

Workshop on Analyzing Developmental Trajectories
Thomas Loughran
Daniel S. Nagin
Carnegie Mellon University

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 STATA-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 but it is important to recognize that our primary focus will be on supporting participants working on the designed training exercises.