difLR Logistic regression DIF statistic

Description

Differential Item Functioning Study

Usage

difLR<-function (x, member, member.type="group",match="score", anchor = 1:ncol(x), type = "both", criterion = "LRT")

Arguments

#' Functions for estimating differential item functioning with a set of

#' scored item responses.The difLR is used to Calculate the "logistic regression"

#' likelihood-ratio statistics and effect sizes for DIF detection"Logistic" for logistic regression

#' (Swaminathan and Rogers,1990).

#' @param x matrix or data.frame whose rows correspond to the subjects and columns to the items..

#' @param member is group indicates the column of Data which corresponds to the group membership, either by specifying its name or by giving the column

#' @param member.type either "group" (default) to specify that group membership is made of two groups,

#' or "cont" to indicate that group membership is based on a continuous criterion.

#' @param SCORES are the test score, or any continuous or discrete variable with the same length as the number of rows of Data

#' @param anchor is a vector of integer values specifying which items (all by default) are currently considered as anchor (DIF free) items.

#' @param type is a character string specifying which DIF effects must be tested. Possible values are "both" (default), "udif" and "nudif".

#' @param criterion a character string specifying which DIF statistic is computed. Possible values are "LRT" (default) or "Wald".

#' @param na.rm logical with default \code{FALSE} specifying whether missings

#' should be removed before calculating individual descriptives.

#' @param GROUP optional grouping variable.

#' @export

The member.type argument is set to "group", with two distinct (numeric or factor) values,

say 0 and 1 (for the reference and focal groups respectively). Those

values are internally transformed onto factors to denote group memebership.

The three possible models to be fitted are:

M0 : logit(pi_g) = alpha + beta*X + gamma_g + delta_g*X

M1 : logit(pi_g) = alpha + beta*X + gamma_g

M2 : logit(pi_g) = alpha + beta*X

where pi_g is the probability of answering correctly the item in group g and X is the

matching variable. Parameters alpha and beta are the intercept and the slope of the

logistic curves (common to all groups), while gamma_g and delta_g are group-specific

parameters. For identification reasons the parameters gamma_0 and alpha_0 for

reference group (g = 0) are set to zero. The parameter gamma_1 of the focal group (g = 1)

represents the uniform DIF effect, and the parameter delta_1 is used to model nonuniform DIF effect.

The models are fitted with the glm function.

Examples

Not Run:

#Loading of the PISA09_math_USA_booklet1 data (booklet1)

data("booklet1")

#Testing both types of DIF simultaneously

difLR(booklet1[, 1:20], booklet1[, 21])

Testing both types of DIF simultaneously

With all items and Wald test

difLR(booklet1[,1:20], booklet1[,21], criterion = "Wald")

Removing item 6 from the set of anchor items

difLR(booklet1[,1:20], booklet1[,21], anchor = c(1:5, 7:21))

```
# Testing for nonuniform DIF
difLR(booklet1[,1:20], booklet1[,21], type = "nudif")
# Testing for uniform DIF
difLR(booklet1[,1:20], booklet1[,21], type = "udif")
# Using the "anger" trait variable as matching criterion
difLR(booklet1[,1:20],booklet1[,21], match = booklet1[,21])
# Using the "anger" trait variable as group membership
difLR(booklet1[,1:20],booklet1[,21], member.type = "cont")
## End(Not run)
```