

discrepancy between model estimates and confidence intervals

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Contents

```
library(readxl)
library(metaSEM)

## Loading required package: OpenMx

## To take full advantage of multiple cores, use:
##   mxOption(key='Number of Threads', value=parallel::detectCores()) #now
##   Sys.setenv(OMP_NUM_THREADS=parallel::detectCores()) #before library(OpenMx)

## "SLSQP" is set as the default optimizer in OpenMx.

## mxOption(NULL, "Gradient algorithm") is set at "central".
## mxOption(NULL, "Optimality tolerance") is set at "6.3e-14".
## mxOption(NULL, "Gradient iterations") is set at "2".

# library(semPlot)
# library(metafor)
# library(meta)
# library(lavaan)
# library(lavaanPlot)
# library(tidyverse)

mxOption(NULL, 'Number of Threads', parallel::detectCores()-2)

# read in the data, correct blip of riskparcor being read as string...
data<-read_excel("MetaSEMmod.xls", col_names=TRUE)
data$riskparcor<-(as.numeric(data$riskparcor))

## Warning: NAs introduced by coercion

# convert data structure to symmetric matrices
nvar<-3
varnames<- c("risk", "par", "out")
labels <-list(varnames, varnames)
cordat <- list()
for (i in 1:nrow(data)){
  cordat[[i]] <- vec2symMat(as.matrix(data[i,3:5]), diag = FALSE)
  dimnames(cordat[[i]]) <- labels
}

# put NA on diagonal if variable is missing
```

```

for (i in 1:length(cordat)){
  for (j in 1:nrow(cordat[[i]])){
    }
  }
if (sum(is.na(cordat[[i]][j,]))==nvar-1) {cordat[[i]][j,j] <- NA}

# convert correlation list to dataframe

dat2<-Cor2DataFrame(cordat, data$'Sample Size', acov='weighted')

# specify lavaan-style model
model1<- "out ~ par + risk
         par ~ risk
         risk ~~ 1*risk"

#create RAM specification of model
RAM1 <- lavaan2RAM(model1, obs.variables=c("risk", "par", "out"))

#create model implied covariance matrices
MO <- create.vechsR(A0=RAM1$A, S0=RAM1$S)
T0 <- create.Tau2(RAM=RAM1, RE.type="Diag", Transform="expLog", RE.startvalues=0.05)

# Define indirect effect
ind <- mxAlgebra(parONrisk*outONpar, name="ind")

# add moderator to working dataset (dat2)

dat2$data <-data.frame(dat2$data, ChildAgepar=scale(data$ChildAgepar), check.names=FALSE)

#define moderator matrix

A1x <- matrix(c(0,0,0,"0*data.ChildAgepar",0,0,"0*data.ChildAgepar","0*data.ChildAgepar",0),
             nrow=3, ncol=3, byrow=TRUE)

M1 <- create.vechsR(A0=RAM1$A, S0=RAM1$S, Ax=A1x)

fit8 <- osmasem(model.name="test with Child age @Parenting as moderator",
               Mmatrix=M1, Tmatrix=T0, data=dat2, intervals.type = "LB",
               mxModel.Args = list(ind, mxCI(c("ind", "A0", "A1"))),
               suppressWarnings=FALSE)

summary(fit8)

```

```
## Summary of test with Child age @Parenting as moderator
```

```
##
```

```
## free parameters:
```

##	name	matrix	row	col	Estimate	Std.Error	A	z value	Pr(> z)
## 1	parONrisk	A0	2	1	-0.30224397	0.02205481		-13.704222	0.000000e+00
## 2	outONrisk	A0	3	1	-0.25741527	0.02626909		-9.799169	0.000000e+00
## 3	outONpar	A0	3	2	0.17535000	0.03426934		5.116819	3.107308e-07
## 4	parONrisk_1	A1	2	1	-0.08579738	0.02773246		-3.093753	1.976423e-03
## 5	outONrisk_1	A1	3	1	0.04989711	0.03188939		1.564693	1.176549e-01
## 6	outONpar_1	A1	3	2	0.05464602	0.03979573		1.373163	1.697017e-01
## 7	Tau1_1	vecTau1	1	1	-3.01768638	0.37031976		-8.148867	4.440892e-16
## 8	Tau1_2	vecTau1	2	1	-3.16263480	0.42054335		-7.520354	5.462297e-14

```

