

Early Learning Coalition of Duval

Report
2006-07



Early Learning Coalition
of Duval



THE EARLY LEARNING COALITION OF DUVAL 2006-2007

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PART I

**THE EARLY LEARNING COALITION OF DUVAL PRESCHOOL PROGRAM EVALUATION:
2006-2007**

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Introduction

There is increasing recognition by parents, policymakers, business leaders, and the general public of the importance of children's first 5 years of life in promoting their healthy physical, emotional, social, and cognitive development. Recent research documents the importance of the quality and frequency of early learning opportunities to children's school readiness and later school success. Finally, cost-benefit studies report that the economic return for high-quality preschool interventions is higher than other youth-centered interventions.

The *Early Learning Coalition of Duval, Inc.* (ELC), working in collaboration with the *Jacksonville Early Literacy Partnership* (JELP), has taken on the challenge of significantly improving the quality of early care and learning services provided to Jacksonville's youngest citizens with a special focus on programs serving the most vulnerable children. This community-wide collaboration has resulted in designing and implementing a variety of strategies. Examples include improving the quality of early care and learning services by increasing community awareness and staff training; providing intensive site-based support and coaching to early care and learning teachers; providing mini-grants to improve the quality of classroom environments and instruction; providing centers with research-based curricula; distributing books to families; and providing instructional interventions to children in most need of additional help.

This report reflects the combined efforts of the ELC and JELP in working with early care and learning centers participating in the ELC/JELP Intensive Support initiative. This report also documents the commitment of the ELC and JELP in answering evaluation questions, monitoring progress, and using the results to inform decision making and guide future actions.

While high-quality programs can positively impact children's outcomes in many different domains, the 2006-2007 evaluation focuses on two benefit domains: general school readiness

and early literacy. The report is organized into two parts: (1) the 2006-2007 intensive support initiative program evaluation; and (2) the second phase of the 2004-2005 cohort longitudinal study.

Participating Children and Sites

In 2006-2007, the ELC continued its leadership role in improving the quality of early care and learning services for Jacksonville’s *School Readiness* children (i.e., children from low-income families receiving subsidized child care); children attending sites collectively referred to as the Florida Institute of Education/University of North Florida (FIE/UNF); and children attending child care centers affiliated with the Jacksonville Children’s Commission (JCC), Episcopal Children’s Services (ECS), and Jacksonville Urban League Head Start (JULHS), all in low-income neighborhoods. As a function of the JELP collaboration and blended funding, the ELC provided services to 309 preschool and 283 infant/toddler classrooms in 128 child care settings serving approximately 6,801 children (2,206 infant/toddlers and 4,595 preschoolers). Table 1 lists the number of centers, classrooms, and children served by partner organizations.

Table 1
The Number of Sites, Teachers, and Children Served by Affiliated Partners (as of September 2006)

Collaborative Partner	Number of		
	Sites	Classes	Children
Episcopal Children’s Services (ECS)	48	92 Preschool 152 Infant/Toddler	1330 1162
Jacksonville Children’s Commission (JCC)	52	116 Preschool 131 Infant/Toddler	1483 1044
Jacksonville Urban League Head Start Program (JULHS)	24	88 Preschool	1561
Florida Institute of Education/University of North Florida (FIE/UNF)	4	13 Preschool	221

Participating classrooms need to be language- and print-rich—in fact, *learning-rich*. In a learning-rich classroom, posters and materials are affixed to the walls at the child's eye-level. The upper- and lowercase letters of the alphabet are prominently displayed, as are the names and photographs of the children in the class and picture/word cards. Activity centers are created to provide opportunities for frequent, purposeful early literacy and learning experiences.

In participating preschool classrooms, blended funding was used in part to purchase the materials needed to craft a rich environment ensuring children were exposed to learning and literacy experiences. In addition, the funding provided coaches for the preschool teachers. Coaches were available to assist the teachers as they created and sustained their learning-rich environments and began to implement one of two research-based and literacy-focused curricula developed by either ECS or FIE. The knowledge and pedagogical skills of preschool teachers grew through the continual job-imbedded, literacy-focused training.

The infant/toddler classrooms served by ELC and JELP also received visually stimulating materials to facilitate child learning. Coaches serving in these classrooms focused their efforts on helping participating infant/toddler teachers create learning-rich environments, establish warm and caring relationships with the children in their care, and engage in literacy-focused experiences that provide a strong foundation for later learning.

Measurement Instruments

The Test of Early Reading Ability-Third Edition (TERA-3) and the Alphabet Letter Recognition Inventory (ALRI) assess important components of children's reading readiness. Results of the ALRI, a measure of letter recognition, were reported in ways that allow teachers to more effectively meet the individual needs of children. The Bracken Basic Concept Scale – Revised (BBCS-R) served as a pretest and posttest school readiness assessment of children. FIE-

trained assessors administered the TERA-3 and the BBCS-R in one-on-one settings; classroom teachers, trained by preschool coaches, administered the ALRI. Responses to all three assessments were recorded on scannable forms and computer scored.

Test of Early Reading Achievement - Third Edition (TERA-3)

The TERA-3 is a norm-referenced test that assesses components of early reading skills, including familiarity with the letters of the alphabet and numerals, discovery of the arbitrary conventions used in reading and writing English, and recognition that print conveys information, ideas, and thoughts. The test is composed of three scales: Alphabet, Conventions of Print, and Meaning, each measuring one of the three components. In addition, a composite score, called the Reading Quotient, is the standardized sum of the three standardized scale scores.

- The *Alphabet* scale includes measures of whether children can recognize different forms of printed letters; recognize the names of letters; and distinguish beginning, middle, and ending sounds in words.
- The *Conventions of Print* scale includes measures of whether children are familiar with the ways that books are organized (front to back) and how text on a page is read (left to right and top to bottom).
- The *Meaning* scale includes measures of whether children can understand the meanings of printed words.

The TERA-3 can be administered to children as young as 3 years, 6 months and as old as 8 years, 6 months. Because children undergo rapid development over the age span covered by the TERA-3, raw scores are standardized relative to fourteen different normative groups of children covering the age range of the test. Depending on the time between pretest and posttest and the age of the child at pretest, a posttest score may be interpreted relative to a different age group than the pretest. This process adjusts standardized scores for natural maturation and allows detection of gains that result from programs.

The TERA-3 Reading Quotient scores are reported as norm-referenced, standardized scores with a mean of 100 and a standard deviation of 15. The TERA-3 scale scores are reported as norm-referenced, standardized scores with a mean of 10 and a standard deviation of three. Because reported scores are norm-referenced, a change in scores represents a change in the rankings of scores relative to the normative populations and does not represent an absolute gain in knowledge. Based on the normative populations, the performance of children assessed with the TERA-3 can be displayed in seven categories ranging from *Very Poor* to *Very Superior*. Table 2 shows the ranges of the TERA-3 Reading Quotient and the scale scores relative to the national normative population. These scores and categories are used in this report to indicate the participating children’s emergent literacy ability.

Table 2
TERA-3 Reading Quotient and Scale Scores by Ability Categories

Score	Categories						
	<i>Very Poor</i>	<i>Poor</i>	<i>Below Average</i>	<i>Average</i>	<i>Above Average</i>	<i>Superior</i>	<i>Very Superior</i>
Reading Quotient Score Intervals	Below 70	70-79	80-89	90-110	111-120	121-130	Above 130
Scale Score Intervals	Below 4	4-5	6-7	8-12	13-14	15-16	17-20
Percentiles	2 nd or lower	3 rd to 9 th	10 th to 25 th	26 th to 75 th	76 th to 90 th	91 st to 97 th	98 th or higher

Alphabet Letter Recognition Inventory (ALRI)

The ALRI is a locally developed inventory measuring children’s ability to recognize and name the upper- and lowercase letters of the alphabet when presented in non-alphabetic order. The test is given by the classroom teacher and is used, in part, to guide classroom instruction.

