1    *Light Exposure Behavior Assessment (LEBA)*: Develop of a novel instrument to capture

2                                light exposure-related behaviours

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8    must be indented, like this line.

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10       The authors made the following contributions. Mushfiqul Anwar Siraji: Data

11   Analysis, Writing - Original Draft Preparation, Data Visualization; Rafael Robert Lazar:

12   Writing - Original Draft Preparation.

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Abstract

One or two sentences providing a **basic introduction** to the field, comprehensible to a scientist in any discipline.

Two to three sentences of **more detailed background**, comprehensible to scientists in related disciplines.

One sentence clearly stating the **general problem** being addressed by this particular study.

One sentence summarizing the main result (with the words "**here we show**" or their equivalent).

Two or three sentences explaining what the **main result** reveals in direct comparison to what was thought to be the case previously, or how the main result adds to previous knowledge.

One or two sentences to put the results into a more **general context**.

Two or three sentences to provide a **broader perspective**, readily comprehensible to a scientist in any discipline.

*Keywords:* keywords

Word count: X

32    *Light Exposure Behavior Assessment (LEBA)*: Develop of a novel instrument to capture

33                                 light exposure-related behaviours

34                                            **Methods**

35    **Participants**

36    **Material**

37    **Procedure**

38    **Data analysis**

39        We used R [Version 4.0.3; R Core Team (2020)] and the R-packages *boot* [Version

40    1.3.28; Davison and Hinkley (1997)], *dlookr* [Version 0.5.0; Ryu (2021)], *dplyr* [Version

41    1.0.7; Wickham, François, Henry, and Müller (2021)], *equate* [Version 2.0.7; Albano (2016)],

42    *forcats* [Version 0.5.1; Wickham (2021a)], *ggplot2* [Version 3.3.3; Wickham (2016)], *hemp*

43    [Version 0.1.0; Bulut (2021)], *kableExtra* [Version 1.3.4; Zhu (2021)], *lattice* [Version

44    0.20.44; Sarkar (2008)], *lavaan* [Version 0.6.9; Rosseel (2012)], *lme4* [Version 1.1.27.1;

45    Bates, Mächler, Bolker, and Walker (2015)], *Matrix* [Version 1.3.3; Bates and Maechler

46    (2021)], *mirt* [Version 1.34; Chalmers (2012)], *papaja* [Version 0.1.0.9997; Aust and Barth

47    (2020)], *psych* [Version 2.1.6; Revelle (2021)], *purrr* [Version 0.3.4; Henry and Wickham

48    (2020)], *qgraph* [Version 1.6.9; Epskamp, Cramer, Waldorp, Schmittmann, and Borsboom

49    (2012)], *readr* [Version 1.4.0; Wickham and Hester (2020)], *readxl* [Version 1.3.1; Wickham

50    and Bryan (2019)], *reshape2* [Version 1.4.4; Wickham (2007)], *semPlot* [Version 1.1.2;