## 9      Tau1_3 vecTau1   3   1 -2.35475855 0.24589807 -9.576157 0.000000e+00
##
## confidence intervals:
##
##                                     lbound
## test with Child age @Parenting as moderator.Amatrix[1,1] 0.0000000000
## test with Child age @Parenting as moderator.Amatrix[2,1] -0.7446142355
## test with Child age @Parenting as moderator.Amatrix[3,1] -0.3299910422
## test with Child age @Parenting as moderator.Amatrix[1,2] 0.0000000000
## test with Child age @Parenting as moderator.Amatrix[2,2] 0.0000000000
## test with Child age @Parenting as moderator.Amatrix[3,2] 0.0696603776
## test with Child age @Parenting as moderator.Amatrix[1,3] 0.0000000000
## test with Child age @Parenting as moderator.Amatrix[2,3] 0.0000000000
## test with Child age @Parenting as moderator.Amatrix[3,3] 0.0000000000
## test with Child age @Parenting as moderator.Smatrix[1,1] 1.0000000000
## test with Child age @Parenting as moderator.Smatrix[2,1] 0.0000000000
## test with Child age @Parenting as moderator.Smatrix[3,1] 0.0000000000
## test with Child age @Parenting as moderator.Smatrix[1,2] 0.0000000000
## test with Child age @Parenting as moderator.Smatrix[2,2] 0.4455375524
## test with Child age @Parenting as moderator.Smatrix[3,2] 0.0000000000
## test with Child age @Parenting as moderator.Smatrix[1,3] 0.0000000000
## test with Child age @Parenting as moderator.Smatrix[2,3] 0.0000000000
## test with Child age @Parenting as moderator.Smatrix[3,3] 0.6359416563
## test with Child age @Parenting as moderator.Tau2[1,1] 0.0004265429
## test with Child age @Parenting as moderator.Tau2[2,1] 0.0000000000
## test with Child age @Parenting as moderator.Tau2[3,1] 0.0000000000
## test with Child age @Parenting as moderator.Tau2[1,2] 0.0000000000
## test with Child age @Parenting as moderator.Tau2[2,2] 0.0001901428
## test with Child age @Parenting as moderator.Tau2[3,2] 0.0000000000
## test with Child age @Parenting as moderator.Tau2[1,3] 0.0000000000
## test with Child age @Parenting as moderator.Tau2[2,3] 0.0000000000
## test with Child age @Parenting as moderator.Tau2[3,3] 0.0034983730
## test with Child age @Parenting as moderator.ind[1,1] -0.0758082882
## parONrisk -0.3506450785
## outONrisk -0.3111145075
## outONpar 0.1022379453
## parONrisk_1 -0.1417309616
## outONrisk_1 -0.0136386549
## outONpar_1 -0.0243180464
##
##                                     estimate
## test with Child age @Parenting as moderator.Amatrix[1,1] 0.0000000000
## test with Child age @Parenting as moderator.Amatrix[2,1] -0.557903104
## test with Child age @Parenting as moderator.Amatrix[3,1] -0.108731800
## test with Child age @Parenting as moderator.Amatrix[1,2] 0.0000000000
## test with Child age @Parenting as moderator.Amatrix[2,2] 0.0000000000
## test with Child age @Parenting as moderator.Amatrix[3,2] 0.338184270
## test with Child age @Parenting as moderator.Amatrix[1,3] 0.0000000000
## test with Child age @Parenting as moderator.Amatrix[2,3] 0.0000000000
## test with Child age @Parenting as moderator.Amatrix[3,3] 0.0000000000
## test with Child age @Parenting as moderator.Smatrix[1,1] 1.0000000000
## test with Child age @Parenting as moderator.Smatrix[2,1] 0.0000000000
## test with Child age @Parenting as moderator.Smatrix[3,1] 0.0000000000
## test with Child age @Parenting as moderator.Smatrix[1,2] 0.0000000000
## test with Child age @Parenting as moderator.Smatrix[2,2] 0.688744126
## test with Child age @Parenting as moderator.Smatrix[3,2] 0.0000000000

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```