Teachers use alphabet letter flashcards to administer the ALRI in one-on-one settings. The uppercase letters are presented first, followed by the lowercase letters. The score represents the number of correctly identified letters. ALRI scores are reported in four recognition categories: 0 to 13 letters, 14 to 26 letters, 27 to 39 letters, and 40 to 52 letters.

The *Early Childhood Longitudinal Study-Kindergarten* (ECLS-K) provides a national benchmark for alphabet letter recognition. In this study, a random sample of upper- and lowercase letters was presented to children. ECLS-K researchers classified letter recognition as *proficient* if children named at least 75% of the sampled letters.¹ Reports using ECLS-K data indicate that 66% of children entering kindergarten for the first time were *proficient* in letter recognition.²

Bracken Basic Concept Scale – Revised (BBCS-R)

The BBCS-R is a battery of 11 subtests designed to measure understanding of basic concepts relevant to the development of young children; the first six subtests compose the School Readiness Composite (SRC). Figure 1 provides details about the SRC.

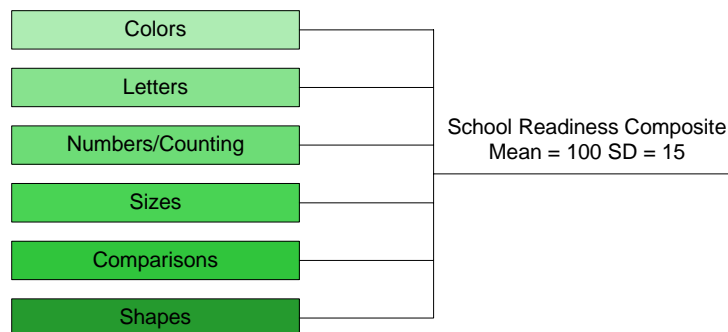


Figure 1. School Readiness Composite (SRC) diagram.

¹ U.S. Department of Education, National Center for Education Statistics. *Early childhood longitudinal study, kindergarten class of 1998-1999: Data files and electronic codebook*. NCES2001-028 {CD ROM} On-line ordering at <http://www.ed.gov?pbus/edpubs.html>

² U.S. Department of Education, National Center for Education Statistics. *Entering kindergarten: A portrait of American children when they begin school: Findings from the condition of education*, Nickolas Zill and Jerry West, NCES2001-035, Washington DC: U.S. Government Print Office, 2001. Available at <http://nces.ed.gov/pubs2001/2001023.pdf>

Standardized scores for the BBCS-R SRC have a mean of 100 and a standard deviation of 15, and percentile rankings can be determined from the standard scores. These rankings *represent the percentage of children who are ranked at or below a given level of performance within a distribution of scores.*³

Assessing Participating Children

Data for this report are drawn from three populations: ECS, JCC, FIE/UNF and JULHS preschool children with parental informed consent enrolled in 128 centers receiving intensive support; all School Readiness children served by the ELC in centers; and a random sample of 10% of School Readiness children served in Family Child Care Homes (FCCHs). Children who were 4 years old by September 1, 2006 were eligible for assessment. The 2006-2007 assessment plan, shown in Table 3, details the number of pretest assessments given in the fall of 2006.

Table 3
2006-2007 ELC Assessment Plan

2006-2007 Assessment Counts (as of October 2006)	
<u>Assessment</u>	<u>Children</u>
TERA-3 (4-year-old children with informed consent from ECS, JCC, and JULHS, and FIE/UNF)	1,804
BBCS-R (all eligible 4-year-old School Readiness children enrolled in centers, a 10% sample of school readiness children enrolled in FCCH; and all children with informed consent enrolled in JCC, ECS, and FIE/UNF centers)	1,590
ALRI (all eligible 4-year-old children at participating sites)	2,425

Attrition of Children

Attrition of children was due to both child and site factors, because some locations closed during the school year. The study of the attrition of the participating children is based on the TERA-3 scores, as they are the best indication of the initial achievement of the children and data

³ Bruce Bracken, *Bracken Basic Concept Scale-Revised Examiner's Manual* (Harcourt Assessment, Inc. 1998), p.5.

were collected by trained assessors. The discrepancy between the number of TERA-3 pretest and posttest scores represents the attrition of 21.5% of the children (10.7% is due to children withdrawing from the child care center; 10.0% is due to centers exiting from the intensive support program or from centers closing; and 0.8% is due to children who were absent the days of testing). To determine if the non-randomness of the attrition resulted in a final sample of children that differs from the original sample relative to initial emergent literacy ability, the TERA-3 pretest scores of the participating children who were not administered the TERA-3 posttest were compared to pretest scores of children who were administered the TERA-3 posttest. Table 4 presents the results of the comparison.

Table 4

Summary Statistics and ANOVA Results: TERA-3 Reading Quotient and TERA-3 Scale Pretest Scores by Attrition Category

	Incomplete Scores (n=388)	Complete Scores (n=1,416)	
TERA-3 Test	Pretest Mean	Pretest Mean	Probability
Reading Quotient	88.7	91.4	.0008
Alphabet Scale	9.1	9.8	.0006
Conventions Scale	7.8	8.0	.0486
Meaning Scale	7.8	8.1	.0213

Looking at the TERA-3 Reading Quotient and subscales, children not completing the preschool year in their original classes had lower initial emergent literacy achievement than children who did complete the year. This finding limits the generalizability of the evaluation results to children with low initial status as they were not necessarily represented in their true proportion in the study.

Evaluation Questions

- Question 1: What preschool children formed the population for the 2006-2007 evaluation?
- Question 2: Were services sponsored by the ELC, with joint funding and collaboration from the JELP, effective in improving the emergent literacy ability of preschool children based on the TERA-3 Reading Quotient and scale scores?
- Question 3: How did the participating preschool children's year-end ability to recognize the upper- and lowercase letters of the alphabet compare to national performance benchmarks in letter recognition?
- Question 4: Were preschool services provided to School Readiness 4 year olds effective in improving school readiness of the children based on scores from the BBCS-R SRC?

The answers to these questions come from data obtained in the fall and spring using the TERA-3, BBCS-R, and ALRI. Both summary statistics and statistical testing of pretest and posttest mean differences provide the answers. Data from all scales were analyzed as repeated measures ANOVA models. To determine the importance of all statistically significant differences, effect sizes are reported. Cohen classified effect sizes of 20 to 49 percent of a standard deviation as small, between 50 and 79 percent of a standard deviation as medium, and 80 percent or more of a standard deviation as large.⁴ Small, medium, and large effect sizes represent meaningful differences.

Evaluation Results

Question 1: What preschool children formed the population for the 2006-2007 evaluation?

The answer to this evaluation question involves a description of the children by gender, ethnicity, and age based on the ALRI data as it is most representative of the participating children.

⁴ Cohen, J. (1988). *Statistical power analysis for behavioral sciences (2nd ed.)*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Gender

There were 820 boys and 856 girls with complete ALRI scores.

Ethnicity

Ethnicity of the children was reported in five categories: *Black*, *White*, *Hispanic*, *Asian*, and *Other*. Of the children with complete ALRI scores, 67.1% were *Black*, 22.2% were *White*, 5.0% were *Hispanic*, 1.6% were *Asian*, and 4.2% were *Other*.

Age

The categorization of the children as 4 years old does not indicate the distribution of the age of the children. Because of the birthday cut-off for children attending public school kindergarten in Florida, the typical 4-year-old child is between 48 and 60 months old on September 1 of the school year. Figure 2 displays participating children's ages in months on the cut-off date.

