

A noniterative item parameter solution in EM cycles of the continuous response model

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Abstract

In this research, we proposed a method to estimate item parameters of the continuous response model (Samejima, 1973, 1974) by the marginal maximum likelihood estimation method with an EM algorithm (Dempster, Laird & Rubin, 1977). The proposed method did not require any numerical approximation in the E-step. Moreover, we showed that exact solutions could easily be obtained in the M-step when prior distributions of item parameters were not assumed. Therefore, our method could be noniteratively completed through each EM cycle if only prior distributions were not considered. In addition, we examined the performance of the proposed method using simulation data. Then, we confirmed the accuracy of our method without taking prior distributions into consideration.

References

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