Quantitative Analysis Using Structural Equation Modeling

What's New

July 5, 2022 – Website Rebuild
Links were broken because of being ported to another webpage format.

For latest methodological developments, refer to my Google Scholar page.
https://scholar.google.com/citations?hl=en&user=53SGwowAAAAJ&view_op=list_works&sortby=pubdate

March 1, 2017 – Updates and Additions
Updated files:
1. All pre-existing files were updated.

Additions Include:
1. "Site Contents" document was added before list of modules. In the next update an index of specific topics will be added.
2. "Example SEM-based Study" added to give a taste of what SEM has to offer for scientific analyses.
3. "Coefficients Involving Logged Variables" (SEM.1.8)
4. "Lavaan Syntax Reference (SEM.2.1a)"
5. "Model Evaluation Exercise"
6. "Confirmatory Factor Analysis (SEM.9.2)"
7. "Confirmatory Factor Analysis Exercise"
8. "Composites with Multiple Effects Exercise"
9. "Multi-Group Modeling (SEM.11.2)"
10. "Latent Trajectory Modeling in lavaan (SEM.11.7)"

Forthcoming:
A set of tutorials on piecewise modeling will be coming as the next major addition, following on a major update of the piecewiseSEM package in R.

April 12, 2016 – Site reformatted when USGS switched from html to Drupal platform

October 16, 2015 – Additions
SEM.9.1-Modeling with Latent Variables is updated to version 1.2 and data plus code are now provided.

June 26, 2015 – Additions
A new tutorial has been added to the IV. Additional Topics section entitled, "Nested Data: Adjusting for hierarchical data using lavaan.survey"

June 22, 2015 - Updates
Updates include:
1. SEM.10.1-Composites and Formative Indicators is updated to version 1.1.
2. Code (including code to generate data for the example) is now given in "SEM.10.1-Composites and Formative Indicators_code – version 1.1.txt"
3. SEM.2.2-Local Estimation is updated to version 1.1, now featuring an introduction to the R package "piecewiseSEM".

June 18, 2015 – Additional Updates
Updates include:

1. New: Tutorials, R Code, and Data files added to the Main page.
   a. SEM.1.7-SEM Essentials Categorical Predictors- version 1.0.pdf
   b. SEM.1.7-SEM Essentials Categorical Predictors_code.txt
   c. SEM.1.7-SEM Essentials Categorical Predictors_data.csv
   d. SEM-Modeling Interactions – version 1.0.pdf
   e. SEM-Modeling Interactions_code.txt
   f. SEM-Modeling Interactions_data.csv
   g. SEM.Sp1-Spatial Autocorrelation Lavaan Procedures - version 1.0.pdf
   h. SEM.Sp1-Spatial Autocorrelation Lavaan Procedures_code.txt
   i. SEM.SP1-Spatial Autocorrelation Lavaan Procedures_data.csv
   j. SEM.Sp1-Spatial Autocorrelation Lavaan Exercise - version 1.0.pdf
   k. SEM.Sp1-Spatial Autocorrelation Lavaan Exercise_code.txt
   l. SEM.Sp1-Spatial Autocorrelation Lavaan Exercise_data.csv
   m. SEM-Reciprocal_Effects_Overview - version 1.0.pdf

May 28, 2015 – Updates to Tutorials, plus addition of Supporting Code and Data to Main page.
Updates include:

1. Replacement pdfs:
    a. SEM.1.5- Path Rules (now "version 1.1")
    b. SEM.2.1- Intro to Lavaan (now "version 1.1")
    c. SEM.2.2- Local Estimation (now "version 1.1")
    d. SEM.3- Model Evaluation (now "version 1.1")
    e. SEM.5- Test of Mediation (now "version 1.1")
    f. SEM.9.1- Modeling with Lvs (now "version 1.1")
2. New: R Code and Data files added to the Main page.
    a. SEM.2.1-Intro to Lavaan code.txt
    b. SEM.2.1-Intro to Lavaan data.csv
    c. SEM.2.2-Local Estimation code.txt
    d. SEM.2.2-Local Estimation data.csv
    e. SEM.3-Model Evaluation code.txt
    f. SEM.3-Model Evaluation data.csv
    g. SEM.5-Test of Mediation code.txt
    h. SEM.5-Test of Mediation data.csv
    i. SEM.6-SEM versus Multiple Regression code.txt
    j. SEM.6-SEM versus Multiple Regression data.csv

April 27, 2015 – Google to co-sponsor Amer. Stat. Association "Causality in Statistics Education Award" in 2016.
Google has joined Microsoft in sponsoring next year's ASA Causality Prize.
For details on this prize see
http://www.amstat.org/education/causalityprize/

February 6, 2015 – New publication describing "Why to" and "How to" do SEM.
Grace, J.B., Scheiner, S.M., Schoolmaster, D.R. Jr. 2015. Structural equation modeling: building and evaluating causal models. Chapter 8 In: Fox, G.A., Negrete-Yankelevich, S., and Sosa, V.J. (eds.) Ecological Statistics: From Principles to Applications. Oxford University Press.
http://ukcatalogue.oup.com/product/9780199672554.do
(for pdf of article, send request to sem@usgs.gov)

February 2, 2015 – Initial launch of the website!