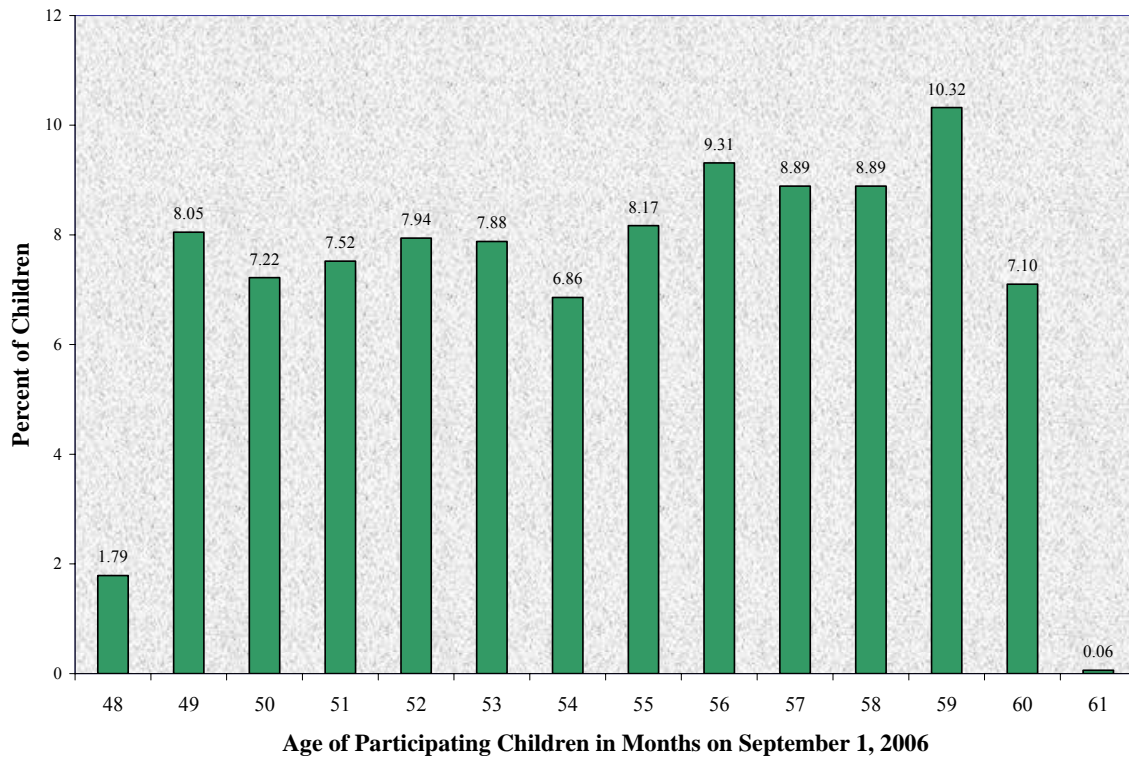


Figure 2. Age (in months) on September 1, 2006 of the 1,676 participating children with complete ALRI scores.

The mean and median ages of the participating children with complete ALRI scores (54.6 and 55.0 months, respectively) fall toward the older end of the 12-month range. More than half of these children were at least 55 months as of September 1, 2006.

Question 2: Were services sponsored by the ELC, with joint funding and collaboration from the JELP, effective in improving the emergent literacy ability of preschool children based on the TERA-3 Reading Quotient and scale scores?

Table 5 presents summary statistics and results from the analyses of the TERA-3 pretest and posttest scale scores of the participating children.

Table 5
Summary Statistics and ANOVA Results: Participating Children’s TERA-3 Scores

	Pretest	Posttest		
Scale	Mean	Mean	p-value	Effect Size
Reading Quotient	91.40	95.51	<.0001	0.27
Alphabet	9.84	11.21	<.0001	0.46
Conventions of Print	8.02	8.39	<.0001	0.12
Meaning	8.13	8.31	.0039	0.06

□ Denotes a statistically significant difference between the pretest and posttest mean scores (n = 1,416).

The positive gains in the abilities measured on the TERA-3 Reading Quotient and all subscales were statistically significant ($\alpha \leq .05$). The small, but meaningful, gain on the Reading Quotient was one-fourth of a standard deviation. The Alphabet scale score gain can almost be classified as medium, and the mean Alphabet posttest score (11.2) ranks above the mean of the TERA-3 normative population (10.0). Furthermore, even though the significant gain in the Conventions of Print subscale is minimal, it does reflect the first significant gain for this subscale in 3 years.

Another way to look at the ELC children’s year-end achievement in emergent literacy ability is by looking at the differences in the percentage of scores ranked in the top, middle, and

bottom quartiles from the beginning to the end of the school year. Figure 3 shows the percentage of scores in these categories at the beginning and end of the school year across the TERA-3 scales.

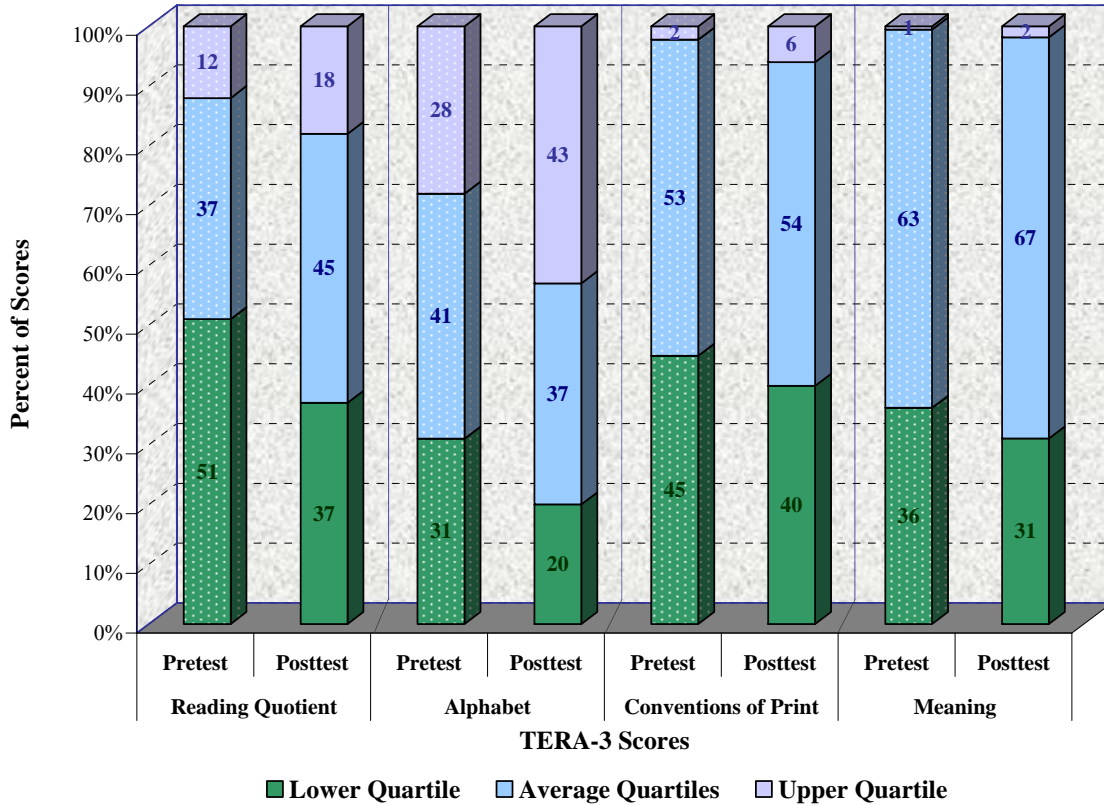


Figure 3. The percentage of TERA-3 scale scores ranked in the bottom, middle, and top quartiles at the beginning and end of the school year (n = 1,416).

Reading Quotient

The changes in the percentage of Reading Quotient scores in the quartiles result from scores ranked in the lower quartile (green portion) and average quartiles (blue portion) at pretest moving to the middle and upper quartiles at posttest. The percentage of Reading Quotient scores ranked in the upper quartile (lavender) increased from 12% to 18% from the beginning to the end of the school year.

