

CFA: Psychological distress during COVID-19 in Canadian youth with and without chronic health conditions

Aims: Perform Confirmatory Factor Analyses (CFA) for the psychological distress scale. In order to examine the reliability of the scale we followed several steps. We examined the factor structure at 2 separate time points (survey round 2 and 3 combined and survey 4&5 combined in order to get a big enough N in each language) along as in English and French. Lastly, we also report Cronbach Alphas.

NB: Survey round equals to survey wave, Leger is the name of the entire dataset and we label waves as wX

Variable names and description:

Because of COVID-19...

impacvd_sq001 [...I have felt nervous, anxious, or worried]

impacvd_sq002 [...I have felt sad, depressed, or hopeless]

impacvd_sq003 [...I have felt lonely and isolated]

impacvd_sq004 [...I have felt irritable, frustrated or angry]

The complete list of measures including detailed protocol description, along with the data dictionaries can be found [here](#).

STEP 1: Examine item to item correlations

Zero-order polychoric item to item correlations for wave 2 and 3

##	impacvd_sq001	impacvd_sq002	impacvd_sq003	impacvd_sq004
## impacvd_sq001	1.00			
## impacvd_sq002	0.77	1		
## impacvd_sq003	0.65	0.79	1	
## impacvd_sq004	0.68	0.74	0.68	1

Zero-order polychoric item to item correlations for wave 4 and 5

##	impacvd_sq001	impacvd_sq002	impacvd_sq003	impacvd_sq004
## impacvd_sq001	1.00			
## impacvd_sq002	0.80	1		
## impacvd_sq003	0.72	0.83	1	
## impacvd_sq004	0.77	0.81	0.73	1

STEP 2: Perform CFA

CFI stands for Comparative Fit Index, TLI for Tucker-Lewis Index, and RMSEA stands for Root Mean Square Error of Approximation. All are commonly used relative goodness-of-fit indices to assess how well the model fits the data. CFI and TLI values range from 0 to 1, with values ≥ 0.9 indicating acceptable model fit. RMSEA values between 0.05 and 0.08 indicate acceptable fit (Hu & Bentler, 1999).

Wave 2 and 3, English scale ($N = 1568$)

```
## lavaan 0.6-9 ended normally after 20 iterations
##
##   Estimator                      ML
##   Optimization method          NLMINB
##   Number of model parameters      8
##
##   Number of observations          1568
##
## Model Test User Model:
##
##   Test statistic                  24.549
##   Degrees of freedom              2
##   P-value (Chi-square)            0.000
##
## Model Test Baseline Model:
##
##   Test statistic                  3396.254
##   Degrees of freedom              6
##   P-value                        0.000
##
## User Model versus Baseline Model:
##
##   Comparative Fit Index (CFI)      0.993
##   Tucker-Lewis Index (TLI)        0.980
##
## Loglikelihood and Information Criteria:
##
##   Loglikelihood user model (H0)    -7292.700
##   Loglikelihood unrestricted model (H1) -7280.426
##
##   Akaike (AIC)                    14601.400
##   Bayesian (BIC)                   14644.261
##   Sample-size adjusted Bayesian (BIC) 14618.846
##
## Root Mean Square Error of Approximation:
##
##   RMSEA                          0.085
##   90 Percent confidence interval - lower 0.057
##   90 Percent confidence interval - upper 0.116
##   P-value RMSEA <= 0.05            0.022
##
## Standardized Root Mean Square Residual:
##
##   SRMR                          0.014
##
## Parameter Estimates:
##
##   Standard errors                  Standard
##   Information                      Expected
##   Information saturated (h1) model Structured
##
## Latent Variables:
```

```

##               Estimate Std.Err z-value P(>|z|) Std.lv Std.all
## f =~
##   impacvd_sq001      1.000          0.750      0.776
##   impacvd_sq002      1.214      0.034    36.179      0.000      0.910      0.888
##   impacvd_sq003      1.148      0.035    33.153      0.000      0.860      0.808
##   impacvd_sq004      1.014      0.033    31.029      0.000      0.760      0.762
##
## Variances:
##               Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##   .impacvd_sq001      0.372      0.016    22.689      0.000      0.372      0.398
##   .impacvd_sq002      0.222      0.015    14.998      0.000      0.222      0.212
##   .impacvd_sq003      0.394      0.019    21.259      0.000      0.394      0.347
##   .impacvd_sq004      0.416      0.018    23.147      0.000      0.416      0.419
##   f                   0.562      0.032    17.523      0.000      1.000      1.000