51    Epskamp (2019)], *semTools* [Version 0.5.5; Jorgensen, Pornprasertmanit, Schoemann, and

52    Rosseel (2021)], *stringr* [Version 1.4.0; Wickham (2019)], *tibble* [Version 3.1.2; Müller and

53    Wickham (2021)], *tidyr* [Version 1.1.3; Wickham (2021b)], and *tidyverse* [Version 1.3.1;

54    Wickham et al. (2019)] for all our analyses.

# Results

## Confirmatory Factor Analysis

```
## Call: mardia(x = LB.cfa, na.rm = T, plot = F)
##
## Mardia tests of multivariate skew and kurtosis
## Use describe(x) the to get univariate tests
## n.obs = 199   num.vars =  48
## b1p =  761.72   skew =  25263.82  with probability  <=  8.8e-152
##  small sample skew =  25660.39  with probability <=  1.2e-171
## b2p =  2540.5   kurtosis =  14.3  with probability <=  0

## lavaan 0.6-9 ended normally after 64 iterations
##
##    Estimator                                         ML
##    Optimization method                           NLMINB
##    Number of model parameters                        79
##
##    Number of observations                           199
##    Number of missing patterns                         1
##
## Model Test User Model:
##                                            Standard      Robust
##    Test Statistic                           406.275     387.999
##    Degrees of freedom                           220         220
##    P-value (Chi-square)                       0.000       0.000
##    Scaling correction factor                              1.047
##        Yuan-Bentler correction (Mplus variant)
```

```
81   ##
82   ## Model Test Baseline Model:
83   ##
84   ##    Test statistic                              1700.445      1368.235
85   ##    Degrees of freedom                               253           253
86   ##    P-value                                        0.000         0.000
87   ##    Scaling correction factor                                    1.243
88   ##
89   ## User Model versus Baseline Model:
90   ##
91   ##    Comparative Fit Index (CFI)                    0.871         0.849
92   ##    Tucker-Lewis Index (TLI)                       0.852         0.827
93   ##
94   ##    Robust Comparative Fit Index (CFI)                           0.873
95   ##    Robust Tucker-Lewis Index (TLI)                              0.854
96   ##
97   ## Loglikelihood and Information Criteria:
98   ##
99   ##    Loglikelihood user model (H0)              -6371.304     -6371.304
100  ##    Scaling correction factor                                    1.877
101  ##        for the MLR correction
102  ##    Loglikelihood unrestricted model (H1)      -6168.166     -6168.166
103  ##    Scaling correction factor                                    1.266
104  ##        for the MLR correction
105  ##
106  ##    Akaike (AIC)                               12900.607     12900.607
107  ##    Bayesian (BIC)                             13160.778     13160.778
```

```
108  ##    Sample-size adjusted Bayesian (BIC)        12910.502   12910.502

109  ##

110  ## Root Mean Square Error of Approximation:

111  ##

112  ##    RMSEA                                           0.065       0.062

113  ##    90 Percent confidence interval - lower          0.055       0.052

114  ##    90 Percent confidence interval - upper          0.075       0.072

115  ##    P-value RMSEA <= 0.05                            0.007       0.026

116  ##

117  ##    Robust RMSEA                                                 0.063

118  ##    90 Percent confidence interval - lower                      0.053

119  ##    90 Percent confidence interval - upper                      0.074

120  ##

121  ## Standardized Root Mean Square Residual:

122  ##

123  ##    SRMR                                            0.075       0.075

124  ##

125  ## Parameter Estimates:

126  ##

127  ##    Standard errors                             Sandwich

128  ##    Information bread                           Observed

129  ##    Observed information based on                Hessian

130  ##

131  ## Latent Variables:

132  ##                     Estimate  Std.Err  z-value  P(>|z|)  Std.lv  Std.all

133  ##    F1 =~

134  ##      item31            1.000                                0.397    0.873
```

```
135 ##     item33           0.823    0.123    6.685    0.000    0.327    0.724
136 ##     item1            0.990    0.158    6.246    0.000    0.393    0.644
137 ##     item37           0.901    0.284    3.176    0.001    0.358    0.507
138 ##     item24           0.437    0.265    1.647    0.100    0.173    0.175
139 ##   F2 =~
140 ##     item10           1.000                                  0.859    0.783
141 ##     item47           0.856    0.111    7.729    0.000    0.736    0.808
142 ##     item36           0.945    0.137    6.876    0.000    0.812    0.701
143 ##     item44          -0.714    0.139   -5.131    0.000   -0.613   -0.490
144 ##     item35           0.739    0.139    5.300    0.000    0.635    0.508
145 ##     item13           0.472    0.113    4.163    0.000    0.406    0.373
146 ##   F3 =~
147 ##     item43           1.000                                  1.291    0.951
148 ##     item26           0.918    0.056   16.313    0.000    1.186    0.843
149 ##     item32           0.895    0.064   13.928    0.000    1.155    0.872
150 ##   F4 =~
151 ##     item14           1.000                                  0.493    0.263
152 ##     item7            0.640    0.267    2.392    0.017    0.316    0.171
153 ##     item11           1.850    0.684    2.706    0.007    0.912    0.708
154 ##     item42           0.788    0.314    2.513    0.012    0.389    0.225
155 ##     item12           1.953    0.779    2.509    0.012    0.963    0.845
156 ##     item16           1.017    0.410    2.479    0.013    0.501    0.343
157 ##   F5 =~
158 ##     item19           1.000                                  0.875    0.683
159 ##     item34           1.312    0.174    7.555    0.000    1.148    0.831
160 ##     item2            0.974    0.143    6.827    0.000    0.852    0.606
161 ##
```

```
162  ## Covariances:
163  ##                    Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
164  ##    F1 ~~
165  ##       F2             0.038    0.033    1.169    0.243    0.112    0.112
166  ##       F3            -0.019    0.051   -0.372    0.710   -0.037   -0.037
167  ##       F4             0.013    0.024    0.532    0.595    0.064    0.064
168  ##       F5             0.027    0.034    0.795    0.427    0.078    0.078
