

# ***Using Curriculum-Based Measurements to Assess Reading: The Cultural Connections of Diverse Students with Learning Disabilities***

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## ***Abstract***

Students with learning disabilities face real reading challenges. Research into the reading performance of culturally diverse students indicates improved reading performance for culturally diverse students when text matches students' cultural perspective. This quasi-experimental research investigates whether Caucasian and African American students with learning disabilities read diverse text differently. Curriculum-based measures (fluency level, comprehension score, and meaning-changing deviations) were used to assess reading performance by ethnicity and reading ability. Two-way MANOVA tests yielded interactions for reading ability x passage and reading ability x ethnicity. Results indicate that low achieving readers comprehended more and had fewer meaning-changing deviations when cultural cues were embedded in text. Results of this study indicate that further consideration must be given to the cultural perspective of readers and text used in reading assessment. Generalizations about student reading ability must be contextualized in discussions about the presence or absence of cultural cues in text to be read.

## ***Using Curriculum-Based Measurements to Assess Reading: The Cultural Connections of Diverse Students with Learning Disabilities***

In the classroom context, many students with learning disabilities face reading challenges (Salend, 2008; Mercer & Mercer, 2005; Mercer & Pullen, 2005). They lose their place, they read slowly, and depend upon phonics strategies to read unknown words. Researchers report that students with disabilities are unable to make sense of literary text, unable to gain reading proficiency (Wong, 1986).

Anderson (1994) thinks that "minority children may sometimes be counted as failing to comprehend school reading material because their schemata does not match those of the majority culture. Basal reading programs, content area texts, and standardized tests lean heavily on the conventional assumption that meaning that is inherent in the words and structure of a text" (p. 480).

Anderson's comments on this topic are consistent with those of Rosenblatt (2004):

"The notion that the marks [on a page] in themselves possess meaning is hard to dispel. From the very beginning and often even before some expectation, some

tentative feeling, idea, or purpose, no matter how vague at first, starts the reading process and develops into the constantly self-revising impulse that guides selection, synthesis, and organization. The linguistic-experimental reservoir reflects the reader's cultural, social, and personal history" (p. 1370). Prominent research in this field substantiates the notion that ethnic/cultural

background influences the way students engage in educational experiences and participate in learning (Delpit & Dowdy, 2008; Gay, 2000; Lee, 2006; Ladson-Billings, 1997; Delpit, 1990). These studies suggest that attention be given to differences in reading performance across student groups when the text to be read matches reader schemata.

### ***Theoretical Framework***

This study is grounded in two theoretical perspectives: social constructivism (Vygotsky, 1978) and transactional theory (Rosenblatt, 2004, 1994, 1969). The theory of social constructivism asserts the notion that learners view themselves in their surroundings through their own experience and the experience of those around them (Vygotsky, 1978). The roles that cultural and linguistic differences play figure prominently in considerations of student performance. Text that is read is interpreted through persona and cultural cues and experiences (Gee, 1992, Vygotsky, 1978, Langer, 1990, Knoeller, 1994, Lee, 1995, 2005, 2006, 2007, Lee & Majors, 2000). When no cultural cues are familiar, students have difficulty identifying with and understanding the literary text (Spinelli, 2008; Sabbatino, 2008; Galda & Beach, 2001; Beach, Appleman & Dorsey, 1995, & Ladson-Billings, 1997).

Transactional theory asserts that learners' personal engagement with text facilitates sense making that is pertinent to their individual past and present (Rosenblatt, 2004; 1994, 1969). Rosenblatt (2004) asserts, "the notion that the marks [on a page] in themselves possesses meaning is hard to dispel" (p. 1370). Readers come to the task using their own experiences, knowledge, and perceptions. They use cultural, social, and historical reservoirs to understand what they read.

### ***Related Literature***

Curriculum-based assessment (CBA) refers to the measurement of student performance of school-related academic tasks using reliable assessment measures of basic skills in reading and mathematics (i.e., words per minute (wpm), fluency, comprehension, percent correct). CBA can document incremental progress for students with learning disabilities and can be used to compare individual students with others (Siberolitti & Hintze, 2007; Deno, Marston, Shinn & Tindal, 1983; Shinn & Marston, 1985; Parmar, Deluca & Janczak, 1994). Since its inception, measures like wpm and fluency have been considered a low-stakes mechanism for progress monitoring for students with disabilities.

