

Improving the Predictive Validity of a Test: A Time-Efficient

Perspective

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Abstract

Tests used for college or university admissions normally contain several types of items. After the desired set of item types has been specified, a decision regarding the proportions of the various item types has to be made. This work offers an approach for determining these proportions. The proposed approach is based on maximization of the predictive validity of the total score with respect to success in higher education, under the constraint of the total testing time available. A procedure of searching for the best allocation of the total testing time among the various item types is presented. This procedure makes use of statistical characteristics of the item types, such as reliability, validity, intercorrelations and variance, coupled with data regarding the response latencies for the item types. The proposed procedure can accommodate additional considerations regarding the desired proportions of the item types by introducing them in the form of additional constraints on the solution. An application of the proposed approach is presented, based on data obtained for 4,543 first-year students in universities in Israel, to whom the Psychometric Entrance Test was administered.