



Technology-Assisted Reading Assessment



Technology Assisted Reading Assessment (TARA)

Frederick Cline
Educational Testing Service





The Purpose of TARA

- To research and develop standards based reading assessments for blind and visually impaired students
- To research the design and development of an alternate assessment of modified achievement standards in reading for blind and visually impaired examinees



Overview of TARA Research

- Differential Item Functioning
 - Evidence of comparability of scores
- Demographic Studies
 - Improved understanding of characteristics of blind and visually impaired students taking state standards based assessments



Differential Item Functioning (DIF) Studies

- Differential Item Functioning
 - Examines performance on a test item of a matched group of test-takers
 - Items are classified as A, B, C DIF
 - DIF can be negative or positive
 - Carried out analyses for a grade 4 and 8 state standards based English-language arts (ELA) assessment



Description of Test

- ELA component of large-scale state standards test
- 75 multiple choice questions for each grade

	Standard	Grade 4		Grade 8	
		Number of Questions	Percentage of test	Number of Questions	Percentage of test
Reading	WORD ANALYSIS, FLUENCY, AND SYSTEMATIC VOCABULARY DEVELOPMENT	18	24%	9	12%
Reading	READING COMPREHENSION	15	20%	18	24%
Reading	LITERARY RESPONSE AND ANALYSIS	9	12%	15	20%
Writing	WRITTEN AND ORAL ENG. LANG. CONVENTIONS	18	24%	16	21%
Writing	WRITING STRATEGIES	15	20%	17	23%

- **Note:** The 4th grade assessment also contains an essay component that was not analyzed and will not be discussed.



Description of Samples: Summary Statistics

Grade	Summary Statistics	Students without Disabilities	Students who are Blind or Visually Impaired	
		Reference	Large Print	Large Print or Braille
			Focal	Focal
4	N	30225	105	141
	Mean	48	37	37
	SD	14	15	15
8	N	30069	74	98
	Mean	46	34	35
	SD	12	12	14

Note – reference groups sampled from larger population



a priori DIF Hypotheses

- **VISUAL CONTENT**
 - Complex or distracting
- **TEXTUAL CONTENT**
 - Insensitive or offensive
- **LANGUAGE**
 - Multiple meanings; homophones; unusual syntax
- **FORMAT**
 - Contracted vs. uncontracted braille



Accuracy of predicted DIF

Grade 4

Actual

Predicted		Yes	No	
	Yes	3	41	44
No	6	25	31	
	9	66	75	

Grade 8

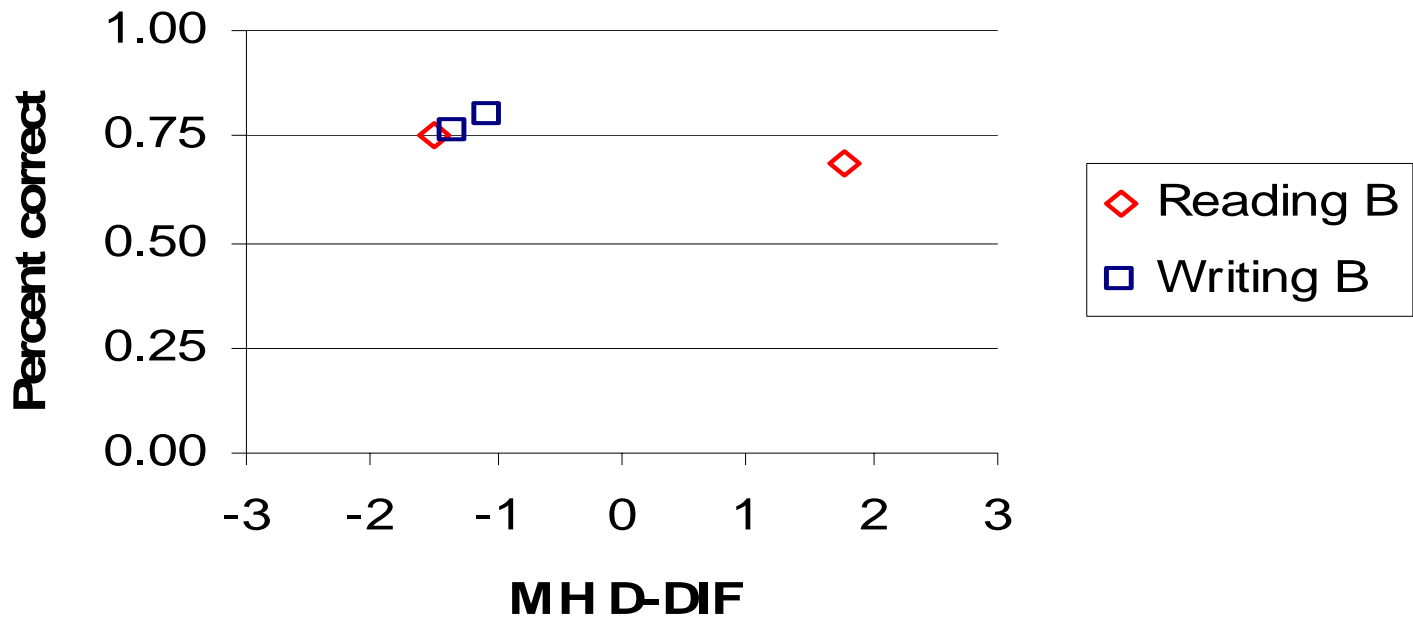
Actual

Predicted		Yes	No	
	Yes	4	5	9
No	6	60	66	
	10	65	75	



Grade 4: Students without disabilities compared with students who are blind or visually impaired