169  ##    F2 ~~
170  ##       F3            -0.076    0.076   -0.998    0.318   -0.069   -0.069
171  ##       F4             0.077    0.054    1.443    0.149    0.182    0.182
172  ##       F5            -0.259    0.088   -2.929    0.003   -0.344   -0.344
173  ##    F3 ~~
174  ##       F4             0.032    0.065    0.501    0.616    0.051    0.051
175  ##       F5            -0.035    0.103   -0.339    0.735   -0.031   -0.031
176  ##    F4 ~~
177  ##       F5            -0.015    0.044   -0.350    0.726   -0.036   -0.036
178  ##
179  ## Intercepts:
180  ##                    Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all
181  ##    .item31          0.879    0.032   27.295    0.000    0.879    1.935
182  ##    .item33          0.869    0.032   27.150    0.000    0.869    1.925
183  ##    .item1           0.990    0.043   22.904    0.000    0.990    1.624
184  ##    .item37          0.995    0.050   19.900    0.000    0.995    1.411
185  ##    .item24          1.131    0.070   16.129    0.000    1.131    1.143
186  ##    .item10          2.543    0.078   32.704    0.000    2.543    2.318
187  ##    .item47          2.035    0.065   31.553    0.000    2.035    2.237
188  ##    .item36          2.095    0.082   25.511    0.000    2.095    1.808
```

```
189 ##    .item44        2.995    0.089   33.796   0.000    2.995    2.396

190 ##    .item35        2.070    0.089   23.362   0.000    2.070    1.656

191 ##    .item13        2.834    0.077   36.750   0.000    2.834    2.605

192 ##    .item43        1.578    0.096   16.401   0.000    1.578    1.163

193 ##    .item26        1.482    0.100   14.868   0.000    1.482    1.054

194 ##    .item32        1.533    0.094   16.314   0.000    1.533    1.156

195 ##    .item14        3.020    0.133   22.749   0.000    3.020    1.613

196 ##    .item7         3.688    0.131   28.175   0.000    3.688    1.997

197 ##    .item11        2.382    0.091   26.054   0.000    2.382    1.847

198 ##    .item42        2.935    0.122   23.959   0.000    2.935    1.698

199 ##    .item12        2.005    0.081   24.793   0.000    2.005    1.758

200 ##    .item16        3.211    0.104   30.991   0.000    3.211    2.197

201 ##    .item19        3.930    0.091   43.244   0.000    3.930    3.065

202 ##    .item34        3.583    0.098   36.558   0.000    3.583    2.592

203 ##    .item2         2.482    0.100   24.897   0.000    2.482    1.765

204 ##     F1            0.000                              0.000    0.000

205 ##     F2            0.000                              0.000    0.000

206 ##     F3            0.000                              0.000    0.000

207 ##     F4            0.000                              0.000    0.000

208 ##     F5            0.000                              0.000    0.000

209 ##

210 ## Variances:

211 ##                 Estimate  Std.Err  z-value  P(>|z|)  Std.lv  Std.all

212 ##    .item31        0.049    0.032    1.533    0.125    0.049    0.237

213 ##    .item33        0.097    0.058    1.678    0.093    0.097    0.476

214 ##    .item1         0.217    0.058    3.718    0.000    0.217    0.585

215 ##    .item37        0.370    0.125    2.952    0.003    0.370    0.743
```

```
216  ##    .item24            0.948    0.200    4.729    0.000    0.948    0.969

217  ##    .item10            0.465    0.130    3.582    0.000    0.465    0.386

218  ##    .item47            0.287    0.054    5.359    0.000    0.287    0.347

219  ##    .item36            0.683    0.094    7.283    0.000    0.683    0.509

220  ##    .item44            1.187    0.139    8.551    0.000    1.187    0.760

221  ##    .item35            1.160    0.156    7.447    0.000    1.160    0.742

222  ##    .item13            1.019    0.112    9.133    0.000    1.019    0.861

223  ##    .item43            0.175    0.101    1.726    0.084    0.175    0.095

224  ##    .item26            0.573    0.164    3.500    0.000    0.573    0.289

225  ##    .item32            0.422    0.114    3.694    0.000    0.422    0.240

226  ##    .item14            3.264    0.236   13.831    0.000    3.264    0.931

227  ##    .item7             3.311    0.274   12.104    0.000    3.311    0.971

228  ##    .item11            0.831    0.172    4.816    0.000    0.831    0.499

229  ##    .item42            2.835    0.171   16.555    0.000    2.835    0.949

230  ##    .item12            0.373    0.155    2.413    0.016    0.373    0.287

231  ##    .item16            1.885    0.199    9.453    0.000    1.885    0.882

232  ##    .item19            0.877    0.130    6.769    0.000    0.877    0.534

233  ##    .item34            0.592    0.179    3.319    0.001    0.592    0.310

234  ##    .item2             1.252    0.144    8.687    0.000    1.252    0.633

235  ##    F1                 0.158    0.033    4.750    0.000    1.000    1.000

236  ##    F2                 0.738    0.147    5.035    0.000    1.000    1.000

237  ##    F3                 1.667    0.246    6.764    0.000    1.000    1.000

238  ##    F4                 0.243    0.170    1.431    0.152    1.000    1.000

239  ##    F5                 0.766    0.164    4.669    0.000    1.000    1.000

240  ##

241  ## R-Square:

242  ##                     Estimate
```

```
## item31          0.763
## item33          0.524
## item1           0.415
## item37          0.257
## item24          0.031
## item10          0.614
## item47          0.653
## item36          0.491
## item44          0.240
## item35          0.258
## item13          0.139
## item43          0.905
## item26          0.711
## item32          0.760
## item14          0.069
## item7           0.029
## item11          0.501
## item42          0.051
## item12          0.713
## item16          0.118
## item19          0.466
## item34          0.690
## item2           0.367

##          gfi         agfi          nfi          rfi   cfi.robust   tli.robust
##        0.974        0.965        0.761        0.725        0.873        0.854
## rmsea.robust         srmr          aic
##        0.063        0.075    12900.607
```

```
## 				    F1 			F2 			F3 			F4 			F5
## alpha  0.6310368 0.4818562 0.9175522 0.5837683 0.7413266
## omega  0.6175478 0.6258140 0.9185279 0.5055608 0.7523535
## omega2 0.6175478 0.6258140 0.9185279 0.5055608 0.7523535
## omega3 0.5953438 0.6255108 0.9183889 0.4373745 0.7559532
## avevar 0.2554061 0.3750499 0.7902138 0.1670288 0.5080283
```

