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AN INVESTIGATION OF GOODNESS OF MODEL DATA FIT: EXAMPLE OF PISA 2009 MATHEMATICS SUBTEST

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ABSTRACT

Although Classical Test Theory (CTT) has been used for test development, Item Response Theory (IRT) is beginning to major theoretical source. However, the model-data fit should be verified as a prerequisite. Therefore, in this study it is aimed to investigate which IRT model will provide the best fit to the data obtained from PISA 2009 mathematics subtest. For goodness-of-fit analysis, first the model assumptions and then the expected model features were tested. The model assumptions unidimensionality, local independence and non-speeded test administration were investigated. In the expected model features part the invariance of ability parameter estimates and invariance of item parameter estimates were analyzed. In addition, item characteristics curves and item information functions were analyzed. To determine the best model, two different ways were followed: first number of items which fits with the model and then the results of the ki-square statistics of -2 log likelihood values of models were compared. The results suggested that two parameter logistic model is the most appropriate model for data fit.

Key Words: Item response theory, model data fit analysis, person and item statistics.