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Methodological issues when studying the relationship between reading and solving mathematical tasks.

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Summary: We examine four statistical methods used for characterizing mathematical test items regarding their demands of reading ability. These methods rely on data of students' performance on test items regarding mathematics and reading and include the use of regression analysis, principal component analysis, and different uses of correlation coefficients. Our investigation of these methods focuses on aspects of validity and reliability, using data from PISA 2003 and 2006. The results show that the method using principal component analysis has the best properties when taking into account aspects of both validity and reliability.

Classification: D50 C50 D60 C40

Keywords: mathematical tasks; mathematical ability; reading ability; linguistic properties of mathematical tasks; mathematical test items; students performance