Alphabet Scale

The changes in the percentage of scores in the quartiles for the Alphabet scale result from scores moving across all three categories, and the percentage of Alphabet scale posttest scores ranked in the bottom quartile, 20%, is less than the expected 25%. Additionally, there is a higher percentage of Alphabet scale pretest and posttest scores ranked in the top quartile, 28% and 43%, respectively, than the 25% percent expected.

Conventions of Print Scale

The percentage of Conventions of Print scale scores in the three categories is relatively unchanged from pretest to posttest. However, the percentage of children's scores in the top quartile increased from 2% to 6%, a three-fold increase and, the percentage of scores in the bottom quartile decreased.

Meaning Scale

The predominant change in the percentage of Meaning scale scores in the quartiles results from scores ranked in the bottom quartile (green portion) at pretest moving to the middle quartiles at posttest. The percentage of scores ranked in the top quartile (lavender) was basically unchanged from the beginning to the end of the school year.

A second way to look at the emergent literacy achievement is through the percentile rankings of the mean scores in the fall and spring of the school year. Figure 4 shows the percentile rankings of the mean TERA-3 scores.

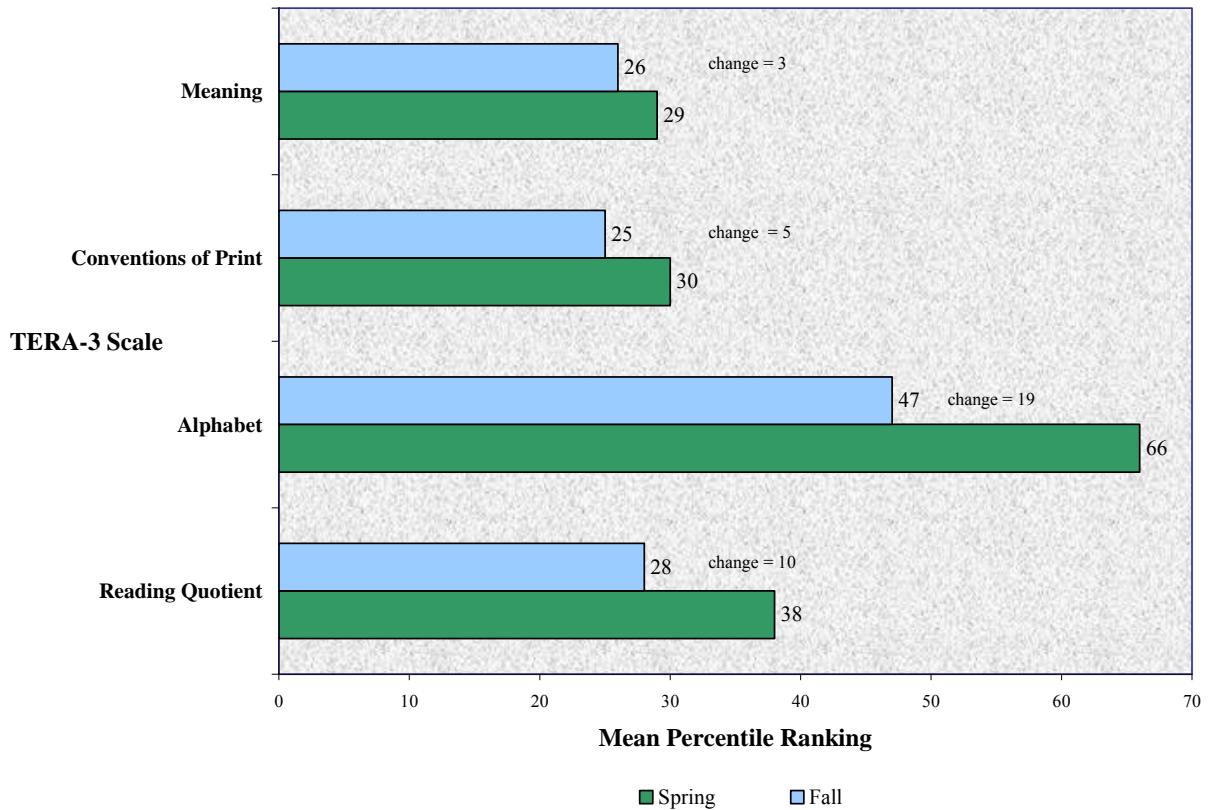


Figure 4. The percentile rankings of the mean TERA-3 scale scores in the fall and spring of the school year.

The two greatest increases in percentile rankings from fall to spring occurred in the achievement measured by the Reading Quotient and the Alphabet scale. Moreover, at year’s end the mean ranking of all TERA-3 scales was above the bottom quartile (25th percentile), and the mean Alphabet scale score ranked more than 15 percentile rankings above the national average.

To enable a closer look at the improvement on the TERA-3 Alphabet scale, scores are displayed in Figure 5 in seven ability categories: three categories representing the lowest 25 percentiles, one category representing the middle 50 percentiles, and three categories representing the highest 25 percentiles. (See Table 2 on page 6 of this report.)

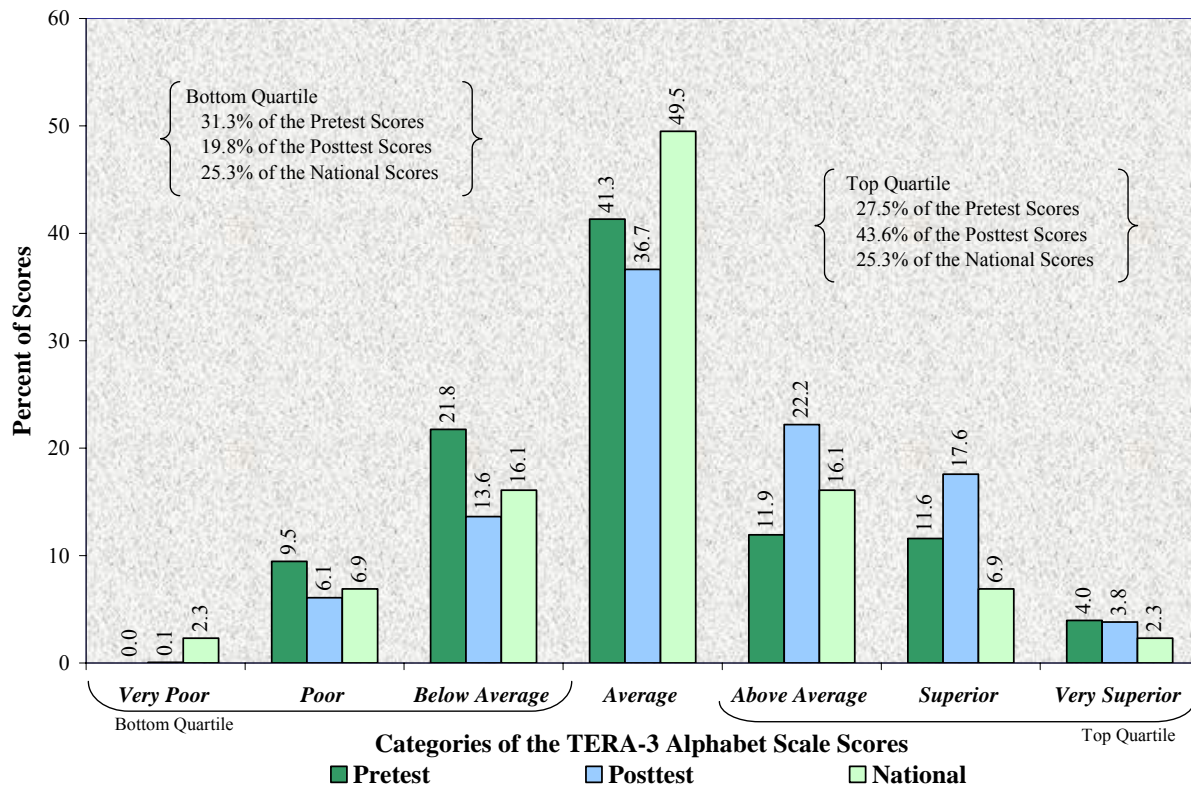


Figure 5. The percentage of TERA-3 Alphabet scale pretest, posttest, and national normative population scores in the seven categories of the ability scale (n = 1,416).

