List of Resource Readings on SEM
(with brief annotations)

Allison reviews approaches to modeling with missing values, and provides support for using full information maximum likelihood (FIML) and multiple imputation.

Seminal citation for the establishment of an adequate measurement model before proceeding to a test of the structural model in a general SEM.

In addition to the Flora and Curran reference below, this article serves as a reference for the use of WLSMV with categorical data. Their simulations took into account the number of categories, the number of factors, and sample size.

A general rule in SEM is that when choosing between two competing models, the more parsimonious model is desirable. This article justifies the choice of the parsimonious model by demonstrating that parameter estimates are more precise in parsimonious models.

This article presents discusses different approaches to finding the correct number of factors in a measurement model. It provides support for the use of a “piecewise jigsaw technique,” which can be useful when complicated, multi-factor models are being tested.

Bollen’s book is a seminal and comprehensive source on virtually all aspects of SEM. If you plan to become a regular user of SEM, this book needs to be on your shelf.

This article provides guidelines for writing SEM articles for peer review.

Bowen, N. K., & Guo, S. (2011). Structural equation modeling. New York, NY: Oxford University Press. This is the book I wished for when I was doing my dissertation. Extensive guides to Mplus and Amos syntax for CFA and SEM analyses are freely available at OUP’s website. Go to: https://www.oup.com/us/catalog/general/subject/SocialWork/?view=usa&ci=9780195367621 Companionsite Resources (Or search book title, click on title, then click on “companion resources”)

Bower, H. A., Bowen, N. K., & Powers, J. D. (2011). Family-faculty trust as measured with the ESSP. Children & Schools, 33, 158-167. The analysis in this article is an example of a second order confirmatory factor model.

Byrne, B. M. (2010). Structural equation modeling with Amos: Basic concepts, applications, and programming (2nd ed.). New York, NY: Taylor and Francis Group. Byrne’s book provides instructions on using Amos as well as on SEM analyses in general. She includes many examples on multiple group analyses.

Byrne, B. M. (2010). Structural equation modeling with Mplus: Basic concepts, applications, and programming. New York, NY: Taylor and Francis Group. Byrne has a series of book about SEM with different programs. The Mplus book’s utility is reduced by her lack of attention to WLSMV estimation with ordinal variables, but otherwise it is a good resource for using the program.

Byrne, B. M., Shavelson, R. J., & Muthén, B. (1989). Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. Psychological Bulletin, 105(3), 456-466. This article describes conceptual and statistical issues in studying the invariance of measurement models across groups. Byrne is an authoritative source on invariance and this is a seminal article.


Curran, P. J., & Willoughby, M. T. (2003). Implications of latent trajectory models for the study of developmental psychopathology. Development and Psychopathology, 15. 581-612. An impressive article demonstrating how SEM can be used to answer many different types of longitudinal questions.

Cohen and Cohen is an essential source on basic and advanced topics of regression and correlation and their relationship to each other. These procedures are foundational to SEM.


This article is a useful source on various modeling techniques for repeated measures data with cross-lagged models.


DeVellis provides a useful conceptual discussion of latent variables.


Dimitrov provides user-friendly instructions for conducting invariance tests of first and second order measurement models. The article includes definitions of different levels of invariance, and Mplus code. An excellent resource if you are planning to conduct a CFA.


This is a good source article on the different ways of modeling CFA models with method effects.


This article provides empirical support for using Full Information Maximum Likelihood estimation in SEM.


In conjunction with the Iacobucci articles cited below, this is a easy-reading discussion of some important issues in SEM, such as inferring causality, sample size, and fit indices.


This article provides a concrete example of the matrix calculations and calculus used in ML estimation of a simple model.

This article provides an understandable explanation of how ordinal variables are handled in common SEM software (converted into polychoric correlations). After presenting methods and results from a simulation study, the authors recommend the use of robust weighted least squares estimation with ordinal data.


This article provides an in-depth discussion of the matrices and equations behind the calculation of indirect effects in path analysis.


Read this article carefully to get a good understanding of how error variance is modeled in measurement models. Different ways of modeling factors and indicators can mean very different things about the sources and nature of error.


