Advanced Statistics for Researchers

Meta-Analysis and Structural Equation Modeling

By Dr. Chris Rakes

rakes@umbc.edu

http://csrakes.yolasite.com

Systematic Review and Meta-Analysis is a set of methods for combining results from multiple studies to examine an overall effect. These techniques allow researchers to "step back" from individual studies and see a clearer picture of the field. This series will include methods for conducting systematic literature reviews and computing effect sizes.

Structural Equation Modeling is a robust analytic framework that envelopes and improves upon many other familiar analytic methods (e.g., ANOVA, regression). Structural equation modeling, allows researchers to model both measured variables (such as items on a questionnaire) and the unobserved (*latent*) factors associated with those variables. This series will include methods for using structural equation modeling to conduct confirmatory factor analysis, testing causal structures, and comparing group differences in latent means.

Session 1, 9/18/13 @ Library, 7th Floor Open Area (1:00 p.m. – 2:15 p.m.)

Introduction to Meta-Analysis and Structural Equation modeling
Basic concepts, theory, design, and relevant contexts

This session will introduce the frameworks for meta-analysis and structural equation modeling and their relationship to basic statistical concepts (e.g., variance, covariance, statistical significance, effect size).

Session 2, 10/9/13 @ COMM 331 (1:00 p.m. - 2:15 p.m.)

Meta-analysis and Systematic Review
Avoiding bias in literature review and calculating effect sizes

This session will focus on methods for obtaining a representative literature sample, developing a coding schema, measuring inter-rater reliability, and computing, analyzing, and interpreting effect sizes.

Session 3, 11/13/13 @ COMM 331 (1:00 p.m. – 2:15 p.m.)

Structural Equation Modeling
Confirmatory Factor Analysis

This session will focus on developing strong conceptual frameworks and testing their validity. Topics will include model identification, goodness of fit indices interpretation, syntax development, modification indices interpretation, and model development.

Session 4, 2/21/14 (Location: TBD, 1:00 p.m. – 2:00 p.m.)

Structural Equation Modeling
Testing the Validity of a Causal Structure

This session will focus on methods for examining relationships between latent factors. Topics will include development of a hypothesized model, input file specification, interpretation of results, and post hoc analyses.

Session 5, 4/11/14 (Location: TBD, 1:00pm – 2:00 p.m.)

Structural Equation Modeling
Latent Mean Difference Models

This session will focus on basic concepts of testing latent mean structures. Topics will include testing multi-group invariance with means and covariance structures, model identification, partial measurement invariance, and practical and statistical criteria used in determining evidence of invariance.