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> ## Confirmatory Factor Analysis - USA - Robust Maximum Likelihood Estimation ##

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>

> # Define two factor model

> Model\_1 <- 'IF =~ PANDEMIC\_FATIGUE\_1\_IF + PANDEMIC\_FATIGUE\_2\_IF + PANDEMIC\_FATIGUE\_3\_IF

+ BF =~ PANDEMIC\_FATIGUE\_4\_BF + PANDEMIC\_FATIGUE\_5\_BF + PANDEMIC\_FATIGUE\_6\_BF'

>

> # Fit two factor model - USA

> Fit\_1\_USA <- cfa(Model\_1, data = E, std.lv = TRUE, estimator = "MLM")

> summary(Fit\_1\_USA, fit.measures=TRUE, standardized=TRUE)

lavaan 0.6-19 ended normally after 22 iterations

Estimator ML

Optimization method NLMINB

Number of model parameters 13

Number of observations 1584

Model Test User Model:

Standard Scaled

Test Statistic 83.077 62.681

Degrees of freedom 8 8

P-value (Chi-square) 0.000 0.000

Scaling correction factor 1.325

Satorra-Bentler correction

Model Test Baseline Model:

Test statistic 4220.739 3696.713

Degrees of freedom 15 15

P-value 0.000 0.000

Scaling correction factor 1.142

User Model versus Baseline Model:

Comparative Fit Index (CFI) 0.982 0.985

Tucker-Lewis Index (TLI) 0.967 0.972

Robust Comparative Fit Index (CFI) 0.983

Robust Tucker-Lewis Index (TLI) 0.968

Loglikelihood and Information Criteria:

Loglikelihood user model (H0) -17400.237 -17400.237

Loglikelihood unrestricted model (H1) -17358.698 -17358.698

Akaike (AIC) 34826.474 34826.474

Bayesian (BIC) 34896.254 34896.254

Sample-size adjusted Bayesian (SABIC) 34854.956 34854.956

Root Mean Square Error of Approximation:

RMSEA 0.077 0.066

90 Percent confidence interval - lower 0.062 0.053

90 Percent confidence interval - upper 0.092 0.079

P-value H\_0: RMSEA <= 0.050 0.001 0.022

P-value H\_0: RMSEA >= 0.080 0.391 0.040

Robust RMSEA 0.076

90 Percent confidence interval - lower 0.059

90 Percent confidence interval - upper 0.094

P-value H\_0: Robust RMSEA <= 0.050 0.007

P-value H\_0: Robust RMSEA >= 0.080 0.363

Standardized Root Mean Square Residual:

SRMR 0.035 0.035

Parameter Estimates:

Standard errors Robust.sem

Information Expected

Information saturated (h1) model Structured

Latent Variables:

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

IF =~

PANDEMIC\_FATIG 1.829 0.032 57.121 0.000 1.829 0.900

PANDEMIC\_FATIG 1.745 0.033 52.547 0.000 1.745 0.879

PANDEMIC\_FATIG 1.264 0.041 30.698 0.000 1.264 0.689

BF =~

PANDEMIC\_FATIG 1.441 0.043 33.210 0.000 1.441 0.745

PANDEMIC\_FATIG 1.151 0.047 24.445 0.000 1.151 0.672

PANDEMIC\_FATIG 1.260 0.046 27.139 0.000 1.260 0.708

Covariances:

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

IF ~~

BF 0.690 0.021 32.154 0.000 0.690 0.690

Variances:

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

.PANDEMIC\_FATIG 0.789 0.081 9.788 0.000 0.789 0.191

.PANDEMIC\_FATIG 0.901 0.079 11.414 0.000 0.901 0.228

.PANDEMIC\_FATIG 1.767 0.077 22.908 0.000 1.767 0.525

.PANDEMIC\_FATIG 1.664 0.107 15.559 0.000 1.664 0.445

.PANDEMIC\_FATIG 1.609 0.095 16.943 0.000 1.609 0.549

.PANDEMIC\_FATIG 1.582 0.096 16.516 0.000 1.582 0.499

IF 1.000 1.000 1.000

BF 1.000 1.000 1.000

> semPaths(Fit\_1\_USA, what="std",edge.label.cex=1,edge.color="black",sizeMan=8,sizeLat=12,fade=FALSE,esize=1,asize=2, label.cex = 1.2,

