Advances in Multilevel Modeling for Educational Research: Addressing Practical Issues Found in Real-World Applications

Conference at the University of Maryland

November 14 and 15, 2014

with a pre-conference workshop on
Cross-Classified and Multiple Membership Models
taught by S. Natasha Beretvas, University of Texas
on November 13, 2014

Presented by the Center for Integrated Latent Variable Research
Keynote Address: Avoiding Omitted-Variable Bias in Multilevel Models
Sophia Rabe-Hesketh

Sophia Rabe-Hesketh is a Professor of Educational Statistics and Biostatistics at the University of California, Berkeley. She was previously Professor of Social Statistics at the University of London. Her research interests include developing latent variable and multilevel models, estimation methods, and software. She has published six books and over 100 peer-reviewed journal articles. Her gllamm software has been used in almost 600 different journals. Sophia is a fellow of the American Statistical Association, elected member of the International Statistical Institute, and President of the Psychometric Society. She also serves as a member of the technical advisory committees for the U.S. National Assessment of Educational Progress (NAEP) and the Programme for International Student Assessment (PISA).

Presentations include:

A Comparison of Approaches to Incomplete Multilevel Data, Joop Hox, Stef van Buuren, & Shahab Jolani

Joop Hox is a professor of social science methodology at the Faculty of Social Sciences of Utrecht University. His research interests are analysis models for complex data and data quality in surveys. He has written a handbook on multilevel modeling and written about a variety of methodological issues in multilevel analysis.

Stef van Buuren is statistical consultant at the Netherlands Organisation for Applied Scientific Research TNO in Leiden with a broad knowledge of quantitative issues in public health. Van Buuren holds a chair as Professor in Applied Statistics in Prevention at the department of Methodology & Statistics, FSS, University of Utrecht, and is the originator of various new statistical tools.

Shahab Jolani is a postdoctoral fellow at the department of Methodology and Statistics in Utrecht University. The areas of his expertise are missing data issues. He is particularly interested in the analysis of incomplete data in longitudinal settings.
Everything I Know I Learned in Kindergarten: Potential Teacher Effects in Longitudinal Student Outcome Data, Paras Mehta

Paras Mehta is an Associate Professor in Clinical and Industrial Organizational Psychology at the University of Houston. His research interests include multilevel structural equations modeling, growth curve modeling, and applications of these methods in educational and organizational research.

Best Practices in Residual Diagnostics and Model Assessment in a Multilevel Framework, Ann A. O’Connell, D. Betsy McCoach, & Gloria Yeomans-Maldonado

Ann A. O’Connell is Professor in the Department of Educational Studies at Ohio State University. She specializes in regression, multivariate techniques, and multilevel modelling with particular emphasis on models for categorical or ordinal outcomes. Much of her applied work is situated in the evaluation of health and education interventions or programs, and evaluation of professional development. Dr. O’Connell is a lead methodologist with the Crane Center for Early Childhood Research and Policy at OSU and is a recent Fulbright Scholar to Addis Ababa University in Ethiopia.

D. Betsy McCoach is Professor and program coordinator of Measurement, Evaluation and Assessment at the University of Connecticut. She is widely published in multiple methodological areas including structural equation modeling, longitudinal data analysis, hierarchical linear modeling, instrument design, and factor analysis. Betsy is the current Director of DATIC, where she teaches summer workshops in Hierarchical Linear Modeling and Structural Equation Modeling, and she is the founder and conference chair of the Modern Modeling Methods conference, held at UCONN every May. She has served as the Research Methodologist for the National Research Center on the Gifted and Talented for the last 7 years.

