

Tuesday  
July 31, 2018



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Mplus Short Courses, Alexandria, Virginia, November 7-11, 2005

## Statistical Analysis with Latent Variables Using Mplus

Muthén and Muthén will offer five one-day short courses on November 7-11, 2005, in Alexandria, Virginia. These courses can be taken individually or as a series. Topics include regression, exploratory and confirmatory factor analysis, structural equation modeling, growth modeling, modeling with categorical variables, modeling with missing data, multilevel modeling, and modeling with categorical variables including latent class analysis, growth mixture modeling, and discrete-time mixture analysis. For each topic, issues of model specification, model testing, and model modification will be discussed. Several examples will be presented. Modeling strategies will be presented. Mplus input setups will be shown. Mplus output will be used for interpretation of analysis results.

### Pricing Information

Enrollment for the short courses is limited. Registration is available on a first-come, first-served basis. The early registration rate of \$250 per day is in effect until September 1, 2005. After that, the registration rate is \$295 per day. Catered breaks are available. Lunches are not included.

**Cancellation Policy:** A full refund will be made if a written request is received by September 1, 2005. Muthén & Muthén reserves the right to cancel short courses.

To register for Mplus Short Courses, please visit our [online store](#).

### Instructors

**Bengt O. Muthén** obtained his Ph.D. in Statistics at the University of Umeå and is Professor at the Graduate School of Education & Informatics at the University of Gothenburg. He is a former President of the Psychometric Society and currently holds the Distinguished Scientist Award from the National Institutes of Health for methodological contributions.

**Linda K. Muthén** is the Director of Product Development at Muthén & Muthén. She obtained her Ph.D. in the Research Methods Division of the Graduate School of Education at UCLA. She was formerly the Manager of Quality Control and Technical Support at BMDP Statistical Software.

### Course Information

Special Mplus Topics  
[Bayesian SEM \(BSEM\)](#)  
[Complex Survey Data](#)  
[Exploratory SEM \(ESEM\)](#)  
[Genetics](#)  
[IRT](#)  
[Measurement Invariance](#)  
[Mediation Analysis](#)  
[Missing Data](#)  
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[Multilevel Modeling](#)  
[Randomized Trials](#)  
[Structural Equation Modeling](#)  
[Survival Analysis](#)  
[Time Series Analysis \(DSEM\)](#)  
[How-To Using Mplus via R](#)  
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The courses will be taught from 8:30am to 5:30pm each day. Courses are presented in English. Following are the topics for each day:

### **Day 1, Monday, November 7: Traditional Latent Variable Modeling**

Prerequisite: Regression analysis and introductory structural equation modeling

- Key concepts in linear regression analysis
- Path analysis
- Exploratory factor analysis (EFA)
- Confirmatory factor analysis (CFA)
- EFA in CFA
- Simple structure CFA
- Bi-factor CFA
- Second-order CFA
- Measurement invariance and population heterogeneity
- CFA with covariates
- Multiple group analysis
- Structural equation modeling (SEM)

### **Day 2, Tuesday, November 8: Growth Modeling With Latent Variables**

Prerequisite: Intermediate understanding of latent variable SEM

- Introductory growth modeling
  - Ideas behind modeling of individual differences in development
  - Comparison of multilevel, random effect mixed linear models and growth modeling approaches
  - Growth modeling using a latent variable framework
  - Linear growth model
  - Growth model with free time scores
  - Covariates in the growth model
  - Centering
  - Piecewise growth model
  - Growth models with individually varying times of observation
  - Regression among random coefficients
  - Multiple process growth models
- Advanced growth modeling
  - Two-part growth modeling when outcomes have structural zero
  - Multiple group growth models
  - Multiple cohorts
  - Randomized preventive interventions

- Multiple indicator growth models
- Power calculations and design issues
- A growth model as part of a bigger model

### **Day 3, Wednesday, November 9: Observed And Latent Categorical Variables Using Mplus**

Prerequisite: Intermediate understanding of latent variable SEM

- Modeling with observed variables that are categorical, continuous, or count
  - Logit, multinomial logit, probit, censored-normal, Poisson, and zero-inflated Poisson regression
  - Path analysis
  - Item response theory
  - Factor analysis with covariates
  - Multiple-group modeling
  - Growth modeling
- Modeling with latent variables that are categorical (mixture models)
  - Regression mixture analysis
  - Randomized response modeling of sensitive questions
  - Complier-average causal effect (CACE) estimation in randomized trials
  - Latent class analysis
  - Latent class analysis with covariates
  - Confirmatory latent class analysis
  - Violations of conditional independence
  - Latent class factor analysis, factor mixture modeling, and mixture modeling

### **Day 4, Thursday, November 10: Longitudinal Modeling With Categorical Latent Variables Using Mplus**

Prerequisite: Intermediate understanding of latent variable SEM modeling or Days 1, 2, and 3

- Latent transition analysis, Hidden Markov modeling
- Latent class growth analysis
- Growth mixture modeling with latent trajectory classes
- Randomized trials and treatment effects varying across latent classes
- Latent class growth analysis vs. growth mixture modeling
- Numerical integration, mixtures, and non-parametric representations of distributions
- Discrete-time survival mixture analysis
- Latent variable analysis with missing data

- MCAR
- MAR
- Non-ignorable, pattern-mixture, informative dropou

## **Day 5, Friday, November 11: Multilevel Modeling With Latent V**

Prerequisite: Intermediate understanding of latent variable SEM  
intermediate understanding of multilevel modeling

- Cross-sectional analysis with two-level data
  - Multilevel regression analysis
  - Multilevel path analysis
  - Multilevel factor analysis
  - Multilevel structural equation modeling
  - Multivariate modeling of family members, twin mod
  - Multilevel latent class analysis
- Longitudinal analysis
  - 3-level growth modeling
  - 3-level, 2-part growth modeling
  - 3-level growth mixture modeling

To register for Mplus Short Courses, please visit our [online store](#)

### **Location and Accommodations**

The short courses will be held at the Old Town Holiday Inn Select just outside Washington, D.C. More information about the hotel is available at <http://www.ichotelsgroup.com/h/d/hi/1/en/hd/axeot>. A special rate, including a complimentary breakfast, is available for a limited number of rooms starting at \$100 per night. This special rate is available for a limited number of rooms starting in 2005 on a first-come first-served basis. Please mention **Mplus Short Courses** for a reservation.

Holiday Inn Select  
480 King Street  
Alexandria, VA 22314  
(703) 549-6080

Click [here](#) for more detailed Driving Directions to the Old Town  
MapBlast!

Click [here](#) for other Mplus short courses.