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A Multi-Method Approach to Investigating Between-Group Differences in Latent Variables

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Abstract

In psychology, much scientific research is based on the development of latent variable models designed to represent psychological constructs and capture the complexity of human reality. This work proposes a multi-method approach to the measurement and analysis of these constructs, combining advanced techniques that allow for more robust, standardized, and replicable results. This approach optimizes the integration of different methods, overcoming the inherent limitations of each technique through the joint application of various procedures.

The example presented in this study analyzes differences in the factors underlying the Conformity to Masculine Norms Inventory (CMNI) across two age groups.

First, Exploratory Graph Analysis (EGA) was used to check correct dimensionality and model specification and to avoid problems associated with incorrect item grouping. Then, Bootstrap Exploratory Factor Analysis (bootEFA) was used to assess the stability and robustness of the factor structure, minimizing the risk of capitalization on chance. Confirmatory Factor Analysis (CFA) was then performed to confirm the adequacy of the proposed model. The derived fit indices allowed the evaluation of the fit between the theoretical model and the empirical data.

Next, a measurement invariance (MI) test between the two age groups was performed to test the equivalence of the model structure in both groups. Then, a Structural Equation Model (SEM) was applied, in which the grouping variable (age) acted as a predictor of the CMNI latent variables, providing information and quantifying the differences in the CMNI latent variables between the two age groups. Finally, recommendations for different scenarios were presented, highlighting the advantages of this multi-method approach to construct analysis.

Keywords

EGA, bootEFA, CFA, MI, SEM

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