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Paper Title: Is the Force Concept Inventory Biased? Investigating Differential Item Functioning on a Test of Conceptual Learning in Physics

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Abstract: Persistent differences in performance between females and males on measures of physics conceptual learning have prompted interest in investigating and reducing the gender gap. Educators and researchers need to have confidence in their interpretations of results and want to know if observed group differences are artifacts of test bias or due to factors like background or instruction. A differential item functioning (DIF) analysis was conducted on responses to a widely used measure of conceptual learning to assess whether properties of the test itself, unrelated to student ability, influence performance by gender. Findings provide evidence that the test is not systematically biased in favor of males. However, three items did exhibit substantial DIF, two favoring males and one favoring females.