The percentage of posttest scores (blue bars) ranked in the bottom quartile (three sets of bars at the left of the figure) is 5 percentage points less than in the national normative population (light green bars), and the percentage of children’s scores ranked in the bottom quartile changed from 31% in the fall (dark green bars) to 20% in the spring (light blue bars). Additionally, only 6% of the participating children's posttest scores ranked below the 9th percentile (the *Very Poor* and *Poor* categories combined). This is less than the percentage in the national normative population. The percentage of scores ranking in the top quartile increased from 28% in the fall to 44% spring, an amount substantially greater than the 25% expected in the normative population. Additionally, 21% of the participating children’s posttest scores ranked above the 90th percentile (the *Superior* and *Very Superior* categories combined). As can be seen, the distribution of

posttest scores shifted further toward the top quartile than the distribution of the national normative population.

Question 3: *How did the participating preschool children's year-end ability to recognize the upper- and lowercase letters of the alphabet compare to national performance benchmarks in letter recognition?*

In 2006-2007, 1,676 participating children had complete Alphabet Letter Recognition Inventory (ALRI) scores. The ALRI mean fall score indicates the typical participating child recognized 40% of the letters (21 letters), and the mean spring score indicates the typical child recognized 81% of the letters (42 letters). The *Early Childhood Longitudinal Study-Kindergarten* (ECLS-K) describes recognizing 75% of the sampled letters as *proficient*; therefore, the typical participating child was *proficient* in letter recognition at the end of the school year. Additionally, at the end of the school year, only 5% of the children recognized seven or fewer letters, 50% of the children recognized 50 or more letters, and 35% of the children recognized all 52 letters.

To determine the range of alphabet letter recognition ability of the children, the ALRI scores are displayed in Figure 6 using four recognition categories: 0-13 letters, 14-26 letters, 27-39 letters, and 40-52 letters.

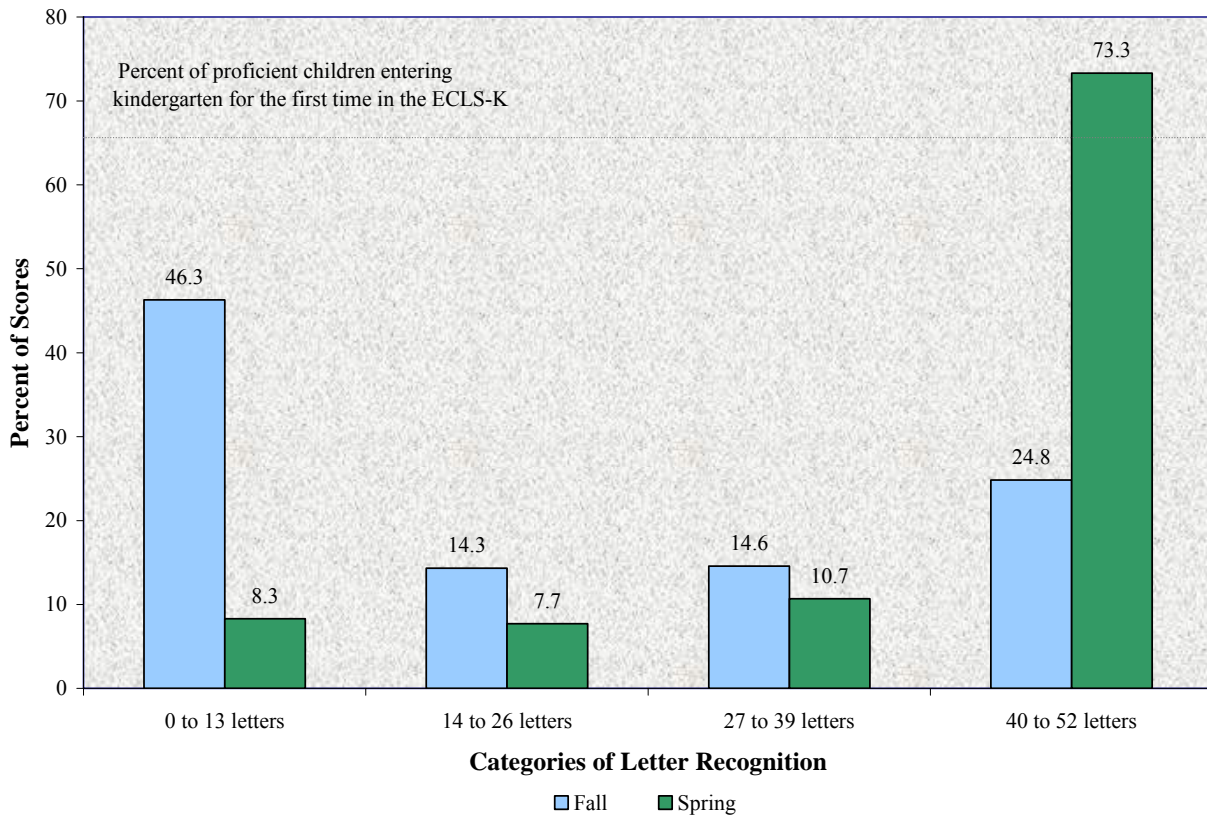


Figure 6. The Alphabet Letter Recognition Inventory scores of the 1,676 participating children.

Inspection of Figure 6 shows that at year's end 73% of the 1,676 children were *proficient*, recognizing at least 75% of the letters. The end of the 4-year-old preschool year is somewhat similar to entering kindergarten for the first time, and ECLS-K researchers reported 66% of all children entering kindergarten for the first time were *proficient*. The participating children's letter recognition ability exceeds the national ECLS-K sample of all children entering kindergarten for the first time.

- Question 4: Were preschool services provided to School Readiness 4 year olds effective in improving school readiness of the children based on scores from the BBCS-R SRC?

There were 583 School Readiness children (combined JCC, ECS, FIE/UNF, FCCH, and any other child care options enrolling School Readiness children) with both pretest and posttest BBCS-R scores. Table 6 shows the results of the analysis of these scores. Again, the SRC mean scores in Table 6 reflect the aggregation of six subtests into a standardized score with a mean of 100 and a standard deviation of 15.

Table 6

Summary Statistics and ANOVA Results: BBCS-R School Readiness Composite Scores

Scale	Pretest Mean	Posttest Mean	p -value
SRC	98.89	99.67	.0662

The children’s school readiness achievement significantly improved ($\alpha=.07$), and the scores demonstrate continued progress toward the national normative mean.

Findings

Question 1: What preschool children formed the population for the 2006-2007 evaluation?

- Slightly less than 68% of the participating children were *Black* and just over 20% were *White*. Additionally, 48.9% were boys. On average, the children's ages tended to be toward the older end of the expected span for 4-year-old preschool children in Florida.
- TERA-3 data for participating children indicated 21.5% attrition that resulted from attrition of both children and sites, and there was evidence suggesting the attrition did not occur at random. Children with lower initial emergent literacy ability were not included in the study proportional to their enrollment in the participating preschool classes.

Question 2: Were services sponsored the ELC effective in improving the emergent literacy ability of preschool children based on the TERA-3 Reading Quotient and scale scores?

- All TERA-3 mean pretest and mean posttest scores ranked in the broad *Average* ability category.
- The TERA-3 Reading Quotient and all subscale mean posttest scores of the participating children were significantly higher than their respective mean pretest scores. The improvement measured by the Alphabet scale represents close to a medium effect, and the improvement measure by the Reading Quotient represents a small, but meaningful effect.
- The Alphabet scale mean posttest score ranked 16 percentiles above the national average ranking at the 50th percentile.
- At the end of the school year, almost 44% of the participating children's Alphabet scale posttest scores ranked at the 75th percentile or higher (25% expected), and 21% of the children's scores ranked at or above the 90th percentile (10% expected).
- The TERA-3 Conventions of Print posttest scale scores indicate the first significant gain in 3 years.