Deno, Marston, Shinn & Tindal (1983) used curriculum-based measures (CBM) to differentiate between fifth grade low-achieving students and students with learning disabilities. Shinn & Marston (1985) wanted to know whether CBM could be used to

differentiate between students with learning disabilities, low achieving, and regular education students. Parmar, Deluca, & Janczak (1994) assessed students' oral reading of science text, comparing the performance of sixth grade students in regular education and students with mild disabilities in grades 2-8. Silberolitt & Hintze (2007) used hierarchical linear modeling to establish and compare student rates of growth. In each of these studies, CBMs were found to be reliable instruments for assessing student ability and differences in academic performance. Today, these measures are valid and reliable ways to assess reading progress of students in general education settings.

Previous CBM studies involving students from diverse ethnic backgrounds sought to determine performance differences across ethnic groups. Recently, researchers reported the use of curriculum-based measures to investigate reading from an intercultural perspective. Kamintz-Berkooza & Shapiro (2005) used curriculum-based measures to assess the oral reading of Hebrew students. Ramirez & Shapiro (2007) investigated the oral reading fluency of Spanish speakers, when reading in their first language and in their second language. Hintz, Callahan, Matthews, Williams & Tobin (2002) examined the differential predictive bias of CBM in reading across African American and Caucasian students in grades two–five using hierarchical multiple regression on oral reading fluency and reading comprehension.

These studies move past comparison of performance by ethnic groups to examine the validity or predictive bias of CBM as a measure of reading performance for students from specific ethnic groups. This is an important distinction because special education research has given little attention to cultural perspective in validating the effectiveness of CBMs in assessing students' reading performance. Neither has attention been given to an examination of how socio cultural perspective informs the sense making of special learners during the reading experience.

### ***Purpose***

The purpose of this study is to examine how African American students with learning disabilities read literary text replete with cultural cues. Our goal is to determine whether access to familiar cultural cues in text improves reading performance as measured by curriculum-based measures. An investigation of a culturally sensitive approach to CBM for African American students with disabilities could impact literacy assessment practices for culturally diverse students receiving special education services.

### ***Research Questions***

- 1) Is there a significant difference in the oral reading performance of African American and Caucasian students with disabilities when they read culture-embedded text?
- 2) Is there a significant difference in the way African American and Caucasian students with disabilities read culture-embedded text?

## Methodology

### Context

Participants were seventh or eighth grade students who received special education services in one of seven public schools in a high poverty school district located in western New York. Students were recruited from special education classrooms. To be eligible to participate, students had to meet three criteria. First, they had to have a Learning Disability (as determined by state and federal guidelines). Second, they had to be identified as “black”/African American or “white”/Caucasian on school records. Third, they had to be enrolled in school as a student in grade seven or eight. Fifty-six students participated. Descriptive statistics indicate that 29 students were African American and 27 were Caucasian. Seventeen of the 56 read at or above the third grade reading level (Woodcock-Johnson scores). See Table 1 for participant demographics.

**Table 1.**  
*Demographics*

Variable	N	African American	Caucasian	Pearson $\chi^2$
Gender				1.7857
Male		19	14	$p=.1814$
Female		10	13	
Age				9.5714
14 yrs old		13	13	$p=.0083$
15 yrs old		13	9	
16 yrs old		3	5	
Woodcock-Johnson Score				2.3929
Less than 3.0		8	9	$p=.3023$
3.0 – 3.9		9	6	
4.0 and above		12	12	
Grade				1.7857
Seven		11	12	$p=.1814$
Eight		18	15	

### Procedures

**Passage Identification.** The researcher identified four excerpts from trade books deemed culturally diverse. Six education experts were surveyed to determine their opinion about the cultural perspective of each excerpt. Based on their assertions, three passages were designated or identified. Experts agreed that an excerpt from *The Gold Cadillac*, by Mildred Taylor, reflected an African American perspective. Similarly, an excerpt from *Stone Fox*, by John Reynolds Gardiner, was thought to reflect a Caucasian perspective. Experts collectively determined that an excerpt from *Bridge to Terabithia*, by Kathryn Paterson, reflected a Neutral perspective.

