

## **INTRODUCTION TO ADVANCED MODELS FOR REPEATED MEASURES OF CONTINUOUS OUTCOMES INCLUDING COGNITION USING R STUDIO**

Friday, July 14, 2023 | 8 a.m. – 5 p.m.  
Hilton (Orange Rooms 3-6) — Amsterdam, Netherlands  
All times are in Central European Time  
In-person attendance only  
*Laptops are required*

### **Overview**

This course's primary goal is to provide researchers and health professionals with a practical review of advanced analytical methods commonly used in scientific articles to model change of continuous outcomes (i.e., cognitive scores, some measure of physical function) over time.

These models are used to ascertain:

- a. Linear change over time depending on predictors at baseline and time-varying.
- b. Linear change over time before and after a known event (i.e., new medication intake or diagnosis of a condition that may be associated with the function of interest).
- c. The onset of accelerated change (i.e., fixed and random change point models commonly used to study terminal decline).
- d. Half-decline of nonlinear curves thru the sigmoidal model (such as the sigmoidal curves postulated in Jack's model).
- e. The shape of the trajectory using a sigmoidal model and other strategies.

This applied workshop will use real data examples to review advanced modern methods to evaluate change in cognition over time. Each module will discuss the concepts and analytical models, their limitations, and data requirements. It will also include a demonstration of code and output interpretation. In this hands-on educational activity, attendees will be able to fit the models using a provided sample dataset and code.

### **Organizing Committee**

- Ana W. Capuano, Rush University, United States
- Donald Hedeker, University of Chicago, United States
- Maude Wagner, University of Bordeaux, France
- Vidayani Suryadevara, Stanford University, United States

## Target Audience

This workshop requires established knowledge of multiple regression models and is open to researchers and health professionals. This workshop can serve as a beginner or refresher course for researchers and clinicians.

*Participants should bring their laptops with [R Studio installed and tested](#) before the workshop.*

## Learning Objectives

- Understand the basic concept of advanced linear and nonlinear mixed effect models.
- Learn the limitations and data requirements of these models.
- Hands-on and interactively practice modeling a sample dataset in R Studio.

## Registration

Educational workshops are offered for in-person attendance only. Workshops require a separate registration fee in addition to AAIC full conference registration, or they may be purchased as stand-alone events.

## Agenda

Time	Session Details	Speakers
8-8:30 a.m.	<b>Introductions and description of the activity</b>	Ana W. Capuano
8:30-11 a.m.	<b>Linear mixed effect models and application in R</b>	Donald Hedeker
11 a.m.-noon	<b>Hands-on exercise in R, data provided</b>	Maude Wagner, Donald Hedeker, Ana W. Capuano
noon-1 p.m.	<b>Lunch break</b>	
1-3:30 p.m.	<b>Nonlinear mixed effects models (Change-point, Sigmoidal, spline-based) and application in R</b>	Ana W. Capuano
3:30-3:35 p.m.	<b>Break</b>	
3:35-5 p.m.	<b>Hands-on exercise in R, data provided</b>	Maude Wagner, Donald Hedeker, Ana W. Capuano