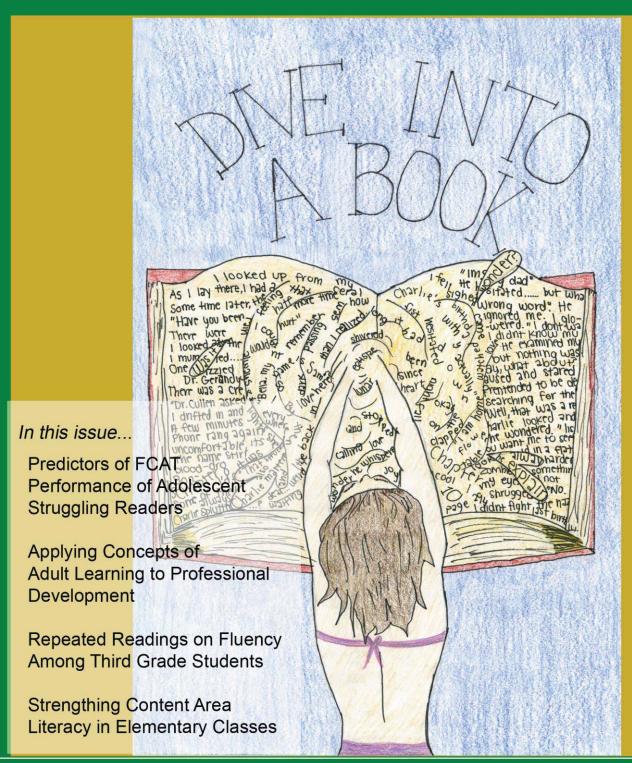
# The RIDALING STATES





#### **Volume 48, No. 2, Spring 2012**

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# .PREDICTORS OF FCAT PERFORMANCE OF ADOLESCENTS WHO STRUGGLE WITH READING

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Abstract: The purpose of this study was to identify reading factors that influence performance on the Florida Comprehensive Assessment Test (FCAT). Participants were 11th graders, mostly Hispanic (96%), who had failed the FCAT once or multiple times. Results indicate the FCAT correlates with the Woodcock Johnson III (WJIII) broad reading test, suggesting it is a valid measure of broad reading. Scores on the phonemic awareness, word attack, reading vocabulary, and passage comprehension subtests from the WJIII Tests of Achievement, as a set, can provide preliminary decision making data. The results suggest vocabulary is a strong predictor of FCAT performance.

Most children learn to read easily; however, many experience difficulty in learning to read (Juel, 1988; Torgesen, 2004a,b, 2005). It is estimated that "8 million youngsters between fourth and twelfth grade struggle to read at grade level" (Biancarosa & Snow, 2004, p. 3). In an attempt to remedy the reading problem and raise standards for student learning, our nation has participated in many campaigns for change. Due to the requirements of the No Child Left Behind Act of 2001, there has been an increased focus on students' performance on measures of reading achievement. Current efforts focus on state accountability systems and high-stakes tests are used with U.S. students like never before (Kohn, 2000; Neill & Medina, 1989).

In Florida, the Florida Comprehensive Assessment Test (FCAT), a comprehension test designed to measure reading achievement, is the high-stakes accountability test (Florida Department of Education [FLDOE], 2012). Florida is no stranger to high-stakes graduation tests or its influences (See Borg, Plumlee, & Stranahan, 2007). Florida was one of the first states to institute a minimum competency graduation test (Bond & King, 1995). Florida is still currently considered a "leader in the high-stakes testing movement" (Myers & Curtiss, 2003, p. 70).

Since reading achievement is being used for high-stakes decision making, there is a need to examine how performance on well-established measures of reading associates with performance on high-stakes measures of reading. The National Reading Panel (National Institute of Child Health and Human Development [NICHHD], 2000) has identified five core areas critical to successfully teaching children to read - phonemic awareness, phonics, fluency, vocabulary, and comprehension. This study focused on the contributions these core areas make to reading achievement, as measured by the FCAT Grade 10 Reading Test.

