

Looking for a global factor for the latent factors

Anastasia (modified by Mike Cheung)

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```
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".
mxOption(key='Number of Threads', value=parallel::detectCores()-2)

DTB5H6allg <- readLowTriMat("Corrs.dat", no.var=14)
n_allg <- c(220,223,293,369,432,364,101,274,95,128,70,132,304,1063,
           180,241,380,304,1448,207,509,507,764,743,340,266,197,637,82,
           44,46,298,544,533,273,246,296,123,290,216,500,819,611,302,501,
           828,164,232,200,287,397,300,789,341,279,770,150,170,368,159,
           245,199,202,80,504,277,892,251,546,198,232,246,232,1568,487,278,
           179,401,180,260,389,676,305,249,107,326,256,443,663,305,316,325,
           394,481,66,1108,221,311,256,634,638,242,192,957,256,680,300,316)
randomDTB5H6 <- tssem1(DTB5H6allg,n_allg,method="REM",RE.type="Zero", acov="weighted")
summary(randomDTB5H6)

##
## Call:
## meta(y = ES, v = acovR, RE.constraints = matrix(0, ncol = no.es,
##       nrow = no.es), I2 = I2, model.name = model.name, suppressWarnings = TRUE,
##       silent = silent, run = run)
##
## 95% confidence intervals: z statistic approximation (robust=FALSE)
## Coefficients:
##           Estimate   Std.Error   lbound   ubound   z value   Pr(>|z|)
## Intercept1  0.37568251  0.00447577  0.36691016  0.38445486  83.9370 < 2.2e-16
## Intercept2  0.53789755  0.00381306  0.53042409  0.54537101 141.0672 < 2.2e-16
## Intercept3 -0.02324699  0.00572188 -0.03446167 -0.01203232  -4.0628 4.848e-05
## Intercept4 -0.18741583  0.00558576 -0.19836371 -0.17646795 -33.5525 < 2.2e-16
## Intercept5 -0.02373149  0.00561598 -0.03473862 -0.01272437  -4.2257 2.382e-05
## Intercept6 -0.40253439  0.00505747 -0.41244685 -0.39262193 -79.5920 < 2.2e-16
## Intercept7  0.13038558  0.00552524  0.11955632  0.14121485  23.5982 < 2.2e-16
## Intercept8 -0.53311852  0.01025589 -0.55321970 -0.51301734 -51.9817 < 2.2e-16
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## Intercept9 -0.11534710 0.01100336 -0.13691330 -0.09378090 -10.4829 < 2.2e-16
## Intercept10 -0.09121188 0.01098764 -0.11274726 -0.06967651 -8.3013 < 2.2e-16
## Intercept11 -0.31206682 0.01070111 -0.33304060 -0.29109304 -29.1621 < 2.2e-16
## Intercept12 -0.17775406 0.01099162 -0.19929724 -0.15621088 -16.1718 < 2.2e-16
## Intercept13 -0.09009973 0.01101407 -0.11168691 -0.06851254 -8.1804 2.220e-16
## Intercept14 0.36955075 0.00450551 0.36072011 0.37838138 82.0220 < 2.2e-16
## Intercept15 0.12722817 0.00567012 0.11611493 0.13834141 22.4383 < 2.2e-16
## Intercept16 -0.00392203 0.00568021 -0.01505503 0.00721096 -0.6905 0.4898963
## Intercept17 0.30799422 0.00533206 0.29754358 0.31844486 57.7627 < 2.2e-16
## Intercept18 -0.18018127 0.00544987 -0.19086282 -0.16949972 -33.0616 < 2.2e-16
## Intercept19 -0.04772290 0.00557873 -0.05865701 -0.03678879 -8.5544 < 2.2e-16
## Intercept20 -0.41992696 0.01042825 -0.44036595 -0.39948797 -40.2682 < 2.2e-16
## Intercept21 -0.12044246 0.01115637 -0.14230855 -0.09857638 -10.7958 < 2.2e-16
## Intercept22 0.36739924 0.01111046 0.34562315 0.38917533 33.0679 < 2.2e-16
