

The Effect of Background Variables on Gender DIF

Nermin Kibrislioglu Uysal,

Hacettepe University

Kubra Atalay Kabasakal,

Hacettepe University

Abstract

The purpose of this study is to investigate the presence of differential item functioning (DIF) between gender groups in PISA 2015 science items in nine selected countries. Moreover, the effect of socioeconomic status, reading ability, science self-efficacy and science motivation on the presence of gender-related DIF are examined, respectively. One cluster from computer-based assessment (CBA) is taken into consideration. The countries are selected among the ones that implemented CBA, on the basis of their rank in science achievement. Multiple Indicator Multiple Causes method (MIMIC) is used in our analysis. DIF analysis in the MIMIC involves fit comparisons of both full and reduced models to determine if the items can measure the latent trait equally among the specified groups. The MIMIC analysis is conducted in two steps. First, the items is being tested for showing DIF among gender groups. Then the socioeconomic status, the reading ability, the science self-efficacy and the motivation are added to the model to test gender-related DIF items and their effects, respectively. According to results of the study, gender-related DIF appeared in all of the selected countries vary between two and six items. In four of the countries none of the selected variables significantly affect the presence of gender-related DIF. Instead, in the remaining countries the number of gender-related DIF items is reduced by adding different combinations of the selected variables to the model. The effect of variables which reduce the number of gender-related DIF items will discussed within each country.

Keywords: Bias, Gender, DIF, MIMIC