Growth Mixture Models: A Structural Equation Modeling Approach

The Growth Mixture Model (GMM) is an extension of the Latent Growth Curve Model (LGCM) that identifies distinct subgroups of growth trajectories and allows individuals to vary around subgroup-specific mean trajectories. Conventional growth modeling estimates a single mean intercept and slope for each individual and variance parameters around the mean intercept and slope. The GMM relaxes the assumption that all individuals are drawn from a single population with common parameters by using latent trajectory classes, resulting in separate intercepts, slopes, and variance parameters for each subgroup.

This three-day workshop will provide training in estimating GMMs to analyze growth trajectories. Key features of this model are that it can identify the number and form of distinct subgroups of growth trajectories, estimate the proportion of the population in each subgroup, and model predictors of class membership as well as predictors of the trajectories within each class. In addition to the basic model, this workshop will cover several extensions, such as including a distal outcome predicted by the trajectories, multiple group GMMs, joint trajectory models, and multilevel GMMs.

Participants should be familiar with LGCMs. Familiarity with MPlus would be helpful but is not required. Some examples will also be demonstrated in R, but no previous knowledge of R is necessary.

Daily Schedule:
9:00 am – 12:00 pm Lecture
12:00 pm – 1:30 pm Lunch Break
1:30 pm – 4:00 pm Computer Lab
4:00 pm – 4:30 pm Question & Answer Session

Topic and Readings

Day 1: Introduction to the GGMM – history, specification, and examples

Overview of GMM:


Finding the optimal number of classes:


Comparison of GMM to other popular approaches:

One-step versus three-step approach

Feingold et al. (2013). New approaches for examining associations with latent categorical variables: Applications to substance abuse and aggression. *Psychology of Addictive Behaviors*

**Day 2: Incorporating predictors and distal outcomes, model checking**

Substantive examples

Classic example – aggression trajectories in boys:


More recent development – drug trials:


Critique of GMMs


Model checking - residual diagnostics


Non-normal distribution

**Day 3: Advanced models and new developments**

**Joint probability model**


**Multiple process model**


**Missing data**