***Data Collection Procedures.*** Data collection was scheduled and completed within two weeks. Students were grouped by ethnicity and reading ability. School records were used to determine ethnicity. Woodcock-Johnson scores were used to determine reading ability (low =  $\leq$  grade 3, middle= grade 3 – grade 4; high= $\geq$  grade 4).

Each of the three graduate students met participants individually in a designated area outside the classroom. Researchers collected demographic and oral reading data. The text presentation was counterbalanced with the neutral text first, followed by either the African American text or the Caucasian text.

Attention to procedural reliability was given when a reliability checker listened to five randomly selected sessions conducted by three graduate students. This individual used a checklist of integral components for each session to ensure that procedures used matched procedures prescribed for the study. Procedural reliability = .93%.

Measurements

***Oral Reading Fluency.*** Oral reading fluency was rated using a fluency rating scale based on the work of Pinnell, Pikulski, Wixson, Campbell, Gough & Beatty (1995; p. 15). The fluency scale focuses on students' grouping of words or phrasing, adherence to the author's syntax or sentence structure, and expressiveness during oral reading. This dependent measure is included as a means for assessing the quality of students' oral reading. Level 1 represents word-by word reading. Level 2 represents two-word phrases with some three- or four-word groupings, which are awkward and unrelated to the larger passage context. Level 3 represents three- or four- word phrase groupings. Although phrasing seems appropriate, there is little or no evidence of expressive interpretation. Level 4 represents larger, meaningful phrase groups. Even with deviations, repetitions, the readers' syntax seems consistent with the authors; there is evidence of expressive interpretation.

To determine reading fluency for each passage, researchers listened to the recording twice before determining a fluency rating. Listening the first time acclimated data recorders to the vocal characteristics of the reader. Listening the second time allowed the data recorder to listen for reading fluency and record a fluency score. Inter-rater reliability for rating five participants was 76%. Follow-up discussion revealed a misunderstanding of scoring procedures, which accounted for the rate of agreement on this measure.

***Oral Reading Rate.*** Oral reading rate refers to the number of words correctly read in one minute. Data collectors used the Pinnell et al. (1995) procedure for calculation of oral reading rate. Repetitions and self-corrections of words are counted as correct. Words omitted or substituted, and not correct were considered oral reading errors. These were subtracted from the overall total of words correctly read per minute. Inter-rater reliability between two reliability raters was 82% (+/- two words). Differences in recording mechanisms and timepieces accounted for some variance in agreement.

***Oral Reading Deviations.*** Each participant's oral reading deviations score was the sum of substitutions, repetitions, omissions, insertions, and self-corrections. Substitutions included the addition or deletion of prefixes or suffixes to text as well as groups of text words substituted with one or more words. Substitutions of partial words were counted as omissions. Omissions were counted when the reader omitted a whole word. Omission of a series of text words in a single instance was considered one omission. Insertions were counted when the reader inserted a whole word or a single string of words at one location. A single word repetition or a single string of words were counted as a repetition. Self-corrections were marked as delineated.

***Meaning Changing Deviations.*** The meaning-changing deviations score refers to the numbers of meaning-changing deviations made during oral reading of each passage. Scorers located each deviation on the text transcript to determine whether the deviations resulted in a change in the meaning of the text. The criteria for determining meaning change included: 1) adherence to grammatical conventions of the sentence; 2) adherence to sentence meaning at the point where the deviation occurred; and 3) the relation of the deviation to the entire passage.

Two graduate students independently coded students' deviations (substitutions, repetitions, insertions, omissions, and self-corrections) and meaning changing deviations. Inter-rater reliability of meaning changing deviations was 93%. Differences in student diction and vocalization accounted for variation.

