



**Society for Prevention Research
30th Annual Meeting**

Pre-Conference Workshop I

Date: Tuesday, May 31, 2022

Time: 8:30 am – 5:30 pm

Title: Introduction to Time-Varying Mediation Analysis with Application to Prevention Research

Presenter and Organizer

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Purpose: The purpose of this workshop is to introduce participants to time-varying mediation effects (i.e., functional mediation) and methods for estimating these effects using R.

Learning Objectives:

Participants will learn what questions may be answered using time-varying mediation analysis. Participants will also learn how they may implement time-varying mediation models in R and interpret the results.

Target Audience: The target audience is researchers who would like to learn methods for assessing mediation with intensive longitudinal data, such as data collected using ecological momentary assessment or wearable devices. Knowledge of regression analysis is assumed but no other advanced statistical skills will be assumed.

Materials provided: Attendees will be provided with the slides and the code used to fit the models to an example data set that they may then modify for their own analysis.

Presenter biosketch:

Dr. Coffman is the Principal Investigator of an R01 grant from the National Cancer Institute and the Office of Behavioral and Social Science Research to develop methods for assessing time-varying mediation effects, specifically within the context of smoking cessation and prevention. She has over 75 publications in substance use prevention, mediation, causal inference, mobile health, and longitudinal analysis.

Outline:

1. Introduction to time-varying effect models (also called varying coefficient models).
2. Overview of the concept of mediation.
3. Introduction to the motivating example: a text-based smoking intervention for adolescents that evaluated smoking-related behaviors using ecological momentary assessments.
4. Introduction to the concept of time-varying mediation effects.
5. Models for estimating time-varying mediation effects.
 - a. Local polynomial estimation
 - b. B-spline estimation
 - c. Scalar-on-function regression
6. A step-by-step implementation of the models using the developed R packages and the motivating example to estimate time-varying mediation effects.
7. Hands-on practice with the R packages and time for questions.

Relevance to conference themes:

Our workshop is relevant to themes 1 and 2 identified by the TNATF. Specifically, for theme 1, the applied example that we will use throughout the workshop collected spatial data as well as ecological momentary assessments. This spatial data provides a context for understanding the mechanisms through which the intervention has an effect on smoking behavior and whether these effects vary across time.

The methods that we will present can be used to understand the role of context in shaping health behavior and to understand the underlying mechanisms of health disparities (i.e., theme 2). The new methods allow an assessment of mediation (i.e., mechanisms) in the context of intensive longitudinal data and allow these mediation effects to vary as function of time or developmental age. Time-varying effect mediation methods are relevant to various research questions in prevention science. For example, one might hypothesize that perceived stress is a mechanism by which race, gender, or sexual minority status influences health behavior outcomes (e.g., substance use). The new methods that we present would allow the assessment of whether the mediated effect via stress varies as a function of developmental age. The application of time-varying mediation in prevention research has the potential to result in a more thorough understanding of the mechanisms by which interventions influence substance use and other relevant outcomes and also how time or age influences such processes.