

Exploring the lavaan ecosystem: Packages to extend the capability of lavaan

Modern Modeling Methods

May 20, 2014

- semTools: Useful tools for SEM with R
 - Alexander M. Schoemann, Sunthud Pornprasertmanit, & Patrick J. Miller
- Getting the most out of your family data with the R-package fSRM
 - Lara Stas, Felix Schönbrodt, Tom Loeys
- semPlot: Unified visualizations of Structural Equation Models
 - Sacha Epskamp
- lavaan.survey
 - Daniel Oberski
- Graphical SEModeling with Onyx
 - Timo von Oertzen, Andreas Brandmaier, and Siny Tsang
- simsem: SIMulated Structural Equation Modeling in R
 - Sunthud Pornprasertmanit, Alexander M. Schoemann, & Patrick J. Miller

- “a free open-source, but commercial-quality package for latent variable modeling.”
 - From lavaan.org
- Features
 - Full support for mean structures and multiple groups
 - Several estimators available (including ML, GLS, WLS...)
 - Standard and robust standard errors and test statistics
 - Missing data handling through FIML
 - Linear and non-linear inequality constraints
 - Support for categorical data (and mixture of binary, ordered and continuous observed variables)

- Straightforward syntax:
 - Factor loadings $=\sim$
 - Variances/Covariances $\sim\sim$
 - Mean structures ~ 1
 - Regressions \sim
 - Fixing/labeling a parameter \star

```
mod <- 'Positive =~ Great + Cheerful + Happy
Positive ~~ 1*Positive #Will be included by default
Great ~~ Great #Will be included by default
Cheerful ~~ Cheerful #Will be included by default
Happy ~~ Happy #Will be included by default'

fit <- cfa(mod, data=dat std.lv=TRUE)

summary(fit, fit.measures=TRUE)
```

lavaan output

Number of observations	100
Estimator	ML
Minimum Function Test Statistic	0.000
Degrees of freedom	0
P-value (Chi-square)	1.000

User model versus baseline model:

Comparative Fit Index (CFI)	1.000
Tucker-Lewis Index (TLI)	1.000

Root Mean Square Error of Approximation:

RMSEA	0.000
90 Percent Confidence Interval	0.000 0.000
P-value RMSEA ≤ 0.05	1.000

lavaan output

Parameter estimates:

Information	Expected		
Standard Errors	Standard		
Estimate	Std.err	Z-value	P(> z)

Latent variables:

Positive =~

Great	0.755	0.092	8.167	0.000
Cheerful	0.804	0.091	8.795	0.000
Happy	0.810	0.091	8.877	0.000

Variances:

Positive	1.000	
Great	0.421	0.083
Cheerful	0.344	0.082
Happy	0.334	0.082

- For more information see lavaan.org
- Slides from this symposium and example syntax will be posted on simsem.org