

Structural Equation Modeling Using Stata

ICPSR Summer Program

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Kristin MacDonald, StataCorp LP

kmacdonald@stata.com

This workshop provides an introduction to structural equation modeling (SEM) and a tutorial for fitting these models in Stata. SEM is a class of statistical techniques for modeling relationships among variables, both observed and unobserved. SEM encompasses some familiar models such as linear regression, multivariate regression, and factor analysis and extends to a variety of more complicated models.

The workshop consists of both classroom discussion and demonstration using the Stata software, version 13. The course begins with an introduction to theoretical concepts involved in SEM, a discussion of model specification using path diagrams and mathematical formulation, and an overview of Stata's tools for fitting structural equation models. Then, a wide variety of models that fall within the SEM framework will be discussed in more detail. Participants will have access to datasets used in all examples, and will learn to fit the models presented using Stata—both with command syntax and with the graphical interface known as the SEM Builder. Topics such as identification, estimation methods, evaluation of model fit, predictions, and interpretation are also covered.

Schedule Wednesday-Friday, June 18-20

Morning session:	9:00-12:00
Lunch:	12:00-1:00
Afternoon session:	1:00-5:00

Textbook

There is no required textbook for this course.

References discussing course topics in more detail include Bollen (1989), Kline (2011), Acock(2013), and Skrondal and Rabe-Hesketh (2004).

Outline

- Day 1
 - Getting acquainted with Stata
 - Introduction to SEM
 - Introduction to Stata's tools for structural equation modeling
 - Building blocks of SEM
 - Systems of equations with observed variables (path analysis)
 - Measurement models (confirmatory factor analysis)
- Day 2
 - Full structural equation models
 - Latent growth curve models
 - Multiple-group analysis
 - Working with complex survey data
- Day 3
 - Overview of generalized structural equation modeling
 - Structural equation models with binary, ordinal, count, and categorical outcomes
 - Item response theory
 - Multilevel structural equation models.

References

Acock, A. C. 2013. *Discovering Structural Equation Modeling Using Stata*. Rev. Ed. College Station, TX: Stata Press.

Bollen, K. A. 1989. *Structural Equations with Latent Variables*. New York: Wiley.

Kline, R. B. 2011. *Principles and Practice of Structural Equation Modeling*. 3rd ed. New York: Guilford Press.

Skrondal, A., and S. Rabe-Hesketh. 2004. *Generalized Latent Variable Modeling: Multilevel, Longitudinal, and Structural Equation Models*. Boca Raton, FL: Chapman & Hall/CRC.