Modern Modeling Methods – 2023 Schedule

Monday, June 26th

Pre-Conference Workshop

8:30-5:00pm

McHugh 101

New Features in Mplus Version 8.9 and 8.10 Bengt Muthén, Tihomir Asparouhov, & Ellen Hamaker

Continental Breakfast and Registration McHugh Atrium

8:00 – 8:30 am

8:30-5:00pm

New Features in Mplus Version 8.9 and 8.10 Bengt Muthén, Tihomir Asparouhov, & Ellen Hamaker

This is your chance to catch up on the latest series of Mplus analysis acronyms: AESEM, ASEM, BSEM, DSEM, ESEM, PSEM, PSEM-ELGM, RDSEM, and RSEM. These techniques offer better ways to do factor analysis, growth modeling, and SEM as well as more practical ways to study measurement invariance and structural differences across groups and time. These techniques also present new ways to analyze intensive longitudinal data (ILD) using multilevel time series analysis with DSEM and Cross-Classified modeling. Novel real-data applications of these techniques will be discussed together with Mplus scripts.

The workshop starts at 8:30 and ends at 5. There will be 4 blocks, each consisting of 1 ½ hours lecturing followed by 15 minutes of Q & A's. There will be no hands-on computing sessions. Some familiarity with Mplus is required. The new applications to be discussed will draw on a combination of ideas in our papers including these:

Asparouhov, T. & Muthén, B. (2009). Exploratory structural equation modeling. Structural Equation Modeling: A Multidisciplinary Journal, 16(3), 397-438.

Muthén, B. & Asparouhov, T. (2018). <u>Recent methods for the study of measurement invariance with many groups: Alignment</u> and random effects. *Sociological Methods & Research, 47*(4) 637-664.

Asparouhov, T. & Muthén, B. (2022). <u>Multiple group alignment for exploratory and structural equation models</u>. *Structural Equation Modeling: A Multidisciplinary Journal*, *30*(2), 169-191. DOI: 10.1080/10705511.2022.2127100

Muthén, B. & Asparouhov, T. (2012). Bayesian SEM: A more flexible representation of substantive theory. *Psychological Methods*, 17, 313-335

Asparouhov, T. & Muthén, B. (2023). Penalized structural equation models. Forthcoming in SEM.

Asparouhov, T., Hamaker, E.L. & Muthen, B. (2018). <u>Dynamic structural equation models</u>. *Structural Equation Modeling: A Multidisciplinary Journal*, 25(3), 359-388, DOI: 10.1080/10705511.2017.1406803 (<u>Download Mplus analyses</u>)

Asparouhov, T. & Muthén, B. (2020). <u>Comparison of models for the analysis of intensive longitudinal data</u>. *Structural Equation Modeling: A Multidisciplinary Journal*, 27(2) 275-297, DOI: 10.1080/10705511.2019.1626733 (<u>Download scripts</u>)

Hamaker, E.L., Asparouhov, T, & Muthén, B. (2023). Dynamic structural equation modeling as a combination of time series modeling, multilevel modeling, and structural equation modeling. Chapter 31 in *The Handbook of Structural Equation Modeling (2nd edition)*; Rick H. Hoyle (Ed.); Publisher: Guilford Press. (Download supplementary materials).

Asparouhov, T. & Muthén, B. (2022). <u>Residual Structural Equation Models</u>. *Structural Equation Modeling: A Multidisciplinary Journal*, DOI: 10.1080/10705511.2022.2074422

Tuesday, June 27th

Continental Breakfast and Registration McHugh Hall Atrium

Concurrent Paper Session 1

Session 1A: Dynamic Fit Index Cutoffs in SEM Room 202

Paper	Authors
<i>Dynamic Fit Index Cutoffs for Generalizing and Extending Hu & Bentler</i>	Daniel McNeish Melissa Wolf Patrick Manapat

Session 1B: Causal Moderation Room 305

Paper	Authors
Alternative Specifications for Instrumental Variable Analysis in Structural Equation Modeling: First Steps Toward Latent Analysis of Symmetrically Predicted Endogenous Subgroups	Anthony J. Gambino
Estimating and Interpreting Heterogeneous Treatment Effects in Online Experiments	Mårten Schultzberg
Causal Language in Evaluating Moderation/Interaction Hypotheses	Amanda Kay Montoya

