THE BIFACTOR S-1 MODEL: AN APPROPRIATE MODEL FOR MULTIDIMENSIONAL MARKETING SCALES"- AN EXTENDED ABSTRACT"

Symmetrical bifactor model (BF_{SYM}) begins garnering interest in marketing and consumer research. Its application, however, often yields anomalous results because many constructs do not meet its assumption of interchangeable specific factors. BF_{SYM} hypothesized exchangeability of specific factors because the general factor is properly defined only if specific factors are exchangeable or random variables. Whereas defining specific factors requires exchangeable or random individuals, defining a general factor requires in addition exchangeable specific factors because it is not possible to define a general factor as a random variable if specific factors are not. Exchangeable (or random) specific factors are specific factors randomly selected from a set of structurally equivalent specific factors.

However, for many constructs in marketing, factors cannot be considered exchangeable. On the contrary, factors are not random variables but fixed variables that differ structurally. When this hypothesis is not met, anomalous results or improper solutions that alter the meaning of the model often appear such as specific factors with non-significant (or even negative) variances and/or non-significant loadings leading to their removal. These anomalies are problematic as they result in a change in the meaning of the model. In the case of weak or non-significant loadings, a specific factor has no specific variance, or in other words, no residual variance independent of the general factor. On the contrary, the variance of the specific factor defines the general factor. In this scenario, the general factor becomes the one for which no specific factor can be identified.

An alternative model, the bifactor (S-1) model (BF_{S-1}), is more appropriate to examine the hierarchical structure of multidimensional data in marketing. By selecting a reference factor among the specific factors onto which other specific factors are regressed, the BF_{S-1} model addresses this issue. It enables to measure a general factor influencing the variance of all items without requiring interchangeability of specific factors; an unambiguous and stable interpretation of the general factor and specific factors and their relations with external variables; the presence of (partial) correlations between specific factors; and avoidance of anomalies in the model parameters.

With an empirical example based on ultimate time pressure measurement scale developed by Gourmelen et al. (2016) both models are tested. Results show that the BF_{SYM} yields typical anomalous results in terms of loadings associated with a change in the meaning of the general factor. In contrast, the BF_{S-1} model, avoids anomalous results and gives a general factor stable and clearly defined in case of non-interchangeable specific factors. We recommend, therefore, to apply BF_{S-1} instead of BF_{SYM} in case of modelling hierarchical constructs with non-interchangeable factors. References available upon request.

Keywords: « bifactor S-1 model »; « confirmatory analyses »; « structural equation modeling »; « symmetrical bifactor model »;

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