A developmental trajectory describes the course of a behavior over age or time. This 3-day workshop aims to provide participants with the training to apply a semi-parametric, group-based method for analyzing developmental trajectories. This methodology has four significant capabilities: (1) the capability to identify rather than assume distinctive groups of trajectories, (2) the capability to estimate the proportion of the population following each such trajectory group, (3) the capability to relate group membership probability to individual characteristics and circumstances, and (4) the capability to use the group membership probabilities for various other purposes such as creating profiles of group members. In addition, workshop participants will be trained in the application of two important extensions of the method—the capability to add time-varying covariates to trajectory models and the capability to estimate joint trajectory models of distinct but related behaviors. The former provides the statistical capacity for testing whether a contemporaneous factor, such as an experimental intervention or a non-experimental event like pregnancy, deflects a pre-existing trajectory. This extension is intended to provide the statistical capacity for modeling turning points in the context of a group-based trajectory model. The latter extension provides the capability to study the unfolding of distinct but related behaviors such as childhood problem behavior and adolescent drug abuse. This extension is designed to address two prominent themes in developmental psychology and criminology—comorbidity and heterotypic continuity. Comorbidity refers to the contemporaneous occurrence of two or more undesirable conditions, such as conduct disorder and hyperactivity. Heterotypic continuity is the manifestation over time of a latent individual trait in different but analogous behaviors. In addition workshop participants will receive training on the application of the Wald test for testing whether differences in model parameters across trajectory groups are significantly different.

The workshop will combine lectures with hands-on, computer lab experience in estimating, analyzing and interpreting trajectory models. Specifically, participants will be trained in the use of a SAS-based procedure for estimating group-based trajectories. This procedure called TRAJ has the capacity to fit models to psychometric, count and binary longitudinal data. Training will involve the application of TRAJ to masked data extracted from a major longitudinal study. Participants may bring their own data sets to analyze in the computer lab but it is important to recognize that our primary focus will be in supporting participants working on the designed training exercises.

Prerequisites: Participants should have at least one year of graduate level statistics and have a working knowledge of multiple regression analysis. A basic working knowledge of SAS and the multinomial logit model is desirable but not required. Students who have no SAS background are encouraged to review any one of the many introductory “how to use SAS” manuals. There are also many introductory discussions of the multinomial logit model available.
Schedule

Day 1

Overview Lecture (Morning)
• Theoretical Motivation for Group-based Trajectory Modeling
• A Statistical Model of a Developmental Trajectory
• Alternative Types of Data and Their Statistical Implications for Trajectory Modeling
• Identifying the Best Fitting Model—How Many Groups is Best?
• Profiling Characteristics of Trajectory Group Members—the Interpretation and Use of the Posterior Probability of Group Membership
• Specifying the Probability of Group Membership as a Function of Individual Characteristics and Family/Community Circumstances

Computer Lab (Afternoon)
• Introduction to the Use of TRAJ
• Application of TRAJ in Exercises Addressing Topics Covered in Morning Lecture

Day 2

Lecture (Through Mid-Morning)
• Joint Trajectory Analysis
• Entering Covariates Beyond Age in the Trajectory Itself
• Starting Values

Computer Lab (Mid-Morning through the afternoon)
• Application of TRAJ to Exercises Addressing Topics Covered in Morning Lecture

Lecture (Late Afternoon)—Groups as an Approximation

Day 3

Lecture (Through Mid-Morning)
• Wald Test
• Causal inference with trajectory models
• Extending the model to account for drop out