Session 1C: Latent Variable Modeling as a Vehicle toward Diversity, Equity, and Inclusion Room 307

Symposium	Authors
Illustrating and Enacting a Critical Quantitative Approach to Measurement with MIMIC Models	Matthew A. Diemer Michael B. Frisby Aixa D. Marchand Emanuele Bardelli
Using QuantCrit to Advance an Anti-Racist Developmental Science: Applications to Mixture Modeling	Sara Johnson Sara Suzuki Stacy Morris
Critical Action and Ethnic-Racial Identity: Tools of Racial Resistance at the College Transition	Channing Mathews Myles Durkee Elan Hope
Development of the White Critical Consciousness Index	Michael B. Frisby Matthew A. Diemer

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Tuesday 8:30 – 10:00 am

7:30 – 8:30 am

Tuesday 8:30 – 10:00 am

Session 1D: Measurement Invariance Room 306

Paper	Authors
Pervasive Differential Item Functioning (DIF)	Paul De Boeck William Goette
Examining SEM Trees for Investigating Measurement Invariance Concerning Multiple Violators	Yuanfang Liu Mark H. C. Lai
Methods for Intersectional Measurement Invariance Testing	Dakota Cintron

Session 1E: Applications of Spatial and Longitudinal Models Room 108

Paper	Authors
Subjective Well-being and Social Isolation in the COVID-19 Pandemic: A 3-Wave Longitudinal Study across One Year	Tingshu Liu Rodica Ioana Damian David Francis
Measuring Self-Regulatory Development from Kindergarten to Fifth Grade: Longitudinal Psychometrics with Alignment Optimization	Emily M. Weiss
Assessing Differences in Medical Debt in CT by Racial/Ethnic	Emil Coman Samuel Bruder
Minorities Using Modern Spatial Path Analytic Methods	Kelly George Saachi Shah

10:00 – 10:15 am: Coffee Break in the McHugh Hall Atrium

Opening Keynote – Bengt Muthén McHugh Hall 102

10:15 – 11:45 am

Recent Advances in Modeling Short and Long Longitudinal Data Bengt Muthén

McHugh Hall 102 10:15 – 11:45 am

The first part of this talk considers repeated measures data with a small number of time points (5-10). Recent thoughts on growth modeling and cross-lagged panel models are discussed. The second part of the talk considers intensive longitudinal data with many time points (20-100). Recent analysis issues in multilevel timeseries analysis using dynamic structural equation models (DSEM), residual DSEM (RDSEM), and cross-classified models are discussed.

Lunch

Tuesday 11:45 am – 1:00 pm

Student Union Ballroom 3rd floor, Student Union

Tuesday 1:00 – 2:30 pm

Session 2A: Penalized Structural Equation Modeling

Room 202	
Paper	Authors
Penalized Structural Equation Modeling	Tihomir Asparouhov

Session 2B: Over-dispersion and Extra-zeros in Multilevel Models for Discrete Count Data Room 108

Paper	Authors
Model Typology and Demonstration for Over-dispersion and Extra-zeros in Multilevel Models for Discrete Count Data	Ann A. O'Connell Nivedita Bhaktha Krisann Stephany Winifred Wilberforce Abena Anvidoho

Session 2C: Bayesian Approaches Room 305

Paper	Authors
Bayesian Model Averaging: A Conceptual Introduction	Tyler Hicks Graham Rifenbark Jesse Pace
A Holistic Bayesian Approach to Addressing Measurement Reactivity with a Planned Missing Data Design	Mark Himmelstein David V. Budescu
Bayesian Model Evaluation using Marginal Likelihood for Growth Mixture Models	Xingyao Xiao Feng Ji Yihong Cheng

Session 2D: SEM Fundamentals

Room 307

Paper	Authors
Structural Equation Models for Between, Within, and Mixed	Alexander M. Schoemann
Factorial Designs	Stephen D. Short
Reenergizing Lost Modeling Treasures: The 100+ Years Old	Emil Coman
Path Analytic Tracing Rule	Sabrina Uva

