Testing NA vs. 1.0 in the diagonals of the matrices

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```
library(metaSEM)

## NA in the diagonal is used to represent a missing variable.
Hunter83$data[11:14]
```

```
## $`Campbell et al. (1973)`
##               Ability Job_knowledge Work_sample Supervisor
## Ability          1.00            NA        0.51       0.29
## Job_knowledge      NA            NA          NA         NA
## Work_sample      0.51            NA        1.00       0.27
## Supervisor       0.29            NA        0.27       1.00
##
## $`Boyles et al. (19??)`
##               Ability Job_knowledge Work_sample Supervisor
## Ability          1.00            NA        0.69       0.40
## Job_knowledge      NA            NA          NA         NA
## Work_sample      0.69            NA        1.00       0.38
## Supervisor       0.40            NA        0.38       1.00
##
## $`Schoon (1979)`
##               Ability Job_knowledge Work_sample Supervisor
## Ability            NA            NA          NA         NA
## Job_knowledge      NA          1.00        0.72       0.05
## Work_sample        NA          0.72        1.00       0.32
## Supervisor         NA          0.05        0.32       1.00
##
## $`van Rijn and Payne (1980)`
##               Ability Job_knowledge Work_sample Supervisor
## Ability          1.00          0.62        0.50         NA
## Job_knowledge    0.62          1.00        0.62         NA
## Work_sample      0.50          0.62        1.00         NA
## Supervisor         NA            NA          NA         NA
```

```
## Create a copy of the dataset
temp <- Hunter83
## Assign 1.0 to all the diagonals
temp$data <- lapply(temp$data, function(x) {diag(x) <- 1.0; x} )

temp$data[11:14]
```

```
## $`Campbell et al. (1973)`
```

```
##               Ability Job_knowledge Work_sample Supervisor
## Ability          1.00            NA        0.51       0.29
## Job_knowledge      NA             1          NA         NA
## Work_sample      0.51            NA        1.00       0.27
## Supervisor       0.29            NA        0.27       1.00
##
## $`Boyles et al. (19??)`
##               Ability Job_knowledge Work_sample Supervisor
## Ability          1.00            NA        0.69       0.40
## Job_knowledge      NA             1          NA         NA
## Work_sample      0.69            NA        1.00       0.38
## Supervisor       0.40            NA        0.38       1.00
##
## $`Schoon (1979)`
##               Ability Job_knowledge Work_sample Supervisor
## Ability             1            NA          NA         NA
## Job_knowledge      NA          1.00        0.72       0.05
## Work_sample        NA          0.72        1.00       0.32
## Supervisor         NA          0.05        0.32       1.00
##
## $`van Rijn and Payne (1980)`
##               Ability Job_knowledge Work_sample Supervisor
## Ability          1.00          0.62        0.50         NA
## Job_knowledge    0.62          1.00        0.62         NA
## Work_sample      0.50          0.62        1.00         NA
## Supervisor         NA            NA          NA          1
```

```r
rand1 <- tssem1(Hunter83$data, Hunter83$n, method="REM")
rand2 <- tssem1(temp$data, temp$n, method="REM")

## Both versions are "almost" identical.
summary(rand1)
```

```
##
## Call:
## meta(y = ES, v = acovR, RE.constraints = Diag(paste0(RE.startvalues,
##     "*Tau2_", 1:no.es, "_", 1:no.es)), RE.lbound = RE.lbound,
##     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  5.0045e-01  2.8249e-02  4.4508e-01  5.5581e-01 17.7157 < 2.2e-16
## Intercept2  4.3124e-01  2.1560e-02  3.8898e-01  4.7350e-01 20.0020 < 2.2e-16
## Intercept3  2.0615e-01  2.5699e-02  1.5578e-01  2.5652e-01  8.0214 1.110e-15
## Intercept4  5.2074e-01  3.1799e-02  4.5842e-01  5.8307e-01 16.3758 < 2.2e-16
## Intercept5  2.5781e-01  3.5914e-02  1.8742e-01  3.2820e-01  7.1786 7.045e-13
## Intercept6  2.3471e-01  1.7505e-02  2.0040e-01  2.6902e-01 13.4085 < 2.2e-16
## Tau2_1_1    6.2569e-03  3.6590e-03 -9.1449e-04  1.3428e-02  1.7100   0.08726
## Tau2_2_2    2.2234e-03  2.1500e-03 -1.9905e-03  6.4373e-03  1.0342   0.30106
## Tau2_3_3    4.3637e-03  3.0130e-03 -1.5417e-03  1.0269e-02  1.4483   0.14754
## Tau2_4_4    7.5513e-03  4.6477e-03 -1.5581e-03  1.6661e-02  1.6247   0.10422
## Tau2_5_5    1.0692e-02  6.0657e-03 -1.1966e-03  2.2581e-02  1.7627   0.07795
```