```

Wave 2 abd 3, French scale ($N = 437$)

```

## lavaan 0.6-9 ended normally after 20 iterations
##
## Estimator                      ML
## Optimization method           NLMINB
## Number of model parameters      8
##
## Number of observations          437
##
## Model Test User Model:
##
## Test statistic                  3.180
## Degrees of freedom              2
## P-value (Chi-square)           0.204
##
## Model Test Baseline Model:
##
## Test statistic                  743.325
## Degrees of freedom              6
## P-value                        0.000
##
## User Model versus Baseline Model:
##
## Comparative Fit Index (CFI)    0.998
## Tucker-Lewis Index (TLI)      0.995
##
## Loglikelihood and Information Criteria:
##
## Loglikelihood user model (H0)   -2059.950
## Loglikelihood unrestricted model (H1) -2058.360
##
## Akaike (AIC)                   4135.900
## Bayesian (BIC)                  4168.540
## Sample-size adjusted Bayesian (BIC) 4143.152
##
## Root Mean Square Error of Approximation:
##

```

```

## RMSEA 0.037
## 90 Percent confidence interval - lower 0.000
## 90 Percent confidence interval - upper 0.109
## P-value RMSEA <= 0.05 0.511
##
## Standardized Root Mean Square Residual:
##
## SRMR 0.013
##
## Parameter Estimates:
##
## Standard errors Standard
## Information Expected
## Information saturated (h1) model Structured
##
## Latent Variables:
## Estimate Std.Err z-value P(>|z|) Std.lv Std.all
## f =~
## impacvd_sq001 1.000 0.662 0.708
## impacvd_sq002 1.356 0.084 16.073 0.000 0.897 0.912
## impacvd_sq003 1.068 0.080 13.376 0.000 0.707 0.689
## impacvd_sq004 1.047 0.074 14.180 0.000 0.693 0.733
##
## Variances:
## Estimate Std.Err z-value P(>|z|) Std.lv Std.all
## .impacvd_sq001 0.435 0.035 12.557 0.000 0.435 0.498
## .impacvd_sq002 0.163 0.031 5.195 0.000 0.163 0.169
## .impacvd_sq003 0.551 0.043 12.816 0.000 0.551 0.525
## .impacvd_sq004 0.414 0.034 12.142 0.000 0.414 0.463
## f 0.438 0.054 8.054 0.000 1.000 1.000

```

Wave 4 and 5, English scale ($N = 1573$)

```

## lavaan 0.6-9 ended normally after 19 iterations
##
## Estimator ML
## Optimization method NLMINB
## Number of model parameters 8
##
## Number of observations 1573
##
## Model Test User Model:
##
## Test statistic 35.334
## Degrees of freedom 2
## P-value (Chi-square) 0.000
##
## Model Test Baseline Model:
##
## Test statistic 4016.293
## Degrees of freedom 6
## P-value 0.000
##

```

```

## User Model versus Baseline Model:
##
##   Comparative Fit Index (CFI)                0.992
##   Tucker-Lewis Index (TLI)                  0.975
##
## Loglikelihood and Information Criteria:
##
##   Loglikelihood user model (H0)              -7050.746
##   Loglikelihood unrestricted model (H1)      -7033.079
##
##   Akaike (AIC)                             14117.492
##   Bayesian (BIC)                           14160.378
##   Sample-size adjusted Bayesian (BIC)       14134.964
##
## Root Mean Square Error of Approximation:
##
##   RMSEA                                     0.103
##   90 Percent confidence interval - lower     0.075
##   90 Percent confidence interval - upper     0.134
##   P-value RMSEA <= 0.05                    0.001
##
## Standardized Root Mean Square Residual:
##
##   SRMR                                     0.015
##
## Parameter Estimates:
##
##   Standard errors                          Standard
##   Information                             Expected
##   Information saturated (h1) model         Structured
##
## Latent Variables:
##
##           Estimate Std.Err z-value P(>|z|) Std.lv Std.all
## f =~
##   impacvd_sq001    1.000
##   impacvd_sq002    1.162    0.028  40.996  0.000    0.940    0.901
##   impacvd_sq003    1.029    0.028  36.346  0.000    0.833    0.816
##   impacvd_sq004    1.025    0.028  36.704  0.000    0.829    0.822
##
## Variances:
##
##           Estimate Std.Err z-value P(>|z|) Std.lv Std.all
##   .impacvd_sq001    0.345    0.015  22.542  0.000    0.345    0.345
##   .impacvd_sq002    0.205    0.013  15.608  0.000    0.205    0.188
##   .impacvd_sq003    0.349    0.016  22.256  0.000    0.349    0.335
##   .impacvd_sq004    0.330    0.015  21.972  0.000    0.330    0.325
##   f                 0.655    0.035  18.881  0.000    1.000    1.000