Tuesday 1:00 – 2:30 pm

Session 2E: Modeling Dynamic Processes I Room 306

Paper	Authors
Empirical Bayes Derivative Estimates	Pascal R. Deboeck
Modeling Dynamic Processes with Panel Data: An Application of Continuous Time Models to Prevention Research	Pascal R. Deboeck David A. Cole Kristopher J. Preacher Rex Forehand Bruce E. Compas

Session 2F: Longitudinal Applications I Room 308

Paper	Authors
Longitudinal Prediction of Health Using the Unique Variance in Personal Suffering Assessment Items	R. Noah Padgett Richard Cowden Tyler VanderWeele
Examination of Heterogeneity of Growth Trajectory on Wage with Auxiliary Covariates: Applying BCH Approach in Growth Mixture Modeling	Hawjeng Chiou Wenyu Chiou
Do Executive Function and Effortful Control Co-Develop? Evidence from Latent Growth Curves with Structured Residuals and Multivariate Growth Mixture Models	Emily M. Weiss

2:30 – 2:45 pm Break – McHugh Hall Atrium

Session 3A: Disaggregating Level-Specific Effects in Cross-Classified Multilevel Models Room 202

Paper	Authors
Disaggregating Level-Specific Effects in Cross-Classified Multilevel Models	Yingchi Guo Jeneesha Dhaliwal Jason D. Rights

Session 3B: Dealing with Missing Data Room 305

Paper	Authors
The Impact of MNAR Dropout on Estimation of Latent Growth Curve Models with Binary Observed Variables	Jason T. Newsom Brian T. Keller Nicholas A. Smith Mallory R. Kroeck
Estimating Treatment Effects in Partially Clustered Randomized Controlled Trials with Missing Data: Challenges and Solutions	Manshu Yang

Session 3C: Modeling Item-Level Heterogeneous Treatment Effects with Explanatory IRT Room 307

Paper	Authors
Modeling Item-Level Heterogeneous Treatment Effects with the Explanatory Item Response Model: Leveraging Online Assessments to Pinpoint the Impact of Educational Interventions	Joshua Gilbert James Kim Luke Miratrix

Session 3D: Comparing Latent and Composite Constructs with Nested Equivalence Testing Room 306

Symposium	Authors
Comparing Latent and Composite Constructs with Nested Equivalence Testing	Danielle Siegel Mijke Rhemtulla

Tuesday 2:45 – 3:45 pm

Session 3E: Latent Class Analysis Room 108

Paper	Authors
Modeling Careless Responding in Ambulatory Assessment Studies Using Multilevel Latent Class Analysis: Factors Influencing Careless Responding	Kilian Hasselhorn Charlotte Ottenstein Tanja Lischetzke
Using Latent Class Models to Derive Subtypes for the Enneagram Personality Typology	Jay Magidson

Session 3F: Bifactor Measurement Models Room 308

Paper	Authors
Confirmatory Bifactor Measurement Models: Their Utility in Scale Development, Psychometric Modeling and Research with Latent Variables and/or Multidimensional Constructs	Rafael Ramirez
Investigating the Factor Structure of Sense of Social and Academic Fit Scale: A Multilevel Bifactor Study	Lizzy Wu Gabriella Jiang Nidia Ruedas-Gracia Taiylor Rayford Shiyu Sun

3:45 – 4:00 pm Break

Tuesday 4:00 – 5:00 pm

Session 4A: Partially Nested Designs Room 202

Paper	Authors
Statistical Power for Multisite Partially Nested Regression Discontinuity Designs	Fangxing Bai Benjamin Kelcey
Estimation, Statistical Power in Partially Nested Multisite Clustered-Randomized Trials	Kyle Cox Yanli Xie Benjamin Kelcey

Session 4B: Longitudinal Causal Effect Estimation Room 305

Paper	Authors
Estimating Longitudinal Causal Effects: A Comparison of Marginal Structural Models, and Structural Equation Modeling Approaches	Jeroen D. Mulder
Asking and Answering Causal Questions Using Longitudinal Data	Rafael Quintana

