

Preparing R console

```
library(metaSEM)
library(OpenMx)
```

Square matrices

```
data <- read.table(file = "MASEM_08.dat", header = TRUE)
head(data)

nvar <- 3
varnames <- c ("vi","vm","vd")
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}

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}}

  cordat[[6]]

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

Stage 1 (without moderators)

```
stagelrandom <- tssem1 (Cov=cordat, n=data$N, method="REM",
RE.type="Diag")
summary (stagelrandom)
```

```
## stagelrandom <- rerun (stagelrandom, autofixtau2 = TRUE)
## summary (stagelrandom)
```

Stage 2 (without moderators)

```
modell1 <- 'vd ~ vi2vd*vi + vm2vd*vm
vm ~ vi2vm*vi
vi ~~ 1*vi
```

```
vm ~~ Errw2*vm
vd ~~ Errs2*vd'
```

```
RAM1 <- lavaan2RAM(model1, obs.variables=c("vi", "vm", "vd"))
RAM1
```

```
stage2random <- tssem2(stage1random, Amatrix=RAM1$A, Smatrix=RAM1$S)
summary(stage2random)
```

Defining 2 subgroups

```
data_low <- cordat[data$M1<2]
n_low <- data$N[data$M1<2]
```

```
##print(data_low)
##print(n_low)
```

```
## Index to remove NA
index_low <- !is.na(n_low)
data_low <- data_low[index_low]
n_low <- n_low[index_low]
```

```
pattern.na(data_low, show.na = FALSE)
```

```
data_high <- cordat[data$M1>1]
n_high <- data$N[data$M1>1]
```

```
##print(data_high)
##print(n_high)
```

```
index_high <- !is.na(n_high)
data_high <- data_high[index_high]
n_high <- n_high[index_high]
```

```
pattern.na(data_high, show.na = FALSE)
```

STAGE 1 (for 2 subgroups)

```
stage1_low.fit <- tssem1(Cov=data_low, n=n_low, method="REM",
RE.type="Diag")
## stage1_low.fit <- rerun (stage1_low.fit, autofixtau2 = TRUE)
summary (stage1_low.fit)
```

```
stage1_high.fit <- tssem1(Cov=data_high, n=n_high, method="REM",
RE.type="Diag")
## stage1_high.fit <- rerun (stage1_high.fit, autofixtau2 = TRUE)
summary (stage1_high.fit)
```

STAGE 2 (for 2 subgroups)

```
stage2_low.fit <- tssem2(stage1_low.fit, Amatrix=RAM1$A,
Smatrix=RAM1$S)
summary (stage2_low.fit)
```

```
stage2_high.fit <- tssem2(stage1_high.fit, Amatrix=RAM1$A,
Smatrix=RAM1$S)
summary (stage2_high.fit)
```

Testing the equality of regression coefficients

```
model2 <- '
vd ~ vi2vd*vi + vm2vd*vm
vm ~ vi2vm*vi
vi ~~ 1*vi
vm ~~ hErrw2*vm
vd ~~ hErrs2*vd'
```

```
RAM2 <- lavaan2RAM(model2, obs.variables=c("vi", "vm", "vd"))
```

```
stage2_low <- tssem2(stage1_low.fit, Amatrix=RAM1$A, Smatrix=RAM1$S,
run=FALSE, model.name="low")
stage2_high <- tssem2(stage1_high.fit, Amatrix=RAM1$A, Smatrix=RAM2$S,
run=FALSE, model.name="high")
```

```
stage2_constrained <- mxModel(model="same_regression_coef",
stage2_low, stage2_high, mxFitFunctionMultigroup(c("low", "high")))
```

```
stage2_constrained.fit <- mxRun(stage2_constrained, intervals=TRUE)
```

```
submodels.fit <- list(stage2_low.fit, stage2_high.fit)
```

```
subgroup.summary (submodels.fit, stage2_constrained.fit)
```