## Intercept23 -0.16803733 0.01086807 -0.18933836 -0.14673630 -15.4616 < 2.2e-16
## Intercept24 0.00866288 0.01115651 -0.01320348 0.03052923 0.7765 0.4374619
## Intercept25 0.07162810 0.01116948 0.04973632 0.09351988 6.4128 1.428e-10
## Intercept26 -0.02716689 0.00572135 -0.03838053 -0.01595324 -4.7483 2.051e-06
## Intercept27 -0.24398358 0.00551589 -0.25479453 -0.23317263 -44.2328 < 2.2e-16
## Intercept28 0.00549350 0.00561649 -0.00551461 0.01650162 0.9781 0.3280235
## Intercept29 -0.47078853 0.00487047 -0.48033447 -0.46124259 -96.6619 < 2.2e-16
## Intercept30 0.07937477 0.00555768 0.06848192 0.09026761 14.2820 < 2.2e-16
## Intercept31 -0.46597442 0.01039368 -0.48634566 -0.44560318 -44.8325 < 2.2e-16
## Intercept32 -0.27409245 0.01111755 -0.29588245 -0.25230244 -24.6540 < 2.2e-16
## Intercept33 -0.06444166 0.01111877 -0.08623404 -0.04264928 -5.7958 6.801e-09
## Intercept34 -0.34598561 0.01081829 -0.36718906 -0.32478215 -31.9816 < 2.2e-16
## Intercept35 -0.30671099 0.01110689 -0.32848010 -0.28494188 -27.6145 < 2.2e-16
## Intercept36 -0.05384611 0.01114656 -0.07569296 -0.03199926 -4.8307 1.360e-06
## Intercept37 0.14231232 0.00692856 0.12873258 0.15589206 20.5399 < 2.2e-16
## Intercept38 0.22604446 0.00685062 0.21261750 0.23947142 32.9962 < 2.2e-16
## Intercept39 0.15347180 0.00678944 0.14016473 0.16677887 22.6045 < 2.2e-16
## Intercept40 -0.07526774 0.00697783 -0.08894403 -0.06159145 -10.7867 < 2.2e-16
## Intercept41 0.06964529 0.04028505 -0.00931195 0.14860253 1.7288 0.0838427
## Intercept42 -0.03460931 0.04063961 -0.11426149 0.04504287 -0.8516 0.3944277
## Intercept43 0.14694853 0.04054819 0.06747553 0.22642153 3.6240 0.0002900
## Intercept44 -0.00467230 0.04056921 -0.08418650 0.07484190 -0.1152 0.9083115
## Intercept45 0.02849573 0.04061148 -0.05110131 0.10809276 0.7017 0.4828870
## Intercept46 0.69991891 0.04068903 0.62016987 0.77966795 17.2017 < 2.2e-16
## Intercept47 0.17906943 0.00684305 0.16565729 0.19248156 26.1681 < 2.2e-16
## Intercept48 0.28498882 0.00665822 0.27193895 0.29803869 42.8026 < 2.2e-16
## Intercept49 -0.27272187 0.00679815 -0.28604600 -0.25939773 -40.1171 < 2.2e-16
## Intercept50 0.14381421 0.03971714 0.06597004 0.22165839 3.6210 0.0002935
## Intercept51 -0.04921496 0.04007223 -0.12775508 0.02932516 -1.2282 0.2193882
## Intercept52 0.20456325 0.03998230 0.12619938 0.28292712 5.1163 3.115e-07
## Intercept53 0.04074546 0.04000053 -0.03765413 0.11914505 1.0186 0.3083819
## Intercept54 0.81039269 0.04004449 0.73190694 0.88887844 20.2373 < 2.2e-16
## Intercept55 0.03425670 0.04012118 -0.04437937 0.11289276 0.8538 0.3931988
## Intercept56 0.16390143 0.00671012 0.15074983 0.17705303 24.4260 < 2.2e-16
## Intercept57 -0.28235328 0.00664598 -0.29537916 -0.26932740 -42.4848 < 2.2e-16
## Intercept58 0.02000540 0.03922313 -0.05687052 0.09688131 0.5100 0.6100228
## Intercept59 -0.03599243 0.03957666 -0.11356125 0.04157640 -0.9094 0.3631202
## Intercept60 0.77822885 0.03948719 0.70083539 0.85562231 19.7084 < 2.2e-16
## Intercept61 0.12288111 0.03950390 0.04545489 0.20030734 3.1106 0.0018670
## Intercept62 0.05285731 0.03954898 -0.02465727 0.13037190 1.3365 0.1813851