## Research Related to Predicting High Stakes Test Scores in Florida

The FCAT is part of Florida's assessment program. In 1999, the FCAT replaced the High School Competency Test (HSCT), the previous graduation requirement which tested basic knowledge (Grech, 2002). In 2003, the FCAT became a gatekeeper to graduation. The criterion-referenced FCAT measures student success with the Sunshine State Standards (FLDOE, 2012). At present, Florida's K-12 statewide assessment program is transitioning to the implementation of FCAT 2.0 and End-of-Course assessments to measure success on the Next Generation Sunshine State Standards (FLDOE, 2012).

According to Torgesen (2005), there are two qualities about the FCAT that pose difficulties for many students. First, the FCAT places high demands on vocabulary. Second, it

places particular demands on reading fluency because the test requires students to read lengthy passages. Torgesen (2004b) examined the reading and language factors that most strongly related to individual variability in performance on the FCAT at grades 3, 7, and 10, and what reading and language factors are most deficient in students who perform below grade level on the FCAT. The findings indicated that the FCAT is sensitive to differences among children in verbal knowledge and reasoning ability as they become older and it identifies students who are both more accurate and fluent readers and who have more knowledge and reasoning ability.

Torgesen (2004a) has also identified six attributes responsible for adolescents' low FCAT performance. The first attribute is an inaccurate reading of passages due to lack of sight words or word attack strategies. The second attribute is slow, dysfluent reading that prolongs the time necessary to comprehend what is being read. A third attribute is limited vocabulary knowledge. Torgesen believes that struggling readers do not know the meanings for enough words that appear on the FCAT, nor are they able to access the layers of meaning for those words when they appear in different contexts. A fourth attribute is limited content knowledge essential to construct new knowledge when reading new passages. The inability to construct new knowledge comes from limited domain-specific knowledge. A fifth attribute is limited use of comprehension strategies to monitor and repair comprehension when it breaks down. A lack of this knowledge impedes comprehension. Last, is a limited ability to engage in higher order thinking. The FCAT, at each grade level, increases the percentage of higher order inferential/reasoning questions; at 10th grade, 70% of the questions require higher order thinking skills (Torgesen, 2004a).

In a technical report of the Florida Center for Reading Research (FCRR), Buck, Torgesen, and Schatschneider (n.d.) attempted to determine how useful students' prior

performance on the FCAT was in helping to identify students who were likely to struggle on the subsequent year's FCAT. For Grades 3, 4, and 5, the researchers were able to develop a formula to determine the probability that a student would perform adequately on the FCAT Sunshine State Standards (FCAT-SSS) based on the previous years' scores. The findings indicated that the "previous year's FCAT performance or another reliable measure of reading comprehension is an excellent way to identify students who are likely to need special support if they are to break the pattern of inadequate performance on these tests" (p. 14). In other words, the researchers propose that performance on the FCAT should correlate with other measures of reading comprehension. Thus, since reading achievement is used for high-stakes decision making, examination of the contributions of core areas of reading to FCAT performance is vital.

#### Method

The purpose of this study was to examine the contributions core areas of reading make to reading achievement as measured by the FCAT Grade 10 Reading Test. The research question was: What is the relationship between students' performance on broad reading tasks (as assessed by the Woodcock Johnson III Tests of Achievement) and the FCAT Grade 10 Reading Test?

Setting and Sample

Miami-Dade County Public Schools (M-DCPS) is the fourth largest school district in the nation. It employs over 21,000 teachers and serves over 350,000 students in pre-kindergarten through 12th grade. Its student membership is 66% Hispanic, 24% Black Non-Hispanic, 8% White Non-Hispanic, 2% Other (i.e. Asian, Pacific Islander, American Indian, and Multiracial; MDCPS, 2012). The study was conducted at Clark Senior High School (pseudonym), a school serving 3,500 ninth through twelfth graders. Its student population is diverse - 67% Hispanic, 19% White, 12% Black, and 2% Asian. In addition, 27% of the

students qualified for Free/Reduced Lunch and 11% were English language learners (ELLs).

