THE UNIVERSITY OF CHICAGO | DEPARTMENT OF STATISTICS

Master's Thesis Presentation

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"A Two-Stage Mixed-Effects Location-Scale (MELS) Analysis of Emotional Responses and Subsequent Cannabis and Nicotine Use"

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Abstract

This paper examines whether emotional responses following cannabis and nicotine use are associated with later substance use. Data came from the CoUse study, where participants reported changes in positive and negative affect around cannabis and nicotine use events during a one-week ecological momentary assessment (EMA) period, then reported use days at 18 biweekly assessments over about 36 weeks. In a two-stage approach, mixed-effects location-scale (MELS) models estimated how cannabis involvement and combustion status related to average affect change and within-person variability. The resulting participant-specific effects, with plausible values accounting for estimation uncertainty, were then used to predict later cannabis and nicotine use days. Our results showed that cannabis involvement was associated with greater increases in positive affect, decreases in negative affect, and greater variability in both. However, these individual affective characteristics were generally not significantly associated with later use. These findings provide limited evidence that immediate emotional responses reflect longer-term use patterns, while highlighting the potential of two-stage MELS models for studying relationships between short-term experiences and longitudinal outcomes.

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