Based on CFI, TLI, RMSEA and SRMR value the fitted five factor model is not acceptable. As a result a close inspection on items with low factor-loadings and low R-square value was conducted. two items were found to be problematic **item7, item 24** with vary low R-square value thus discarded from the model.

```
## lavaan 0.6-9 ended normally after 67 iterations
##
##   Estimator                                         ML
##   Optimization method                           NLMINB
##   Number of model parameters                        73
##
##   Number of observations                           199
##   Number of missing patterns                         1
##
## Model Test User Model:
##                                             Standard      Robust
##   Test Statistic                             273.193     263.376
##   Degrees of freedom                             179         179
##   P-value (Chi-square)                         0.000       0.000
##   Scaling correction factor                                1.037
##       Yuan-Bentler correction (Mplus variant)
```

```
##

## Model Test Baseline Model:

##

##    Test statistic                          1557.809    1230.314

##    Degrees of freedom                            210         210

##    P-value                                     0.000       0.000

##    Scaling correction factor                               1.266

##

## User Model versus Baseline Model:

##

##    Comparative Fit Index (CFI)                 0.930       0.917

##    Tucker-Lewis Index (TLI)                    0.918       0.903

##

##    Robust Comparative Fit Index (CFI)                      0.932

##    Robust Tucker-Lewis Index (TLI)                         0.921

##

## Loglikelihood and Information Criteria:

##

##    Loglikelihood user model (H0)           -5691.495   -5691.495

##    Scaling correction factor                               1.890

##        for the MLR correction

##    Loglikelihood unrestricted model (H1)   -5554.899   -5554.899

##    Scaling correction factor                               1.284

##        for the MLR correction

##

##    Akaike (AIC)                            11528.990   11528.990

##    Bayesian (BIC)                          11769.401   11769.401
```

```
323 ##    Sample-size adjusted Bayesian (BIC)        11538.134   11538.134

324 ##

325 ## Root Mean Square Error of Approximation:

326 ##

327 ##    RMSEA                                           0.051       0.049

328 ##    90 Percent confidence interval - lower          0.039       0.036

329 ##    90 Percent confidence interval - upper          0.063       0.061

330 ##    P-value RMSEA <= 0.05                           0.412       0.559

331 ##

332 ##    Robust RMSEA                                                0.050

333 ##    90 Percent confidence interval - lower                      0.036

334 ##    90 Percent confidence interval - upper                      0.062

335 ##

336 ## Standardized Root Mean Square Residual:

337 ##

338 ##    SRMR                                            0.068       0.068

339 ##

340 ## Parameter Estimates:

341 ##

342 ##    Standard errors                             Sandwich

343 ##    Information bread                           Observed

344 ##    Observed information based on                 Hessian

345 ##

346 ## Latent Variables:

347 ##                     Estimate  Std.Err  z-value  P(>|z|)   Std.lv  Std.all

348 ##   F1 =~

349 ##     item31              1.000                                0.397    0.873
```

```
350 ##      item33          0.828    0.119    6.962    0.000    0.328    0.727
351 ##      item1           0.992    0.153    6.503    0.000    0.394    0.645
352 ##      item37          0.890    0.278    3.203    0.001    0.353    0.501
353 ##    F2 =~
354 ##      item10          1.000                                0.859    0.783
355 ##      item47          0.856    0.111    7.739    0.000    0.735    0.808
356 ##      item36          0.946    0.138    6.876    0.000    0.812    0.701
357 ##      item35          0.739    0.139    5.300    0.000    0.635    0.508
358 ##      item13          0.472    0.113    4.162    0.000    0.405    0.373
359 ##      item44         -0.714    0.139   -5.133    0.000   -0.613   -0.490
360 ##    F3 =~
361 ##      item43          1.000                                1.291    0.951
362 ##      item26          0.919    0.056   16.331    0.000    1.186    0.843
363 ##      item32          0.895    0.064   13.941    0.000    1.155    0.872
364 ##    F4 =~
365 ##      item14          1.000                                0.444    0.237
366 ##      item42          0.867    0.332    2.614    0.009    0.385    0.223
367 ##      item12          2.245    0.830    2.704    0.007    0.996    0.873
368 ##      item11          2.009    0.720    2.791    0.005    0.891    0.691
369 ##      item16          1.108    0.445    2.488    0.013    0.492    0.336
370 ##    F5 =~
371 ##      item19          1.000                                0.875    0.683
372 ##      item34          1.312    0.173    7.568    0.000    1.148    0.831
373 ##      item2           0.974    0.143    6.828    0.000    0.852    0.606
374 ##
375 ## Covariances:
376 ##                     Estimate  Std.Err  z-value  P(>|z|)  Std.lv   Std.all
```

```
377  ##    F1 ~~
378  ##       F2              0.037    0.032    1.143    0.253    0.108    0.108
379  ##       F3             -0.020    0.051   -0.400    0.689   -0.040   -0.040
380  ##       F4              0.011    0.020    0.535    0.593    0.062    0.062
381  ##       F5              0.029    0.034    0.843    0.399    0.083    0.083
382  ##    F2 ~~
383  ##       F3             -0.076    0.076   -0.998    0.318   -0.069   -0.069
384  ##       F4              0.069    0.048    1.434    0.152    0.181    0.181
385  ##       F5             -0.259    0.088   -2.931    0.003   -0.344   -0.344
386  ##    F3 ~~
387  ##       F4              0.025    0.056    0.449    0.654    0.044    0.044
388  ##       F5             -0.035    0.103   -0.339    0.735   -0.031   -0.031
389  ##    F4 ~~
390  ##       F5             -0.015    0.039   -0.376    0.707   -0.038   -0.038
391  ##
392  ## Intercepts:
393  ##                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv   Std.all
394  ##      .item31        0.879    0.032   27.295    0.000    0.879    1.935
395  ##      .item33        0.869    0.032   27.150    0.000    0.869    1.925
396  ##      .item1         0.990    0.043   22.904    0.000    0.990    1.624
397  ##      .item37        0.995    0.050   19.900    0.000    0.995    1.411
398  ##      .item10        2.543    0.078   32.704    0.000    2.543    2.318
399  ##      .item47        2.035    0.065   31.553    0.000    2.035    2.237
400  ##      .item36        2.095    0.082   25.511    0.000    2.095    1.808
401  ##      .item35        2.070    0.089   23.362    0.000    2.070    1.656
402  ##      .item13        2.834    0.077   36.750    0.000    2.834    2.605
403  ##      .item44        2.995    0.089   33.796    0.000    2.995    2.396
```

```
404 ##     .item43       1.578    0.096   16.401   0.000     1.578    1.163

405 ##     .item26       1.482    0.100   14.868   0.000     1.482    1.054

406 ##     .item32       1.533    0.094   16.314   0.000     1.533    1.156

407 ##     .item14       3.020    0.133   22.749   0.000     3.020    1.613

408 ##     .item42       2.935    0.122   23.959   0.000     2.935    1.698

409 ##     .item12       2.005    0.081   24.793   0.000     2.005    1.758

410 ##     .item11       2.382    0.091   26.054   0.000     2.382    1.847

411 ##     .item16       3.211    0.104   30.991   0.000     3.211    2.197

412 ##     .item19       3.930    0.091   43.244   0.000     3.930    3.065