Question 3: How did the participating preschool children's year-end ability to recognize the upper- and lowercase letters of the alphabet compare to national performance benchmarks in letter recognition?

- At the end of the school year, 73% of the participating children recognized at least 75% of the upper- and lowercase letters (categorized as *proficient* by ECLS-K), which exceeds the 66% of all children in the ECLS-K national sample of children entering kindergarten for the first time.
- At the end of the school year, 35% of the participating children recognized all upper- and lowercase letters of the alphabet, and 50% of the children recognized 50 or more letters.

Question 4: Were preschool services provided to School Readiness 4 year olds effective in improving school readiness of the children based on scores from the BBCS?

- The School Readiness children's school readiness significantly improved and scores demonstrate continued progress toward the national normative mean.

Conclusion

During the 2006-2007 school year, the ELC was successful in significantly increasing participating children's mastery of emergent literacy achievement in the area of alphabet letter knowledge. The three areas of alphabet letter knowledge include knowing the names of letters, recognizing upper- and lowercase letters arranged in non-alphabetic order, and understanding the function of the letters of the alphabet. This achievement is documented through posttest TERA-3 and ALRI results. More specifically, the pre- to posttest gains achieved on the Conventions of Print scale represent the first significant gain in three years.

Part II

The Sustained Effects of Attending Early Learning Coalition of Duval County, Inc. and Jacksonville Early Learning Partnership Sponsored High-Quality Preschool: A Quasi-Experimental Study of First-Grade Literacy Skills

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During the 2004-2005 school year, the *Early Learning Coalition of Duval County, Inc.* (ELC) and the *Jacksonville Early Learning Partnership* (JELP) provided 5,100 children attending child care programs in low-income neighborhoods high-quality preschool experiences. The initiative provided literacy-focused curricula with job-embedded training for the children's 376 teachers. The ELC/JELP initiative continues with preschool centers; however, the full impact of the children's preschool literacy experiences is determined by their acquisition of literacy skills as they progress through the primary grades. In Florida's early grades, children's literacy skills are not routinely measured by widely used instruments. However, in Duval County Public Schools (DCPS) elementary schools designated as *Reading First* schools, measures of literacy skills are made three times during the school year. These data were made available and used in this study to address the research question: *Do children who participated in ELC/JELP sponsored preschool classes during the 2004-2005 school year and attended first grade at DCPS Reading First schools during the 2006-2007 school year have greater literacy skills than comparison children in the same Reading First schools but who did not attend the ELC/JELP sponsored preschools?* Outcome variables used in the study include the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Letter Naming Fluency (LNF), Nonsense Word Fluency (NWF), Oral Reading Fluency (ORF), and Phoneme Segmentation Fluency (PSF) scales.

Measures

DIBELS measures are individually administered tests that provide a measure of risk in three of the five big ideas of early literacy – phonological awareness, alphabetic principle, and fluency with connected text. DIBELS Letter Naming Fluency (LNF) measure is designed for use with children from the beginning of kindergarten through the first grade. In the LNF measure, children are presented a page of randomly ordered upper- and lowercase letters and asked to

name as many letters as they can in 1 minute. The score represents the number of letters correctly named in 1 minute. A benchmark goal is not established for LNF as it does not directly correspond with one of the three big ideas assessed by DIBELS. First-grade students in DCPS Reading First schools are assessed once in the fall of the first grade using the DIBELS LNF measure.

DIBELS Nonsense Word Fluency (NWF) measure is designed for use with children from the middle of kindergarten through the beginning of second grade. The NWF is a measure of the alphabetic principle, specifically letter-sound correspondence and the ability to blend letters into words. The children are presented a sheet of randomly ordered VC (vowel – consonant) and CVC nonsense words and asked to orally produce the letter sound for each letter and orally produce the word. The child is allowed 1 minute to produce as many letter sounds as he or she can. The score represents the number of correctly produced letter sounds in 1 minute. The benchmark goal for the NWF assessment is correctly producing at least 50 letter sounds by mid first grade. If the mid first-grade score is less than 30, the child may need intensive instructional support to achieve first-grade reading goals. First-grade students in DCPS Reading First schools are assessed using the DIBELS NWF measure three times during the school year, once in the fall, once in winter, and once in spring.

DIBELS Oral Reading Fluency (ORF) scale is designed to measure children's fluency with connected text and can be used from the first grade through the end of third grade. The children are provided a passage to read aloud for 1 minute. Words omitted, substituted, and hesitations of more than 3 seconds are counted as errors. The ORF score is the number of words correctly read aloud in 1 minute. The DIBELS Retell Fluency measure is a companion to the ORF assessment and is designed to measure comprehension of the passage the child reads.

However, the DCPS Reading First schools do not use the Retell Fluency measure. First-grade children in DCPS Reading First schools are assessed using the DIBELS ORF measure three times during the school year, once in the fall, once in winter, and once in spring.

DIBELS Phoneme Segmentation Fluency (PSF) scale is designed to measure children's phonological awareness and can be used from the middle of the kindergarten year through the end of first grade. The children are orally presented words of three to four phonemes and asked to verbally produce the individual phonemes for each word. After the child responds, the assessor presents a new word. The score represents the number of phonemes correctly produced in 1 minute. The benchmark goal for the PSF assessment is correctly producing at least 35 phonemes at the beginning first grade. Children scoring fewer than 10 phonemes at the beginning of first grade may need intensive instructional support. First-grade students in DCPS Reading First schools are assessed using the DIBELS PSF measure three times during the school year, once in the fall, once in winter, and once in spring.

Sample

DIBELS assessments included in this study are from children attending first grade during the 2006-2007 school year in DCPS Reading First schools. The 2005-2006 study of the school readiness of the 2004-2005 ELC/JELP preschoolers used Florida assessments of kindergarten readiness which included the Early Screening Inventory-Kindergarten, DIBELS LNF, and DIBELS Initial Sounds Fluency measures. Of the 2005-2006 kindergarten children with valid DIBELS LNF scores, 6,166 did not participate in ELC/JELP sponsored preschool during the 2004-2005 school year and 1,581 did. More important, 26.1% of the kindergarten children who participated in ELC/JELP sponsored preschool and 12.7% of the kindergarten comparison children attended DCPS Reading First schools during the 2005-2006 school year. The 21 DCPS

Reading First schools include Biltmore Elementary School, George W. Carver Elementary School, Saint Clair Evans Academy, John E. Ford Elementary School, S. A. Hull Elementary School, Hyde Grove Elementary School, Martin Luther King Elementary School, Lake Forest Elementary School, S. P. Livingston Elementary School, Long Branch Elementary School, Sallye B. Mathis Elementary School, Annie R. Morgan Elementary School, North Shore Elementary School, Rufus E. Payne Elementary School, Rutledge H. Pearson Elementary School, Reynolds Lane Elementary School, Andrew Robinson Elementary School, San Jose Elementary School, West Jacksonville Elementary School, Woodland Acres Elementary School, and Carter G. Woodson Elementary School. Scores from first-grade children who were not assessed as part of the 2005-2006 Florida school readiness assessment in Duval County were excluded from this study. DIBELS LNF scores used for the first-grade analyses in this study include 630 children who participated in preschools classes sponsored by ELC/JELP during the 2004-2005 school year and 956 children who did not.

Methodology

Because the children experienced learning in the same schools, their DIBELS scores are related; thus, the shared learning experiences are accounted for in the analytic models of these data. DIBELS LNF was used at one time point; therefore, the model for LNF scores is a simple, two-level hierarchical linear model (HLM) having child-level data at the first level and the 21 DCPS Reading First schools at the second level. DIBELS NWF, ORF, and PSF assessments were used at three time points; therefore, the analytic models for these scores are repeated-measures, two-level HLMS. These models include the possibility of only a linear trend as well as the possibility of both linear and quadratic trends in the data over time. The model presented is the simplest model that adequately explains the data.