```
## Tau2_6_6    1.0000e-10  1.7130e-03 -3.3575e-03  3.3575e-03  0.0000   1.00000
##
## Intercept1 ***
## Intercept2 ***
## Intercept3 ***
## Intercept4 ***
## Intercept5 ***
## Intercept6 ***
## Tau2_1_1   .
## Tau2_2_2
## Tau2_3_3
## Tau2_4_4
## Tau2_5_5   .
## Tau2_6_6
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Q statistic on the homogeneity of effect sizes: 205.2251
## Degrees of freedom of the Q statistic: 60
## P value of the Q statistic: 0
##
## Heterogeneity indices (based on the estimated Tau2):
##                              Estimate
## Intercept1: I2 (Q statistic)   0.7209
## Intercept2: I2 (Q statistic)   0.4475
## Intercept3: I2 (Q statistic)   0.5671
## Intercept4: I2 (Q statistic)   0.7459
## Intercept5: I2 (Q statistic)   0.7691
## Intercept6: I2 (Q statistic)   0.0000
##
## Number of studies (or clusters): 14
## Number of observed statistics: 27
## Number of estimated parameters: 12
## Degrees of freedom: 15
## -2 log likelihood: -130.2042
## OpenMx status1: 0 ("0" or "1": The optimization is considered fine.
## Other values may indicate problems.)
```

```
summary(rand2)
```

```
##
## Call:
## meta(y = ES, v = acovR, RE.constraints = Diag(paste0(RE.startvalues,
##     "*Tau2_", 1:no.es, "_", 1:no.es)), RE.lbound = RE.lbound,
##     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  5.0045e-01  2.8249e-02  4.4508e-01  5.5581e-01 17.7157 < 2.2e-16
## Intercept2  4.3124e-01  2.1560e-02  3.8898e-01  4.7350e-01 20.0020 < 2.2e-16
## Intercept3  2.0615e-01  2.5699e-02  1.5578e-01  2.5652e-01  8.0214 1.110e-15
## Intercept4  5.2074e-01  3.1799e-02  4.5842e-01  5.8307e-01 16.3758 < 2.2e-16
```

```
## Intercept5  2.5781e-01  3.5914e-02  1.8742e-01  3.2820e-01  7.1786 7.045e-13
## Intercept6  2.3471e-01  1.7505e-02  2.0040e-01  2.6902e-01 13.4085 < 2.2e-16
## Tau2_1_1    6.2569e-03  3.6590e-03 -9.1449e-04  1.3428e-02  1.7100   0.08726
## Tau2_2_2    2.2234e-03  2.1500e-03 -1.9905e-03  6.4373e-03  1.0342   0.30106
## Tau2_3_3    4.3637e-03  3.0130e-03 -1.5417e-03  1.0269e-02  1.4483   0.14754
## Tau2_4_4    7.5512e-03  4.6477e-03 -1.5581e-03  1.6661e-02  1.6247   0.10422
## Tau2_5_5    1.0692e-02  6.0657e-03 -1.1966e-03  2.2581e-02  1.7627   0.07795
## Tau2_6_6    1.0000e-10  1.7130e-03 -3.3575e-03  3.3575e-03  0.0000   1.00000
##
## Intercept1 ***
## Intercept2 ***
## Intercept3 ***
## Intercept4 ***
## Intercept5 ***
## Intercept6 ***
## Tau2_1_1   .
## Tau2_2_2
## Tau2_3_3
## Tau2_4_4
## Tau2_5_5   .
## Tau2_6_6
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Q statistic on the homogeneity of effect sizes: 205.2251
## Degrees of freedom of the Q statistic: 60
## P value of the Q statistic: 0
##
## Heterogeneity indices (based on the estimated Tau2):
##                              Estimate
## Intercept1: I2 (Q statistic)   0.7209
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## Intercept3: I2 (Q statistic)   0.5671
## Intercept4: I2 (Q statistic)   0.7459
## Intercept5: I2 (Q statistic)   0.7691
## Intercept6: I2 (Q statistic)   0.0000
##
## Number of studies (or clusters): 14
## Number of observed statistics: 27
## Number of estimated parameters: 12
## Degrees of freedom: 15
## -2 log likelihood: -130.2042
## OpenMx status1: 0 ("0" or "1": The optimization is considered fine.
## Other values may indicate problems.)
```

```
sessionInfo()
```

```
## R version 4.2.1 (2022-06-23)
## Platform: x86_64-pc-linux-gnu (64-bit)
## Running under: Ubuntu 20.04.4 LTS
##
## Matrix products: default
## BLAS:   /usr/lib/x86_64-linux-gnu/blas/libblas.so.3.9.0
## LAPACK: /usr/lib/x86_64-linux-gnu/lapack/liblapack.so.3.9.0
```

```
##
## 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_1.2.5.1 OpenMx_2.20.6
##
## loaded via a namespace (and not attached):
##  [1] Rcpp_1.0.9         rstudioapi_0.13    knitr_1.39         magrittr_2.0.3
##  [5] MASS_7.3-58        mnormt_2.1.0       pbivnorm_0.6.0     ellipse_0.4.3
##  [9] lattice_0.20-45    rlang_1.0.4        fastmap_1.1.0      stringr_1.4.0
## [13] tools_4.2.1        parallel_4.2.1     grid_4.2.1         xfun_0.31
## [17] cli_3.3.0          htmltools_0.5.2    yaml_2.3.5         RcppParallel_5.1.5
## [21] digest_0.6.29      lifecycle_1.0.1    lavaan_0.6-11      Matrix_1.4-1
## [25] evaluate_0.15      rmarkdown_2.14     stringi_1.7.8      compiler_4.2.1
## [29] stats4_4.2.1       mvtnorm_1.1-3
```