On the distortion of loadings in comparing the bifactor model and the second-order model

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Abstract:

The purpose of this research is to compare, the second-order symmetrical model (SO_{SYM}) and the bifactor symmetrical model (BF_{SYM}) in terms of loadings associated with the proportionality condition. With a simulation study, items' loadings on first-order order factors of both models are compared. Results show that SO_{SYM} model, because of the proportionality condition, tends to artificially yield more homogenous loadings leading to biased values. Magnitude in homogenization is observed to be associated with the degree of violation. At low level of violation, there is no significant difference between both models. In contrast, at moderate to high level of violation the SO_{SYM} significantly homogenizes loadings, leading to substantive differences between both models. We recommend, therefore, to apply the BF_{SYM} in addition to the SO_{SYM} in order to check the presence of biased loadings.

Keywords: second-order model; confirmatory analyses; structural equation modeling;

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