Using Rasch measurement to investigate the construct of motor competence in preschool children

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Abstract

Introduction. One of the most sensitive developmental periods is preschool age, where motor assessments help to describe motor development. The purpose of this study was to investigate the construct of motor competence, which is defined as the ability that underlies the performance of a wide variety of motor skills (Haga, Pedersen, & Sigmundsson, 2008). In motor tests, a composite score, built out of different motor skills (Burton & Rodgerson, 2001), often indicates this construct.

Methods. Using the MOT 4-6 (Zimmer & Volkamer, 1987), data were collected in 1467 children (aged 3-6 years) in Flanders, Belgium. The MOT 4-6 is a frequently used test assessment in preschool and consists of 17 items (3-level categories).

Results. Detailed analyses using the Partial Credit Model and mixed Rasch model revealed a one-dimensional structure (CR = 1.964, p_{CR} = .06; P-χ^2 = -.227, $p_{P\text{-}\chi^2}$ = .24). Due to unordered threshold parameters, 5 items were excluded. These items have the same scoring system counting zero, one or more successful trials, which deviates from the other items. The remaining items attain the requirements of objective measurement provided by Rasch measurement and therefore can be accumulated to one composite score.

Conclusion. The study shows item and person homogeneity within a validated composite score for the MOT 4-6, using 12 instead of 17 MOT 4-6 items. Thus, it provides evidence in terms of a single latent construct (i. e. motor competence), that underlies the performance of motor skills in preschool children. Furthermore, it shows that some scoring systems are less suitable in motor competence assessment.

References

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