

A Three-Day Advanced Training Course on Group Based Trajectory Modeling

Prof. Thomas Loughran, The Pennsylvania State University

February 14-16, 2022

Monday, February 14 th – Room M-649	
08:30 – 10:00	Overview of Group-based Trajectory Modeling (GBTM); Estimating a censored normal model and sorting individuals into trajectory groups
10:00 – 10:15	Coffee Break
10:15 – 11:45	Estimating zero-inflated Poisson-based model; Estimating a binary logit-based model
11:45 – 12:45	Lunch break
12:45 – 14:15	Adding predictors of trajectory group, Wald tests; Calculating the impact of each predictor on the probability of trajectory group membership
14:15 – 14:30	Coffee Break
14:30 – 16:00	Adding time-varying covariates to the trajectory itself and more on Wald tests

Tuesday, February 15 th – Room M-649	
08:30 – 10:00	Dual trajectory analysis
10:00 – 10:15	Coffee Break
10:15 – 11:45	Dual trajectory analysis with risk factors
11:45 – 12:45	Lunch break
12:45 – 14:15	Multi-trajectory modeling
14:15 – 14:30	Coffee Break
14:30 – 16:00	Linking trajectories to later outcomes. Prediction

Wednesday, February 16 th – Room M-224	
08:30 – 10:00	Causal inference with group-based trajectory models
10:00 – 10:15	Coffee Break
10:15 – 11:45	Accounting for non-random subject attrition; Model Search
11:45 – 12:30	Lunch Break
12:30 – 14:00	Judging Model Adequacy and Starting Values

About the course: This course aims to provide participants with the training to apply a group-based trajectory modeling method which allows to a) identify distinctive groups of trajectories, b) estimate the proportion of population following each such trajectory, c) relate group membership probability to individual characteristics and circumstances, and d) use the group membership probabilities for various other purposes such as creating profiles of group members. The program supports developing of knowledge and skills in using STATA for preparation and analysis of longitudinal data for estimating developmental trajectories, adding time-varying covariates, modeling turning points in the context of a GBTM and studying the unfolding of distinct but related behaviors.

Target group: Researchers and PhD students from all disciplines

Group size: max. 12 persons

Thomas Loughran is a Professor of Sociology, Criminology, and Public Policy and Director of the Graduate Program in Criminology at the Pennsylvania State University. His research and teaching interests include offender decision-making, individuals' responses to criminal sanctions in terms of multiple outcomes, and methods to infer treatment effects from nonexperimental data. He is also interested in the consequences of these issues for public policy.

Course readings and examples

Daniel S Nagin, and Candice L Odgers (2010). Group-based trajectory modeling in clinical research, *Annu Rev Clin Psychol*, 6:109-38.

Bobby L. Jones, and Daniel S. Nagin, (2007). Advances in Group-Based Trajectory Modeling and an SAS Procedure for Estimating Them, *Sociological Methods & Research*, vol. 35, issue 4, pages 542-571.

Nagin, D., L. Pagani, R. Tremblay, and F. Vitaro. (2003). Life Course Turning Points: A Case Study of the Effect of School Failure on Interpersonal Violence, Development and Psychopathology, 15:343-61.

Nagin, D.S. and R.E. Tremblay. (2001). Analyzing Developmental Trajectories of Distinct but Related Behaviors: A Group-Based Method, *Psychological Methods*, 6 (1): 18-34

Thomas A. Loughran, Pilar Larroulet, and Terence P. Thornberry (2017). Definitional Elasticity in the Measurement of Intergenerational Continuity in Substance Use, *Child Development*, Volume 89, Issue 5, pages 1625-1641.

Definitional Elasticity in the Measurement of Intergenerational Continuity in Substance Use

Nagin, D., L. Pagani, R. Tremblay, and F. Vitaro. (2003). Life Course Turning Points: A Case Study of the Effect of School Failure on Interpersonal Violence, Development and Psychopathology, 15: 343-61.

Pilar Larroulet, Thomas A. Loughran, Megan B. Augustyn, Terence P. Thornberry & Kimberly L. Henry (2021). Intergenerational Continuity and Discontinuity in Substance Use: The Role of Concurrent Parental Marijuana Use, *Journal of Developmental and Life-Course Criminology*, volume 7, pages 127–150.

Megan Bears Augustyn, Thomas Loughran, Pilar Larroulet Philippi, Terence P. Thornberry & Kimberly L. Henry (2020). How Early Is Too Early? Identification of Elevated, Persistent Problem Behavior in Childhood, *Prevention Science*, volume 21, pages 445–455.

Amelia M. Haviland & Daniel S. Nagin (2005). Causal inferences with group based trajectory models, *Psychometrika*, volume 70, pages 557–578.

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