1524      0.891
## H3 4.168 2.327 1523      0.883
## H4 3.780 2.465 1526      0.883
## H5 3.412 2.268 1523      0.882
## H6 5.443 2.175 1524      0.898
## H7 5.353 1.819 1525      0.888
## H8 5.545 1.772 1524      0.888
```

```r
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.913
```

```r
print('Sweden Users - CM')
```

```
## [1] "Sweden Users - CM"
```

```r
dlambda <- d  %>%
  dplyr::filter(group=='seuser') %>%
  dplyr::select(EA1,EA2,PN1,PN2)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.881
##
## Standardized
## 0.885
##
## Item Statistics
##      Mean    SD  Obs If.Dropped
## EA1 5.632 1.830 1052      0.752
## EA2 5.722 1.729 1053      0.766
## PN1 4.577 2.246 1052      0.732
## PN2 3.923 2.251 1050      0.758
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.858
```

```
print('Sweden Non-users - CM')
```

```
## [1] "Sweden Non-users - CM"
```

```
dlambda <- d  %>%
  dplyr::filter(group=='senon') %>%
  dplyr::select(EA1,EA2,PN1,PN2)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.874
##
## Standardized
## 0.875
##
## Item Statistics
##      Mean    SD  Obs If.Dropped
## EA1 5.086 2.030 1730      0.740
## EA2 5.194 1.906 1730      0.754
## PN1 3.976 2.267 1730      0.736
## PN2 3.387 2.183 1727      0.751
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.851
```

```
print('Sweden Users - SN')
```

```
## [1] "Sweden Users - SN"
```

```
dlambda <- d  %>%
  dplyr::filter(group=='seuser') %>%
  dplyr::select(U_SN1,U_SN2,U_SN3)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.872
##
## Standardized
```

```
## 0.879
##
## Item Statistics
##        Mean    SD Obs If.Dropped
## U_SN1 4.350 1.826 548      0.702
## U_SN2 5.033 1.593 547      0.552
## U_SN3 5.184 1.587 548      0.590
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.82
```

```
print('Sweden Non-users - SN')
```

```
## [1] "Sweden Non-users - SN"
```

```
dlambda <- d  %>%
  dplyr::filter(group=='senon') %>%
  dplyr::select(NU_SN1,NU_SN2,NU_SN3)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.791
##
## Standardized
## 0.79
##
## Item Statistics
##         Mean    SD  Obs If.Dropped
## NU_SN1 2.105 1.511 1709      0.635
## NU_SN2 3.350 1.961 1710      0.405
## NU_SN3 3.901 2.068 1709      0.517
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.759
```

```
print('Sweden Users - Control')
```

```
## [1] "Sweden Users - Control"
```

```
dlambda <- d  %>%
  dplyr::filter(group=='seuser') %>%
  dplyr::select(U_PBC1,U_PBC2,U_EOU1,U_EOU2,U_PU1,U_PU2)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.838
##
## Standardized
## 0.842
##
## Item Statistics
##         Mean    SD  Obs If.Dropped
## U_PBC1 3.264 2.180 1053      0.787
## U_PBC2 3.591 2.324 1058      0.774
## U_EOU1 5.625 1.578 1051      0.793
## U_EOU2 5.346 1.735 1045      0.776
## U_PU1  4.940 1.792 1058      0.778
## U_PU2  4.073 2.177 1058      0.763
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.833
```

```
print('Sweden Non-users - Control')
```

```
## [1] "Sweden Non-users - Control"
```

```
dlambda <- d  %>%
  dplyr::filter(group=='senon') %>%
  dplyr::select(NU_PBC1,NU_PBC2,NU_EOU1,NU_EOU2,NU_PU1,NU_PU2)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.84
##
## Standardized
## 0.841
##
## Item Statistics
##          Mean    SD  Obs If.Dropped
## NU_PBC1 2.583 1.867 1731      0.786
## NU_PBC2 2.254 1.786 1728      0.793
## NU_EOU1 4.447 2.208 1723      0.786
## NU_EOU2 3.895 2.069 1725      0.769
## NU_PU1  3.395 2.004 1723      0.772
## NU_PU2  2.519 1.808 1728      0.783
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.835
```

```r
print('Sweden Users - Trust')
```

```
## [1] "Sweden Users - Trust"
```

```r
dlambda <- d  %>%
  dplyr::filter(group=='seuser') %>%
  dplyr::select(U_T1,U_T2,U_T3)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.896
##
## Standardized
## 0.896
##
## Item Statistics
##       Mean    SD Obs If.Dropped
## U_T1 5.379 1.437 917      0.662
## U_T2 5.016 1.467 862      0.641
## U_T3 5.333 1.366 920      0.611
```