There were 779 students in the 11th grade class. Almost 52% of the 11th graders failed the 10th grade FCAT. Of those 402 students who failed the FCAT, 377 were listed to retake the FCAT. Of the 377 students, 330 took the reading portion of the FCAT, with 90 of them passing the test. Thus, there was a group of 240 11th grade students remaining who had not passed the FCAT. This represented 31% of the 11th grade class. The researcher invited the 240 students to participate in this study. Participation was voluntary. Out of the 240 students, 133 students (55% of the targeted sample) returned signed permission forms. Of the 133 students, 14 students withdrew from school, three students stopped attending school, 59 refused to participate, and 57 agreed to participate, with 55 completing the study. Of the 55 students who completed the study, 23 were males (42%) and 32 were females (58%). One student was African American, one was Asian, and the remaining 53 students were Hispanic (96%).

#### Procedure and Instrumentation

Four graduate students and the researcher established an inter-rater reliability of .90 in administering and scoring the tests. The researcher checked the test scoring before SPSS database entry. Each student was individually assessed during a 90-minute session in the high school's media center that began with an icebreaker and continued with the administration of the broad reading tests from the Woodcock-Johnson III Tests of Achievement (WJ III ACH; Woodcock, McGrew, & Mather, 2001). The broad reading tests include letter-word identification, reading fluency, and passage comprehension from the standard battery and word attack and reading vocabulary from the extended battery. The WJ III ACH is an established test with data supporting its validity (Mather & Woodcock, 2001).

Mean scores for the criterion-referenced FCAT are reported on a scale of 100 to 500.

Student FCAT Grade 10 Reading Test scores provided by the school district were used.

Design and Data Analysis

To address the research question, relationships were evaluated between performance on the broad reading tests from the WJ III ACH standard battery (i.e., letterword identification, reading fluency, and passage comprehension) as well as two tests from the extended battery (i.e., word attack and reading vocabulary) and FCAT scores. Following evidence in previous studies, descriptive as well as simple and multiple correlation analyses were documented and reported.

#### Results

Means and standard deviations for student performance are in Table 1. According to the WJ III, average scores range between 90 and 110. The majority of the students in this sample scored well below this range. The subtests of the WJ III with scores that enter into calculation of the Broad Reading measure evidenced strong reliability in this sample. Reliability estimates calculated for the population of this study using Cronbach's alpha were .88 for letter-word identification, .96 for reading fluency, and .89 for passage comprehension. Correlations (see Table 2) between these core area predictor variables and FCAT performance were statistically significant and moderate (range .28 - .56) reflecting small effect sizes (r2) between .08 and .31. The relationships among the predictor variables were generally higher (.40 - .96).

A summary of the regression analysis is in Table 3. Residual plots were examined, and it was determined that linearity and homoscedasticity assumptions were not violated. The multiple regression omnibus test with all predictors included was statistically significant, F(4,50) = 6.180, R2 = .33, p < .001. The coefficient of determination, R2, can be interpreted to mean that the variables, as a set, accounted for 33 percent of the variance in the scores of the FCAT Grade 10 Reading Test

Table 1			
WJ III Test and Subtest Means and S	Standard De	viations	
Variables	<u>M</u>	<u>SD</u>	n
Derived Sc	ores		
WJIII Verbal Ability	73.29	14.33	55
WJIII Phonemic Awareness	82.38	13.44	55
WJIII Broad Reading	78.47	13.23	55
WJIII Basic Reading Skills	87.31	13.58	55
WJIII Reading Comprehension	69.65	55	
Subtest	S		
WJIII Letter-Word Identification	88.25	17.04	55
WJIII Reading Fluency	78.87	11.05	55
WJIII Passage Comprehension	65.36	23.86	55
WJIII Word Attack	84.69	11.93	55
WJIII Reading Vocabulary	75.76	13.58	55
<u> </u>			