Session 4C: Characterisation and Identification of Multivariate Latent Manifolds: Analytically Resolving Factor Score Indeterminacy

Room 307PaperAuthorsCharacterisation and Identification of Multivariate Latent
Manifolds: Analytically Resolving Factor Score
IndeterminacyLandon Hurley

Session 4D: Latent Variable Models for Location, Shape, and Scale Parameters Room 306

Paper	Authors
Latent Variable Models for Location, Shape, and Scale	Camilo Cardenas-Hurtado Irini Moustaki
Parameters	Giampiero Marra
	Yunxiao Chen

Session 4E: Interactive, Automated, and Dynamic SEMs for Maximal Productivity Room 308

Paper	Authors
Interactive, Automated, and Dynamic SEMs for Maximal Productivity	Laura Castro-Schilo

Session 4F: Mixed Effect Location Scale Models: Methodological and Substantive Considerations Room 108

Paper	Authors
Mixed Effect Location Scale Models: Methodological and Substantive Considerations	Jennifer Richardson D. Betsy McCoach

Poster Session and Reception

Student Union Ballroom 5:00 – 7:00 pm Tuesday, June 27th Third Floor, Student Union

Wednesday, June 28th

Continental Breakfast 7:30 – 8:00 am McHugh Hall Atrium

Concurrent Paper Session 5

Wednesday 8:00 – 9:00 am

Session 5A: A Two-Step Robust Estimation Approach for Inferring Within-Person Relations in Longitudinal Design Room 102

Paper	Authors
A Two-Step Robust Estimation Approach for Inferring Within- Person Relations in Longitudinal Design	Satoshi Usami

Session 5B: Model Fit Issues in Measurement Models

Room 202	
Paper	Authors
ESEM, CFA, and Somewhere In-Between: The Effect of Measurement Quality on Model Fit Sensitivity	Tim Konold Elizabeth Sanders
Performance of Model Fit Indices in Confirmatory Factor Analysis on Misspecified Item Response Models with Local Dependence	Jiangqiong Li Dubravka Svetina Valdivia

Session 5C: Causal Inference I

Room 305

Paper	Authors
Synthetic Control Models for Causal Inference in Observational Social and Behavioral Sciences	John M. Felt Zachary Fisher Chad Shenk
A Tutorial on Propensity Score Analysis with Semi- Continuous Treatment	Huibin Zhang Walter L. Leite

Wednesday 8:00 – 9:00 am

Session 5D: Partially/Disparately Nested Structures Room 306

Paper	Authors
Croon's Estimation of Multilevel Structural Equation Models with Partially Nested Data	Kyle Cox Benjamin Kelcey
Structural After Measurement Estimation of Disparately Nested Structures	Fangxing Bai Ben Kelcey Yanli Xie Kyle Cox

Session 5E: Difference-in-Differences: A Methodological Illustration Room 107

Paper	Authors
Difference-in-Differences: A Methodological Illustration	Meghan Cain

Session 5F: Designing Against Bias: Identifying and Mitigating Bias in Machine Learning and AI Room 108

Paper	Authors
Designing Against Bias: Identifying and Mitigating Bias in Machine Learning and AI	David J. Corliss

9:00 – 9:15 am Break –McHugh Hall Atrium

Opportunities and Challenges of Intensive Longitudinal Data Ellen Hamaker

McHugh Hall 102 9:15 am – 10:30 am

Technological developments like smart phones and activity trackers have made it relatively easy to obtain many repeated measures from large samples of people while they are living their daily life. Measures may include self-report on affect, behaviors, cognitions, and the environment, but also physiological and/or non-intrusive measurements throughout the day. Such intensive longitudinal data offer new opportunities for studying the dynamics of everyday processes, and allow researchers to pose new research questions. However, with these new opportunities also come new challenges: How should we measure a process—e.g., how often and at what rate should we measure it—and what model should we use to analyze the data—e.g., how can we link our model to our research question? In this talk I will discuss opportunities and challenges associated with this exciting new methodology and sketch various ways in which we may move forward.