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## Intercept63 0.02054484 0.03962459 -0.05711793 0.09820761 0.5185 0.6041184
## Intercept64 -0.24869703 0.00664555 -0.26172207 -0.23567198 -37.4231 < 2.2e-16
## Intercept65 0.40364221 0.03746319 0.33021570 0.47706873 10.7744 < 2.2e-16
## Intercept66 0.05766989 0.03781794 -0.01645192 0.13179170 1.5249 0.1272754
## Intercept67 0.26625510 0.03773333 0.19229913 0.34021107 7.0562 1.711e-12
## Intercept68 0.68835002 0.03774087 0.61437927 0.76232076 18.2388 < 2.2e-16
## Intercept69 0.15234138 0.03779132 0.07827175 0.22641100 4.0311 5.551e-05
## Intercept70 0.02002442 0.03786393 -0.05418753 0.09423636 0.5289 0.5969081
## Intercept71 -0.07488801 0.04020282 -0.15368408 0.00390806 -1.8628 0.0624967
## Intercept72 0.56236200 0.04055767 0.48287044 0.64185356 13.8657 < 2.2e-16
## Intercept73 -0.45079313 0.04046693 -0.53010685 -0.37147940 -11.1398 < 2.2e-16
## Intercept74 -0.38021908 0.04048765 -0.45957342 -0.30086473 -9.3910 < 2.2e-16
## Intercept75 -0.16139261 0.04053008 -0.24083009 -0.08195512 -3.9820 6.832e-05
## Intercept76 -0.03136094 0.04060761 -0.11095039 0.04822852 -0.7723 0.4399414
## Intercept77 0.03851013 0.01331153 0.01242002 0.06460024 2.8930 0.0038159
## Intercept78 0.02567354 0.01329952 -0.00039305 0.05174013 1.9304 0.0535560
## Intercept79 0.28449643 0.01283553 0.25933925 0.30965361 22.1648 < 2.2e-16
## Intercept80 0.21369311 0.01329847 0.18762860 0.23975762 16.0690 < 2.2e-16
## Intercept81 0.09317232 0.01331506 0.06707528 0.11926936 6.9975 2.605e-12
## Intercept82 -0.14651919 0.01333105 -0.17264756 -0.12039081 -10.9908 < 2.2e-16
## Intercept83 -0.06560679 0.01333715 -0.09174713 -0.03946645 -4.9191 8.694e-07
## Intercept84 0.05794389 0.01334295 0.03179219 0.08409558 4.3427 1.408e-05
## Intercept85 -0.01218777 0.01335058 -0.03835443 0.01397888 -0.9129 0.3612940
## Intercept86 0.12753088 0.01332385 0.10141662 0.15364515 9.5716 < 2.2e-16
## Intercept87 0.23238892 0.01332054 0.20628113 0.25849670 17.4459 < 2.2e-16
## Intercept88 0.12006217 0.01333735 0.09392144 0.14620290 9.0020 < 2.2e-16
## Intercept89 0.08891497 0.01333369 0.06278141 0.11504853 6.6684 2.585e-11
## Intercept90 0.05404079 0.01334260 0.02788977 0.08019181 4.0502 5.116e-05
## Intercept91 0.14097040 0.01334283 0.11481893 0.16712187 10.5653 < 2.2e-16
##
## Intercept1 ***
## Intercept2 ***
## Intercept3 ***
## Intercept4 ***
## Intercept5 ***
## Intercept6 ***
## Intercept7 ***
## Intercept8 ***
## Intercept9 ***
## Intercept10 ***
## Intercept11 ***
## Intercept12 ***
## Intercept13 ***
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## Intercept16
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## Intercept19 ***
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## Intercept21 ***
## Intercept22 ***
## Intercept23 ***
## Intercept24

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## Intercept25 ***
## Intercept26 ***
## Intercept27 ***
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## Intercept29 ***
## Intercept30 ***
## Intercept31 ***
## Intercept32 ***
## Intercept33 ***
## Intercept34 ***
## Intercept35 ***
## Intercept36 ***
## Intercept37 ***
## Intercept38 ***
## Intercept39 ***
## Intercept40 ***
## Intercept41 .
## Intercept42
## Intercept43 ***
## Intercept44
## Intercept45
## Intercept46 ***
## Intercept47 ***
## Intercept48 ***
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## Intercept50 ***
## Intercept51
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## Intercept57 ***
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## Intercept59
## Intercept60 ***
## Intercept61 **
## Intercept62
## Intercept63
## Intercept64 ***
## Intercept65 ***
## Intercept66
## Intercept67 ***
## Intercept68 ***
## Intercept69 ***
## Intercept70
## Intercept71 .
## Intercept72 ***
## Intercept73 ***
## Intercept74 ***
## Intercept75 ***
## Intercept76
## Intercept77 **
## Intercept78 .
```