413 ##     .item34       3.583    0.098   36.558   0.000     3.583    2.592

414 ##     .item2        2.482    0.100   24.897   0.000     2.482    1.765

415 ##      F1           0.000                               0.000    0.000

416 ##      F2           0.000                               0.000    0.000

417 ##      F3           0.000                               0.000    0.000

418 ##      F4           0.000                               0.000    0.000

419 ##      F5           0.000                               0.000    0.000

420 ##

421 ## Variances:

422 ##                 Estimate  Std.Err  z-value  P(>|z|)   Std.lv   Std.all

423 ##     .item31       0.049    0.031    1.578    0.115     0.049    0.238

424 ##     .item33       0.096    0.058    1.669    0.095     0.096    0.472

425 ##     .item1        0.217    0.058    3.717    0.000     0.217    0.583

426 ##     .item37       0.373    0.124    3.005    0.003     0.373    0.749

427 ##     .item10       0.465    0.130    3.584    0.000     0.465    0.387

428 ##     .item47       0.287    0.054    5.343    0.000     0.287    0.347

429 ##     .item36       0.683    0.094    7.276    0.000     0.683    0.509

430 ##     .item35       1.160    0.156    7.452    0.000     1.160    0.742
```

```
## .item13        1.019  0.112   9.133  0.000  1.019  0.861

## .item44        1.187  0.139   8.549  0.000  1.187  0.759

## .item43        0.175  0.101   1.731  0.083  0.175  0.095

## .item26        0.572  0.164   3.498  0.000  0.572  0.289

## .item32        0.422  0.114   3.695  0.000  0.422  0.240

## .item14        3.310  0.213  15.534  0.000  3.310  0.944

## .item42        2.838  0.170  16.714  0.000  2.838  0.950

## .item12        0.310  0.180   1.719  0.086  0.310  0.238

## .item11        0.869  0.182   4.765  0.000  0.869  0.522

## .item16        1.895  0.201   9.419  0.000  1.895  0.887

## .item19        0.877  0.129   6.775  0.000  0.877  0.534

## .item34        0.593  0.178   3.327  0.001  0.593  0.310

## .item2         1.252  0.144   8.693  0.000  1.252  0.633

## F1             0.157  0.032   4.874  0.000  1.000  1.000

## F2             0.738  0.146   5.037  0.000  1.000  1.000

## F3             1.667  0.246   6.765  0.000  1.000  1.000

## F4             0.197  0.132   1.493  0.136  1.000  1.000

## F5             0.766  0.164   4.669  0.000  1.000  1.000

##

## R-Square:

##              Estimate

##    item31      0.762

##    item33      0.528

##    item1       0.417

##    item37      0.251

##    item10      0.613

##    item47      0.653
```

```
458 ##      item36              0.491
459 ##      item35              0.258
460 ##      item13              0.139
461 ##      item44              0.241
462 ##      item43              0.905
463 ##      item26              0.711
464 ##      item32              0.760
465 ##      item14              0.056
466 ##      item42              0.050
467 ##      item12              0.762
468 ##      item11              0.478
469 ##      item16              0.113
470 ##      item19              0.466
471 ##      item34              0.690
472 ##      item2               0.367


473 ##                  F1          F2          F3          F4          F5
474 ## alpha  0.7547222 0.4818562 0.9175522 0.5566040 0.7413266
475 ## omega  0.7466444 0.6258291 0.9185357 0.5272886 0.7523499
476 ## omega2 0.7466444 0.6258291 0.9185357 0.5272886 0.7523499
477 ## omega3 0.7344825 0.6255092 0.9184124 0.4921277 0.7559546
478 ## avevar 0.4256850 0.3750895 0.7902299 0.2046565 0.5080155


479 ##         lhs op    rhs     mi    epc sepc.lv sepc.all sepc.nox
480 ## 168 item31 ~~ item33 17.975  0.090   0.090    1.313    1.313
481 ## 136     F4 =~  item1 14.553  0.339   0.150    0.247    0.247
482 ## 245 item10 ~~ item13 13.377  0.222   0.222    0.322    0.322
483 ## 134     F4 =~ item31 11.467 -0.210  -0.093   -0.205   -0.205
```

```
## 359 item42 ~~ item16 11.094  0.562   0.562    0.242    0.242

## 207  item1 ~~ item37 10.910  0.078   0.078    0.274    0.274

## 104     F2 =~ item37 10.403  0.184   0.158    0.224    0.224

## 363 item12 ~~ item11  9.624  1.312   1.312    2.529    2.529

## 339 item26 ~~ item19  8.623  0.177   0.177    0.250    0.250

## 137     F4 =~ item37  7.959  0.316   0.140    0.199    0.199

## 101     F2 =~ item31  7.808 -0.089  -0.076   -0.167   -0.167

## 237 item37 ~~ item11  7.249  0.122   0.122    0.215    0.215

## 218  item1 ~~ item42  7.190  0.159   0.159    0.203    0.203

## 188 item33 ~~  item1  6.541 -0.046  -0.046   -0.318   -0.318

## 308 item13 ~~ item16  6.525  0.258   0.258    0.186    0.186

## 332 item43 ~~  item2  6.427  0.140   0.140    0.300    0.300

## 350 item14 ~~ item42  5.773  0.530   0.530    0.173    0.173

## 362 item42 ~~  item2  5.298  0.330   0.330    0.175    0.175

## 100     F1 =~  item2  5.261 -0.547  -0.217   -0.154   -0.154

## 233 item37 ~~ item32  5.251  0.074   0.074    0.186    0.186

## 173 item31 ~~ item36  5.150 -0.045  -0.045   -0.248   -0.248

## 330 item43 ~~ item19  5.106 -0.109  -0.109   -0.277   -0.277

## 192 item33 ~~ item36  4.870  0.048   0.048    0.187    0.187

## 167     F5 =~ item16  4.750  0.278   0.243    0.166    0.166

## 170 item31 ~~ item37  4.638 -0.042  -0.042   -0.313   -0.313

## 141     F4 =~ item35  4.630  0.435   0.193    0.154    0.154

## 258 item47 ~~ item36  4.608  0.121   0.121    0.273    0.273

## 358 item42 ~~ item11  4.551 -0.293  -0.293   -0.187   -0.187

## 115     F2 =~  item2  4.513 -0.260  -0.224   -0.159   -0.159

## 226 item37 ~~ item47  4.505  0.060   0.060    0.184    0.184

## 114     F2 =~ item34  4.482  0.276   0.237    0.172    0.172
```

```
## 219  item1 ~~ item12  4.328  0.064    0.064     0.247     0.247

## 206 item33 ~~   item2  4.291 -0.060   -0.060    -0.173    -0.173

## 96       F1 =~ item11  4.020 -0.412   -0.164    -0.127    -0.127


## lavaan 0.6-9 ended normally after 67 iterations

##

##    Estimator                                        ML

##    Optimization method                          NLMINB

##    Number of model parameters                       75

##

##    Number of observations                          199

##    Number of missing patterns                        1

##

## Model Test User Model:

##                                          Standard      Robust

##    Test Statistic                         233.643     228.963

##    Degrees of freedom                         177         177

##    P-value (Chi-square)                     0.003       0.005

##    Scaling correction factor                            1.020

##         Yuan-Bentler correction (Mplus variant)

##

## Model Test Baseline Model:

##

##    Test statistic                        1557.809    1230.314

##    Degrees of freedom                         210         210

##    P-value                                  0.000       0.000

##    Scaling correction factor                            1.266

##
```

```
538  ## User Model versus Baseline Model:

539  ##

540  ##   Comparative Fit Index (CFI)                        0.958        0.949

541  ##   Tucker-Lewis Index (TLI)                           0.950        0.940

542  ##

543  ##   Robust Comparative Fit Index (CFI)                              0.959

544  ##   Robust Tucker-Lewis Index (TLI)                                 0.951

545  ##

546  ## Loglikelihood and Information Criteria:

547  ##

548  ##   Loglikelihood user model (H0)             -5671.720    -5671.720

549  ##   Scaling correction factor                                      1.907

550  ##       for the MLR correction

551  ##   Loglikelihood unrestricted model (H1)     -5554.899    -5554.899

552  ##   Scaling correction factor                                      1.284