10:30 – 10:45 am Break –McHugh Hall Atrium

Session 6A: Transparency, Reproducibility, and Replicability of Modeling Methods: **Problems and Solutions Room 102**

Symposium	Authors
	Jessica Kay Flake
Transparency, Reproducibility, and Replicability of Modeling	D. Betsy McCoach
Methods: Problems and Solutions	Andrea Howard
	Amanda Montoya

Session 6B: Complex Designs which Stretch the Boundaries of Conventional IRT **Room 108**

Symposium	Authors
Scoring the Complexities of Alphabet Knowledge	Jason Anthony Janelle J. Montroy Jeffrey M. Williams
Multinomial Models for Unpacking Linguistically Informative Response Choices: Test Structure and Item Function	Lee Branum-Martin Julie A. Washington Katherine Rhodes
Picturing the Impossible: Pictures, Repetitions, and Item-Set Card Effects in Measuring Vocabulary	Eleanor Fang Yan Lee Branum-Martin
Assessment of Children with Autism Using Eye Gaze and Generalized Additive Logistic Regression	Ryan P. Bowles Emily Lorang Courtney E. Venker Madeline Klotz

Session 6C: Reconsidering Lord's Paradox

Room 202

Paper	Authors
Robust and Pseudo-Robust Solutions to Lord's Paradox	Robert E. Larzelere Hua Lin
Does Group-Mean Centering Always Inflate Type I Error Rates in Multiple Regression Analyses?	Robert E. Larzelere Hua Lin
Dual Centered-ANCOVA with interaction, a Solution for Lord's paradox with Implications for Valid Causal Inferences in Longitudinal Analyses	Hua Lin Robert E. Larzelere

Wednesday 10:45 am – 12:15 pm

Session 6D: Modeling Dynamic Processes II Room 305

Paper	Authors
Consequences of Sampling Frequency on the Estimated Dynamics of AR Processes using Continuous Time Models	Rohit Batra Simran Johal Meng Chen Emilio Ferrer
Summing the up and downs of life: The Bayesian Reservoir Model of Psychological Regulation	Mirinda M. Whitaker Cindy S. Bergeman Pascal R. Deboeck

Session 6E: Dyadic and Group Applications Room 306

Paper	Authors
Generalizability Theory Applied to Daily Relationship Quality: Substantive and Statistical Directions	Madison Shea Smith Susan C. South
The Dynamics of Opinion Expression During Group Discussion	Joseph A. Bonito Stephen A. Rains
Boosting Powers by Combining Spatial Econometrics with Dyadic Analysis and SEM: Racial/Ethnic Differences in Life Expectancy across the US States	Emil Coman Peter Xiang Chen Sandro Steinbach Adrian-Gabriel Enescu Monica Raileanu Szeles

Lunch Student Union

Wednesday 12:15 – 1:15 pm

Please be sure to return your lunch card!

Wednesday 1:15 – 2:15 pm

Session 7A: Tutorial: Methods for Sensitivity Analysis to Omitted Confounders in SEM Room 102

Paper	Authors
	Walter L. Leite
	Zuchao Shen
A Tutorial on Methods for Sensitivity Analysis to Omitted	Charles L. Fisk
Confounders in Structural Equation Modeling	Eric A. Wright
	Jeffrey Harring
	Katerina M. Marcoulides

Session 7B: Issues in Multilevel Modeling Room 202

Paper	Authors
Modeling Options for Clustered Data: An Empirical Comparison of Hierarchical and Population Average Models	Bethany A. Bell Jason Schoeneberger Anthony A. Mangino
Understanding the Consequences of Collinearity for Multilevel Models: The Importance of Disaggregation across Levels	Haley E. Yaremych Kristopher J. Preacher

Session 7C: Modeling Single Subject Data Room 305

Paper	Authors
	Haoran Li
GLMMs for Overdispersed Count Data in SCED Studies: Does Autocorrelation Matter?	Wen Luo
	Eunkyeng Baek
	Kwok Hap Lam
	Wenyi Du
	Noah Koehler
Individual Participant Data Meta-Analysis Including Moderators: Empirical Validation	Mariola Moeyaert
	Yukang Xue
	Panpan Yang

