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Using confirmatory factor analysis as tool for discriminating between attribute and method effects

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Abstract

Research addressing the suitability of confirmatory factor analysis (CFA) measurement models for discriminating between common systematic variation associated with the measured attribute and common systematic variation of method effects is reported. The CFA standard version that is specified according to the congeneric model of measurement includes one latent variable that is expected to account for all the common systematic variation of data and, therefore, may not be suitable for discriminating between different types of common systematic variation. Alternatives for achieving such discrimination are variants of the tau-equivalent measurement model which we refer to as tau-based models. Such models require assumptions characterizing the type of common systematic variation in order to account for what they are expected to account.

The empirical part of this study included the simulation of data including components reflecting the item-position effect, effect of speededness, high subset homogeneity (HSH) and wording effect besides the component reflecting the attribute. These data were investigated by one-factor congeneric and tau-equivalent and two-factor tau-based measurement models. The congeneric model led to good model fit but only discriminated between attribute and method effect in the case of HSH. In contrast, CFA with variants of the tau-based measurement models indicated good model fit whenever the specification as one-factor or two-factor model corresponded to the type of method effect. The two-factor tau-based model yielded good model fit and at the same time accomplished correct discrimination between types of common systematic variation.

Keywords

CFA, measurement models, method effects

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