

# FAST™ aReading and aMath Bias Analysis

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Bias analyses of a sample of the items that comprise FAST™ aReading and FAST™ aMath were conducted using data collected during the 2016-17 and 2017-18 academic years. Data for each year were analyzed separately. There were sufficient data to examine bias in relation to race/ethnicity. The race/ethnicity group comparisons examined were White versus Black, White versus Hispanic, White versus Asian, and White versus Native American. Of the FAST™ aReading items, 19-25% of the items were examined for bias depending on the comparison. Of the FAST™ aMath items, 14-22% of the items were examined for bias depending on the comparison. There were not sufficient demographic data to analyze bias in the remaining items or for other demographic characteristics. To be included, an item needed to have data for 10 or more examinees in the focal and reference groups each.

Bias was assessed using the logistic regression procedure for detection of uniform and non-uniform differential item functioning (DIF). The advantages of using the logistic regression procedure for DIF detection include being a model-based approach and having the capability to detect both uniform and non-uniform DIF with adequate and equal power; however, the procedure also tends to inflate Type I error rates. As such, an effect size measure developed by Jodoin and Gierl (2001) was computed and evaluated in addition to statistical significance. Jodoin and Gierl present a four-category framework for interpreting the effect size measure, where the four categories are indicative of no, negligible, moderate, and severe DIF.

Regarding FAST™ aReading, the results indicate that there is no or negligible DIF for all items examined in both years for all the race/ethnicity comparisons, which suggests no bias in how the items perform. Similarly, for FAST™ aMath the results indicate no or negligible DIF for all items examined in both years when comparing White examinees to Hispanic, Asian, and Native American examinees. When comparing White and Black examinees using data collected during the 2016-17 academic year the results indicate moderate or severe DIF on five and three items, respectively, all of which is non-uniform. For the 2017-18 academic year, the results indicate moderate (non-uniform) DIF on one item. All items displaying DIF are being examined for evidence of bias.