Gloria Yeomans-Maldonado is a doctoral student in the Quantitative Research, Evaluation and Measurement program at The Ohio State University. Gloria’s current research interests include issues related to multilevel modeling, specifically tied to adequate sample sizes, effect size, and model fit. She is currently a Graduate Research Associate at The Crane Center for Early Childhood Research and Policy.
Causal Inference with Observational and Multilevel Data, Jee-Seon Kim & Peter Steiner

Jee-Seon Kim is Professor of Quantitative Methods in the Educational Psychology Department and an affiliated faculty member in the Center for Health Enhancement Systems Studies, the Interdisciplinary Training Program in the Education Sciences, and the Interdisciplinary Research Training in Speech and Language Disorders at the University of Wisconsin-Madison. Her research interests focus on multilevel models and other latent variable models, methods for modeling change, learning, and human development using longitudinal data, and the implementation of experimental and quasi-experimental designs, including propensity score matching techniques for clustered data.

Peter M. Steiner is a quantitative methodologist at the University of Wisconsin-Madison. His primary research focuses on causal inference with experimental and quasi-experimental designs, including propensity score matching, regression discontinuity, and interrupted time series designs. He applies these designs and corresponding analyses to educational data, either in the context of methodological within-study comparisons or in collaboration with substantive researchers evaluating interventions. His most recent work is on covariate selection for removing selection bias from observational data and on matching strategies for observational multilevel data.

On the Importance of Advanced Psychometrics in Multi-Level Impact Evaluation Studies, Li Cai & Kilchan Choi

Li Cai is a faculty member in the advanced quantitative methodology program in the UCLA Graduate School of Education and Information Studies, where he also serves as co-director of the National Center for Research on Evaluation, Standards, and Student Testing (CRESST). His methodological research agenda involves the development, integration, and evaluation of innovative latent variable models that have wide-ranging applications in educational, psychological, and health-related domains of study.

Kilchan (KC) Choi is an assistant director of the National Center for Research on Evaluation, Standards, and Student Testing (CRESST) in the UCLA Graduate School of Education and Information Studies. He serves as the director of Statistical and Methodological Innovations within the CRESST. His expertise is in the development and application of advanced statistical methodologies and hierarchical modeling to applied problems in multi-site evaluation, growth modeling, and school effectiveness/accountability in a large-scale assessment system.
Cross-Classified Random Effects Analysis of Multiple-Indicator Growth Models, Bengt Muthén & Tihomir Asparouhov

Bengt Muthén is Professor Emeritus at the Graduate School of Education & Information Studies at UCLA. He is one of the developers of the Mplus computer program, which implements many of his statistical procedures. His research interests focus on the development of applied statistical methodology in areas of education and public health, including latent variable modeling, analysis of individual differences in longitudinal data, preventive intervention studies, analysis of categorical data, multilevel modeling, and the development of statistical software.

Tihomir Asparouhov obtained his Ph.D. in Mathematics at the California Institute of Technology. He is an integral part of the development team of the Mplus software. His responsibilities include the development of new statistical techniques, algorithms, and models; statistical programming; and statistical and technical writing. He has written on complex survey analysis, multilevel modeling, survival analysis, structural equation modeling, and Bayesian analysis.

Multilevel Latent Variable Model Plausible Values Approach to Handle Measurement Error in Predictors, Ji Seung Yang & Michael Seltzer

Ji Seung Yang is an Assistant Professor of Measurement, Statistics, and Evaluation in the Department of Human Development and Quantitative Methodology at the University of Maryland. Dr. Yang received her Ph.D. in the Social Research Methodology Program at University of California- Los Angeles. Her research focus is on measurement and statistical modeling in multilevel settings, and she is particularly interested in the development of statistical models for handling measurement error in predictor and outcome variables.