## test with Child age @Parenting as moderator.Smatrix[1,3] 0.000000000
## test with Child age @Parenting as moderator.Smatrix[2,3] 0.000000000
## test with Child age @Parenting as moderator.Smatrix[3,3] 0.832779056
## test with Child age @Parenting as moderator.Tau2[1,1] 0.002392604
## test with Child age @Parenting as moderator.Tau2[2,1] 0.000000000
## test with Child age @Parenting as moderator.Tau2[3,1] 0.000000000
## test with Child age @Parenting as moderator.Tau2[1,2] 0.000000000
## test with Child age @Parenting as moderator.Tau2[2,2] 0.001790483
## test with Child age @Parenting as moderator.Tau2[3,2] 0.000000000
## test with Child age @Parenting as moderator.Tau2[1,3] 0.000000000
## test with Child age @Parenting as moderator.Tau2[2,3] 0.000000000
## test with Child age @Parenting as moderator.Tau2[3,3] 0.009009127
## test with Child age @Parenting as moderator.ind[1,1] -0.052998482
## parONrisk -0.302243974
## outONrisk -0.257415273
## outONpar 0.175350004
## parONrisk_1 -0.085797382
## outONrisk_1 0.049897114
## outONpar_1 0.054646019
## ubound note
## test with Child age @Parenting as moderator.Amatrix[1,1] 0.000000000 !!!
## test with Child age @Parenting as moderator.Amatrix[2,1] -0.376676513
## test with Child age @Parenting as moderator.Amatrix[3,1] 0.119157390
## test with Child age @Parenting as moderator.Amatrix[1,2] 0.000000000 !!!
## test with Child age @Parenting as moderator.Amatrix[2,2] 0.000000000 !!!
## test with Child age @Parenting as moderator.Amatrix[3,2] 0.611936357
## test with Child age @Parenting as moderator.Amatrix[1,3] 0.000000000 !!!
## test with Child age @Parenting as moderator.Amatrix[2,3] 0.000000000 !!!
## test with Child age @Parenting as moderator.Amatrix[3,3] 0.000000000 !!!
## test with Child age @Parenting as moderator.Smatrix[1,1] 1.000000000 !!!
## test with Child age @Parenting as moderator.Smatrix[2,1] 0.000000000 !!!
## test with Child age @Parenting as moderator.Smatrix[3,1] 0.000000000 !!!
## test with Child age @Parenting as moderator.Smatrix[1,2] 0.000000000 !!!
## test with Child age @Parenting as moderator.Smatrix[2,2] 0.858125488
## test with Child age @Parenting as moderator.Smatrix[3,2] 0.000000000 !!!
## test with Child age @Parenting as moderator.Smatrix[1,3] 0.000000000 !!!
## test with Child age @Parenting as moderator.Smatrix[2,3] 0.000000000 !!!
## test with Child age @Parenting as moderator.Smatrix[3,3] 0.949723068
## test with Child age @Parenting as moderator.Tau2[1,1] 0.009974579
## test with Child age @Parenting as moderator.Tau2[2,1] 0.000000000 !!!
## test with Child age @Parenting as moderator.Tau2[3,1] 0.000000000 !!!
## test with Child age @Parenting as moderator.Tau2[1,2] 0.000000000 !!!
## test with Child age @Parenting as moderator.Tau2[2,2] 0.008713193
## test with Child age @Parenting as moderator.Tau2[3,2] 0.000000000 !!!
## test with Child age @Parenting as moderator.Tau2[1,3] 0.000000000 !!!
## test with Child age @Parenting as moderator.Tau2[2,3] 0.000000000 !!!
## test with Child age @Parenting as moderator.Tau2[3,3] 0.024380609
## test with Child age @Parenting as moderator.ind[1,1] -0.030706204
## parONrisk -0.259658930
## outONrisk -0.203384343
## outONpar 0.241662618
## parONrisk_1 -0.030936040
## outONrisk_1 0.115163145
## outONpar_1 0.136937702

```

