

On Muthén's Maximum Likelihood for Two-level Covariance Structure Models

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Abstract

Data in social and behavioral sciences are often hierarchically organized. Special statistical procedures have been developed to analyze such data while taking into account the dependence of observations. Among existing methods for 2-level covariance structure analysis, Muthén's (1990, 1994) maximum likelihood (MUML) has the advantage of easier computation and convergence than other methods. It is known that, for balanced data, MUML is equivalent to the maximum likelihood procedure. Simulation results in the literature also endorse the MUML procedure for unbalanced data (Hox, 1993; Hox & Maas, 2001). We study the analytical properties of the MUML procedure in general. Our results indicate that the MUML procedure leads to correct model inference asymptotically when level-2 and the average of level-1 sample sizes go to infinity. The study clearly identifies the role of level-1 and level-2 sample sizes in the standard errors and test statistic of the MUML procedure. Analytical results explain previous simulation results regarding MUML (.

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