**Investigating Bayesian Item Response Theory Multidimensional Models**

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ABSTRACT

The aim of this work is to investigate item response theory (IRT) models characterized by different structures in the latent abilities (Reckase, 2009). In fact, the assumption of unidimensionality is often violated in presence of separate subtests. When the underlying ability structure is multidimensional, a possible solution is to fit separate unidimensional models. However, this approach does not take into account the correlation between the latent variables explicitly and may led to biased parameter estimates (Sheng and Wikle, 2008; 2009). On the other hand, multidimensional models are efficient in treating complex ability structures. In this work we compare the performances of different multidimensional models for binary data under several conditions such as test and subtest length, sample size and number of latent abilities. Model estimation is conducted via Markov chain Monte Carlo (MCMC) methods, adopting a fully Bayesian approach (Béguin and Glas, 2001). The results show that the precision of the parameter estimates is affected by the manipulated factors.

Keywords: Item response theory models, Multidimensional models, MCMC.

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