```

##
## Model Statistics:
##           | Parameters | Degrees of Freedom | Fit (-2lnL units)
##   Model:           9             41             -84.74765
##   Saturated:       9             41             NA
## Independence:      6             44             NA
## Number of observations/statistics: 6433/50
##
## Information Criteria:
##           | df Penalty | Parameters Penalty | Sample-Size Adjusted
## AIC:      -166.7476             -66.747648             -66.71962
## BIC:      -444.2847             -5.824882             -34.42457
## CFI: NA
## TLI: 1 (also known as NNFI)
## RMSEA: 0 [95% CI (NA, NA)]
## Prob(RMSEA <= 0.05): NA
## To get additional fit indices, see help(mxRefModels)
## timestamp: 2020-01-30 11:09:28
## Wall clock time: 13.12087 secs
## optimizer: SLSQP
## OpenMx version number: 2.15.5
## Need help? See help(mxSummary)
## Get the matrices
mxEval(A0, fit8$mx.fit)

##           risk      par out
## risk  0.0000000 0.00000  0
## par   -0.3022440 0.00000  0
## out   -0.2574153 0.17535  0
mxEval(A1, fit8$mx.fit)

##           risk      par out
## risk  0.00000000 0.00000000  0
## par   -0.08579738 0.00000000  0
## out    0.04989711 0.05464602  0
sessionInfo()

## R version 3.6.2 (2019-12-12)
## Platform: x86_64-pc-linux-gnu (64-bit)
## Running under: Ubuntu 18.04.3 LTS
##
## Matrix products: default
## BLAS: /usr/lib/x86_64-linux-gnu/blas/libblas.so.3.7.1
## LAPACK: /usr/lib/x86_64-linux-gnu/lapack/liblapack.so.3.7.1
##
## locale:
## [1] LC_CTYPE=en_SG.UTF-8 LC_NUMERIC=C
## [3] LC_TIME=en_SG.UTF-8 LC_COLLATE=en_SG.UTF-8
## [5] LC_MONETARY=en_SG.UTF-8 LC_MESSAGES=en_SG.UTF-8
## [7] LC_PAPER=en_SG.UTF-8 LC_NAME=C
## [9] LC_ADDRESS=C LC_TELEPHONE=C
## [11] LC_MEASUREMENT=en_SG.UTF-8 LC_IDENTIFICATION=C
##

```

```
## attached base packages:
## [1] stats      graphics  grDevices  utils      datasets  methods   base
##
## other attached packages:
## [1] metaSEM_1.2.3.1 OpenMx_2.15.5  readxl_1.3.1
##
## loaded via a namespace (and not attached):
## [1] Rcpp_1.0.3      knitr_1.27      magrittr_1.5    MASS_7.3-51.5
## [5] mnormt_1.5-5    pbivnorm_0.6.0  ellipse_0.4.1   lattice_0.20-38
## [9] rlang_0.4.2     stringr_1.4.0   tools_3.6.2     parallel_3.6.2
## [13] grid_3.6.2      xfun_0.12       htmltools_0.4.0 yaml_2.2.0
## [17] digest_0.6.23  tibble_2.1.3    crayon_1.3.4    lavaan_0.6-5
## [21] Matrix_1.2-18  evaluate_0.14   rmarkdown_2.1   stringi_1.4.5
## [25] pillar_1.4.3   compiler_3.6.2  cellranger_1.1.0 stats4_3.6.2
## [29] mvtnorm_1.0-12  pkgconfig_2.0.3
```