Model without custom starting values

```
library(lavaan)
```

```
## This is lavaan 0.6-1.1176
```

```
## lavaan is BETA software! Please report any bugs.
```

```
HS.model <- ' visual  =~ x1 + lam2*x2 + x3
              textual =~ x4 + x5 + x6
              speed   =~ x7 + x8 + x9
              x1 ~~ x1 + psi1*x1
              x2 ~~ x2 + psi2*x2
              x3 ~~ x3 + psi3*x3
              x4 ~~ x4 + psi4*x4
              x5 ~~ x5 + psi5*x5
              x6 ~~ x6 + psi6*x6
              x7 ~~ x7 + psi7*x7
              x8 ~~ x8 + psi8*x8
              x9 ~~ x9 + psi9*x9
              stdlam2 := lam2/sqrt(lam2^2 + psi2)'
fit <- lavaan(HS.model, data=HolzingerSwineford1939,
              auto.var=TRUE, auto.fix.first=FALSE, std.lv=TRUE,
              auto.cov.lv.x=TRUE, estimator="MLM",
              meanstructure=TRUE, int.ov.free=TRUE)

const<-"stdlam2 == -0.8"
fit.const <- lavaan(HS.model, data=HolzingerSwineford1939,constraints=const,
              auto.var=TRUE, auto.fix.first=FALSE, std.lv=TRUE,
              auto.cov.lv.x=TRUE, estimator="MLM",
              meanstructure=TRUE, int.ov.free=TRUE)

# negative scaling factor? test was 31.536 in version 0.5-20
lavTestLRT(fit,fit.const,method="satorra.bentler.2001")
```

```
## Warning in lav_test_diff_SatorraBentler2001(mods[[m]], mods[[m + 1]]):
## lavaan WARNING: scaling factor is negative
```

```
## Scaled Chi Square Difference Test (method = "satorra.bentler.2001")
##
##           Df    AIC    BIC   Chisq Chisq diff Df diff Pr(>Chisq)
## fit       24 7535.5 7646.7  85.305
## fit.const 25 7586.8 7694.3 138.607                  1
```

```
# ? was 29.904 in 0.5-20
lavTestLRT(fit,fit.const,method="satorra.bentler.2010")
```

```
## Scaled Chi Square Difference Test (method = "satorra.bentler.2010")
##
##           Df    AIC    BIC   Chisq Chisq diff Df diff Pr(>Chisq)
## fit       24 7535.5 7646.7  85.305
## fit.const 25 7586.8 7694.3 138.607     15.451       1  8.468e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Model with custom start values

```
HS.model <- ' visual  =~ x1 + start(0.7)*lam2*x2 + x3
              textual =~ x4 + x5 + x6
              speed   =~ x7 + x8 + x9
              x1 ~~ start(0.5)*x1 + psi1*x1
              x2 ~~ x2 + psi2*x2
              x3 ~~ x3 + psi3*x3
              x4 ~~ x4 + psi4*x4
              x5 ~~ x5 + psi5*x5
              x6 ~~ x6 + psi6*x6
              x7 ~~ x7 + psi7*x7
              x8 ~~ x8 + psi8*x8
              x9 ~~ x9 + psi9*x9
              stdlam2 := lam2/sqrt(lam2^2 + psi2)'
fit <- lavaan(HS.model, data=HolzingerSwineford1939,
              auto.var=TRUE, auto.fix.first=FALSE, std.lv=TRUE,
              auto.cov.lv.x=TRUE, estimator="MLM",
              meanstructure=TRUE, int.ov.free=TRUE)

const<-"stdlam2 == -0.8"
fit.const <- lavaan(HS.model, data=HolzingerSwineford1939,constraints=const,
              auto.var=TRUE, auto.fix.first=FALSE, std.lv=TRUE,
              auto.cov.lv.x=TRUE, estimator="MLM",
              meanstructure=TRUE, int.ov.free=TRUE)

 # negative scaling factor? test was 31.536 in version 0.5-20
lavTestLRT(fit,fit.const,method="satorra.bentler.2001")
```

```
## Warning in lav_test_diff_SatorraBentler2001(mods[[m]], mods[[m + 1]]):
## lavaan WARNING: scaling factor is negative
```

```
## Scaled Chi Square Difference Test (method = "satorra.bentler.2001")
##
##           Df    AIC    BIC   Chisq Chisq diff Df diff Pr(>Chisq)
## fit       24 7535.5 7646.7  85.305
## fit.const 25 7586.8 7694.3 138.607                  1
```

```
# This looks to have also been broken in 0.5-20,
# but here it doesn't match what appears w/o custom starting values.
# and doesn't match 0.5-20
lavTestLRT(fit,fit.const,method="satorra.bentler.2010")
```

```
## Scaled Chi Square Difference Test (method = "satorra.bentler.2010")
##
##           Df    AIC    BIC   Chisq Chisq diff Df diff Pr(>Chisq)
## fit       24 7535.5 7646.7  85.305
## fit.const 25 7586.8 7694.3 138.607     27.634       1  1.465e-07 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```