Factor Analysis Example

library(lavaan)  
library(semPlot)  
fa\_lower <- '  
 1   
 .828 1   
 .776 .779 1   
 .439 .493 .460 1   
 .432 .464 .425 .674 1   
 .447 .489 .443 .590 .541 1   
 .447 .432 .401 .381 .402 .288 1   
 .541 .537 .534 .350 .367 .320 .555 1   
 .380 .358 .359 .424 .446 .325 .598 .452 1'  
  
fa\_cor <- getCov(fa\_lower,  
 names = c("Sentences", "Vocabulary", "Sentence\_Completion", "First\_Letters",  
 "FourLetterWords", "Suffices","Letter\_Series","Pedigrees", "Letter\_Grouping"))  
  
fa\_model <- 'verbal =~ Sentences + Vocabulary + Sentence\_Completion  
 Wrd\_Fluen =~ First\_Letters + FourLetterWords + Suffices  
 Reasoning =~ Letter\_Series + Pedigrees + Letter\_Grouping'  
  
  
fa\_model\_fit <- cfa(model = fa\_model,  
 sample.cov = fa\_cor,   
 sample.nobs = 213,   
 std.lv = TRUE)  
  
fitMeasures(fa\_model\_fit, c("chisq", "df", "pvalue", "cfi", "rmsea"))

chisq df pvalue cfi rmsea   
38.376 24.000 0.032 0.987 0.053

lavInspect(fa\_model\_fit, "est")

$lambda  
 verbal Wrd\_Fl Resnng  
Sentences 0.903 0.000 0.000  
Vocabulary 0.912 0.000 0.000  
Sentence\_Completion 0.854 0.000 0.000  
First\_Letters 0.000 0.834 0.000  
FourLetterWords 0.000 0.795 0.000  
Suffices 0.000 0.701 0.000  
Letter\_Series 0.000 0.000 0.779  
Pedigrees 0.000 0.000 0.718  
Letter\_Grouping 0.000 0.000 0.702  
  
$theta  
 Sntncs Vcblry Sntn\_C Frst\_L FrLttW Suffcs Lttr\_S  
Sentences 0.181   
Vocabulary 0.000 0.164   
Sentence\_Completion 0.000 0.000 0.266   
First\_Letters 0.000 0.000 0.000 0.300   
FourLetterWords 0.000 0.000 0.000 0.000 0.363   
Suffices 0.000 0.000 0.000 0.000 0.000 0.504   
Letter\_Series 0.000 0.000 0.000 0.000 0.000 0.000 0.388   
Pedigrees 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
Letter\_Grouping 0.000 0.000 0.000 0.000 0.000 0.000 0.000   
 Pedgrs Lttr\_G  
Sentences   
Vocabulary   
Sentence\_Completion   
First\_Letters   
FourLetterWords   
Suffices   
Letter\_Series   
Pedigrees 0.479   
Letter\_Grouping 0.000 0.503   
  
$psi  
 verbal Wrd\_Fl Resnng  
verbal 1.000   
Wrd\_Fluen 0.643 1.000   
Reasoning 0.670 0.637 1.000