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birtr: A Package for "The Basics of Item Response Theory Using R"

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Keywords

item response theory, computer program, Rasch model

Description

The birtr package provides nine important functions, iccplot, icccal, icc, iccfit, groupinv, tcc, ability, tif, and rasch, for Baker and Kim (2017). Note that the functions can be used with the previous edition of the book (Baker, 2001) that is freely available from the following URL: http://echo.edres.org:8080/irt/baker/

The iccplot function plots an item characteristic curve under the two-parameter logistic model. The icccal function computes the logistic deviate L, the exponent of negative L, the denominator, and the value of probability of correct response for each of seven ability levels evenly spaced from –3 to +3 under the one-, two-, or three-parameter logistic item characteristic curve model. The icc function plots an item characteristic curve under the one-, two-, or three-parameter logistic model. The iccfit function plots the item characteristic curve and the simulated observed proportions of correct response from the one-, two-, or three-parameter logistic model. The groupinv function plots the item characteristic curve and the two sets of simulated observed proportions of correct response from two groups under the one-, two-, or three-parameter logistic model. The tcc function plots a test characteristic curve from a set of item parameters under the one-, two-, or three-parameter logistic model. The ability function estimates the ability parameter and obtains the standard error of the estimate given the item characteristic curve model, the response vector, and the set of known item parameters under the one-, two-, or three-parameter logistic model. The tif function plots a test information function from a set of item parameters under the one-, two-, or three-parameter logistic model. The rasch function yields estimates of item difficulty parameters and ability parameters under the one-parameter logistic Rasch model by the Birnbaum paradigm.

Availability

The package birtr runs on any Windows- or Mac-based computer with R installed. R, a free software environment for statistical computing and graphics, can be downloaded from a mirror at the home page URL: https://cran.r-project.org/ The source package that contains copies of the birtr source code, documentation, and example files can be obtained through email from

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Seock-Ho Kim (shkim@uga.edu). The birtr package is also available on the Comprehensive R Archive Network (CRAN), the public clearing house for R packages.

Declaration of Conflicting Interests

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