

THE EFFECT OF ABILITY ESTIMATION METHOD, AND HANDLING METHOD WITH MISSING VALUES, ON THE ACCURACY OF ITEMS AND PERSONS' PARAMETERS

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ABSTRACT_ *The process of estimating items parameters and abilities of respondents are considered very important step in applying item response theory. This estimation differs according to the number of items or differences in the distribution of respondents' abilities, which may be affected by the size and the nature of missing values.*

The purpose of this study is to investigate the effect of ability estimation method and handling method with missing values, on the accuracy of items and persons' parameters. To achieve this aim data were generated using(WINGEN) software, (1500) respondent on a test consisted of (80) dichotomous items fitting the three parameters logistic model were generated with the following ranges of discrimination (0.01 - 2.0), difficulty (-2.5 - 2.50), and guessing (0.10 - 0.30) assuming that abilities are distributed normally.

Using (SPSS) and (Excel) that data with (5%) missing responses were generated. The data was processed through the three handling methods of missing values; Expectation Maximizing (EM), Multiple Imputation (MI), and Response Function (RF).

The data was tested for unidimensionality using factor analysis, the items and individuals were fitted the used model, and standard errors were estimated through Maximum Likelihood (ML), and Expected A Posteriori (EAP) methods.

To explore the accuracy of items and individuals according to different methods of estimation and imputation, ANOVA for the repeated measures on two factors were used. The findings showed that there are significant differences in the estimation accuracy of discrimination parameter attributed to estimation method is favor of (ML) and in the difficulty is favor of (EAP) method.

Moreover, findings showed that there were no statistically significant differences in the estimation accuracy of item difficulty and guessing parameter attributed to the handling method or the interaction between the dealing method and the estimation method.

The study recommended the need of using multiple Imputation (MI) and Expectation maximization (EM) in handling missing values, conducting studies on missing values with sleekness distributions and with different rates of missing values were recommended.

Keywords: *Missing Values, Expectation Maximization (EM), Multiple Imputation (MI), Response Function (RF), Individuals Abilities, Maximum Likelihood (ML) Method, Bayesian Expected A Posteriori Method (EAP), Estimation Accuracy.*