```

Wave 4 and 5, French scale ($N = 420$)

```

## lavaan 0.6-9 ended normally after 18 iterations
##
##   Estimator                      ML
##   Optimization method           NLMINB

```

```

##      Number of model parameters                8
##
##      Number of observations                    420
##
## Model Test User Model:
##
##      Test statistic                          2.620
##      Degrees of freedom                      2
##      P-value (Chi-square)                   0.270
##
## Model Test Baseline Model:
##
##      Test statistic                        1006.271
##      Degrees of freedom                     6
##      P-value                               0.000
##
## User Model versus Baseline Model:
##
##      Comparative Fit Index (CFI)            0.999
##      Tucker-Lewis Index (TLI)              0.998
##
## Loglikelihood and Information Criteria:
##
##      Loglikelihood user model (H0)          -1965.216
##      Loglikelihood unrestricted model (H1)   -1963.905
##
##      Akaike (AIC)                          3946.431
##      Bayesian (BIC)                        3978.753
##      Sample-size adjusted Bayesian (BIC)    3953.367
##
## Root Mean Square Error of Approximation:
##
##      RMSEA                                0.027
##      90 Percent confidence interval - lower  0.000
##      90 Percent confidence interval - upper  0.105
##      P-value RMSEA <= 0.05                 0.575
##
## Standardized Root Mean Square Residual:
##
##      SRMR                                0.008
##
## Parameter Estimates:
##
##      Standard errors                        Standard
##      Information                          Expected
##      Information saturated (h1) model      Structured
##
## Latent Variables:
##
##      Estimate  Std.Err  z-value  P(>|z|)  Std.lv  Std.all
##      f =~
##      impacvd_sq001    1.000
##      impacvd_sq002    1.208    0.061   19.875    0.000    0.794    0.774
##      impacvd_sq003    1.068    0.061   17.409    0.000    0.848    0.803
##      impacvd_sq004    1.086    0.063   17.342    0.000    0.863    0.801

```

```
##
## Variances:
##           Estimate Std.Err z-value P(>|z|) Std.lv Std.all
## .impacvd_sq001    0.421   0.034  12.226   0.000   0.421   0.400
## .impacvd_sq002    0.171   0.026   6.636   0.000   0.171   0.157
## .impacvd_sq003    0.395   0.034  11.676   0.000   0.395   0.354
## .impacvd_sq004    0.416   0.035  11.733   0.000   0.416   0.359
## f                 0.631   0.069   9.138   0.000   1.000   1.000
```

