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A simulation study comparing structural-after-measurement versus traditional approaches to estimate nonlinear effects in structural equation modeling

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Abstract

Several methods have been proposed to include quadratic or interaction terms involving latent variables in structural equation models. Some examples are the latent moderated structural equations (LMS) approach and several variants of the product indicator (PI) approach. All of these methods use a system-wide estimation approach and estimate the free parameters of the model simulta-neously. They tend to perform effectively in models featuring only a limited number of nonlinear effects. However, as the complexity of the model increases with a higher number of nonlinear terms, the feasibility of joint or one-step methods progressively diminishes. Recently, several so-called structural-after-measurement (SAM) approaches to handle latent quadratic and interaction terms have been proposed in the literature. In a SAM approach, estimation proceeds in two stages. In a first stage, we estimate the parameters related to the measurement part of the model, while in a second stage, we estimate the parameters related to the structural part of the model. In this presentation, we will present initial simulation results where different one-step and SAM approaches are compared, in a large variety of conditions, including conditions that involve a large number of latent interaction and quadratic terms.

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