+ nodeLabels = (c("Item 1", "Item 2", "Item 3", "Item 4", "Item 5", "Item 6", "Information\nfatigue", "Behavioral\nfatigue")),

+ color = list(lat = rgb(255,250,205, maxColorValue = 255), man = rgb(224,255,255, maxColorValue = 255)), mar=c(7, 7, 7,7))

>

> # Define higher order model

> Model\_2 <- 'IF =~ PANDEMIC\_FATIGUE\_1\_IF + PANDEMIC\_FATIGUE\_2\_IF + PANDEMIC\_FATIGUE\_3\_IF

+ BF =~ PANDEMIC\_FATIGUE\_4\_BF + PANDEMIC\_FATIGUE\_5\_BF + PANDEMIC\_FATIGUE\_6\_BF

+ PF =~ a\*IF + a\*BF'

>

> # Fit higher order model

> Fit\_2\_USA <- cfa(Model\_2, data = E, std.lv = TRUE, estimator = "MLM")

> summary(Fit\_2\_USA, fit.measures=TRUE, standardized=TRUE)

lavaan 0.6-19 ended normally after 26 iterations

Estimator ML

Optimization method NLMINB

Number of model parameters 14

Number of equality constraints 1

Number of observations 1584

Model Test User Model:

Standard Scaled

Test Statistic 83.077 62.681

Degrees of freedom 8 8

P-value (Chi-square) 0.000 0.000

Scaling correction factor 1.325

Satorra-Bentler correction

Model Test Baseline Model:

Test statistic 4220.739 3696.713

Degrees of freedom 15 15

P-value 0.000 0.000

Scaling correction factor 1.142

User Model versus Baseline Model:

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Loglikelihood unrestricted model (H1) -17358.698 -17358.698

Akaike (AIC) 34826.474 34826.474

Bayesian (BIC) 34896.254 34896.254

Sample-size adjusted Bayesian (SABIC) 34854.956 34854.956

Root Mean Square Error of Approximation:

RMSEA 0.077 0.066

90 Percent confidence interval - lower 0.062 0.053

90 Percent confidence interval - upper 0.092 0.079

P-value H\_0: RMSEA <= 0.050 0.001 0.022

P-value H\_0: RMSEA >= 0.080 0.391 0.040

Robust RMSEA 0.076

90 Percent confidence interval - lower 0.059

90 Percent confidence interval - upper 0.094

P-value H\_0: Robust RMSEA <= 0.050 0.007

P-value H\_0: Robust RMSEA >= 0.080 0.363

Standardized Root Mean Square Residual:

SRMR 0.035 0.035

Parameter Estimates:

Standard errors Robust.sem

Information Expected

Information saturated (h1) model Structured

Latent Variables:

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

IF =~

PANDEMIC\_F 1.019 0.038 27.054 0.000 1.829 0.900

PANDEMIC\_F 0.972 0.036 26.760 0.000 1.745 0.879

PANDEMIC\_F 0.704 0.030 23.609 0.000 1.264 0.689

BF =~

PANDEMIC\_F 0.803 0.036 22.436 0.000 1.441 0.745

PANDEMIC\_F 0.641 0.033 19.227 0.000 1.151 0.672

PANDEMIC\_F 0.702 0.035 19.998 0.000 1.260 0.708

PF =~

IF (a) 1.491 0.075 19.955 0.000 0.830 0.830

BF (a) 1.491 0.075 19.955 0.000 0.830 0.830

Variances:

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

.PANDEMIC\_FATIG 0.789 0.081 9.788 0.000 0.789 0.191

.PANDEMIC\_FATIG 0.901 0.079 11.414 0.000 0.901 0.228

.PANDEMIC\_FATIG 1.767 0.077 22.908 0.000 1.767 0.525

.PANDEMIC\_FATIG 1.664 0.107 15.559 0.000 1.664 0.445

.PANDEMIC\_FATIG 1.609 0.095 16.943 0.000 1.609 0.549

.PANDEMIC\_FATIG 1.582 0.096 16.516 0.000 1.582 0.499

.IF 1.000 0.310 0.310

.BF 1.000 0.310 0.310

PF 1.000 1.000 1.000