553  ##       for the MLR correction

554  ##

555  ##   Akaike (AIC)                              11493.441    11493.441

556  ##   Bayesian (BIC)                            11740.438    11740.438

557  ##   Sample-size adjusted Bayesian (BIC)       11502.834    11502.834

558  ##

559  ## Root Mean Square Error of Approximation:

560  ##

561  ##   RMSEA                                          0.040        0.038

562  ##   90 Percent confidence interval - lower         0.024        0.022

563  ##   90 Percent confidence interval - upper         0.053        0.052

564  ##   P-value RMSEA <= 0.05                          0.884        0.920
```

```
565  ##

566  ##    Robust RMSEA                                                0.039

567  ##    90 Percent confidence interval - lower                     0.022

568  ##    90 Percent confidence interval - upper                     0.052

569  ##

570  ## Standardized Root Mean Square Residual:

571  ##

572  ##    SRMR                                            0.061        0.061

573  ##

574  ## Parameter Estimates:

575  ##

576  ##    Standard errors                          Sandwich

577  ##    Information bread                        Observed

578  ##    Observed information based on              Hessian

579  ##

580  ## Latent Variables:

581  ##                    Estimate  Std.Err  z-value  P(>|z|)  Std.lv  Std.all

582  ##    F1 =~

583  ##      item31         1.000                                0.293    0.645

584  ##      item33         0.755    0.145    5.204    0.000    0.221    0.490

585  ##      item1          1.782    0.655    2.721    0.007    0.522    0.856

586  ##      item37         1.345    0.379    3.548    0.000    0.394    0.559

587  ##    F2 =~

588  ##      item10         1.000                                0.858    0.782

589  ##      item47         0.859    0.109    7.846    0.000    0.736    0.809

590  ##      item36         0.947    0.137    6.937    0.000    0.813    0.701

591  ##      item35         0.740    0.139    5.318    0.000    0.634    0.507
```

```
592 ##     item13          0.475    0.114    4.169    0.000    0.407    0.374

593 ##     item44         -0.714    0.139   -5.146    0.000   -0.612   -0.490

594 ##   F3 =~

595 ##     item43          1.000                                1.291    0.951

596 ##     item26          0.918    0.056   16.327    0.000    1.185    0.843

597 ##     item32          0.895    0.064   13.889    0.000    1.155    0.872

598 ##   F4 =~

599 ##     item14          1.000                                0.658    0.351

600 ##     item42          1.470    0.481    3.058    0.002    0.967    0.559

601 ##     item12          0.797    0.266    2.995    0.003    0.524    0.459

602 ##     item11          0.527    0.254    2.078    0.038    0.347    0.269

603 ##     item16          0.993    0.429    2.313    0.021    0.653    0.447

604 ##   F5 =~

605 ##     item19          1.000                                0.870    0.679

606 ##     item34          1.313    0.167    7.871    0.000    1.142    0.826

607 ##     item2           0.995    0.150    6.653    0.000    0.866    0.615

608 ##

609 ## Covariances:

610 ##                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv   Std.all

611 ##  .item31 ~~

612 ##     .item33         0.070    0.027    2.632    0.008    0.070    0.513

613 ##  .item12 ~~

614 ##     .item11         0.716    0.139    5.135    0.000    0.716    0.569

615 ##   F1 ~~

616 ##     F2              0.050    0.027    1.849    0.064    0.197    0.197

617 ##     F3             -0.008    0.035   -0.239    0.811   -0.022   -0.022

618 ##     F4              0.080    0.031    2.530    0.011    0.413    0.413
```

```
619  ##      F5                  0.010    0.026    0.395    0.693    0.040    0.040

620  ##   F2 ~~

621  ##      F3                 -0.076    0.076   -1.000    0.317   -0.069   -0.069

622  ##      F4                  0.119    0.083    1.424    0.154    0.210    0.210

623  ##      F5                 -0.259    0.087   -2.972    0.003   -0.347   -0.347

624  ##   F3 ~~

625  ##      F4                  0.073    0.102    0.716    0.474    0.086    0.086

626  ##      F5                 -0.034    0.102   -0.336    0.737   -0.031   -0.031

627  ##   F4 ~~

628  ##      F5                  0.089    0.076    1.171    0.242    0.155    0.155

629  ##

630  ## Intercepts:

631  ##                   Estimate  Std.Err  z-value  P(>|z|)   Std.lv   Std.all

632  ##    .item31            0.879    0.032   27.295    0.000    0.879    1.935

633  ##    .item33            0.869    0.032   27.150    0.000    0.869    1.925

634  ##    .item1             0.990    0.043   22.904    0.000    0.990    1.624

635  ##    .item37            0.995    0.050   19.900    0.000    0.995    1.411

636  ##    .item10            2.543    0.078   32.704    0.000    2.543    2.318

637  ##    .item47            2.035    0.065   31.553    0.000    2.035    2.237

638  ##    .item36            2.095    0.082   25.511    0.000    2.095    1.808

639  ##    .item35            2.070    0.089   23.362    0.000    2.070    1.656

640  ##    .item13            2.834    0.077   36.750    0.000    2.834    2.605

641  ##    .item44            2.995    0.089   33.796    0.000    2.995    2.396

642  ##    .item43            1.578    0.096   16.401    0.000    1.578    1.163

643  ##    .item26            1.482    0.100   14.868    0.000    1.482    1.054

644  ##    .item32            1.533    0.094   16.314    0.000    1.533    1.156

645  ##    .item14            3.020    0.133   22.749    0.000    3.020    1.613
```

```
646  ##    .item42        2.935    0.122   23.959    0.000    2.935    1.698

647  ##    .item12        2.005    0.081   24.793    0.000    2.005    1.758

648  ##    .item11        2.382    0.091   26.054    0.000    2.382    1.847

649  ##    .item16        3.211    0.104   30.991    0.000    3.211    2.197

650  ##    .item19        3.930    0.091   43.244    0.000    3.930    3.065

651  ##    .item34        3.583    0.098   36.558    0.000    3.583    2.592

652  ##    .item2         2.482    0.100   24.897    0.000    2.482    1.765

653  ##    F1             0.000                              0.000    0.000

654  ##    F2             0.000                              0.000    0.000

655  ##    F3             0.000                              0.000    0.000

656  ##    F4             0.000                              0.000    0.000

657  ##    F5             0.000                              0.000    0.000

658  ##

659  ## Variances:

660  ##                 Estimate  Std.Err  z-value  P(>|z|)  Std.lv   Std.all

661  ##    .item31        0.121    0.035    3.491    0.000    0.121    0.584

662  ##    .item33        0.155    0.070    2.218    0.027    0.155    0.760

663  ##    .item1         0.099    0.090    1.099    0.272    0.099    0.267

664  ##    .item37        0.342    0.130    2.621    0.009    0.342    0.688

665  ##    .item10        0.468    0.128    3.650    0.000    0.468    0.389

666  ##    .item47        0.286    0.054    5.312    0.000    0.286    0.345

667  ##    .item36        0.682    0.094    7.244    0.000    0.682    0.508

668  ##    .item35        1.161    0.155    7.465    0.000    1.161    0.743

669  ##    .item13        1.018    0.112    9.101    0.000    1.018    0.860

670  ##    .item44        1.188    0.138    8.579    0.000    1.188    0.760

671  ##    .item43        0.175    0.101    1.731    0.083    0.175    0.095

672  ##    .item26        0.573    0.164    3.503    0.000    0.573    0.290
```

```
673 ##    .item32          0.422   0.114    3.684   0.000    0.422   0.240
674 ##    .item14          3.075   0.292   10.534   0.000    3.075   0.877
