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Evaluation of the Robustness of a Second Order Cohort Data Based Growth Model to Detect Individual Dynamics in Growth

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The investigation of growth processes for not direct observable variables (latent variables) is an important issue in social sciences. When time is measured discrete latent growth curve models (LGM) has become a widely applied method to evaluate growth processes. Longitudinal data with repeated measures of the same subjects are needed to identify the parameters of the model. Means and (co-)variances of latent variables that represent initial status and slope are then used to describe the growth process. However, growth processes may also be investigated using cohort data, i.e. cross-sectional data from different subjects who are located at different stages of the growth process. When standard model are applied to cohort data (e.g. ANOVA) only information over the average growth can be retrieved from the data. Recently, a cohort data based growth model (CGM) has been introduced (Klein & Fischer, 2014) that allows to identify all parameters of a LGM under a set of assumptions solely based on cohort data. In this presentation we introduce the so-called second order cohort data based growth model (2-CGM) which is an extension of the CGM with less restrictive assumptions for not direct observable variables. In a simulation study we evaluate the robustness of the novel method in respect to the bias of the parameters and accuracy of standard errors. In addition we discuss the underlying assumptions of both the LGM and the CGM and point out their appropriateness and limitations in applied research.