



Predictive and Concurrent Relationships of the K-2 Florida Assessments for Instruction in Reading (FAIR) to the 3-12 FAIR and the FCAT

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The K-2 FAIR is a classroom teacher delivered battery of early reading and pre-reading skills used by the State of Florida in both a screening and progress monitoring capacity. As part of its screening battery, students in kindergarten through grade 2 are assessed throughout the year on a statistically optimized combination of letter name knowledge, letter sound knowledge, phonological awareness and word reading skills. A resulting probability of reading success (i.e., PRS) score is provided which is designed to predict to the 40th percentile on the Stanford Achievement Test. Students with scores <15% are identified as at high-risk for developing future reading problems, scores between 16% and 84% are at moderate risk, and >84% are at low risk. Subsequent to the administration of the Broad Screen, students who are at moderate or high risk are placed into various tasks within the Broad Diagnostic and Targeted Diagnostic Inventories. The technical adequacy of the FAIR has been previously reported (Buros Center for Testing, 2010; Florida Department of Education, 2009), which pertain to the psychometrics of the individual tasks, and predictive validity specific to the alignment of the Broad Screen to the Stanford Achievement Test.

As students move from the K-2 FAIR into the 3-12 FAIR, questions of how well students' pre-reading and early reading skills predict reading skills measured by both the 3-12 FAIR and the Florida Comprehensive Assessment Test (FCAT) become increasingly relevant. Because several score types within the K-2 FAIR systems are used for individual and class level instructional decision-making, an empirical analysis of the predictive relationship of K-2 FAIR score types will illuminate the extent to which scores may be used to measure more future reading skills.

The following research questions were proposed:

- 1) What is the relationship between Grade 2 PRS in the fall and spring and spring Grade 3 performance on the FAIR Reading Comprehension, FAIR Spelling, FAIR Maze, and FCAT tests?
- 2) What are the relationships among Kindergarten PRS in the fall and spring with their Grade 1 fall and spring PRS? What are the relationships among Grade 1 PRS in the fall and spring with their Grade 2 fall and spring PRS?
- 3) How well does the FAIR PRS in Kindergarten and Grade 1 predict low risk status on the FAIR PRS in the following year?
- 4) What is the relationship between students' PRS in K-2 and placement into the Broad Diagnostic Inventory Reading/Listening Comprehension Task?
- 5) What is the likelihood that a Grade 2 student who meets the PRS benchmark will score at or above Achievement Level 3 on FCAT Reading?

In order to address the research questions, a cross-sequential design was used to draw three longitudinal samples from SY0910 and SY1011. The first group was comprised of 120,619 students who were in kindergarten during SY0910 and in grade 1 during SY1011; the second group was 128,451 grade 1 students in SY0910 and grade 2 in SY1011; and the final sample was 112,878 grade 2 students in SY0910 and grade 3 in SY1011.

Research Question 1: *What is the relationship between Grade 2 PRS in the fall and spring and spring Grade 3 performance on the FAIR Reading Comprehension, FAIR Spelling, FAIR Maze, and FCAT tests?*

A simple correlation matrix was generated among the Grade 2 PRS scores and the Grade 3 measures; results are reported in Table 1.

Table 1. Correlations between the Grade 2 Fall and Spring PRS with Grade 3 Outcomes

Grade 3 Test	Grade 2	
	Fall PRS	Spring PRS
FCAT	0.60	0.60
FAIR RC	0.55	0.55
FAIR WA	0.63	0.62
FAIR Maze	0.67	0.66

The longitudinal correlations suggested that a strong relationship is estimated between grade 2 and grade 3 scores. The strongest associations were observed between the fall and spring PRS scores in grade 2 and performance on the FAIR Maze task (i.e., text reading efficiency) in grade 3. Importantly, the correlation between grade 2 PRS and performance on the FCAT was $r = 0.60$, indicating that students with high PRS scores in grade 2 tended to perform well on the FCAT in grade 3. An explanation for the consistent correlations for fall and spring PRS associations to the grade 3 outcomes was that a very strong relationship existed between the two scores (i.e., $r = 0.76$).

Research Question 2: *What are the relationships among Kindergarten PRS in the fall and spring with their Grade 1 fall and spring PRS? What are the relationships among Grade 1 PRS in the fall and spring with their Grade 2 fall and spring PRS?*

As before, a correlation matrix was generated to estimate the four correlations of interest. Because these associations were a function of fall and spring over two years, it was expected that the strongest correlation would occur between closest time-points (i.e., spring kindergarten PRS and fall grade 1 PRS), while the weakest correlation would be observed for the time-points furthest from each other (i.e., fall kindergarten PRS and the spring grade 1 PRS). The results from Table 2 for kindergarten-grade 1 supported this hypothesis with a $r = 0.62$ correlation estimated between the two closest time-points, with more moderate associations

occurring for the 1-year longitudinal correlation (i.e., $r \approx 0.50$ for fall to fall and 0.54 spring to spring), and the lowest correlation observed for the 2-year correlation ($r = 0.39$).

Table 2. Correlations between Fall and Spring PRS in Kindergarten and Grade 1

Grade 1	Kindergarten	
	Fall PRS	Spring PRS
Fall PRS	0.50	0.62
Spring PRS	0.39	0.54

A similar trend occurred for the grade 1 longitudinal group (Table 3); however, the strongest correlation existed for the 1-year fall correlation ($r = 0.62$). A large correlation was still estimated for the short spring-fall correlation ($r = 0.57$), with moderate associations for the 1-year spring correlation and 2-year correlation ($r = 0.54$ and 0.39, respectively).

