Master’s Thesis Presentation

Diemeng Hu
Department of Statistics
The University of Chicago

“Application of Mixed Effects Location Scale Models in Analyzing
Environmental Impacts on Sedentary Behavior”

May 2, 2024, at 3:30 PM
Jones 111, 5747 S. Ellis Avenue

Abstract

In the quest to refine interventions aimed at reducing sedentary behavior, understanding the interplay between environmental conditions and sedentary behavioral change is paramount. This study explores the significant impact of weather-related factors—precipitation, temperature, and day length—on the effectiveness of interventions designed to decrease sedentary time. Leveraging data from the "Make Better Choices 1" trial, we employ Mixed Effects Location Scale (MELS) models to delve deeper into these moderating effects, contrasting findings with those obtained from conventional linear mixed effects models. This approach enhances the traditional analysis by accommodating heteroscedasticity and allowing for a deeper exploration of individual variability in responses to the intervention. Our findings, derived from contrasting MELS model results with those from conventional linear mixed effects models, highlight the significant influence of some environmental factors on the effectiveness of behavioral interventions. The use of MELS models elucidates complex dynamics within intervention data, showcasing how personalized environmental adaptations can optimize outcomes.