

A comparison of the efficiency of polytomous and dichotomous items for latent trait estimation

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Abstract

In IRT literature references and textbooks, there is a common view that places polytomous above dichotomous items in their role of extracting information about an examinee's latent trait level from his/her response pattern. This view, however, should not be taken for granted. The validity of such standpoint is model-dependent. A dichotomous-polytomous transition and the ensuing changes on Fisher's information will be evaluated for nominal and graded response models (NRM and GRM, respectively). They can both be reduced to a two parameters logistic (2PL) model, once only two categories are considered. A comparative evaluation will show that, for the purpose of trait estimation, multi-categorical response options seem to be unambiguously advantageous for items described by GRM, but not necessarily NRM. An example of test design optimisation based on a composite item pool, containing both dichotomous and polytomous items, will illustrate that, as far as nominal response data are concerned, the upper hand of polytomous items in terms of Fisher's information is not always justified.