lavaan Examples

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02.07.2018

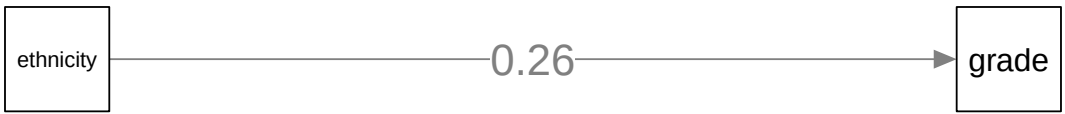
Example Data

```
head(gradeData)
```

```
##   ethnicity        SES    prev_ach   homework      grade
## 1         1 -0.7977791  -1.4419791  0.5336867 -0.7309092
## 2         1 -0.8075082   1.1376473 -0.8019978 -0.7513296
## 3         0 -0.1701263  -3.1331268  0.3120830 -1.4298637
## 4         0 -1.0506864  -9.3873619  0.5780830  0.1625113
## 5         1  1.6082192  -0.2241623  0.8738290  0.3962423
## 6         0 -0.6954397 -16.2162287 -1.1700796 -3.7096746
```

T-Test

```
t.test.model <- '
  grade ~ ethnicity
'
fit.t.test <- sem(t.test.model, data=gradeData)
```



Output

- summary function is useful but a bit verbose

```
parameterEstimates(fit.t.test)
```

```
##          lhs op       rhs   est    se      z pvalue ci.lower ci.upper
## 1      grade  ~ ethnicity 0.262 0.094  2.797  0.005    0.078    0.445
## 2      grade ~~     grade 2.188 0.098 22.361  0.000    1.996    2.380
## 3 ethnicity ~~ ethnicity 0.250 0.000     NA     NA    0.250    0.250
```

```
tmp <- parameterEstimates(fit.t.test,standardized = TRUE)
tmp[,c('lhs','op','rhs','est','std.all')]
```

```
##          lhs op       rhs   est std.all
## 1      grade  ~ ethnicity 0.262   0.088
## 2      grade ~~     grade 2.188   0.992
## 3 ethnicity ~~ ethnicity 0.250   1.000
```

Labeling Parameters

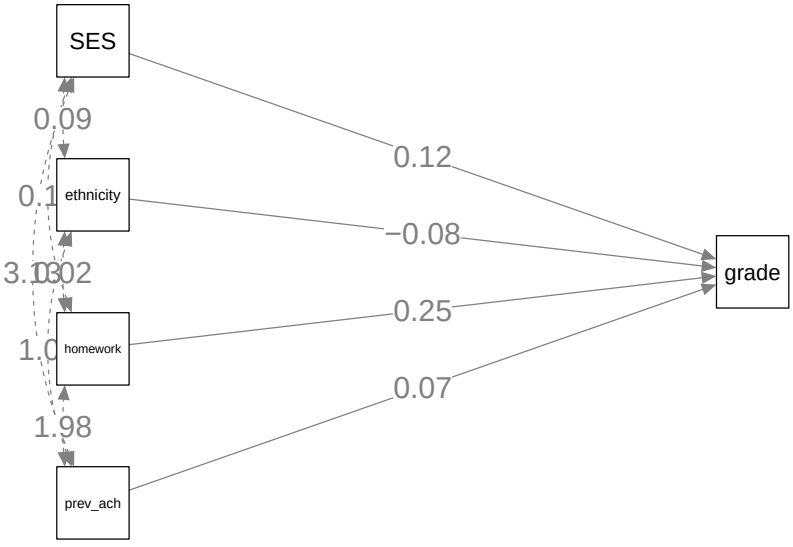
```
t.test.model <- '
  grade ~ b1*ethnicity
'
fit.t.test <- sem(t.test.model, data=gradeData)
parameterEstimates(fit.t.test)
```

```
##          lhs op       rhs label   est    se      z pvalue ci.lower ci.up
## 1      grade  ~ ethnicity    b1 0.262 0.094  2.797  0.005    0.078    0.4
## 2      grade ~~     grade       2.188 0.098 22.361  0.000    1.996    2.3
## 3 ethnicity ~~ ethnicity       0.250 0.000     NA     NA    0.250    0.2
```

Multiple Regression

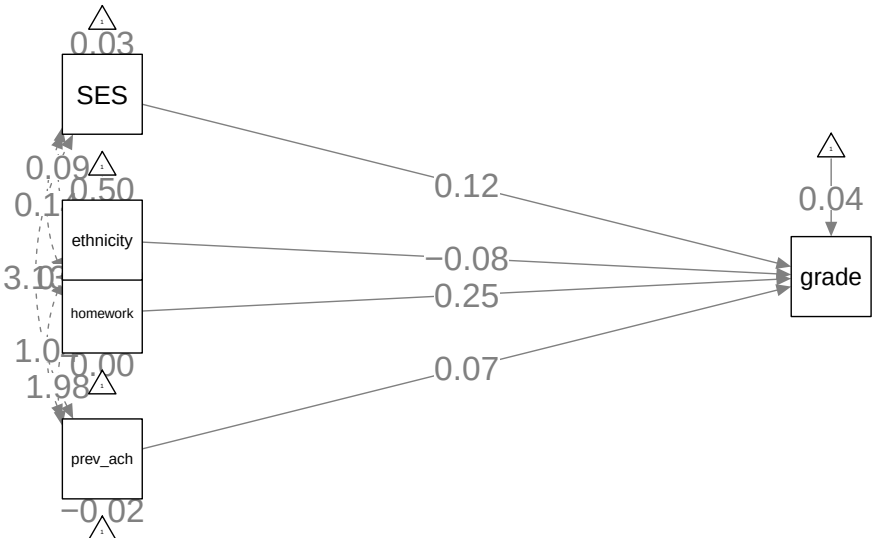
```
mult.reg.model <- '
  grade ~ prev_ach + homework + ethnicity + SES
'
fit.mult.reg <- sem(mult.reg.model, gradeData)
```

Multiple Regression Plot



Multiple Regression Model 2

```
fit.mult.reg2 <- sem(mult.reg.model, gradeData,meanstructure=TRUE)
```



Example SEM

```
keith.model <- '
  grade ~ prev_ach + homework
  homework ~ ethnicity + SES
  prev_ach ~ ethnicity + SES
  homework ~~ prev_ach
'
fit.keith <- sem(keith.model,gradeData)
keith.cov <- cov(gradeData)
fit.keith2 <- sem(keith.model, sample.cov=keith.cov, sample.nobs=1000)
```

Example SEM Plot