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Computer Program Exchange

DIFCUT: A SAS/IML Program for Conducting Significance Tests for Differential Functioning of Items and Tests (DFIT)

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Description

The differential functioning of items and tests (DFIT) framework is one procedure used to identify differential item functioning (DIF) and differential test functioning (DTF) (Raju, van der Linden, & Fleer, 1995). Recently, a new method to determine the cutoff scores for DIF and DTF in the framework of DFIT was developed for dichotomously scored test data using item response theory (Oshima, Raju, & Nanda, in press). The new method, named item parameter replication (IPR), is based on a Monte Carlo technique in which a large number of item parameter pairs are simulated from one original item parameter file, making it possible to obtain the distribution of DIF/DTF indices under the no-DIF/DTF condition.

The DIFCUT program reads a focal group output file from BILOG-MG3 (Zimowski, Muraki, Mislevy, & Bock, 2002), which contains item parameter estimates and their variance-covariance information, creates a desired number of replications (typically 1,000 or more pairs) of the focal group file, and determines the 90th, 95th, 99th, and 99.9th percentile rank scores of DIF for each item and DTF for the test. Those percentile scores serve as cutoff scores for significance tests for $\alpha = .10, .05, .01,$ and $.001$, respectively. The program also calls in the BILOG-MG3 focal group file containing ability estimates, the reference group file containing item parameter estimates, and a file containing linking coefficients. The program calculates actual DIF and DTF and then identifies the level of significance for each item and the test as a whole. Although the program is made specifically for DFIT, it can be modified to accommodate any other DIF indices that make use of item response theory (IRT)–based item parameter estimates.

Availability

DIFCUT is written in SAS/IML and runs on SAS-PC (SAS Institute, 2001). To obtain the DIFCUT source code, user's guide, and sample input and output files, e-mail Alice Nanda at alicenanda@gmail.com or write to Alice Nanda, Department of Educational Psychology and Special Education, Georgia State University, P.O. Box 3979, Atlanta, GA 30302-3979.

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