675 ##    .item42          2.051   0.322    6.376   0.000    2.051   0.687
676 ##    .item12          1.027   0.150    6.867   0.000    1.027   0.789
677 ##    .item11          1.543   0.172    8.957   0.000    1.543   0.928
678 ##    .item16          1.710   0.272    6.292   0.000    1.710   0.800
679 ##    .item19          0.886   0.131    6.783   0.000    0.886   0.539
680 ##    .item34          0.606   0.178    3.402   0.001    0.606   0.317
681 ##    .item2           1.229   0.150    8.214   0.000    1.229   0.621
682 ##    F1               0.086   0.036    2.376   0.017    1.000   1.000
683 ##    F2               0.735   0.145    5.067   0.000    1.000   1.000
684 ##    F3               1.667   0.246    6.771   0.000    1.000   1.000
685 ##    F4               0.433   0.228    1.902   0.057    1.000   1.000
686 ##    F5               0.757   0.162    4.668   0.000    1.000   1.000
687 ##
688 ## R-Square:
689 ##                  Estimate
690 ##    item31          0.416
691 ##    item33          0.240
692 ##    item1           0.733
693 ##    item37          0.312
694 ##    item10          0.611
695 ##    item47          0.655
696 ##    item36          0.492
697 ##    item35          0.257
698 ##    item13          0.140
699 ##    item44          0.240
```

```
## 700    item43              0.905

## 701    item26              0.710

## 702    item32              0.760

## 703    item14              0.123

## 704    item42              0.313

## 705    item12              0.211

## 706    item11              0.072

## 707    item16              0.200

## 708    item19              0.461

## 709    item34              0.683

## 710    item2               0.379


## 711              F1         F2         F3         F4         F5      total
## 712 alpha  0.7547222 0.4818562 0.9175522 0.5566040 0.7413266 0.5705737
## 713 omega  0.7047603 0.6261744 0.9185244 0.4777356 0.7527269 0.7006145
## 714 omega2 0.7047603 0.6261744 0.9185244 0.4777356 0.7527269 0.7006145
## 715 omega3 0.6939390 0.6265598 0.9183878 0.4742914 0.7572671 0.6879404
## 716 avevar 0.4397748 0.3749622 0.7902041 0.1887734 0.5081583 0.4058147


## 717 lavaan 0.6-9 ended normally after 86 iterations

## 718

## 719    Estimator                                         ML

## 720    Optimization method                           NLMINB

## 721    Number of model parameters                        91

## 722

## 723    Number of observations                           199

## 724    Number of missing patterns                         1

## 725
```

```
726 ## Model Test User Model:

727 ##                                                      Standard         Robust

728 ##    Test Statistic                                     312.650        319.502

729 ##    Degrees of freedom                                     233            233

730 ##    P-value (Chi-square)                                 0.000          0.000

731 ##    Scaling correction factor                                           0.979

732 ##        Yuan-Bentler correction (Mplus variant)

733 ##

734 ## Model Test Baseline Model:

735 ##

736 ##    Test statistic                                    1718.830       1439.817

737 ##    Degrees of freedom                                     276            276

738 ##    P-value                                              0.000          0.000

739 ##    Scaling correction factor                                           1.194

740 ##

741 ## User Model versus Baseline Model:

742 ##

743 ##    Comparative Fit Index (CFI)                          0.945          0.926

744 ##    Tucker-Lewis Index (TLI)                             0.935          0.912

745 ##

746 ##    Robust Comparative Fit Index (CFI)                                  0.939

747 ##    Robust Tucker-Lewis Index (TLI)                                     0.928

748 ##

749 ## Loglikelihood and Information Criteria:

750 ##

751 ##    Loglikelihood user model (H0)                     -6703.605      -6703.605

752 ##    Scaling correction factor                                           1.802
```

```
753  ##        for the MLR correction
754  ##    Loglikelihood unrestricted model (H1)    -6547.280   -6547.280
755  ##    Scaling correction factor                             1.210
756  ##        for the MLR correction
757  ##
758  ##    Akaike (AIC)                             13589.210   13589.210
759  ##    Bayesian (BIC)                           13888.900   13888.900
760  ##    Sample-size adjusted Bayesian (BIC)      13600.607   13600.607
761  ##
762  ## Root Mean Square Error of Approximation:
763  ##
764  ##    RMSEA                                        0.041       0.043
765  ##    90 Percent confidence interval - lower       0.028       0.031
766  ##    90 Percent confidence interval - upper       0.053       0.055
767  ##    P-value RMSEA <= 0.05                        0.885       0.830
768  ##
769  ##    Robust RMSEA                                             0.043
770  ##    90 Percent confidence interval - lower                   0.030
771  ##    90 Percent confidence interval - upper                   0.054
772  ##
773  ## Standardized Root Mean Square Residual:
774  ##
775  ##    SRMR                                         0.065       0.065
776  ##
777  ## Parameter Estimates:
778  ##
779  ##    Standard errors                           Sandwich
```

```
780  ##    Information bread                            Observed
781  ##    Observed information based on                Hessian
782  ##
783  ## Latent Variables:
784  ##                    Estimate  Std.Err  z-value  P(>|z|)  Std.lv  Std.all
785  ##    F1 =~
786  ##      item31          1.000                                0.294    0.646
787  ##      item33          0.752    0.145    5.183    0.000      0.221    0.489
788  ##      item1           1.776    0.638    2.781    0.005      0.521    0.855
789  ##      item37          1.344    0.379    3.549    0.000      0.395    0.560
790  ##    F2 =~
791  ##      item10          1.000                                0.830    0.757
792  ##      item47          0.899    0.124    7.268    0.000      0.747    0.821
793  ##      item36          0.997    0.151    6.609    0.000      0.828    0.714
794  ##      item35          0.766    0.147    5.201    0.000      0.636    0.509
795  ##      item13          0.398    0.119    3.347    0.001      0.330    0.303
796  ##      item44         -0.751    0.146   -5.135    0.000     -0.624   -0.499
797  ##    F3 =~
798  ##      item43          1.000                                1.297    0.956
799  ##      item26          0.904    0.055   16.458    0.000      1.173    0.838
800  ##      item32          0.887    0.063   14.039    0.000      1.150    0.868
801  ##    F4 =~
802  ##      item14          1.000                                0.632    0.337
803  ##      item42          1.476    0.486    3.039    0.002      0.932    0.540
804  ##      item12          0.855    0.351    2.437    0.015      0.540    0.474
805  ##      item11          0.595    0.375    1.586    0.113      0.376    0.292
806  ##      item16          1.088    0.568    1.916    0.055      0.687    0.470
```

```
807  ##    F5 =~
808  ##      item19          1.000                                      0.889    0.689
809  ##      item34          1.271    0.147    8.639    0.000    1.130    0.817
810  ##      item2           0.990    0.147    6.759    0.000    0.880    0.626
811  ##    F6 =~
812  ##      item38          1.000                                      0.526    0.388
813  ##      item28          2.058    3.153    0.653    0.514    1.083    0.737
814  ##      item45          1.518    0.693    2.192    0.028    0.799    0.512
815  ##
816  ## Covariances:
817  ##                    Estimate  Std.Err  z-value  P(>|z|)   Std.lv   Std.all