***Comprehension Scores.*** Comprehension scores were gleaned using students' answers to short constructed questions, which followed their reading of African American text and the Caucasian text. Primary trait scoring (acceptable or unacceptable) was used to determine comprehension scores (Langer, Campbell, Neuman, Mullis, Persky & Donahue, 1995). Inter-rater reliability in comprehension scoring was 81%. Variance can be accounted for by scorers' second-guessing their decisions about each item. Raters indicate that judging each item on its own merit was more difficult to score.

#### Study Design

To determine whether there is a significant difference in the oral reading fluency of African American students with learning disabilities, a Pearson's chi-square was run for each of three independent variables. A 2 x 3 x 2 multivariate analysis of variance statistical test was run to determine whether there is a significant difference in the reading performance, using CBM, for African American students with disabilities when reading culturally cued text. Independent variables were ethnicity, reading ability, and passage. Dependent variables used in this study were oral reading fluency (ORF), oral reading deviations (ORD), meaning-changing deviations (MCD), and comprehension (C).

### ***Results***

**Research Question 1:** *Is there a significant difference in the oral reading fluency of African American and Caucasian students with disabilities when they read culturally cued text?*

Pearson's chi-square test were run to assess oral reading fluency for ethnicity: Gold Cadillac  $\chi^2 = .28969$ , 3 df,  $p = .96196$ ; for Stone Fox  $\chi^2 = 4.317$ , 3 df,  $p = .22917$ . There is no significant difference in the oral reading fluency of African American and Caucasian students with disabilities when they read culturally cued text.

**Research Question 2:** *Is there a significant difference in reading performance for African American students and Caucasian students when reading culturally cued text?*

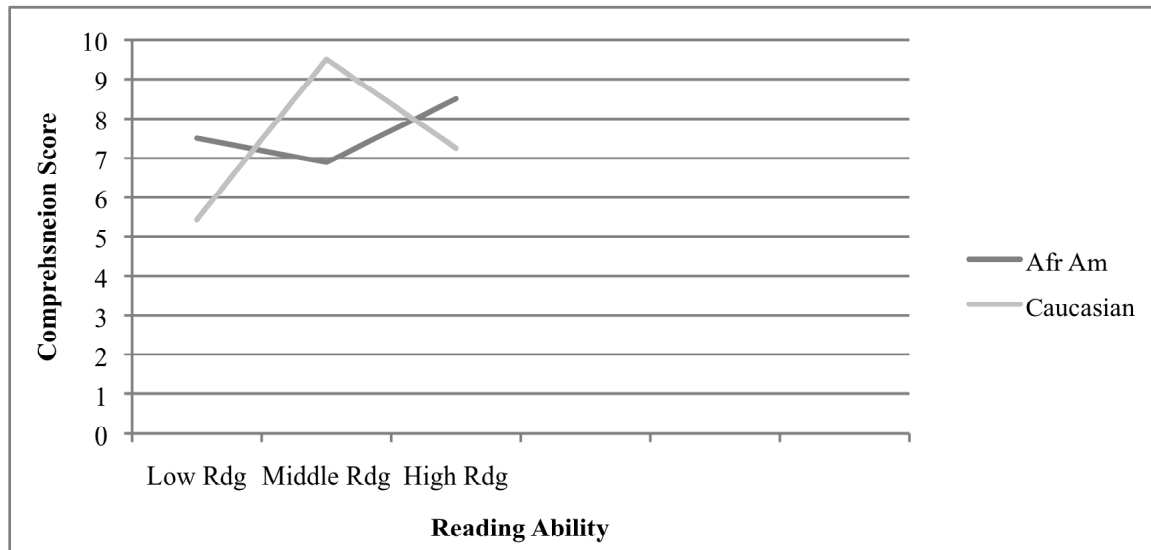
A 2 x 3 x 2 multi-variate analysis of variance (MANOVA) yielded a significant multivariate for ethnicity x ability x passage:  $F(6,96) = 2.48$ ,  $p = .03$ . Significant univariate main effects for comprehension were:  $F(2,50) = 5.52$ ,  $p = .01$  (Table 2).