```

## Intercept79 ***
## Intercept80 ***
## Intercept81 ***
## Intercept82 ***
## Intercept83 ***
## Intercept84 ***
## Intercept85
## Intercept86 ***
## Intercept87 ***
## Intercept88 ***
## Intercept89 ***
## Intercept90 ***
## Intercept91 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Q statistic on the homogeneity of effect sizes: 14568.88
## Degrees of freedom of the Q statistic: 2658
## P value of the Q statistic: 0
##
## Heterogeneity indices (based on the estimated Tau2):
##
##               Estimate
## Intercept1: I2 (Q statistic)      0
## Intercept2: I2 (Q statistic)      0
## Intercept3: I2 (Q statistic)      0
## Intercept4: I2 (Q statistic)      0
## Intercept5: I2 (Q statistic)      0
## Intercept6: I2 (Q statistic)      0
## Intercept7: I2 (Q statistic)      0
## Intercept8: I2 (Q statistic)      0
## Intercept9: I2 (Q statistic)      0
## Intercept10: I2 (Q statistic)     0
## Intercept11: I2 (Q statistic)     0
## Intercept12: I2 (Q statistic)     0
## Intercept13: I2 (Q statistic)     0
## Intercept14: I2 (Q statistic)     0
## Intercept15: I2 (Q statistic)     0
## Intercept16: I2 (Q statistic)     0
## Intercept17: I2 (Q statistic)     0
## Intercept18: I2 (Q statistic)     0
## Intercept19: I2 (Q statistic)     0
## Intercept20: I2 (Q statistic)     0
## Intercept21: I2 (Q statistic)     0
## Intercept22: I2 (Q statistic)     0
## Intercept23: I2 (Q statistic)     0
## Intercept24: I2 (Q statistic)     0
## Intercept25: I2 (Q statistic)     0
## Intercept26: I2 (Q statistic)     0
## Intercept27: I2 (Q statistic)     0
## Intercept28: I2 (Q statistic)     0
## Intercept29: I2 (Q statistic)     0
## Intercept30: I2 (Q statistic)     0
## Intercept31: I2 (Q statistic)     0
## Intercept32: I2 (Q statistic)     0

```

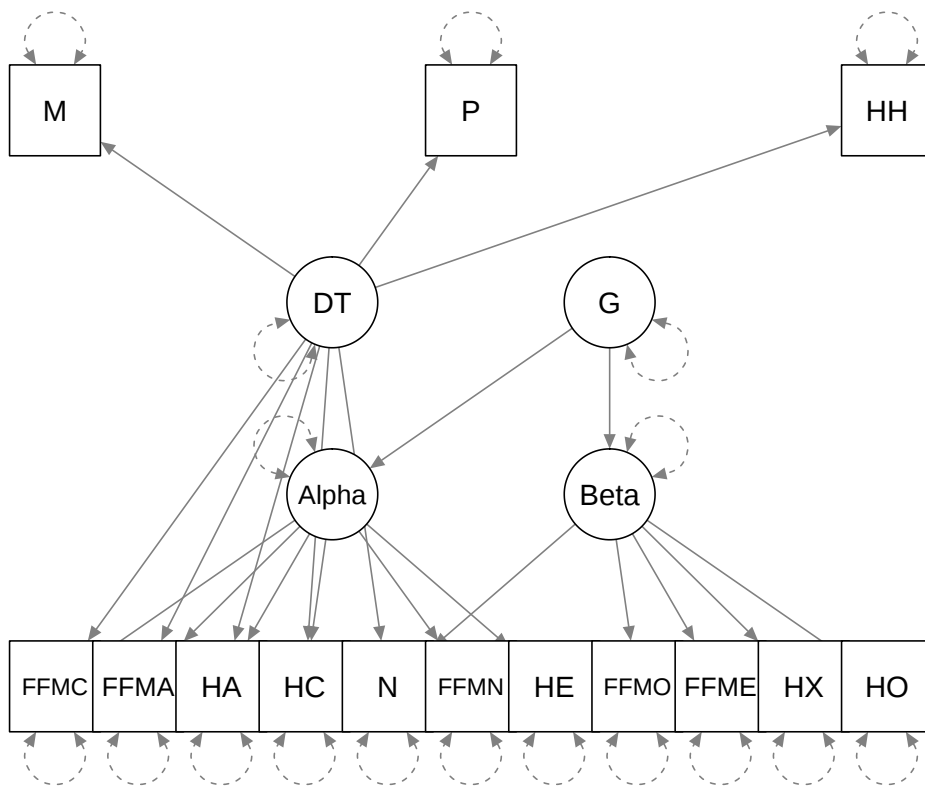
## Intercept33: I2 (Q statistic)	0
## Intercept34: I2 (Q statistic)	0
## Intercept35: I2 (Q statistic)	0
## Intercept36: I2 (Q statistic)	0
## Intercept37: I2 (Q statistic)	0
## Intercept38: I2 (Q statistic)	0
## Intercept39: I2 (Q statistic)	0
## Intercept40: I2 (Q statistic)	0
## Intercept41: I2 (Q statistic)	0
## Intercept42: I2 (Q statistic)	0
## Intercept43: I2 (Q statistic)	0
## Intercept44: I2 (Q statistic)	0
## Intercept45: I2 (Q statistic)	0
## Intercept46: I2 (Q statistic)	0
## Intercept47: I2 (Q statistic)	0
## Intercept48: I2 (Q statistic)	0
## Intercept49: I2 (Q statistic)	0
## Intercept50: I2 (Q statistic)	0
## Intercept51: I2 (Q statistic)	0
## Intercept52: I2 (Q statistic)	0
## Intercept53: I2 (Q statistic)	0
## Intercept54: I2 (Q statistic)	0
## Intercept55: I2 (Q statistic)	0
## Intercept56: I2 (Q statistic)	0
## Intercept57: I2 (Q statistic)	0
## Intercept58: I2 (Q statistic)	0
## Intercept59: I2 (Q statistic)	0
## Intercept60: I2 (Q statistic)	0
## Intercept61: I2 (Q statistic)	0
## Intercept62: I2 (Q statistic)	0
## Intercept63: I2 (Q statistic)	0
## Intercept64: I2 (Q statistic)	0
## Intercept65: I2 (Q statistic)	0
## Intercept66: I2 (Q statistic)	0
## Intercept67: I2 (Q statistic)	0
## Intercept68: I2 (Q statistic)	0
## Intercept69: I2 (Q statistic)	0
## Intercept70: I2 (Q statistic)	0
## Intercept71: I2 (Q statistic)	0
## Intercept72: I2 (Q statistic)	0
## Intercept73: I2 (Q statistic)	0
## Intercept74: I2 (Q statistic)	0
## Intercept75: I2 (Q statistic)	0
## Intercept76: I2 (Q statistic)	0
## Intercept77: I2 (Q statistic)	0
## Intercept78: I2 (Q statistic)	0
## Intercept79: I2 (Q statistic)	0
## Intercept80: I2 (Q statistic)	0
## Intercept81: I2 (Q statistic)	0
## Intercept82: I2 (Q statistic)	0
## Intercept83: I2 (Q statistic)	0
## Intercept84: I2 (Q statistic)	0
## Intercept85: I2 (Q statistic)	0
## Intercept86: I2 (Q statistic)	0