818  ##   .item31 ~~
819  ##      .item33          0.070    0.026    2.680    0.007    0.070    0.513
820  ##   .item10 ~~
821  ##      .item13          0.218    0.098    2.213    0.027    0.218    0.293
822  ##   .item12 ~~
823  ##      .item11          0.694    0.153    4.549    0.000    0.694    0.560
824  ##   .item26 ~~
825  ##      .item19          0.179    0.072    2.487    0.013    0.179    0.250
826  ##    F1 ~~
827  ##      F2               0.047    0.026    1.860    0.063    0.195    0.195
828  ##      F3              -0.008    0.035   -0.238    0.812   -0.022   -0.022
829  ##      F4               0.075    0.036    2.120    0.034    0.407    0.407
830  ##      F5               0.011    0.027    0.403    0.687    0.041    0.041
831  ##      F6               0.021    0.053    0.406    0.685    0.138    0.138
832  ##    F2 ~~
833  ##      F3              -0.086    0.072   -1.181    0.237   -0.079   -0.079
```

```
834  ##      F4            0.094    0.084    1.116    0.265    0.179    0.179

835  ##      F5           -0.258    0.086   -3.002    0.003   -0.350   -0.350

836  ##      F6           -0.035    0.146   -0.240    0.810   -0.080   -0.080

837  ##    F3 ~~

838  ##      F4            0.079    0.098    0.804    0.421    0.096    0.096

839  ##      F5           -0.039    0.105   -0.374    0.708   -0.034   -0.034

840  ##      F6           -0.025    0.132   -0.187    0.851   -0.036   -0.036

841  ##    F4 ~~

842  ##      F5            0.087    0.076    1.133    0.257    0.154    0.154

843  ##      F6            0.081    0.054    1.488    0.137    0.243    0.243

844  ##    F5 ~~

845  ##      F6            0.114    0.150    0.759    0.448    0.244    0.244

846  ##

847  ## Intercepts:

848  ##                  Estimate  Std.Err  z-value  P(>|z|)   Std.lv   Std.all

849  ##    .item31         0.879    0.032   27.295    0.000    0.879    1.935

850  ##    .item33         0.869    0.032   27.150    0.000    0.869    1.925

851  ##    .item1          0.990    0.043   22.904    0.000    0.990    1.624

852  ##    .item37         0.995    0.050   19.900    0.000    0.995    1.411

853  ##    .item10         2.543    0.078   32.704    0.000    2.543    2.318

854  ##    .item47         2.035    0.065   31.553    0.000    2.035    2.237

855  ##    .item36         2.095    0.082   25.511    0.000    2.095    1.808

856  ##    .item35         2.070    0.089   23.362    0.000    2.070    1.656

857  ##    .item13         2.834    0.077   36.750    0.000    2.834    2.605

858  ##    .item44         2.995    0.089   33.796    0.000    2.995    2.396

859  ##    .item43         1.578    0.096   16.401    0.000    1.578    1.163

860  ##    .item26         1.482    0.100   14.868    0.000    1.482    1.060
```

```
861 ##    .item32          1.533    0.094   16.314    0.000    1.533    1.156

862 ##    .item14          3.020    0.133   22.749    0.000    3.020    1.613

863 ##    .item42          2.935    0.122   23.959    0.000    2.935    1.698

864 ##    .item12          2.005    0.081   24.793    0.000    2.005    1.758

865 ##    .item11          2.382    0.091   26.054    0.000    2.382    1.847

866 ##    .item16          3.211    0.104   30.991    0.000    3.211    2.197

867 ##    .item19          3.930    0.091   43.244    0.000    3.930    3.043

868 ##    .item34          3.583    0.098   36.558    0.000    3.583    2.592

869 ##    .item2           2.482    0.100   24.897    0.000    2.482    1.765

870 ##    .item38          2.201    0.096   22.896    0.000    2.201    1.623

871 ##    .item28          2.111    0.104   20.264    0.000    2.111    1.437

872 ##    .item45          2.432    0.111   21.981    0.000    2.432    1.558

873 ##    F1               0.000                               0.000    0.000

874 ##    F2               0.000                               0.000    0.000

875 ##    F3               0.000                               0.000    0.000

876 ##    F4               0.000                               0.000    0.000

877 ##    F5               0.000                               0.000    0.000

878 ##    F6               0.000                               0.000    0.000

879 ##

880 ## Variances:

881 ##                   Estimate  Std.Err  z-value  P(>|z|)  Std.lv   Std.all

882 ##    .item31          0.120    0.034    3.520    0.000    0.120    0.583

883 ##    .item33          0.155    0.070    2.220    0.026    0.155    0.761

884 ##    .item1           0.100    0.087    1.155    0.248    0.100    0.269

885 ##    .item37          0.342    0.129    2.641    0.008    0.342    0.687

886 ##    .item10          0.513    0.131    3.925    0.000    0.513    0.427

887 ##    .item47          0.270    0.057    4.734    0.000    0.270    0.327
```

```
888 ##     .item36         0.657    0.096    6.878    0.000    0.657    0.490
889 ##     .item35         1.158    0.157    7.382    0.000    1.158    0.741
890 ##     .item13         1.075    0.103   10.395    0.000    1.075    0.908
891 ##     .item44         1.174    0.137    8.550    0.000    1.174    0.751
892 ##     .item43         0.160    0.091    1.757    0.079    0.160    0.087
893 ##     .item26         0.582    0.166    3.505    0.000    0.582    0.297
894 ##     .item32         0.434    0.114    3.813    0.000    0.434    0.247
895 ##     .item14         3.108    0.316    9.836    0.000    3.108    0.886
896 ##     .item42         2.116    0.334    6.345    0.000    2.116    0.709
897 ##     .item12         1.009    0.148    6.804    0.000    1.009    0.776
898 ##     .item11         1.522    0.190    8.005    0.000    1.522    0.915
899 ##     .item16         1.664    0.316    5.267    0.000    1.664    0.779
900 ##     .item19         0.877    0.132    6.664    0.000    0.877    0.526
901 ##     .item34         0.634    0.162    3.905    0.000    0.634    0.332
902 ##     .item2          1.203    0.151    7.993    0.000    1.203    0.608
903 ##     .item38         1.562    0.478    3.270    0.001    1.562    0.849
904 ##     .item28         0.985    1.584    0.622    0.534    0.985    0.456
905 ##     .item45         1.798    0.670    2.681    0.007    1.798    0.738
906 ##     F1              0.086    0.036    2.407    0.016    1.000    1.000
907 ##     F2              0.690    0.150    4.608    0.000    1.000    1.000
908 ##     F3              1.682    0.244    6.901    0.000    1.000    1.000
909 ##     F4              0.399    0.251    1.588    0.112    1.000    1.000
910 ##     F5              0.791    0.161    4.899    0.000    1.000    1.000
911 ##     F6              0.277    0.473    0.586    0.558    1.000    1.000
912 ##
913 ## R-Square:
914 ##                         Estimate
```

```
## 	item31 		0.417
## 	item33 		0.239
## 	item1 		0.731
## 	item37 		0.313
## 	item10 		0.573
## 	item47 		0.673
## 	item36 		0.510
## 	item35 		0.259
## 	item13 		0.092
## 	item44 		0.249
## 	item43 		0.913
## 	item26 		0.703
## 	item32 		0.753
## 	item14 		0.114
## 	item42 		0.291
## 	item12 		0.224
## 	item11 		0.085
## 	item16 		0.221
## 	item19 		0.474
## 	item34 		0.668
## 	item2 		0.392
## 	item38 		0.151
## 	item28 		0.544
## 	item45 		0.262
```

```
##                 F1        F2        F3        F4        F5        F6        total
## alpha   0.7547222 0.4818562 0.9175522 0.5566040 0.7413266 0.5529540 0.5867087
## omega   0.7047233 0.5882585 0.9176537 0.4814294 0.7559836 0.5718535 0.6975681
```

```
## omega2 0.7047233 0.5882585 0.9176537 0.4814294 0.7559836 0.5718535 0.6975681
```

```
## omega3 0.6939357 0.5880241 0.9123335 0.4801057 0.7686670 0.5694246 0.6768555
```

```
## avevar 0.4396193 0.3689684 0.7883714 0.1875180 0.5116007 0.3247497 0.3906214
```

## Discussion

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