**Table 2.**  
*Skeletal Source Table*  
*2/x/3x2 MANOVA*

2 x 3 x Oral Reading Dependent Variables										
Multivariate Analyses				Univariate Analyses						
					Comprehension		WPM		MC Dev	
Variable	<i>df</i>	<u>F</u>	<b>P</b>	<i>df</i>	<u>F</u>	<b>P</b>	<u>F</u>	<b>p</b>	<u>F</u>	<b>P</b>
Ethnicity	3,48	.56	.65	1,50	.07	.79	.06	.81	1.36	.25
Rdg Ability	6,95	6.28	.00	2,50	3.36	.05	12.09	.00	15.39	.00
Passage	3,48	20.45	.00	1,50	54.61	.00	9.84	.00	3.74	.06
Eth x Rdg Ability	6,96	2.29	.04	2,50	2.52	.09	.39	.68	3.31	.05
Eth x Passage	3,48	.83	.49	1,50	.15	.70	.58	.45	1.26	.27
Rdg Ability x Passage	6,96	2.33	.04	2,50	.90	.41	6.09	.00	.52	.60
Eth x Rdg Ability x Passage	6, 96	2.48	.03	2,50	5.52	.01	2.29	.11	.30	.74

African American Low Ability readers' mean scores reflect two more accurately answered questions (7.5) more than Caucasian Low Ability readers (5.44) on the comprehension measure for *Gold Cadillac* than Caucasian Low Ability readers (Figure1). The trend line is curvilinear for African American readers and Caucasian readers. African American Middle readers' mean scores reflect three fewer accurately answered questions (6.89) than Caucasian Middle readers (9.5). African American High readers' mean scores reflect one more accurately answered question (8.5) than Caucasian High readers (7.25).

**Figure 1. Ethnicity x Reading Ability x Passage**  
*Gold Cadillac* (Comprehension)



The statistical test yielded a significant multivariate for ethnicity x reading ability interaction:  $F(6,96)=2.29, p=.42$ . Significant univariate main effects for meaning-changing deviations  $F(2,50)=3.3312, p=.045$ . African American Low Ability readers' mean M-C Deviation score reflects eight fewer meaning-changing deviations (15) than Caucasian Low Ability readers (23.67) when reading the *Gold Cadillac* text (Figure 2). The trend line for African American readers is consistent with expectations—the mean score for Low Ability readers reflects more meaning-changing deviations than Middle Ability (11.11) and High Ability readers (5.83). That is not the case for Caucasian readers. The trend line reflects the dramatic difference in meaning-changing deviations for Caucasian readers. Middle Ability readers' mean M-C Deviation score was 6.83 and 4.33 for High Ability readers.

### *Summary*

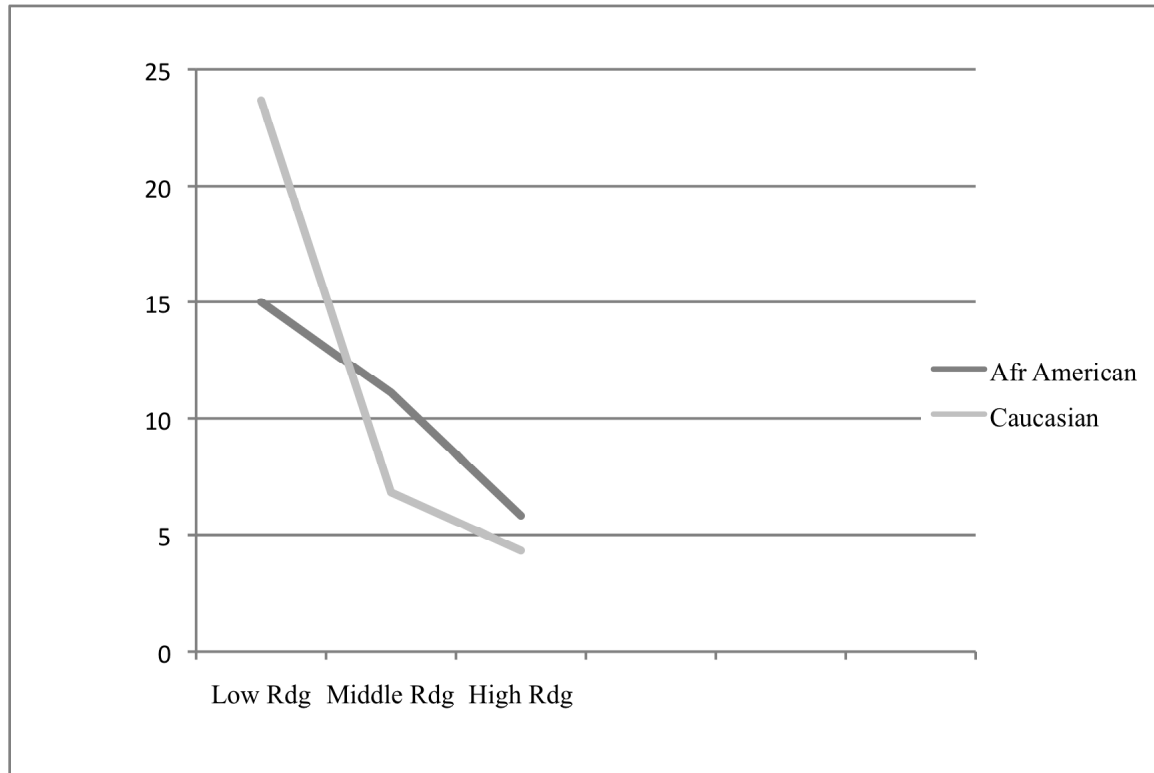
There were no significant main effects for ethnicity in Oral Reading Fluency. There were two-way interactions for reading ability x passage and reading ability x ethnicity. Reading ability, to some extent, is dependent upon cultural cues embedded in text.