[FCAT Reading Score = 130.80 + 2.08(reading vocabulary) + -.63 (phonemic awareness) +.27 (word attack) +.08 (passage comprehension)]. A second stepwise regression [FCAT = 120.67 + 1.89 (reading vocabulary)]indicated that reading vocabulary accounted for 31 percent of variance in FCAT scores and that the additional variance accounted for by adding phonemic awareness, word attack, and passage comprehension scores to the model was judged trivial (i.e., accounting for less than 5% of additional variance). Although phonemic awareness had a positive and statistically significant correlation with the FCAT, its beta was negative in the regression equation. This was most likely due to multicollinearity or high relationship between some predictor variables in the equation. In an attempt to reduce multicollinearity and thereby obtain a more

clearly interpretable analysis, several additional regression analyses were performed, each systematically removing one of the predictor variables. Each time a variable was removed, the resulting equation included a negative beta value for another independent variable. In summary, reading vocabulary was the only independent variable that contributed unique variance to prediction of the dependent variable. This can be interpreted to mean that all things being equal, unit increases in reading vocabulary are associated with FCAT increases of about 2 points. Put another way, reading vocabulary score was a significant and best predictor of FCAT performance for students participating in this study.

#### Discussion

The significant association between the scores on the FCAT Grade 10 Reading Test and the broad reading measure on the WJ III reveals a small amount of shared variance (23%) between scores obtained with these instruments. This finding is surprising given that both are purported to be

general measures of reading ability. A possible reason for the unaccounted for variance is that the sample data are characterized by restriction of range, in that students' scores were all at the low end of the range of possible scores on the test. Also, the content and test structure of these measures may be different; therefore, potentially measuring different constructs. Another result of this study is that as a set, phonemic awareness, word attack, reading vocabulary, and passage comprehension explain approximately 33% of the variation in FCAT scores. Interestingly, the observed variance accounted for by these variables as a set, exceeded the variance accounted for by broad reading. In addition, they explained more of the variability in the FCAT scores than did any of the other variables individually; however, a large amount of variability

Table 2										
Pearson Prod	duct Correlat	ions Among	Variables							
Measures	verbabil	phonawar	brdread	bascread	readcomp	ltwrdid	rdfluncy	passcomp	wrdattck	readvoo
fcat	.38**	.29*	.48**	.28*	.53**	.25	.51**	.47**	.31*	.56**
verbabil		.71**	.74**	.49**	.87**	.45**	.68	.80**	.47**	.86**
phonawar			.66**	.51**	.69**	.47**	.60	.65**	.51**	.67**
brdread				.84**	.85**	.81**	.90**	.83**	.72**	.78**
bascread					.55**	.96**	.62**	.54**	.85**	.52**
readcomp						.52**	.75**	.97**	.54**	.95**
ltwrdid							.55**	.52**	.69**	.48**
rdfluncy								.70**	.63**	.74**
passcomp									.51**	.83**
wrdattck										.52**
readvoc										
									4 4 14	

Note: \*\* = correlation is significant at the 0.01 level. \* = correlation is significant at the 0.05 level. fcat = FCAT. verbabil = verbal ability. phonawar = phonemic awareness. brdread = broad reading. bascread = basic reading skills. readcomp = reading comprehension. ltwrdid = letter-word identification. rdfluncy = reading fluency. passcomp = passage comprehension. wrdattck = word attack. readvoc = reading vocabulary.

remained unexplained. It may be concluded that for adolescents it may not be possible to separate the core systems of reading that contribute to comprehension; on the other hand, the majority of the variance is still unaccounted for. Another result of this study is that reading vocabulary uniquely captures 10.3% of the variability in the FCAT scores. This finding is consistent with other research indicating that there is a strong relationship between vocabulary and comprehension (Anderson & Freebody, 1981; Baumann, 2005, Davis, 1983; Nagy, 1988). Thus, it can be predicted that 11th graders who have poor performance on the reading vocabulary subtest of the WJ III ACH may also perform poorly on the FCAT Grade 10 Reading Test.

