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Abstract

catcher is a software program designed to compute the ω index, a common statistical index for the identification of collusions (cheating) among examinees taking an educational or psychological test. It requires (a) responses and (b) ability estimations of individuals, and (c) item parameters to make computations and outputs the results of the analyses in two text files. The program uses the nominal response model to estimate ω index and is based on residuals between expected and observed values of matched answers between examinee pairs (copier and source) by considering correct and incorrect answers, conditioning on source's answers, copier's ability level, and item parameters.

Keywords

cheating, nominal response model, computer program

Cheating is one of the most powerful threats to validity in testing. Many precautions are taken against copying, such as interleaving the order of questions, distant seating, and so on. However, despite of all the efforts to prevent cheating, it does not seem possible to eliminate cheating completely. Therefore, some method is needed to detect if cheating exists.

Although commonly used sample-dependent dichotomous models in item response theory (IRT; Embretson & Reise, 2000) define the probability of answering an item correctly, the main concern for the detection of answer copying is the probability that pairs of examinees select the same alternatives in a test. Nominal response model (Bock, 1972) would be more suitable in this case because it allows for an estimation of the probability that an examinee with ability level of θ selects an alternative on a given item.

A common statistical index, ω , defined by Wollack (1997), for the identification of collusions among examinees taking an educational or psychological test, has provided promising results for cheating analysis. ω is based on residuals between expected and observed values of matched answers between examinee pairs (called copier and source). It uses correct and incorrect answers between a pair of examinees and is conditioned on the source's answers, the copier's ability level, and item parameters. A software tool conducting collusion analysis based on IRT can be very useful for researchers working on answer copying based on IRT.

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Description

catcher is a software program that can be used to compute ω (Wollack, 1997). It evaluates each ω value against unit normal distribution and gives a label according to the classification criteria given by Wollack (2004). The criteria correspond to six levels of copying, changing from 1 to 6, into which each ω estimate is classified. The distribution of ω is asymptotically standard normal as shown by Wollack (1997); therefore, values of ω may be evaluated against unit normal distribution using statistical tables. Large values indicate the increasing probability of cheating. Negative values of ω indicate no evidence for copying.

Program Availability and Conditions of Use

catcher is a point-and-click program with an intuitive user interface. It runs on Microsoft Windows. There is no limit into the number of items and the number of examinees. The program is available at no cost. A copy of the program, sample files, and a detailed user manual can be obtained by sending an e-mail to the author (kalenderi@bilkent.edu.tr). Use is limited to academic and nonprofit purposes.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Erratum

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