Table 3. Correlations between Fall and Spring PRS in Grade 1 and Grade 2

Grade 2	Grade 1	
	Fall PRS	Spring PRS
Fall PRS	0.62	0.57
Spring PRS	0.39	0.54

Research Question 3: *How well does the FAIR PRS in Kindergarten and Grade 1 predict low risk status on the FAIR PRS in the following year?*

This question was addressed by conducting a logistic regression analysis where the outcome scores were dichotomized to be “0” when the PRS was <85, which represented moderate/high risk, and “1” when ≥ 85 to represent low risk. This value was then predicted by the previous year PRS score to estimate how much of the pseudo-variance in risk status was explained by prior year PRS performance. Tables 4 and 5 provide the summary of findings for the kindergarten-grade 1 and grade 1-grade 2 cohorts.

Table 4. Proportion of Pseudo-Variance in Future Risk Status Predicted by Current PRS in Kindergarten to Grade 1

Grade 1	Kindergarten	
	Fall	Spring
Fall	22%	
Spring	16%	21%

Table 4 demonstrates that between 16% and 22% of the pseudo variance in risk status was explained by prior year performance. As a contextual marker, Cohen (1988) indicated that between 2% and 14% constitutes a small proportion explained, 14% to 21% is moderate, and

greater than 21% is large. Subsequently, a moderate to large proportion of why students met the future benchmark was explained by prior year performance.

Table 5. Proportion of Pseudo-Variance in Future Risk Status Predicted by Current PRS in Grade 1 to Grade 2

Grade 2	Grade 1	
	Fall	Spring
Fall	30%	
Spring	21%	20%

Similarly, Table 5 highlights that a large proportion of pseudo-variance in grade 2 risk status, ranging from 21% to 30%, was explained by students’ grade 1 PRS performance.

Research Question 4: *What is the relationship between students’ PRS in K-2 and placement into the Broad Diagnostic Inventory Reading/Listening Comprehension Task?*

In the process of the K-2 FAIR system, students scoring <85 on the PRS score are placed into a battery of follow-up assessments in the Broad Diagnostic Inventory. One such task is a Listening/Reading Comprehension task, into which students are placed as a function of performance on a sight word reading list. Because pre- and early reading skills should be aligned to appropriately decodable passages, the relationship between students’ basic reading skills and passage placement was estimated through correlations. Table 6 presents the findings from this analysis.

Table 6. Descriptive Statistics and Correlations for PRS and Comprehension Placement

Score Type	Grade 1	Grade 2
Passage Correlation	0.67	0.93
PRS Mean	76	66
PRS Max	96	99

A strong association was observed in grade 1 ($r = 0.67$), and a nearly perfect association existed in grade 2 ($r = 0.93$). For grades 1 and 2, higher PRS scores were associated with being matched to passages which were more challenging, indicating appropriate placement according to their early reading skills.

The correlation between the PRS in kindergarten with the Passage Placement was not estimated because the listening comprehension passage in the spring of kindergarten is fixed. As such, any student with a PRS score <85 would be assigned to the same passage, and a correlational analysis would not provide any insight into the relationship between PRS and listening comprehension. For students with a PRS score ≥ 85 , they are able to be placed into

the grade 1 reading comprehension test as a function of reading a word placement list. According the data, nearly 80% of kindergarten students at AP3 placed into a grade 1 reading comprehension passage (i.e., 94,187 out of 120,619 students), with approximately 50% of those students ($n = 48,916$) reading the median passage. As part of the reading comprehension assessment, students are presented with five questions pertaining to the stimulus passage. On average, students who placed into any grade 1 passage correctly answered 60% of the presented questions.

Research Question 5: *What is the likelihood that a Grade 2 student who meets the PRS benchmark will score at or above Achievement Level 3 on FCAT Reading?*

To address this question, students' scores on the FCAT were dichotomized such that performance less than level 3 was scored as "0" and performance at or above level 3 was scored as "1". Of the 37,049 students who had a .85 or greater PRS at the end of Grade 2, 34,762 (i.e., 94%) scored at or above Achievement Level 3 on FCAT Reading.

Summary

The present set of analyses were conducted to examine concurrent relations of selected K-2 FAIR subtests as well as the predictive validity of the K-2 PRS to the FCAT and the 3-12 FAIR components. Results suggested that the PRS is highly stable across the year ($r = 0.75$) and that it maintains a strong overall predictive relationship to the FCAT ($r = 0.60$). Moreover, for students who meet the benchmark goal of PRS ≥ 85 at the end of grade 2, there is high likelihood for scoring at or above Achievement Level 3 on FCAT Reading. Such results indicate that the K-2 FAIR demonstrates adequate one and two-year predictive validity, and holds significant promise as a screen for FCAT performance.

As data are continually collect through the PMRN, it will be possible to test correlations between the FCAT and FAIR grade 1 and kindergarten data. Because longitudinal data are necessary to conduct such analyses, we anticipate the ability to test grade 1 predictions to the FCAT at the end of the 2011-12 academic year, and kindergarten associations at the end of the 2012-13 academic year.

The results from the kindergarten analyses suggested that students are able to read well and comprehend text designed for students in grade 1. The implications of the reading advances students are making in kindergarten will be better understood in its relationship to FCAT, which will be studied in future years, but may demonstrate that early instruction in decoding and sight word reading skills relates to greater reading comprehension.

References

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