

Public Abstract

First Name:Michelle

Middle Name:Anne

Last Name:Williams

Adviser's First Name:Phillip

Adviser's Last Name:Wood

Co-Adviser's First Name:

Co-Adviser's Last Name:

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Title:Using Nested Structures to Select Models for Developmental Trajectories of Cognitive Abilities in Adulthood

Change over time can be modeled through a variety of statistical techniques, including linear slope-intercept, repeated-measures MANOVA, and single-factor growth models, to name a few. Researchers wishing to characterize developmental trajectories typically wish to model change over time. Choice of method for modeling longitudinal data is often based on convention or familiarity with a particular modeling approach. It is argued that this should not be common practice, but rather the data and model comparisons should be used to inform the choice of model. The current work shows how several growth models are actually special cases of the free curve slope-intercept (FCSI) model, and as such, the models are nested within the FCSI model. Given the nested structure, direct model comparisons can be made, using chi-square difference tests as well as comparisons of alternative fit indices (e.g., AIC, BIC, RMSEA), to determine the best model for a given dataset. This idea is illustrated through application to an example dataset that included cognitive ability information over adulthood. More specifically, the developmental trajectories of crystallized and fluid abilities over adulthood were modeled. Substantively, the results suggest that crystallized abilities change at a non-linear rate that is not adequately characterized by either a quadratic or linear slope-intercept model (which are commonly used). Fluid abilities, however, showed a more linear rate of change than crystallized abilities, consistent with the literature.