```
## Intercept87: I2 (Q statistic)      0
## Intercept88: I2 (Q statistic)      0
## Intercept89: I2 (Q statistic)      0
## Intercept90: I2 (Q statistic)      0
## Intercept91: I2 (Q statistic)      0
##
## Number of studies (or clusters): 108
## Number of observed statistics: 2749
## Number of estimated parameters: 91
## Degrees of freedom: 2658
## -2 log likelihood: 3339.209
## OpenMx status1: 0 ("0" or "1": The optimization is considered fine.
## Other values may indicate problems.)
```

```
DTB5H6Gk2 <- "## Factor loadings
DT =~ M+N+P+FFMC+FFMA+HH+HA+HC
Alpha =~ FPMC+FFMA+FFMN+HE+HA+HC
Beta =~ N+FFMO+FFME+HX+HO
## Fix the variance of DT at 1
DT ~~ 1*DT
## 2nd order general factor
G =~ Alpha + Beta
## Fix the variance of G at 1
G ~~ 1*G
## Please decide whether DT and G are correlated!"

## Display the model
plot(DTB5H6Gk2)
```

```
## Registered S3 methods overwritten by 'huge':
##   method      from
##   plot.sim    BDgraph
##   print.sim   BDgraph
```



Convert model to RAM

```
RAM <- lavaan2RAM(DTB5H6Gk2, obs.variables=c("M","N","P","FFMO","FFMC","FFME", "FFMA",
                                              "FFMN","HH","HE","HX","HA","HC","HO"),
                  std.lv=FALSE)
```

RAM

