

Evaluating Latent Interaction Effects by Model-Based Satorra-Bentler Scaled Chi-square Test and Path-Based Z-test

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The research is aimed to illustrate two statistical tests in evaluating latent interaction effects. The model-based Satorra-Bentler scaled chi-square difference test and path-based Z-test are the two statistical tests. By modifying Wu and Cheng's two-stage model (2006), the one-stage structural equation model with various latent interaction effects was created and simulated. Various sample sizes, interaction effects, and regression coefficients were designed in the numerical simulations to evaluate the two statistical tests. The latent moderated structural equations with robust standard errors estimation were used in estimating the simulated datasets. The results showed that increasing sample sizes or increasing the absolute values of interaction effects helped the performance of both tests. Effects of sample sizes and magnitudes of interaction effect were shown to interact with each other. The paper concludes that the model-based Satorra-Bentler scaled chi-square difference test should be used in testing latent interactions.

Keywords: *Satorra-Bentler test, Z-test, latent interaction, latent variable*