### *Discussion*

The results of this study substantiate the importance of using multiple measures to assess the reading process. Over-reliance upon one measure could thwart performance results for African American students with learning disabilities. This may be the case for students from other cultural backgrounds. Oral reading rate, accuracy, and



**Figure 2. Ethnicity x Reading Ability: *Gold Cadillac***  
(MC Deviations)



comprehension are well established as reliable curriculum-based measurements. Much research has been done to substantiate each as standalone measures of student performance. However, any one of these alone, may not be effective. They must be employed collectively to provide insight into reading.

Findings also suggest that African American students with learning disabilities who struggle with reading may use cultural connections with text to make sense of what they read. Findings presented here are consistent with findings by Lee & Majors (2000) and Lee (1995), which suggest that struggling readers draw upon cultural perspective to navigate learning experiences. When they personally engage, they draw upon historical and present experiences. The schema informs the reader, thereby connecting him/her to a frame of reference useful during the oral reading process. While all students may draw upon prior experiences when reading culturally cued text, access to such text is less important for middle and high ability readers with learning disabilities. Rather, access to culturally-cued text provides much needed support.

The findings of this study are consistent with Rosenblatt's transactional theory and Vygotsky's theory of sociocultural learning. Struggling readers draw upon cues and

nuances familiar to them to interpret what they read. Rosenblatt calls this a transaction with the text. According to Vygotsky, the way one interprets any given situation rests within previous sociocultural experiences. Past experience informs one about what is present. When it comes to reading text, what the symbols mean to the reader is inherent within the readers. The meaning of the text is embedded in the experience of the reader, not the text itself.

Socio-cultural perspective is an important consideration when assessing student performance and proficiency. Study results indicate that low achieving African American students with learning disabilities perform differently when familiar cultural cues are embedded in text. This study suggests the importance of incorporating reading materials, which scaffold the cultural perspective of struggling readers. A move toward the use of culturally sensitive materials for African American students with disabilities could impact literacy assessment practices.

This study suggests further study in three areas. First, researchers could investigate whether students with learning disabilities have access to culturally cued text during learning, instruction, and assessment. Secondly, researchers could examine classroom resources to investigate the amount of culturally cued text available to students. Finally, researchers could also examine the impact of reading multicultural text on oral reading behaviors for African American students.

### ***Conclusion***

Curriculum based-measurements are reliable measures of reading performance. However, they may not be reliable performance indicators for African Americans students who read unfamiliar text. For this reason, the investigation of cultural perspective cannot be underestimated when assessing the way students read text. Students with disabilities need access to a variety of texts from diverse cultural perspectives. Generalizations about student reading ability must be contextualized in discussions about the presence or absence of cultural cues in text to be read.

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