A general source on the nature of missing data and how to address them in analyses.


A substantial reading that demonstrates how SEM scholars can argue about SEM procedures at great length. This reading can be considered along with Anderson and Gerbing (1988) and Bollen (2000), as well as others cited in Hayduk, when thinking about how best to find a correct model.


A new and updated source on major aspects of SEM with chapters by the big names in the field. The chapters in this book will be references you will use often.


This author provides a user-friendly summary of SEM notation and its relationship to the matrices. The article is good for reinforcing emerging knowledge of SEM. Fabrigar above refers to this article.


More user-friendly discussion of SEM basics.

A seminal piece on SEM by the developer of LISREL.


A seminal piece on analyzing polychoric correlation matrices when data are ordinal, by the developer of LISREL.


A seminal piece on multiple group SEM by the developer of LISREL.


This web posting discusses issues of reliability of scales modeled in CFAs, and a method for calculating it using SEM output.


Kaplan’s book is a recent comprehensive source on SEM.


Kline’s presentation of SEM topics is user-friendly and practical. The third edition was released in 2011. Kline’s discussion of direct, indirect, and reciprocal effects in path analysis is especially useful and thorough.


A recent chapter that provides an overview and update of MacCallum’s previous work on using RMSEA estimates for power analysis.


This book is a source of information on missing data and multiple imputation.


Long provides a technical, yet accessible, presentation that helps the reader gain a deep understanding of CFA.

This article is a must-read for those interested in gaining a deeper understanding of power analysis using RMSEA. The tables can be used on their own to estimate power.


The article demonstrates how sample size requirements for confirmatory factor analyses may vary based on the magnitude of factor loadings and the number of indicators loading on a factor. The point is that rules of thumb about how many cases are needed for analyses are not valid.


The authors propose the use of RMSEA values from nested models to determine the power available for testing model differences.


This article is good for reinforcing emerging knowledge of SEM. It talks about important aspects of SEM while providing advice on how to report SEM analyses in manuscripts for publication.


One of the rather daunting sources on invariance testing of CFA models with ordinal data.


This article started as a presidential address to the Psychometric Society. It describes how MIMIC modeling can be useful when multiple group modeling may not be feasible.


Muthén’s webnotes are not for the faint at heart, but they are primary sources from a leader in the field! One of the rather daunting sources on invariance testing of CFA models with ordinal data.


Part of this short addendum explains how to request tests of configural, metric, and scalar invariance in one line of code. The code can also be modified to allow tests of partial invariance if full invariance is not found. The code saves invariance tester a lot of coding because Mplus’
default is a constrained model, while it is easiest to start a series of invariance tests with an unconstrained model.

The Mplus website includes the User’s Guide, technical notes, webnotes, publications using and about Mplus and informative, searchable discussion threads on all Mplus analysis topics.

Pohl, S., & Steyer, R. (2012). Modeling traits and method effects as latent variables. In S. Salzborn, E. Davidov & J. Reinecke (Eds.), Methods, theories, and empirical applications in the social sciences (pp. 57-65; 2) VS Verlag für Sozialwissenschaften. doi:10.1007/978-3-531-18898-0_8
Along with the Eid article above, this one is a good source on modeling method effects. This one is shorter!

One of the rather daunting sources on invariance testing of CFA models with ordinal data.

This source on invariance testing with ordinal data is more accessible than most, but doesn’t resolve the differences in approaches that are found in the literature.

Another source on how to write up an SEM analysis that includes good basic information about structural equation modeling in general.

The authors present results of a study of how well difference cutoff values for fit indices identify correct models and reject poor models. Based on the study they make recommendations about which fit indices to use and under which conditions they work best.

This book is a comprehensive source on statistical procedures. It includes useful information on diagnosing distributional problems and transforming variables, among many other topics. It also has chi square and normal distribution tables.

The two Tomarken and Waller articles listed here are good for reinforcing the growing knowledge of SEM in emerging learners because they cover many central issues. They also remind us to be humble in the use of statistics.


This article provides a social work example of a CFA with Mplus using ordinal, clustered data.


The authors relate results of a Monte Carlo study comparing reliability estimates from SEM analyses versus coefficient alpha.