Results

DIBELS Letter Naming Fluency

The HLM analysis includes scores from 1,586 children attending 21 DCPS Reading First schools. Table 1 shows the results of the analysis.

Table 1
Results of the HLM Analysis of DIBELS LNF Scores

Effect	Estimate	<i>t</i> value	p-value	Effect size
Intercept	50.51	46.59	<.0001	
ELC/JELP Participation	2.06	2.49	.0129	0.126

The children who participated in ELC/JELP sponsored preschool classes correctly named between 50 and 51 letters in 1 minute which is two letters more than the children who did not participate in ELC/JELP sponsored preschool classes. This statistically significant difference represents 12.6% of a standard deviation.

DIBELS Nonsense Word Fluency

Data from three time points were analyzed using repeated-measures, two-level HLMs. The final model allows only a linear trend. Figure 1 shows the mean scores at each of the three time points. The mean scores shown are determined by the form of the analytic model; therefore, the means are not necessarily the simple arithmetic mean of the NWF scores. As can be seen, the scores show a linear trend across the time points with no visual indication of a quadratic trend.

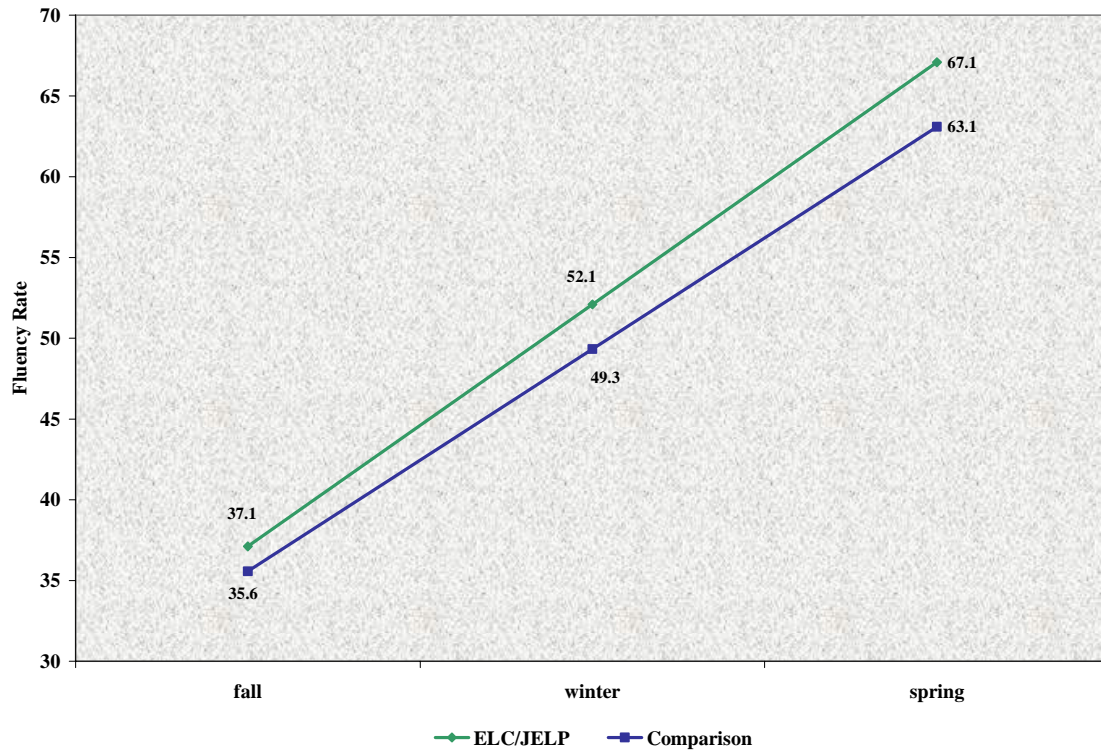


Figure 1. DIBELS Nonsense Word Fluency mean scores of ELC/JELP and comparison children across three first-grade time points.

Table 2 shows the results of the analysis of DIBELS NWF scores.

Table 2
Results of the HLM Analysis of DIBELS NWF Scores

Effect	F value	p-value
ELC/JELP Participation	5.68	.0173
Linear Trend	166.31	<.0001
ELC/JELP Participation by Time Interaction	3.56	.0593

The results confirm the linear trend seen in Figure 1 and that the nonsense word fluency of children who participated in ELC/JELP sponsored preschool classes is different from the comparison children’s nonsense word fluency. However, the *ELC/JELP Participation by Time Interaction* result indicates the difference is not the same across all three time points. Table 3 shows the results of the analysis at each time point.

Table 3
DIBELS NWF Results for the Fall, Winter, and Spring Effects

ELC/JELP Participation Effect	Estimate	<i>t</i> -value	p-value	Effect Size
Fall	1.54	1.42	.1550	0.069
Winter	2.77	2.38	.0173	0.124
Spring	3.99	2.59	.0095	0.179

Even though the children correctly produced between one and two more sounds in 1 minute in the fall than the comparison children, the *ELC/JELP Participation Effect* is not statistically significant. However, at both the winter and spring assessments, the difference in the skill level is statistically significant, and the increasing effect size across the three first-grade times shows the children who participated in ELC/JELP sponsored preschool classes were acquiring letter sound fluency skills more quickly than the comparison children.

DIBELS NWF mid first-grade benchmark goal is correctly producing at least 50 sounds in 1 minute, and children scoring less than 30 at mid first grade might need intensive instructional support. Table 4 shows both the percentage of children who participated in ELC/JELP preschool classes and the percentage of comparison children who met the benchmark goal. The second row of the table shows both the percentage of children who participated in ELC/JELP preschool classes and the percentage of comparison children who were identified by their DIBELS NWF score as possibly needing intensive instructional support.

Table 4
Benchmark Results for DIBELS NWF Scores

	Percent of Children	
	ELC/JELP	Comparison
Met Mid-Year Benchmark Goal	47.7	48.7
Below Support Benchmark	11.8	16.2

The difference between the percentage of children who participated in ELC/JELP preschool classes and the percentage of comparison children who met the NWF benchmark goal is 1% with a greater percentage of comparison children attaining the goal. However, the

difference between the percentage of children who participated in ELC/JELP preschool classes and the percentage of comparison children whose NWF score indicates they may need intensive instructional support to attain first-grade reading goals is 4% with a greater percentage of comparison children identified for intensive support.

DIBELS Oral Reading Fluency

Data from three first-grade time points were analyzed using repeated-measures, two-level HLMs. The final model allows only a linear trend. Figure 2 shows the mean scores at each time point. The mean scores shown are determined by the form of the analytic model; therefore, the means are not necessarily the simple arithmetic mean of the ORF scores. As can be seen, the scores show a linear trend across the three time points with no visual indication of a quadratic trend. The two groups of children correctly read aloud almost the same number of words in 1 minute at the beginning of the first grade.

