

## INVESTIGATING DIFFERENTIAL ITEM FUNCTIONING ON THE EDI WITH REGARD TO GENDER AND CULTURE

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### ABSTRACT

This poster addresses the psychometric properties of the EDI with a focus on Differential Item Functioning (DIF). The validity of inferences made on the basis of EDI results hinges on the assumption that the EDI performs in the same way for any subgroup of Kindergarten children. In order to test this assumption, we employed ordinal logistic regression to examine whether DIF is present with regard to gender or cultural background (Aboriginal/Non-Aboriginal) in the BC EDI data set. The presence of DIF between groups provides evidence that either item impact or item bias exists (Zumbo, 1999); i.e., whether DIF occurs due to real group differences in regard to school readiness or due to some nuisance variable.

In the gender comparison, we found non-uniform DIF for one item on physical aggression: in the lower total EDI score range, boys were perceived as more physically aggressive than girls, whereas in the high total EDI score range, this difference was not evident. In the Aboriginal/Non-Aboriginal comparison, none of the items displayed significant DIF.

### METHOD

Sample: 46,400 Kindergarten Children, British Columbia, 2000-2004 (Cycle 1)

(n)	Aboriginal	Non-Aboriginal	
Girls	1,500	21,100	22,600 (49%)
Boys	1,600	22,200	23,800 (51%)
	3,100 (7%)	43,300 (93%)	46,400 (Total)

Statistical method: Ordinal Logistic Regression

For every individual item, our analyses examined whether groups of Kindergarten  
 (i) girls and boys, or  
 (ii) aboriginal and non-aboriginal children  
 when being matched on their EDI total score, perform similarly on that particular item.

### RESULTS

Aboriginal status: No DIF was detected.

Gender: non-uniform DIF was detected for one item (Item c37; Figure 1a; see Figure 1b (Item c38) for an example of an item without DIF).

### WHAT IS DIFFERENTIAL ITEM FUNCTIONING (DIF)?

[Zumbo, B. D. (1999). *A Handbook on the Theory and Methods of Differential Item Functioning.*]

#### DIFFERENTIAL ITEM FUNCTIONING (DIF)

Examinees from different groups show differing probabilities of endorsing the item after matching on the characteristic that the item is intended to measure.

#### ITEM IMPACT

Examinees from different groups have differing probabilities of endorsing an item because of true group differences in the characteristic being measured.

#### ITEM BIAS

Examinees from different groups have differing probabilities of endorsing an item because of some characteristic of the test item or testing situation that is not relevant to the test purpose.

### WHY STUDY DIF IN THE EDI?

The presence of DIF might indicate test bias, whereas the absence of DIF is an indication that the EDI similarly measures school readiness across all groups of Kindergarten children.

FIGURE 1A: ITEM C37

"Would you say that this child ...  
 ... gets into physical fights?"  
 often or very true (10)  
 sometimes or somewhat true (5)  
 never or not true (0)  
 don't know

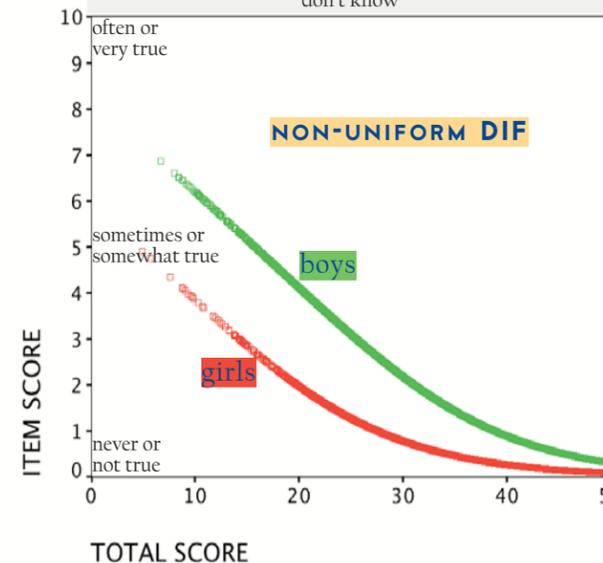
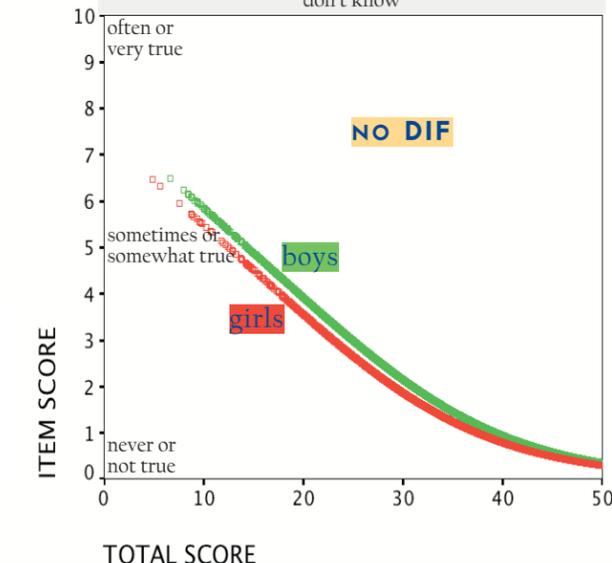


FIGURE 1B: ITEM C38

"Would you say that this child ...  
 ... bullies or is mean to others?"  
 often or very true (10)  
 sometimes or somewhat true (5)  
 never or not true (0)  
 don't know



### CONCLUSIONS

The only item with DIF refers to gender differences in physical aggression. In line with previous research (e.g., Loeber & Stouthamer-Loeber, 1998), our findings indicate that boys are (perceived as being) more physically aggressive than girls in Kindergarten-suggesting that the DIF derives from real group differences and is thus item impact, not item bias. Interestingly, the identified DIF is not uni-form: boys with low school readiness are (perceived as) physically more aggressive than girls with low school readiness, whereas both boys and girls with high school readiness are generally (perceived as) not physically aggressive. At the item level, our findings thus confirm the validity and fairness of the EDI. Currently, we are analysing whether the EDI displays Differential Test Functioning (DTF).