

Testing OpenMx 2.2.3 with lbound

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- No lbound: SLSQP works fine.

```
library(OpenMx)
```

```
## Loading required package: digest
## Loading required package: MASS
## Loading required package: parallel
```

```
set.seed(3910811)
```

```
## Sample data with mean=0 and var=1
my.df <- data.frame(x=rnorm(100))
mean(my.df$x)
```

```
## [1] -0.03931262
```

```
var(my.df$x)
```

```
## [1] 0.9351102
```

```
## no lbound on V
my.model1 <- mxModel(name = "My model",
  mxData(observed=my.df, type="raw"),
  mxMatrix(type="Full", nrow=1, ncol=1, free=TRUE, values=0, name="M"),
  mxMatrix(type="Symm", nrow=1, ncol=1, free=TRUE, values=1.1, name="V"),
  mxFitFunctionML(),
  mxExpectationNormal(covariance="V", means="M", dimnames="x")
)
```

```
my.fit1 <- mxRun(my.model1)
```

```
## Running My model
```

```
## Status code is 0
my.fit1$output$status[[1]]
```

```
## [1] 0
```

```
summary(my.fit1)
```

```
## Summary of My model
##
## free parameters:
```

```

##           name matrix row col  Estimate  Std.Error
## 1 My model.M[1,1]      M   1   x -0.0393137 0.09621577
## 2 My model.V[1,1]      V   x   x  0.9257581 0.13092031
##
## observed statistics: 100
## estimated parameters: 2
## degrees of freedom: 98
## fit value ( -2lnL units ): 276.0736
## number of observations: 100
## Information Criteria:
##      | df Penalty | Parameters Penalty | Sample-Size Adjusted
## AIC:      80.07359           280.0736           NA
## BIC:     -175.23309           285.2839           278.9674
## CFI: NA
## TLI: 1 (also known as NNFI)
## RMSEA: 0 [95% CI (NA, NA)]
## Prob(RMSEA <= 0.05): NA
## OpenMx does not recommend using GFI, AGFI, NFI (aka Bentler-Bonett), or SRMR:
## See help(mxSummary) for why.
## Some of your fit indices are missing.
## To get them, fit saturated and independence models, and include them with
## summary(yourModel, refModels=...)
## See help(mxRefModels) for an easy way of doing this in many cases.
## timestamp: 2015-05-24 00:03:18
## Wall clock time (HH:MM:SS.hh): 00:00:00.06
## OpenMx version number: 2.2.3
## Need help? See help(mxSummary)

```

- Estimate hit the lbound=1: SLSQP returns an error code 6.

```

## with lbound=1.0 on V
my.model2 <- mxModel(name = "My model",
  mxData(observed=my.df, type="raw"),
  mxMatrix(type="Full", nrow=1, ncol=1, free=TRUE, values=0, name="M"),
  mxMatrix(type="Symm", nrow=1, ncol=1, free=TRUE, values=1.1,
    lbound=1, name="V"),
  mxFitFunctionML(),
  mxExpectationNormal(covariance="V", means="M", dimnames="x")
)

my.fit2 <- mxRun(my.model2)

```

```
## Running My model
```

```

## Warning: In model 'My model' Optimizer returned a non-zero status code 6.
## The model does not satisfy the first-order optimality conditions to the
## required accuracy, and no improved point for the merit function could be
## found during the final linesearch (Mx status RED)

```

```

## Status code is 6
my.fit2@output$status[[1]]

```

```
## [1] 6
```

```
summary(my.fit2)
```

```
## Summary of My model
##
## The model does not satisfy the first-order optimality conditions to the required accuracy, and no imp
##
## free parameters:
##           name matrix row col   Estimate Std.Error lbound ubound
## 1 My model.M[1,1]      M   1   x -0.03931428 0.1000003
## 2 My model.V[1,1]      V   x   x  1.00000000 0.1532583      1*
##
## observed statistics: 100
## estimated parameters: 2
## degrees of freedom: 98
## fit value ( -2lnL units ): 276.3636
## number of observations: 100
## Information Criteria:
##      | df Penalty | Parameters Penalty | Sample-Size Adjusted
## AIC:      80.36362          280.3636          NA
## BIC:     -174.94306          285.5740          279.2575
## CFI: NA
## TLI: 1 (also known as NNFI)
## RMSEA: 0 [95% CI (NA, NA)]
## Prob(RMSEA <= 0.05): NA
## OpenMx does not recommend using GFI, AGFI, NFI (aka Bentler-Bonett), or SRMR:
## See help(mxSummary) for why.
## Some of your fit indices are missing.
## To get them, fit saturated and independence models, and include them with
## summary(yourModel, refModels=...)
## See help(mxRefModels) for an easy way of doing this in many cases.
## timestamp: 2015-05-24 00:03:18
## Wall clock time (HH:MM:SS.hh): 00:00:00.01
## OpenMx version number: 2.2.3
## Need help? See help(mxSummary)
```

- Estimate hit the lbound: NPSOL works fine.

```
## Change the optimizer to NPSOL
mxOption(NULL, "Default optimizer", "NPSOL")
```

```
my.fit2 <- mxRun(my.model2)
```

```
## Running My model
```

```
## Status code is 0
my.fit2@output$status[[1]]
```

```
## [1] 0
```

```
summary(my.fit2)
```

```
## Summary of My model
##
## free parameters:
##      name matrix row col   Estimate Std.Error lbound ubound
## 1 My model.M[1,1]      M   1   x -0.03931261 0.09999999
## 2 My model.V[1,1]      V   x   x  1.00000000 0.15325506      1*
##
## observed statistics: 100
## estimated parameters: 2
## degrees of freedom: 98
## fit value ( -2lnL units ): 276.3636
## number of observations: 100
## Information Criteria:
##      | df Penalty | Parameters Penalty | Sample-Size Adjusted
## AIC:      80.36362          280.3636          NA
## BIC:     -174.94306          285.5740          279.2575
## CFI: NA
## TLI: 1 (also known as NNFI)
## RMSEA: 0 [95% CI (NA, NA)]
## Prob(RMSEA <= 0.05): NA
## OpenMx does not recommend using GFI, AGFI, NFI (aka Bentler-Bonett), or SRMR:
## See help(mxSummary) for why.
## Some of your fit indices are missing.
## To get them, fit saturated and independence models, and include them with
## summary(yourModel, refModels=...)
## See help(mxRefModels) for an easy way of doing this in many cases.
## timestamp: 2015-05-24 00:03:18
## Wall clock time (HH:MM:SS.hh): 00:00:00.10
## OpenMx version number: 2.2.3
## Need help? See help(mxSummary)
```

```
sessionInfo()
```

```
## R version 3.2.0 (2015-04-16)
## Platform: x86_64-pc-linux-gnu (64-bit)
## Running under: Ubuntu 14.04.1 LTS
##
## 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] parallel stats graphics grDevices utils datasets methods
## [8] base
##
## other attached packages:
## [1] OpenMx_2.2.3 MASS_7.3-40 digest_0.6.8
```

```
##  
## loaded via a namespace (and not attached):  
## [1] magrittr_1.5      tools_3.2.0      htmltools_0.2.6 yaml_2.1.13  
## [5] stringi_0.4-1    rmarkdown_0.6.1 knitr_1.10.5    stringr_1.0.0  
## [9] evaluate_0.7
```