Easy



Favors Students without Disabilities

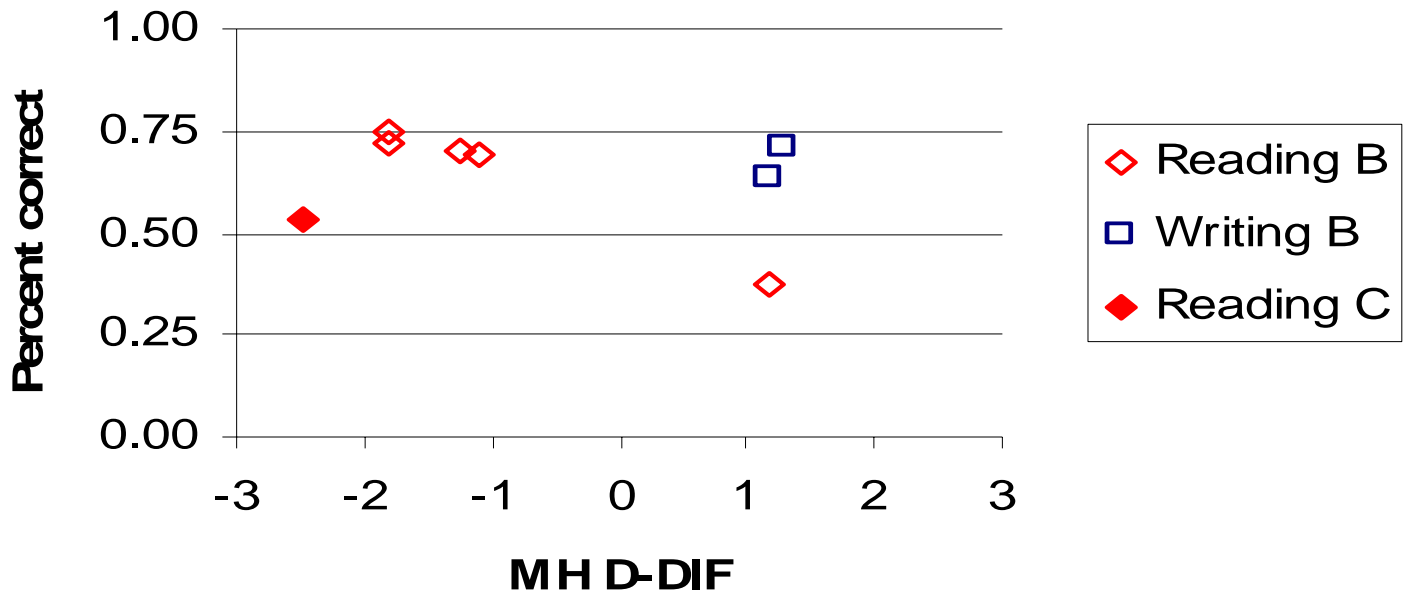


Favors Students who are Blind or Visually Impaired using Large Print or Braille



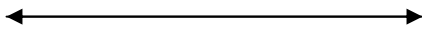
Grade 8: Students without disabilities compared with students who are blind or visually impaired

Easy



Difficult

Favors Students without Disabilities



Favors Students who are Blind or Visually Impaired using Large Print or Braille



Summary of DIF Results

- Minimal Amount of DIF for all groups
 - Only 1 C-DIF item
- Number of DIF items smaller than expected
 - DIF over-hypothesized
 - a priori analysis not very predictive
- Small sample size is an issue
 - Combined ELL/Non-ELL
 - Combined Braille and Large Print
 - Item sample size also ‘small’



Summary of DIF Results

- Effects did not apply to all items associated with a passage
- Where DIF did seem to show up:
 - Metaphor
 - Items and passages related to how people experience the world (e.g. through touch)
 - Items following reading passages taken from other media, e.g., advertisements, instructional manuals, showed more negative DIF
- Where DIF did not seem to show up:
 - Items and passages involving typically “sighted” activities or interests, e.g. photography (in fact, some favor focal groups)



Implications of Study Results

- Scores on ELA assessment are basically comparable
- It might be best to avoid passages with topics associated with disabilities
- It is important to ensure that students have adequate exposure (in braille and large print format) to different types of reading material



Questions? Comments?