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Evaluating the Impact of Item Biasedness in Confidence Intervals of Equated Ability Estimations

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Equating is a statistical technique used to ensure that multiple forms of an assessment are on the same scale. In other words, each form of the assessment is invariant of the population distribution. A procedure that is used within equating is item calibration. During item calibration, items can become biased due to the sample size and distribution of ability. The purpose of this research is to determine the effect of item biasedness on the confidence interval of an equated ability level. The motivation of this work stems from the notion of calibration error of item parameters and its affect not only on the ability levels but also on the equating coefficients as well. The sample sizes investigated will be $N=500$, $N=1,000$, and $N=2,000$, and the test length will be $J=50$ where the number of common items will be $J_c=10$. The distribution of ability for the two forms will be $N(0,1)$ for the reference form (the base form) and $N(0,1)$, $N(0.2,1)$ or $N(0.4,1)$ for the new form (the form needed to be equated). Preliminary results show that biased item parameters not only affect the estimation of the ability levels but also negatively influence the equating procedure.