Michael Seltzer is a Professor in the Advanced Quantitative Methods program in the Graduate School of Education and Information Studies at the University of California - Los Angeles. He received his Ph. D. in Education from the University of Chicago. His areas of specialization include the use of multilevel models in multi-site studies of educational programs, and in studying change. His work also focuses on Bayesian estimation of multilevel models using Markov chain Monte Carlo techniques and the development of modeling strategies for treating key predictors as latent variables in multilevel modeling settings.
Multilevel Cross-Classified Testlet Model for Complex Item and Person Clustering in Item Response Modeling, Hong Jiao, Akihito Kamata, & Chao Xie

**Hong Jiao** is an Associate Professor in Measurement, Statistics and Evaluation in the Department of Human Development and Quantitative Methodology at the University of Maryland. Her research interests include item response theory, multilevel item response theory modeling, mixture item response theory modeling, and their applications in solving psychometric issues in large-scale assessments.

**Akihito Kamata** is Professor of Psychology at Southern Methodist University. His primary research interest is psychometrics and educational and psychological measurement, focusing on implementation of item-level test data analysis methodology through various modeling framework, including item response theory, multilevel modeling, and structural equation modeling, pioneering work on multilevel item response theory modeling, where item response data from individuals are nested with group units, such as schools.

**Chao Xie** is a Psychometrician in the assessment program at American Institutes for Research. She received her Ph.D. in Measurement, Statistics and Evaluation at the University of Maryland, College Park. Her research focuses on multilevel parameterization of measurement models, and she is particularly interested in cross-classified modeling and multi-membership modeling in handling non-strict hierarchical structures.
Mixed Membership Models in the Hierarchical Network Modeling Framework,  
Tracy Sweet

Tracy Sweet is an Assistant Professor in the Measurement, Statistics and Evaluation program at the University of Maryland. She earned her PhD in statistics from Carnegie Mellon University where she was also an IES pre-doctoral training fellow. Her research focuses on social network statistical models that accommodate multiple networks.

Longitudinal Integrative Data Analysis with Multilevel Models,  Daniel Bauer & Patrick Curran

Daniel Bauer is a Professor in the Quantitative Psychology program of the L. L. Thurstone Psychometric Laboratory in the Department of Psychology at the University of North Carolina, Chapel Hill. The overarching goals of his program of research are to propose, evaluate, and apply quantitative modeling techniques to improve research on the development of negative social and health behaviors and psychopathology, focusing particularly on generalized and nonlinear latent variable models.

Patrick Curran is a Professor in the Department of Psychology at the University of North Carolina at Chapel Hill and serves as the Director of the doctoral training program in Quantitative Psychology housed in the L.L. Thurstone Psychometric Laboratory. His current quantitative work relates to various topics in the analysis of longitudinal data from both a structural equations and multilevel modeling perspectives.
**Cross-Classification Multilevel Models for Doubly Nested Repeated Measures Data, Jeffrey R. Harring & S. Natasha Beretvas**

Jeff Harring is Associate Professor of Measurement, Statistics and Evaluation in the Department of Human Development and Quantitative Methodology at the University of Maryland. His research focuses on linear, generalized linear, and nonlinear models for longitudinal data, finite mixtures of longitudinal models, and nonlinear structural equation models.

**S. Natasha Beretvas** is Associate Dean of Research and Graduate Studies in the College of Education at the University of Texas at Austin. Her research interests center on the evaluation of statistical and psychometric models used for social and behavioral science research. Her current focus is on extensions to the multilevel model for handling complex data structures and for synthesizing single-case design research results.

**Sampling Weight Considerations for Multilevel Modeling of Panel Data, Laura M. Stapleton & Jeffrey R. Harring**

Laura M. Stapleton is an Associate Professor in the Measurement, Statistics, and Evaluation program of the Department of Human Development and Quantitative Methodology at the University of Maryland. Her research interests include multilevel latent variable models, including tests of mediation within a multilevel framework, and the analysis of survey data obtained under complex sampling designs.

For more conference information, contact Laura Stapleton at Lstaplet@umd.edu.

For conference sponsorship opportunities, please contact Liska Radachi at lradachi@umd.edu.

Conference registration information will soon be posted at: [http://www.education.umd.edu/EDMS/events/conference.html](http://www.education.umd.edu/EDMS/events/conference.html)