Conditional Covariance Based Subtest Selection for DIMTEST

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ABSTRACT

DIMTEST is a nonparametric hypothesis testing procedure designed to test the assumptions of unidimensionality and local independence for item response theory models. Several previous Monte Carlo studies have found using linear factor analysis to select the assessment subtest for DIMTEST results in a moderate to severe loss of power when the exam lacks simple structure, the ability and difficulty parameter distributions differ greatly, or the underlying model is non-compensatory. A new method of selecting the assessment subtest for DIMTEST based on the conditional covariance dimensionality programs DETECT and HCA/CCPROX is presented. Simulation studies show DIMTEST with this new selection method often has much higher power to detect multidimensionality than using linear factor analysis for subtest selection.