An application of analyzing the trajectories of two disorders: A parallel piecewise growth model of substance use and attention-deficit/hyperactivity disorder.

Mamey MR, Barbosa-Leiker C, McPherson S, Burns GL, Parks C, Roll J.


Abstract

Researchers often want to examine 2 comorbid conditions simultaneously. One strategy to do so is through the use of parallel latent growth curve modeling (LGCM). This statistical technique allows for the simultaneous evaluation of 2 disorders to determine the explanations and predictors of change over time. Additionally, a piecewise model can help identify whether there are more than 2 growth processes within each disorder (e.g., during a clinical trial). A parallel piecewise LGCM was applied to self-reported attention-deficit/hyperactivity disorder (ADHD) and self-reported substance use symptoms in 303 adolescents enrolled in cognitive-behavioral therapy treatment for a substance use disorder and receiving either oral-methylphenidate or placebo for ADHD across 16 weeks. Assessing these 2 disorders concurrently allowed us to determine whether elevated levels of 1 disorder predicted elevated levels or increased risk of the other disorder. First, a piecewise growth model measured ADHD and substance use separately. Next, a parallel piecewise LGCM was used to estimate the regressions across disorders to determine whether higher scores at baseline of the disorders (i.e., ADHD or substance use disorder) predicted rates of change in the related disorder. Finally, treatment was added to the model to predict change. While the analyses revealed no significant relationships across disorders, this study explains and applies a parallel piecewise growth model to examine the developmental processes of comorbid conditions over the course of a clinical trial. Strengths of piecewise and parallel LGCMs for other addictions researchers interested in examining dual processes over time are discussed.