```r
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.841
```

```r
print('Sweden Non-users - Trust')
```

```
## [1] "Sweden Non-users - Trust"
```

```r
dlambda <- d  %>%
  dplyr::filter(group=='senon') %>%
  dplyr::select(NU_T1,NU_T2,NU_T3)
dlambda %>% Lambda4::lambda3()
```

```
## Coefficient Alpha (Guttman's Lambda 3 Coefficient)
##
## Unstandardized
## 0.909
##
## Standardized
## 0.909
##
## Item Statistics
##        Mean    SD  Obs If.Dropped
## NU_T1 4.474 1.553 1094      0.679
## NU_T2 4.203 1.499  983      0.642
## NU_T3 4.365 1.529 1033      0.634
```

```
dlambda %>% Lambda4::lambda2()
```

```
## Guttman's Lambda 2 Coefficient:
## 0.853
```

Analysis of configural invariance

For the analysis of invariance (configural, metric, scalar), run:

```
model1 <- 'BehaviorInt =~ BI
Habit =~ H1 + H2 + H3 + H4 + H5 + H6 + H7 + H8
H2~~H5 + H6 + H7
H8~~H5 + H7 + H2 + H6 + H4
H5~~H6
CM =~ EA1 + EA2 + PN1 + PN2
PN1~~PN2
EA1~~EA2
SN =~ SN1 + SN2 + SN3
SN1~~SN3
SN2~~PU1
Control =~ PBC1 + PBC2 + EOU1 + EOU2 + PU1 + PU2
EOU1~~EOU2
PBC1~~PBC2
PU2~~EOU1 + EOU2
PBC2~~PU1 + SN2 + SN3
Trust =~ T1 + T2 + T3
BehaviorInt~ Habit + CM + SN + Control + Trust'

fit1 <- cfa(model1,
            data= d,
            std.lv = TRUE,
            group="group",
            missing="fiml",
            se="robust.mlr")
```

To obtain Chi-squared, degrees of freedom, p-value, CFI and RMSEA (with lower and upper ci and p-value), run:

```
fit1measures<-lavaan::fitmeasures(fit1)
fit1measures[c('chisq',
               'df',
               'pvalue',
               'cfi',
               'rmsea',
               'rmsea.ci.lower',
               'rmsea.ci.upper',
               'rmsea.pvalue')]
```

```
##          chisq             df         pvalue            cfi          rmsea
##   5.394604e+03   9.640000e+02   0.000000e+00   9.484378e-01   5.503369e-02
## rmsea.ci.lower rmsea.ci.upper   rmsea.pvalue
##   5.360645e-02   5.647038e-02   0.000000e+00
```

Analysis of metric invariance

```
model2 <- 'BehaviorInt =~ BI
Habit =~ H1 + H2 + H3 + H4 + H5 + H6 + H7 + H8
H2~~H5 + H6 + H7
H8~~H5 + H7 + H2 + H6 + H4
H5~~H6
CM =~ EA1 + EA2 + PN1 + PN2
PN1~~PN2
EA1~~EA2
SN =~ SN1 + SN2 + SN3
SN1~~SN3
SN2~~PU1
Control =~ PBC1 + PBC2 + EOU1 + EOU2 + PU1 + PU2
EOU1~~EOU2
PBC1~~PBC2
PU2~~EOU1 + EOU2
PBC2~~PU1 + SN2 + SN3
Trust =~ T1 + T2 + T3
BehaviorInt~ c(a,a,a,a)*Habit + c(b,b,b,b)*CM + c(c,c,c,c)*SN + c(d,d,d,d)*Control +
c(e,e,e,e)*Trust'

fit2 <- cfa(model2,
            data= d,
            std.lv = TRUE,
            group="group",
            missing="fiml",
            se="robust.mlr")
```

To obtain Chi-squared, degrees of freedom, p-value, CFI and RMSEA (with lower and upper ci and p-value), run:

```
fit2measures<-lavaan::fitmeasures(fit2)
fit2measures[c('chisq',
               'df',
               'pvalue',
               'cfi',
               'rmsea',
               'rmsea.ci.lower',
               'rmsea.ci.upper',
               'rmsea.pvalue')]
```

```
##          chisq             df         pvalue            cfi          rmsea
##   5.611823e+03   9.790000e+02   0.000000e+00   9.460844e-01   5.584279e-02
## rmsea.ci.lower rmsea.ci.upper   rmsea.pvalue
##   5.442848e-02   5.726637e-02   0.000000e+00
```

Analysis of scalar invariance (fixed loading for habits)