#### Limitations

Other factors that affect test performance (i.e. test-wiseness, passage dependency, genre, and length, task demands, test anxiety, written responses) were beyond the scope of this study.

## **Implications and Recommendations for Improvement of Practice**

An important finding of this study suggests that reading vocabulary is a strong predictor of performance on the FCAT. The results of this study concur with the plethora of research that supports providing students with rich experiences and teaching general vocabulary and content area vocabulary in order to improve reading comprehension. Thus, an emphasis on reading vocabulary instruction provided within the context of meaningful

Table 3						
Regression Analysis Summary Tab	ole					
7	В	SE B	β	T	P	Semi-Partial <sup>2</sup>
WJIII Phonemic Awareness	63	.56	19	-1.13	.26	0.02
WJIII Passage Comprehension	.08	.41	.04	.18	.86	0.00
WJIII Word Attack	.27	.54	.07	.50	.62	0.00
WJIII Reading Vocabulary	2.08	.75	.62	2.77	.01	0.10

Note. R = .58,  $R^2 = .33$ .

reading tasks that require the enactment of all the core reading systems for reading comprehension to occur is recommended.

At the secondary school level, the global reading score provided by the FCAT on its own may identify students who need support in reading, and the cluster scores may identify the general areas in which a student needs assistance, but more sensitive diagnostic measures are needed to pinpoint the contents of the core systems of reading in most need of remediation. It is imperative to identify students who struggle with reading before they fail the FCAT. The inclusion of diagnostic tests of vocabulary would be beneficial upon entrance into high school.

Additionally, consistent and purposeful interventions are necessary. For adolescents who struggle with reading, comprehensive and balanced reading programs that devote attention to all the core areas of reading are necessary. There are high school appropriate, research-based interventions (e.g., Language! Project, Fell-Greene, 1998) and research-based strategies, for example, Peer-Assisted Learning Strategies (Fuchs, Fuchs, & Kazdan, 1999), Collaborative Strategic Reading (Klingner, Vaughn, Dimino, Schumm, & Bryant, 2001), Questioning the Author (McKeown, Beck, & Worthy, 1993), and Reciprocal Teaching (Palinscar & Brown, 1984) that focus on the core skill areas as a student enacts reading.

Lastly, instructional materials need to be age-appropriate for the student's independent reading and vocabulary level and instruction needs to be differentiated to meet each student's reading needs. As Buly and Valencia's (2002) study found, students in the same classroom may look similar in terms of test performance, but their strengths and weaknesses may differ because each has progressed through distinct patterns of learning to read. Instruction must be re-arranged so that one core area receives attention as the student engages in meaningful reading tasks that require the coordination of all areas of reading.

## Implications and Recommendations for Research

The results of this study do not provide support for the idea that posited constituent components of skilled reading - phonemic awareness, phonics, reading vocabulary, fluency, and passage comprehension – make unique and separable contributions to overall reading achievement of adolescents who are poor readers. Additional research is warranted. Also, more research is needed to identify tests that correlate with and predict FCAT performance especially with the introduction of the FCAT 2.0 and the Next Generation Sunshine State Standards. Other feasible measures are needed to identify students' strengths and weaknesses before they fail (cf. Stanley & Stanley, 2011). Successful interventions could lead to improved achievement and proficiency in reading and to fewer students failing the FCAT and an increase in graduation rates. Moreover, the context of high-stakes testing cannot be ignored. Future research needs to aggressively address the issue of adolescents' reading proficiencies and statewide tests. The stakes are high at the secondary level; remediation is of an essence and time is limited. For the students in this study, "time was up," but for their peers, good news: improvement in vocabulary relates strongly to improvement on high-stakes tests of reading.

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