STEP 3: Report internal consistency at each time point (Cronbach Alpha)

```
##
## Reliability analysis
## Call: psych::alpha(x = leger_cfa_w2_en)
##
##   raw_alpha std.alpha G6(smc) average_r S/N   ase mean   sd median_r
##     0.88     0.88     0.85     0.65 7.5 0.0048   1.8 0.87     0.64
##
## lower alpha upper      95% confidence boundaries
## 0.87 0.88 0.89
##
## Reliability if an item is dropped:
##           raw_alpha std.alpha G6(smc) average_r S/N alpha se   var.r med.r
## impacvd_sq001    0.86     0.86     0.81     0.67 6.1   0.0061 0.00247 0.66
## impacvd_sq002    0.83     0.83     0.76     0.61 4.8   0.0076 0.00023 0.61
## impacvd_sq003    0.85     0.85     0.80     0.66 5.7   0.0065 0.00166 0.66
## impacvd_sq004    0.86     0.86     0.81     0.67 6.2   0.0061 0.00447 0.70
##
## Item statistics
##           n raw.r std.r r.cor r.drop mean   sd
## impacvd_sq001 1568 0.84 0.84 0.77 0.72 1.9 0.97
## impacvd_sq002 1568 0.90 0.90 0.86 0.81 1.7 1.03
## impacvd_sq003 1568 0.86 0.86 0.79 0.74 1.7 1.07
## impacvd_sq004 1568 0.84 0.84 0.76 0.72 1.7 1.00
##
## Non missing response frequency for each item
##           0    1    2    3 miss
## impacvd_sq001 0.10 0.21 0.37 0.32    0
## impacvd_sq002 0.17 0.24 0.35 0.25    0
## impacvd_sq003 0.18 0.22 0.32 0.28    0
## impacvd_sq004 0.15 0.22 0.38 0.25    0

##
## Reliability analysis
## Call: psych::alpha(x = leger_cfa_w2_fr)
##
##   raw_alpha std.alpha G6(smc) average_r S/N   ase mean   sd median_r
##     0.84     0.84     0.81     0.58 5.4 0.012   1.5 0.8     0.59
##
## lower alpha upper      95% confidence boundaries
## 0.82 0.84 0.87
##
## Reliability if an item is dropped:
```

```

##          raw_alpha std.alpha G6(smc) average_r S/N alpha se  var.r med.r
## impacvd_sq001    0.82    0.82    0.76    0.60 4.4    0.015 0.0090 0.64
## impacvd_sq002    0.75    0.75    0.67    0.50 3.0    0.021 0.0017 0.49
## impacvd_sq003    0.83    0.83    0.77    0.62 4.9    0.014 0.0038 0.64
## impacvd_sq004    0.81    0.81    0.75    0.58 4.2    0.016 0.0095 0.64
##
## Item statistics
##          n raw.r std.r r.cor r.drop mean  sd
## impacvd_sq001 437 0.80 0.81 0.71 0.65 1.6 0.94
## impacvd_sq002 437 0.89 0.89 0.86 0.79 1.5 0.99
## impacvd_sq003 437 0.80 0.79 0.68 0.62 1.5 1.03
## impacvd_sq004 437 0.81 0.82 0.73 0.67 1.5 0.95
##
## Non missing response frequency for each item
##          0 1 2 3 miss
## impacvd_sq001 0.12 0.30 0.37 0.20 0
## impacvd_sq002 0.17 0.36 0.28 0.19 0
## impacvd_sq003 0.20 0.32 0.28 0.20 0
## impacvd_sq004 0.17 0.36 0.32 0.16 0

##
## Reliability analysis
## Call: psych::alpha(x = leger_cfa_w4_en)
##
## raw_alpha std.alpha G6(smc) average_r S/N ase mean sd median_r
##          0.9      0.9      0.88      0.7 9.3 0.004 1.9 0.9      0.71
##
## lower alpha upper      95% confidence boundaries
## 0.9 0.9 0.91
##
## Reliability if an item is dropped:
##          raw_alpha std.alpha G6(smc) average_r S/N alpha se  var.r med.r
## impacvd_sq001    0.88    0.88    0.84    0.71 7.5    0.0051 0.00221 0.73
## impacvd_sq002    0.86    0.86    0.80    0.67 6.0    0.0063 0.00100 0.66
## impacvd_sq003    0.88    0.88    0.84    0.72 7.6    0.0051 0.00027 0.72
## impacvd_sq004    0.88    0.88    0.83    0.70 7.1    0.0054 0.00371 0.72
##
## Item statistics
##          n raw.r std.r r.cor r.drop mean sd
## impacvd_sq001 1573 0.87 0.87 0.80 0.76 2.0 1
## impacvd_sq002 1573 0.91 0.91 0.88 0.83 1.8 1
## impacvd_sq003 1573 0.87 0.87 0.80 0.76 1.9 1
## impacvd_sq004 1573 0.88 0.88 0.82 0.78 1.9 1
##
## Non missing response frequency for each item
##          0 1 2 3 miss
## impacvd_sq001 0.12 0.17 0.35 0.37 0
## impacvd_sq002 0.15 0.21 0.32 0.33 0
## impacvd_sq003 0.13 0.17 0.35 0.35 0
## impacvd_sq004 0.13 0.19 0.35 0.33 0

##
## Reliability analysis
## Call: psych::alpha(x = leger_cfa_w4_fr)