```
## $A
##      M      N      P      FFMO      FFMC      FFME      FFMA      FFMN      HH      HE      HX      HA      HC      HO      DT
## M      "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0*MONDT"
## N      "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0*NONDT"
## P      "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0*PONDT"
## FFMO   "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"
## FFMC   "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0*FFMCONDT"
## FFME   "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"
## FFMA   "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0*FFMAONDT"
## FFMN   "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"
## HH     "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0*HHONDT"
## HE     "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"
## HX     "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"
## HA     "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0*HAONDT"
## HC     "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0*HCONDT"
## HO     "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"
## DT     "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"
## Alpha  "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"
## Beta   "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"
## G      "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"    "0"
##      Alpha      Beta      G
## M      "0"      "0"      "0"
## N      "0"      "0*NONBeta"  "0"
```

## P	"0"	"0"	"0"		
## FFMO	"0"	"0*FFMOONBeta"	"0"		
## FFMC	"0*FFMCONAlpha"	"0"	"0"		
## FFME	"0"	"0*FFMEONBeta"	"0"		
## FFMA	"0*FFMAONAlpha"	"0"	"0"		
## FFMN	"0*FFMNONAlpha"	"0"	"0"		
## HH	"0"	"0"	"0"		
## HE	"0*HEONAlpha"	"0"	"0"		
## HX	"0"	"0*HXONBeta"	"0"		
## HA	"0*HAONAlpha"	"0"	"0"		
## HC	"0*HCONAlpha"	"0"	"0"		
## HO	"0"	"0*HOONBeta"	"0"		
## DT	"0"	"0"	"0"		
## Alpha	"0"	"0"	"0*AlphaONG"		
## Beta	"0"	"0"	"0*BetaONG"		
## G	"0"	"0"	"0"		
##					
## \$S					
##	M	N	P	FFMO	FFMC
## M	"0*MWITHM"	"0"	"0"	"0"	"0"
## N	"0"	"0*NWITHN"	"0"	"0"	"0"
## P	"0"	"0"	"0*PWITHP"	"0"	"0"
## FFMO	"0"	"0"	"0"	"0*FFMOWITHFFMO"	"0"
## FFMC	"0"	"0"	"0"	"0"	"0*FFMCWITHFFMC"
## FFME	"0"	"0"	"0"	"0"	"0"
## FFMA	"0"	"0"	"0"	"0"	"0"
## FFMN	"0"	"0"	"0"	"0"	"0"
## HH	"0"	"0"	"0"	"0"	"0"
## HE	"0"	"0"	"0"	"0"	"0"
## HX	"0"	"0"	"0"	"0"	"0"
## HA	"0"	"0"	"0"	"0"	"0"
## HC	"0"	"0"	"0"	"0"	"0"
## HO	"0"	"0"	"0"	"0"	"0"
## DT	"0"	"0"	"0"	"0"	"0"
## Alpha	"0"	"0"	"0"	"0"	"0"
## Beta	"0"	"0"	"0"	"0"	"0"
## G	"0"	"0"	"0"	"0"	"0"
##	FFME	FFMA	FFMN	HH	
## M	"0"	"0"	"0"	"0"	
## N	"0"	"0"	"0"	"0"	
## P	"0"	"0"	"0"	"0"	
## FFMO	"0"	"0"	"0"	"0"	
## FFMC	"0"	"0"	"0"	"0"	
## FFME	"0*FFMEWITHFFME"	"0"	"0"	"0"	
## FFMA	"0"	"0*FFMAWITHFFMA"	"0"	"0"	
## FFMN	"0"	"0"	"0*FFMNWITHFFMN"	"0"	
## HH	"0"	"0"	"0"	"0*HHWITHHHH"	
## HE	"0"	"0"	"0"	"0"	
## HX	"0"	"0"	"0"	"0"	
## HA	"0"	"0"	"0"	"0"	
## HC	"0"	"0"	"0"	"0"	
## HO	"0"	"0"	"0"	"0"	
## DT	"0"	"0"	"0"	"0"	
## Alpha	"0"	"0"	"0"	"0"	

```

## Beta "0" "0" "0" "0"
## G "0" "0" "0" "0"
## HE HX HA HC HO DT
## M "0" "0" "0" "0" "0" "0"
## N "0" "0" "0" "0" "0" "0"
## P "0" "0" "0" "0" "0" "0"
## FFMO "0" "0" "0" "0" "0" "0"
## FFMC "0" "0" "0" "0" "0" "0"
## FFME "0" "0" "0" "0" "0" "0"
## FFMA "0" "0" "0" "0" "0" "0"
## FFMN "0" "0" "0" "0" "0" "0"
## HH "0" "0" "0" "0" "0" "0"
## HE "0*HEWITHHE" "0" "0" "0" "0" "0"
## HX "0" "0*HXWITHHX" "0" "0" "0" "0"
## HA "0" "0" "0*HAWITHHA" "0" "0" "0"
## HC "0" "0" "0" "0*HCWITHHC" "0" "0"
## HO "0" "0" "0" "0" "0*HOWITHHO" "0"
## DT "0" "0" "0" "0" "0" "1"
## Alpha "0" "0" "0" "0" "0" "0"
## Beta "0" "0" "0" "0" "0" "0"
## G "0" "0" "0" "0" "0" "0"
## Alpha Beta G
## M "0" "0" "0"
## N "0" "0" "0"
## P "0" "0" "0"
## FFMO "0" "0" "0"
## FFMC "0" "0" "0"
## FFME "0" "0" "0"
## FFMA "0" "0" "0"
## FFMN "0" "0" "0"
## HH "0" "0" "0"
## HE "0" "0" "0"
## HX "0" "0" "0"
## HA "0" "0" "0"
## HC "0" "0" "0"
## HO "0" "0" "0"
## DT "0" "0" "0"
## Alpha "0*AlphaWITHAlpha" "0" "0"
## Beta "0" "0*BetaWITHBeta" "0"
## G "0" "0" "1"
##
## $F
## M N P FFMO FFMC FFME FFMA FFMN HH HE HX HA HC HO DT Alpha Beta G
## M 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## N 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## P 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
## FFMO 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
## FFMC 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0
## FFME 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
## FFMA 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0
## FFMN 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0
## HH 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0
## HE 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0
## HX 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0

```

