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Comparing DIF methods for data with dual dependency.

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Summary: Background: The current study compared four differential item functioning (DIF) methods to examine their performances in terms of accounting for dual dependency (i.e., person and item clustering effects) simultaneously by a simulation study, which is not sufficiently studied under the current DIF literature. The four methods compared are logistic regression accounting neither person nor item clustering effect, hierarchical logistic regression accounting for person clustering effect, the testlet model accounting for the item clustering effect, and the multilevel testlet model accounting for both person and item clustering effects. The secondary goal of the current study was to evaluate the trade-off between simple models and complex models for the accuracy of DIF detection. An empirical example analyzing the 2011 TIMSS Mathematics data was also included to demonstrate the differential performances of the four DIF methods. A number of DIF analyses have been done on the TIMSS data, and rarely had these analyses accounted for the dual dependence of the data. Results: Results indicated the complex models did not outperform simple models under certain conditions, especially when DIF parameters were considered in addition to significance tests. Conclusions: Results of the current study could provide supporting evidence for applied researchers in selecting the appropriate DIF methods under various conditions.

Classification: D20 K40
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