```



```

##
##   raw_alpha std.alpha G6(smc) average_r S/N   ase mean   sd median_r
##     0.89     0.89     0.87     0.68 8.4 0.0085   1.7 0.92     0.67
##
##   lower alpha upper      95% confidence boundaries
## 0.88 0.89 0.91
##
## Reliability if an item is dropped:
##           raw_alpha std.alpha G6(smc) average_r S/N alpha se   var.r med.r
## impacvd_sq001     0.88     0.88     0.83     0.70 7.1   0.011 4.3e-03 0.74
## impacvd_sq002     0.84     0.84     0.77     0.63 5.1   0.014 5.5e-05 0.63
## impacvd_sq003     0.87     0.87     0.82     0.69 6.8   0.011 2.5e-03 0.70
## impacvd_sq004     0.87     0.87     0.82     0.69 6.7   0.011 3.7e-03 0.70
##
## Item statistics
##           n raw.r std.r r.cor r.drop mean   sd
## impacvd_sq001 420  0.85  0.85  0.77  0.73  1.7 1.0
## impacvd_sq002 420  0.91  0.91  0.89  0.84  1.6 1.0
## impacvd_sq003 420  0.86  0.86  0.79  0.75  1.8 1.1
## impacvd_sq004 420  0.86  0.86  0.79  0.75  1.6 1.1
##
## Non missing response frequency for each item
##           0    1    2    3 miss
## impacvd_sq001 0.15 0.27 0.31 0.27    0
## impacvd_sq002 0.18 0.27 0.30 0.25    0
## impacvd_sq003 0.17 0.21 0.32 0.30    0
## impacvd_sq004 0.20 0.25 0.29 0.26    0

##
## Reliability analysis
## Call: psych::alpha(x = leger_w2)
##
##   raw_alpha std.alpha G6(smc) average_r S/N   ase mean   sd median_r
##     0.88     0.88     0.85     0.65 7.4 0.0059   1.6 0.88     0.65
##
##   lower alpha upper      95% confidence boundaries
## 0.87 0.88 0.89
##
## Reliability if an item is dropped:
##           raw_alpha std.alpha G6(smc) average_r S/N alpha se   var.r med.r
## impacvd_sq001     0.85     0.85     0.80     0.66 5.9   0.0077 0.00286 0.67
## impacvd_sq002     0.82     0.82     0.76     0.61 4.7   0.0093 0.00020 0.60
## impacvd_sq003     0.85     0.85     0.80     0.66 5.9   0.0077 0.00092 0.67
## impacvd_sq004     0.86     0.86     0.80     0.67 6.0   0.0076 0.00331 0.68
##
## Item statistics
##           n raw.r std.r r.cor r.drop mean   sd
## impacvd_sq001 1070  0.84  0.85  0.77  0.72  1.8 0.99
## impacvd_sq002 1070  0.89  0.89  0.86  0.80  1.6 1.03
## impacvd_sq003 1070  0.85  0.85  0.78  0.73  1.6 1.07
## impacvd_sq004 1070  0.84  0.85  0.77  0.72  1.6 0.99
##
## Non missing response frequency for each item
##           0    1    2    3 miss