```

## HA  0 0 0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0
## HC  0 0 0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0
## HO  0 0 0  0  0  0  0  0  0  0  0  0  0  1  0  0  0  0
##
## $M
##   M N P FFMO FFMC FFME FFMA FFMN HH HE HX HA HC HO DT Alpha Beta G
## 1 0 0 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
fitDTB5H6Gk2 <- tssem2(randomDTB5H6, RAM=RAM, intervals="z")
fitDTB5H6Gk2 <- rerun(fitDTB5H6Gk2)

## Running TSSEM2 Correlation with 21 parameters
##
## Beginning initial fit attempt
## Running TSSEM2 Correlation with 21 parameters
##
## Lowest minimum so far: 3538.56016089473
##
## Solution found
##
## Solution found! Final fit=3538.5602 (started at 3538.5602) (1 attempt(s): 1 valid, 0 errors)
summary(fitDTB5H6Gk2)

##
## Call:
## wls(Cov = pooledS, aCov = aCov, n = tssem1.obj$total.n, RAM = RAM,
##      Amatrix = Amatrix, Smatrix = Smatrix, Fmatrix = Fmatrix,
##      diag.constraints = diag.constraints, cor.analysis = cor.analysis,
##      intervals.type = intervals.type, mx.algebras = mx.algebras,
##      model.name = model.name, suppressWarnings = suppressWarnings,
##      silent = silent, run = run)
##
## 95% confidence intervals: z statistic approximation
## Coefficients:
##              Estimate Std.Error    lbound    ubound    z value Pr(>|z|)
## AlphaONG      0.6729159  7.8717902 -14.7555094  16.1013411   0.0855  0.9319
## BetaONG       0.9597168 11.2267877 -21.0443827  22.9638163   0.0855  0.9319
## FFMAONAlpha   0.3629114  0.0079084  0.3474112  0.3784116  45.8893 <2e-16
## FFMAONDT     -0.5753426  0.0052996 -0.5857297 -0.5649555 -108.5628 <2e-16
## FFMCONAlpha   0.4388739  0.0085765  0.4220642  0.4556836  51.1715 <2e-16
## FFMCONDT     -0.2591220  0.0060592 -0.2709978 -0.2472462 -42.7650 <2e-16
## FFMEONBeta    0.7353384  0.0093498  0.7170132  0.7536636  78.6478 <2e-16
## FFMNONAlpha  -0.5513320  0.0095604 -0.5700700 -0.5325939 -57.6681 <2e-16
## FFMONBeta     0.3292667  0.0075106  0.3145462  0.3439873  43.8402 <2e-16
## HAONAlpha     0.1828948  0.0166231  0.1503140  0.2154755  11.0024 <2e-16
## HAONDT       -0.4266128  0.0106762 -0.4475377 -0.4056879 -39.9594 <2e-16
## HCONAlpha     0.3832932  0.0195826  0.3449119  0.4216745  19.5731 <2e-16
## HCONDT       -0.2860227  0.0108065 -0.3072031 -0.2648423 -26.4676 <2e-16
## HEONAlpha    -0.1938476  0.0167375 -0.2266526 -0.1610426 -11.5816 <2e-16
## HHONDT       -0.6891154  0.0110661 -0.7108046 -0.6674262 -62.2724 <2e-16
## HOONBeta      0.1779990  0.0125582  0.1533854  0.2026126  14.1739 <2e-16
## HXONBeta      0.9385564  0.0222964  0.8948562  0.9822566  42.0945 <2e-16

```

```

## MONDT          0.7081764    0.0037587    0.7008094    0.7155434    188.4078    <2e-16
## NONBeta        0.4258400    0.0058400    0.4143938    0.4372862    72.9176    <2e-16
## NONDT          0.5080462    0.0043980    0.4994262    0.5166662    115.5164    <2e-16
## PONDt          0.7678102    0.0037406    0.7604788    0.7751416    205.2655    <2e-16
##
## AlphaONG
## BetaONG
## FFMAONAlpha ***
## FFMAONDT      ***
## FFMCONAlpha ***
## FFMCONDt      ***
## FFMEONBeta    ***
## FFMNONAlpha   ***
## FFMOONBeta    ***
## HAONAlpha     ***
## HAONDT        ***
## HCONAlpha     ***
## HCONDt        ***
## HEONAlpha     ***
## HHONDT        ***
## HOONBeta      ***
## HXONBeta      ***
## MONDT         ***
## NONBeta       ***
## NONDT         ***
## PONDt         ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Goodness-of-fit indices:
##
##                                     Value
## Sample size                        40818.0000
## Chi-square of target model         3538.5602
## DF of target model                 70.0000
## p value of target model            0.0000
## Number of constraints imposed on "Smatrix" 0.0000
## DF manually adjusted               0.0000
## Chi-square of independence model    51059.5307
## DF of independence model           91.0000
## RMSEA                             0.0348
## RMSEA lower 95% CI                 0.0339
## RMSEA upper 95% CI                 0.0358
## SRMR                              0.1318
## TLI                               0.9115
## CFI                               0.9319
## AIC                               3398.5602
## BIC                               2795.3787
## OpenMx status1: 0 ("0" or "1": The optimization is considered fine.
## Other values indicate problems.)

```

