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Evaluating (Mixture) Multigroup Structural Equation Modelling with Exploratory Measurement Models

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Structural equation modelling (SEM) is the state-of-the-art method for analysing relations between latent variables (e.g., attitudes or behaviours), also called 'factors'. SEM consists of a measurement model (MM), which specifies how questionnaire items measure the factors, and a structural model (SM), which captures the relations of interests. Traditionally, SEM estimates the MM and the SM simultaneously, whereas the structural-after-measurement (SAM) approach estimates the MM first, and then the SM. When comparing relations across multiple groups (e.g., countries), measurement invariance (MI) is a prerequisite. When MI fails, it is crucial to model the measurement non-invariances to avoid biasing the comparisons. Multigroup exploratory factor analysis (MG-EFA) estimates all factor loadings, and thus allows to identify all kinds of loading non-invariances. The choice of rotation in MG-EFA can, however, affect the MM. Also, rotation per group affects the detection of loading non-invariance, as it disregards the loading agreement between groups. But this is accounted for by multigroup alignment (MG-A) and multigroup factor rotation (MG-FR). In this talk, I will present the results of a simulation study that evaluates how well MG-A and MG-FR perform to recover the measurement parameters and loading (non-)invariances (when using different rotations) in the first step of multigroup exploratory SAM (MG-ESAM), and how this, in turn, affects the recovery of the relations in the second step. We examine how MG-ESAM can be used to tackle the challenge of finding the most optimal rotation before comparing the relations across groups. Finally, I will present some specific challenges to consider when extending MG-ESAM into Mixture Multigroup ESAM to find clusters of groups based on their structural relations.

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