Wednesday 1:15 – 2:15 pm

Session 7D: Enacting Critical Quantitative Methodology: Leveraging IRT to Advance Critical Consciousness Measurement Room 108

Paper	Authors	
	Matthew Diemer	
	Michael B. Frisby	
Enacting Critical Quantitative Methodology: Leveraging IRT	Andres Pinedo	
to Advance Critical Consciousness Measurement	Emanuele Bardelli	
	Elise Wilkerson	
	Sara McAlister	

Session 7E: The Construction and Estimation of Multidimensional Linear Factor Models without Parametric Assumptions Room 306

Paper	Authors
The Construction and Estimation of Multidimensional Linear Factor Models without Parametric Assumptions	Landon Hurley

2:15 – 2:30 pm Break – Refreshments in McHugh Atrium

Wednesday 2:30 – 4:00 pm

Session 8A: Dyadic and Group Designs Room 102

Paper	Authors
Understanding Group Effects Using the Co-Partner Design	David A. Kenny
Sample Considerations for Detecting Person, Dyad, and Contextual Effects Using the Common Fate Model for Dyadic Analysis	Robert E. Wickham

Session 8B: Optimal Design and Cost Considerations Room 202

Paper	Authors
Power Analysis and Sample Size Planning in the Design of Two-Level Randomized Cost-Effectiveness Trials	Wei Li Nianbo Dong Rebecca Maynard Benjamin Kelcey Jessaca Spybrook Yue Xu
<i>Optimal Design of Experimental Studies Under Condition- and Unit-Specific Cost Structures</i>	Zuchao Shen Benjamin Kelcey
<i>Optimal Design of Multisite-Randomized Trials Investigating Mediation Effects Under Unequal Costs</i>	Zuchao Shen Wei Li Benjamin Kelcey Walter Leite Huibin Zhang

Session 8C: Longitudinal Applications II Room 108

	Paper	Authors
		Zachary J. Kunicki
	An Application of Random Changepoint Models to Cognitive Aging Research	Yi Feng
		Douglas Tommet
		Sharon K. Inouye
		Richard N. Jones
	Application of a Novel Model for Analyzing Data from Randomized Pretest, Posttest, Follow-up Designs: Results from a Pediatric Randomized Behavioral Clinical Trial	Constance Mara
	Health in All Polices Approach: A Dynamic Modelling of Social Policies' Effect on Mental Health	Ekaterina Melianova

Wednesday 2:30 – 4:00 pm

Session 8D: Sample Heterogeneity in Dynamic Psychological Processes Room 305

Symposium	Authors
A Bayesian Multilevel Mixture Autoregressive Model	Xingyao Xiao Feng Ji
Identifying and Explaining Sample Heterogeneity in Dynamic Psychological Processes Using ml-VARTree	D. Jody Zhou Emilio Ferrer Siwei Liu
Impact of Temporal Order Selection on Clustering Intensive Longitudinal Data Based on Vector Autoregressive Models	Hairong Song Yaqi Li
Penalized Subgrouping of Heterogeneous Time Series	Christopher Crawford Jonathan Park Sy-Miin Chow Zachary Fisher
Clustering Analysis of Time Series of Affect in Dyadic Interactions	Samuel D. Aragones Emilio Ferrer

Session 8E: Modeling COVID-19 Room 306

Paper	Authors	
Unobserved Components Models: Applications in Post- COVID Analysis	David J. Corliss	
Using Cross-classified Multi-level Modeling to Identify COVID-19 Period Effects on Race and Gender Differences in Training Effectiveness	Youngmin Kim Bridget McHugh Rebecca Berenbon Abena Anyidoho	
Daily Associations of Emotion and Fatigue in College Students during the Early Stages of the COVID-19 Pandemic: An Application of Dynamic Structural Equation Modeling	Parisa Rafiee Elizabeth Pauley Melissa Rothstein Amy L. Stamates Manshu Yang	