```

```

## impacvd_sq001 0.12 0.27 0.34 0.28    0
## impacvd_sq002 0.19 0.29 0.30 0.22    0
## impacvd_sq003 0.21 0.26 0.29 0.24    0
## impacvd_sq004 0.16 0.25 0.37 0.22    0

##
## Reliability analysis
## Call: psych::alpha(x = leger_w3)
##
##   raw_alpha std.alpha G6(smc) average_r S/N   ase mean   sd median_r
##       0.87      0.87   0.84      0.63 6.7 0.0069   1.8 0.84      0.63
##
## lower alpha upper      95% confidence boundaries
## 0.86 0.87 0.88
##
## Reliability if an item is dropped:
##           raw_alpha std.alpha G6(smc) average_r S/N alpha se  var.r med.r
## impacvd_sq001      0.85      0.85   0.79      0.65 5.6   0.0086 0.0026  0.65
## impacvd_sq002      0.80      0.80   0.73      0.57 4.0   0.0113 0.0011  0.58
## impacvd_sq003      0.84      0.84   0.78      0.64 5.3   0.0090 0.0028  0.65
## impacvd_sq004      0.84      0.84   0.80      0.64 5.4   0.0090 0.0082  0.68
##
## Item statistics
##           n raw.r std.r r.cor r.drop mean   sd
## impacvd_sq001 935  0.82  0.83  0.74  0.68  1.9 0.94
## impacvd_sq002 935  0.90  0.90  0.86  0.80  1.7 1.00
## impacvd_sq003 935  0.84  0.84  0.76  0.71  1.7 1.04
## impacvd_sq004 935  0.84  0.84  0.75  0.70  1.7 0.99
##
## Non missing response frequency for each item
##           0   1   2   3 miss
## impacvd_sq001 0.09 0.19 0.41 0.31    0
## impacvd_sq002 0.14 0.23 0.37 0.26    0
## impacvd_sq003 0.16 0.22 0.33 0.29    0
## impacvd_sq004 0.14 0.25 0.36 0.24    0

##
## Reliability analysis
## Call: psych::alpha(x = leger_w4)
##
##   raw_alpha std.alpha G6(smc) average_r S/N   ase mean   sd median_r
##       0.9      0.9   0.88      0.69  9 0.0051   1.9 0.89      0.7
##
## lower alpha upper      95% confidence boundaries
## 0.89 0.9 0.91
##
## Reliability if an item is dropped:
##           raw_alpha std.alpha G6(smc) average_r S/N alpha se  var.r med.r
## impacvd_sq001      0.88      0.88   0.84      0.71 7.5   0.0064 0.00191  0.73
## impacvd_sq002      0.85      0.85   0.79      0.66 5.8   0.0081 0.00076  0.67
## impacvd_sq003      0.88      0.88   0.83      0.71 7.2   0.0067 0.00057  0.71
## impacvd_sq004      0.87      0.87   0.83      0.70 6.9   0.0069 0.00407  0.71
##
## Item statistics

```

```

##              n raw.r std.r r.cor r.drop mean sd
## impacvd_sq001 1007 0.86 0.86 0.79 0.75 1.9 1
## impacvd_sq002 1007 0.91 0.91 0.88 0.83 1.8 1
## impacvd_sq003 1007 0.87 0.87 0.81 0.76 1.9 1
## impacvd_sq004 1007 0.87 0.88 0.81 0.77 1.8 1
##
## Non missing response frequency for each item
##              0    1    2    3 miss
## impacvd_sq001 0.12 0.17 0.36 0.35    0
## impacvd_sq002 0.15 0.21 0.32 0.32    0
## impacvd_sq003 0.14 0.18 0.35 0.33    0
## impacvd_sq004 0.14 0.20 0.36 0.30    0

##
## Reliability analysis
## Call: psych::alpha(x = leger_w5)
##
##   raw_alpha std.alpha G6(smc) average_r S/N   ase mean   sd median_r
##         0.9         0.9      0.88         0.7 9.4 0.005   1.8 0.92      0.71
##
##   lower alpha upper      95% confidence boundaries
## 0.89 0.9 0.91
##
## Reliability if an item is dropped:
##           raw_alpha std.alpha G6(smc) average_r S/N alpha se   var.r med.r
## impacvd_sq001      0.88      0.88   0.84         0.71 7.4   0.0066 0.00341 0.74
## impacvd_sq002      0.85      0.85   0.80         0.66 5.9   0.0081 0.00096 0.64
## impacvd_sq003      0.89      0.89   0.84         0.72 7.8   0.0063 0.00049 0.73
## impacvd_sq004      0.88      0.88   0.84         0.71 7.3   0.0067 0.00333 0.73
##
## Item statistics
##              n raw.r std.r r.cor r.drop mean sd
## impacvd_sq001 986 0.87 0.87 0.81 0.77 1.9 1.0
## impacvd_sq002 986 0.92 0.91 0.89 0.84 1.8 1.1
## impacvd_sq003 986 0.86 0.86 0.80 0.75 1.9 1.0
## impacvd_sq004 986 0.87 0.87 0.81 0.77 1.8 1.1
##
## Non missing response frequency for each item
##              0    1    2    3 miss
## impacvd_sq001 0.13 0.21 0.32 0.34    0
## impacvd_sq002 0.16 0.23 0.31 0.31    0
## impacvd_sq003 0.15 0.18 0.33 0.34    0
## impacvd_sq004 0.15 0.20 0.32 0.33    0

##
## Reliability analysis
## Call: psych::alpha(x = leger_w6)
##
##   raw_alpha std.alpha G6(smc) average_r S/N   ase mean   sd median_r
##         0.89         0.89      0.86         0.67 8.2 0.0058   1.7 0.9      0.67
##
##   lower alpha upper      95% confidence boundaries
## 0.88 0.89 0.9
##