```
model3 <- 'BehaviorInt =~ BI
Habit =~ 1*H1 + c(f,f,f,f)*H2 + c(g,g,g,g)*H3 +
c(h,h,h,h)*H4 + c(i,i,i,i)*H5 + c(j,j,j,j)*H6 +
c(k,k,k,k)*H7 + c(l,l,l,l)*H8
H2~~H5 + H6 + H7
H8~~H5 + H7 + H2 + H6 + H4
H5~~H6
CM =~ EA1 + EA2 + PN1 + PN2
PN1~~PN2
EA1~~EA2
SN =~ SN1 + SN2 + SN3
SN1~~SN3
SN2~~PU1
Control =~ PBC1 + PBC2 + EOU1 + EOU2 + PU1 + PU2
EOU1~~EOU2
PBC1~~PBC2
PU2~~EOU1 + EOU2
PBC2~~PU1 + SN2 + SN3
Trust =~ T1 + T2 + T3
BehaviorInt~ c(a,a,a,a)*Habit + c(b,b,b,b)*CM +
c(c,c,c,c)*SN + c(d,d,d,d)*Control + c(e,e,e,e)*Trust'

fit3 <- cfa(model3,
            data= d,
            std.lv = TRUE,
            group="group",
            missing="fiml",
            se="robust.mlr")
```

To obtain Chi-squared, degrees of freedom, p-value, CFI and RMSEA (with lower and upper ci and p-value), run:

```
fit3measures<-lavaan::fitmeasures(fit3)
fit3measures[c('chisq',
               'df',
               'pvalue',
               'cfi',
               'rmsea',
               'rmsea.ci.lower',
               'rmsea.ci.upper',
               'rmsea.pvalue')]
```

```
##          chisq             df         pvalue            cfi          rmsea
##   6.520621e+03   1.004000e+03   0.000000e+00   9.357990e-01   6.017351e-02
## rmsea.ci.lower rmsea.ci.upper   rmsea.pvalue
##   5.878603e-02   6.156974e-02   0.000000e+00
```

Analysis of scalar invariance (fixed loading for habits and Climate Morality (CL))

```
model4 <- 'BehaviorInt =~ BI
Habit =~ 1*H1 + c(f,f,f,f)*H2 + c(g,g,g,g)*H3 +
c(h,h,h,h)*H4 + c(i,i,i,i)*H5 + c(j,j,j,j)*H6 +
c(k,k,k,k)*H7 + c(l,l,l,l)*H8
H2~~H5 + H6 + H7
H8~~H5 + H7 + H2 + H6 + H4
H5~~H6
CM =~ c(m,m,m,m)*EA1 + c(n,n,n,n)*EA2 +
c(o,o,o,o)*PN1 + c(p,p,p,p)*PN2
PN1~~PN2
EA1~~EA2
SN =~ SN1 + SN2 + SN3
SN1~~SN3
SN2~~PU1
Control =~ PBC1 + PBC2 + EOU1 + EOU2 + PU1 + PU2
EOU1~~EOU2
PBC1~~PBC2
PU2~~EOU1 + EOU2
PBC2~~PU1 + SN2 + SN3
Trust =~ T1 + T2 + T3
BehaviorInt~ c(a,a,a,a)*Habit + c(b,b,b,b)*CM +
c(c,c,c,c)*SN + c(d,d,d,d)*Control + c(e,e,e,e)*Trust'

fit4 <- cfa(model4,
            data= d,
            std.lv = TRUE,
            group="group",
            missing="fiml",
            se="robust.mlr")
```

To obtain Chi-squared, degrees of freedom, p-value, CFI and RMSEA (with lower and upper ci and p-value), run:

```
fit4measures<-lavaan::fitmeasures(fit4)
fit4measures[c('chisq',
               'df',
               'pvalue',
               'cfi',
               'rmsea',
               'rmsea.ci.lower',
               'rmsea.ci.upper',
               'rmsea.pvalue')]
```

```
##          chisq             df         pvalue            cfi          rmsea
##   6.699104e+03   1.016000e+03   0.000000e+00   9.338615e-01   6.071298e-02
## rmsea.ci.lower rmsea.ci.upper   rmsea.pvalue
##   5.933469e-02   6.209987e-02   0.000000e+00
```

For all fit measures, run:

```r
summary(fit1, fit.measures=TRUE, ci= TRUE) #model1
summary(fit2, fit.measures=TRUE, ci= TRUE) #model2
summary(fit3, fit.measures=TRUE, ci= TRUE) #model3
summary(fit4, fit.measures=TRUE, ci= TRUE) #model4
```

Software environment

This document was created with the following environment:

```r
sessionInfo()
```

```
## R version 3.6.0 (2019-04-26)
## Platform: x86_64-apple-darwin15.6.0 (64-bit)
## Running under: macOS  10.15.7
##
## Matrix products: default
## BLAS:   /Library/Frameworks/R.framework/Versions/3.6/Resources/lib/libRblas.0.dylib
## LAPACK: /Library/Frameworks/R.framework/Versions/3.6/Resources/lib/libRlapack.dylib
##
## locale:
## [1] en_US.UTF-8/en_US.UTF-8/en_US.UTF-8/C/en_US.UTF-8/en_US.UTF-8
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
##  [1] semTable_1.8       Lambda4_3.0        psych_1.8.12       sjPlot_2.8.4
##  [5] semTools_0.5-3     semPlot_1.1.2      piecewiseSEM_2.1.0 lavaan_0.6-7
##  [9] kableExtra_1.2.1   forcats_0.4.0      stringr_1.4.0      dplyr_0.8.4
## [13] purrr_0.3.2        readr_1.3.1        tidyr_1.0.2        tibble_2.1.3
## [17] ggplot2_3.3.2      tidyverse_1.2.1
##
## loaded via a namespace (and not attached):
##   [1] readxl_1.3.1        backports_1.1.4     Hmisc_4.2-0
##   [4] BDgraph_2.59        plyr_1.8.4          igraph_1.2.4.1
##   [7] splines_3.6.0       TH.data_1.0-10      digest_0.6.20
##  [10] htmltools_0.3.6     matrixcalc_1.0-3    magrittr_1.5
##  [13] Rsolnp_1.16         checkmate_1.9.4     lisrelToR_0.1.4
##  [16] cluster_2.0.8       openxlsx_4.1.0      modelr_0.1.4
##  [19] sandwich_2.5-1      jpeg_0.1-8          sem_3.1-9
##  [22] colorspace_1.4-1    rvest_0.3.4         haven_2.1.0
##  [25] xfun_0.19           crayon_1.3.4        jsonlite_1.6
##  [28] lme4_1.1-21         regsem_1.3.9        zeallot_0.1.0
##  [31] survival_2.44-1.1   zoo_1.8-5           glue_1.3.1
##  [34] gtable_0.3.0        emmeans_1.5.1       webshot_0.5.2
##  [37] sjstats_0.17.9      sjmisc_2.8.3        mi_1.0
##  [40] car_3.0-2           ggm_2.3             abind_1.4-5
##  [43] scales_1.1.1        mvtnorm_1.0-10      ggeffects_0.15.1
##  [46] Rcpp_1.0.2          performance_0.4.4   viridisLite_0.3.0
##  [49] xtable_1.8-4        htmlTable_1.13.1    foreign_0.8-71
##  [52] Formula_1.2-3       stats4_3.6.0        truncnorm_1.0-8
```

```
##  [55] htmlwidgets_1.3     httr_1.4.0          DiagrammeR_1.0.5
##  [58] RColorBrewer_1.1-2  acepack_1.4.1       pkgconfig_2.0.2
##  [61] XML_3.99-0.3        nnet_7.3-12         kutils_1.69
##  [64] effectsize_0.2.0    tidyselect_0.2.5    rlang_0.4.7
##  [67] reshape2_1.4.3      munsell_0.5.0       cellranger_1.1.0
##  [70] tools_3.6.0         visNetwork_2.0.9    cli_1.1.0
##  [73] generics_0.0.2      sjlabelled_1.1.3    broom_0.5.2
##  [76] fdrtool_1.2.15      evaluate_0.14       arm_1.10-1
##  [79] yaml_2.2.0          knitr_1.30          stationery_0.98.30
##  [82] zip_2.1.1           glasso_1.10         pbapply_1.4-0
##  [85] nlme_3.1-139        whisker_0.3-2       xml2_1.2.0
##  [88] compiler_3.6.0      rstudioapi_0.10     curl_3.3
##  [91] png_0.1-7           huge_1.3.2          pbivnorm_0.6.0
##  [94] stringi_1.4.3       parameters_0.8.2    qgraph_1.6.2
##  [97] rockchalk_1.8.144   lattice_0.20-38     Matrix_1.2-17
## [100] nloptr_1.2.1        vctrs_0.2.0         pillar_1.4.2
## [103] lifecycle_0.1.0     OpenMx_2.15.5       estimability_1.3
## [106] insight_0.9.1       data.table_1.12.2   corpcor_1.6.9
## [109] R6_2.4.0            latticeExtra_0.6-28 gridExtra_2.3
## [112] rio_0.5.16          codetools_0.2-16    boot_1.3-22
## [115] MASS_7.3-51.4       gtools_3.8.1        assertthat_0.2.1
## [118] rjson_0.2.20        withr_2.1.2         mnormt_1.5-5
## [121] multcomp_1.4-10     bayestestR_0.7.2    parallel_3.6.0
## [124] hms_0.4.2           grid_3.6.0          rpart_4.1-15
## [127] coda_0.19-3         minqa_1.2.4         rmarkdown_1.12
## [130] carData_3.0-2       d3Network_0.5.2.1   lubridate_1.7.4
## [133] base64enc_0.1-3
```