```
sessionInfo()
```

```

## R version 3.6.3 (2020-02-29)
## Platform: x86_64-pc-linux-gnu (64-bit)
## Running under: Ubuntu 18.04.4 LTS

```

```

##
## Matrix products: default
## BLAS: /usr/lib/x86_64-linux-gnu/openblas/libblas.so.3
## LAPACK: /usr/lib/x86_64-linux-gnu/libopenblas-p-r0.2.20.so
##
## locale:
## [1] LC_CTYPE=en_US.UTF-8 LC_NUMERIC=C
## [3] LC_TIME=en_US.UTF-8 LC_COLLATE=en_US.UTF-8
## [5] LC_MONETARY=en_US.UTF-8 LC_MESSAGES=en_US.UTF-8
## [7] LC_PAPER=en_US.UTF-8 LC_NAME=C
## [9] LC_ADDRESS=C LC_TELEPHONE=C
## [11] LC_MEASUREMENT=en_US.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_2.17.3
##
## loaded via a namespace (and not attached):
## [1] nlme_3.1-144 RColorBrewer_1.1-2 mi_1.0
## [4] tools_3.6.3 backports_1.1.5 R6_2.4.1
## [7] d3Network_0.5.2.1 rpart_4.1-15 Hmisc_4.3-1
## [10] colorspace_1.4-1 nnet_7.3-13 tidyselect_1.0.0
## [13] gridExtra_2.3 mnormt_1.5-6 compiler_3.6.3
## [16] qgraph_1.6.5 fdrtool_1.2.15 htmlTable_1.13.3
## [19] regsem_1.5.2 scales_1.1.0 checkmate_2.0.0
## [22] mvtnorm_1.1-0 psych_1.9.12.31 pbapply_1.4-2
## [25] sem_3.1-9 stringr_1.4.0 digest_0.6.25
## [28] pbivnorm_0.6.0 foreign_0.8-75 minqa_1.2.4
## [31] rmarkdown_2.1 base64enc_0.1-3 jpeg_0.1-8
## [34] pkgconfig_2.0.3 htmltools_0.4.0 lme4_1.1-21
## [37] lisrelToR_0.1.4 htmlwidgets_1.5.1 rlang_0.4.5
## [40] rstudioapi_0.11 huge_1.3.4 gtools_3.8.1
## [43] acepack_1.4.1 dplyr_0.8.5 zip_2.0.4
## [46] magrittr_1.5 Formula_1.2-3 Matrix_1.2-18
## [49] Rcpp_1.0.3 munsell_0.5.0 abind_1.4-5
## [52] rockchalk_1.8.144 lifecycle_0.2.0 whisker_0.4
## [55] stringi_1.4.6 yaml_2.2.1 carData_3.0-3
## [58] MASS_7.3-51.5 plyr_1.8.6 matrixcalc_1.0-3
## [61] lavaan_0.6-5 grid_3.6.3 parallel_3.6.3
## [64] crayon_1.3.4 lattice_0.20-40 semPlot_1.1.3
## [67] kutils_1.69 splines_3.6.3 knitr_1.28
## [70] pillar_1.4.3 igraph_1.2.4.2 rjson_0.2.20
## [73] boot_1.3-24 corpcor_1.6.9 BDgraph_2.62
## [76] reshape2_1.4.3 stats4_3.6.3 XML_3.99-0.3
## [79] glue_1.3.2 evaluate_0.14 latticeExtra_0.6-29
## [82] data.table_1.12.8 png_0.1-7 nloptr_1.2.2.1
## [85] gtable_0.3.0 purrr_0.3.3 assertthat_0.2.1
## [88] ggplot2_3.3.0 xfun_0.12 openxlsx_4.1.4
## [91] xtable_1.8-4 coda_0.19-3 Rsolnp_1.16
## [94] survival_3.1-8 glasso_1.11 truncnorm_1.0-8
## [97] tibble_2.1.3 arm_1.10-1 ellipse_0.4.1
## [100] cluster_2.1.0

```