```

```

## Reliability if an item is dropped:
##      raw_alpha std.alpha G6(smc) average_r S/N alpha se   var.r med.r
## impacvd_sq001    0.86    0.86    0.81    0.68 6.4   0.0077 1.4e-03  0.70
## impacvd_sq002    0.84    0.84    0.78    0.64 5.4   0.0089 2.5e-05  0.64
## impacvd_sq003    0.87    0.87    0.81    0.68 6.4   0.0076 8.7e-04  0.70
## impacvd_sq004    0.87    0.87    0.81    0.68 6.4   0.0076 1.2e-03  0.70
##
## Item statistics
##      n raw.r std.r r.cor r.drop mean  sd
## impacvd_sq001 935  0.86 0.86 0.79  0.75 1.8 1.0
## impacvd_sq002 935  0.89 0.89 0.85  0.80 1.6 1.0
## impacvd_sq003 935  0.86 0.86 0.79  0.75 1.7 1.1
## impacvd_sq004 935  0.86 0.86 0.79  0.75 1.7 1.0
##
## Non missing response frequency for each item
##      0    1    2    3 miss
## impacvd_sq001 0.14 0.20 0.36 0.30  0
## impacvd_sq002 0.19 0.23 0.34 0.24  0
## impacvd_sq003 0.18 0.19 0.34 0.28  0
## impacvd_sq004 0.16 0.21 0.36 0.26  0

##
## Reliability analysis
## Call: psych::alpha(x = leger_w7)
##
##      raw_alpha std.alpha G6(smc) average_r S/N   ase mean   sd median_r
##      0.89      0.89    0.86      0.66 7.8 0.0061  1.6 0.91    0.67
##
## lower alpha upper      95% confidence boundaries
## 0.87 0.89 0.9
##
## Reliability if an item is dropped:
##      raw_alpha std.alpha G6(smc) average_r S/N alpha se   var.r med.r
## impacvd_sq001    0.85    0.85    0.80    0.66 5.8   0.0083 0.00204  0.68
## impacvd_sq002    0.84    0.84    0.77    0.63 5.1   0.0093 0.00047  0.63
## impacvd_sq003    0.87    0.87    0.81    0.68 6.4   0.0076 0.00074  0.69
## impacvd_sq004    0.86    0.86    0.81    0.67 6.2   0.0080 0.00126  0.68
##
## Item statistics
##      n raw.r std.r r.cor r.drop mean  sd
## impacvd_sq001 926  0.87 0.87 0.80  0.75 1.7 1.1
## impacvd_sq002 926  0.89 0.89 0.85  0.80 1.6 1.1
## impacvd_sq003 926  0.85 0.85 0.77  0.72 1.6 1.1
## impacvd_sq004 926  0.85 0.85 0.78  0.74 1.6 1.0
##
## Non missing response frequency for each item
##      0    1    2    3 miss
## impacvd_sq001 0.18 0.21 0.33 0.28  0
## impacvd_sq002 0.21 0.25 0.32 0.23  0
## impacvd_sq003 0.20 0.22 0.35 0.24  0
## impacvd_sq004 0.18 0.22 0.36 0.23  0

```