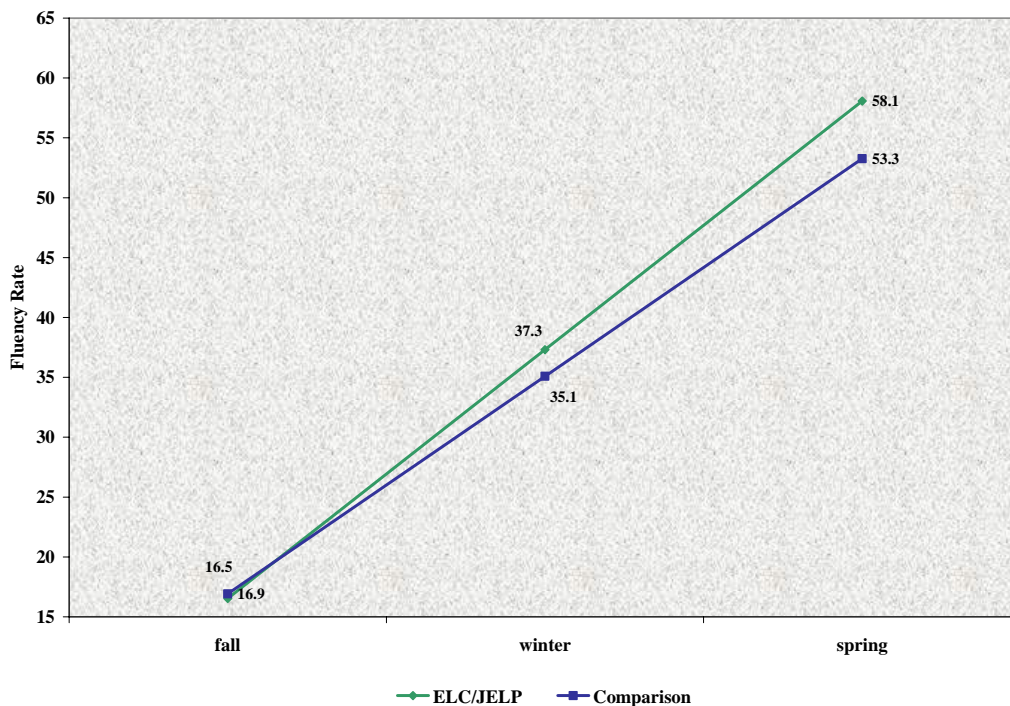


Figure 2. DIBELS Oral Reading Fluency mean scores of ELC/JELP and comparison children across three first-grade time points.

Table 5 shows the results of the analysis of DIBELS ORF scores.

Table 5
Results of the HLM Analysis of DIBELS ORF Scores

Effect	F value	p-value
ELC/JELP Participation	3.31	.0692
Linear Trend	2044.87	<.0001
ELC/JELP Participation by Time Interaction	26.07	<.0001

The results confirm the linear trend and the *ELC/JELP Participation by Time Interaction* effect that is seen in Figure 2. Because of the strong interaction with time, the effect of participation in ELC/JELP sponsored preschool classes cannot be determined without looking at the individual time points. Table 6 shows the results of these analyses.

Table 6
DIBELS ORF Results for the Fall, Winter, and Spring Effects

ELC/JELP Participation Effect	Estimate	t-value	p-value	Effect Size
Fall	-0.37	-0.37	.7120	-0.019
Winter	2.22	1.82	.0692	0.110
Spring	4.82	3.06	.0022	0.239

The *ELC/JELP Participation Effect* was not statistically significant at the time of the fall assessment and was statistically significant at only $\alpha = .07$ at the winter assessment. However, the differential rate of growth on the ORF measure can be seen in Figure 2 beginning at the time of the winter assessment. The children who participated in ELC/JELP preschool classes correctly read aloud two more words in 1 minute in the winter, and by spring, the advantage had grown to almost five more words in a minute. Additionally, the increasing effect size across the three time points indicates that the children who participated in ELC/JELP sponsored preschool classes were acquiring skills in reading connected text more quickly than the comparison children. The spring effect represents a positive difference of 24% of a standard deviation.

DIBELS Phonemic Segmentation Fluency

Data from three first-grade time points were analyzed using repeated-measures, two-level HLMs. The final model allows both linear and quadratic trends. Figure 3 shows the mean scores at each time point. The mean scores shown are determined by the form of the analytic model; therefore, the means are not necessarily the simple arithmetic mean of the PSF scores. As can be seen, the scores clearly show both linear and quadratic trends across the time points. The quadratic trend is typical of children’s growth in acquiring skills when the growth approaches a maximal level. This *ceiling effect* indicates there is an ever decreasing amount of improvement possible.

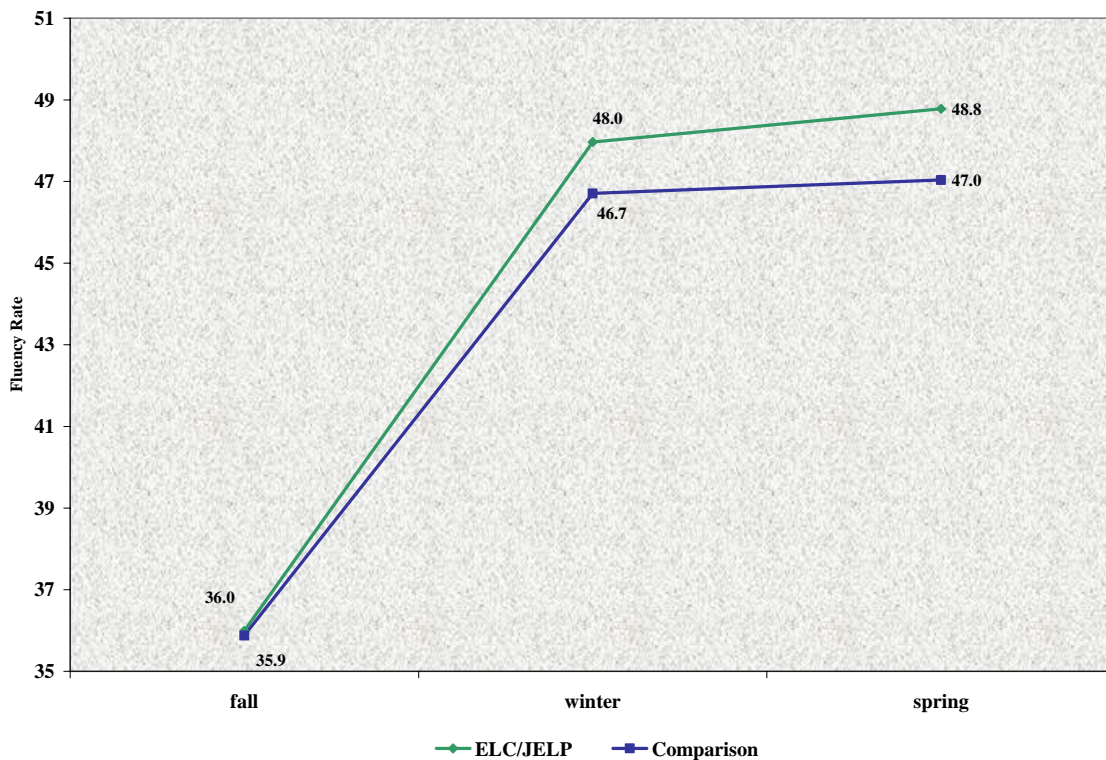


Figure 3. DIBELS Phonemic Segmentation Fluency mean scores of ELC/JELP and comparison children across three first-grade time points.

Table 7 shows the results of the analysis of DIBELS PSF scores.

Table 7
Results of the HLM Analysis of DIBELS PSF Scores

Effect	F value	p-value
ELC/JELP Participation	2.44	.1184
Linear Trend	44.23	<.0001
Quadratic Trend	52.03	<.0001
ELC/JELP Participation by Time Interaction (Linear)	3.28	.0704
ELC/JELP Participation by Time Interaction (Quadratic)	0.26	.6122

The results indicate the effect of participating in ELC/JELP sponsored preschool classes can be determined only by looking at the *ELC/JELP Participation by Time Interaction* in the linear trend. Table 8 shows the results of the analysis at each time point.

Table 8
DIBELS NWF Results for Fall, Winter, and Spring Effects

ELC/JELP Participation Effect	Estimate	t-value	p-value	Effect Size
Fall	0.11	0.12	.9067	0.006
Winter	1.26	1.57	.1169	0.064
Spring	1.74	2.51	.0122	0.088

The *ELC/JELP Participation Effect* is not statistically significant at either the fall or winter assessment times; however, the spring difference of producing almost two more phonemes in a minute is statistically significant. DIBELS PSF assessment has a fall first-grade benchmark goal of correctly producing at least 35 phonemes. Children scoring fewer than 10 phonemes at the beginning of first grade could need intensive instructional support to acquire first-grade reading goals. Table 9 shows both the percentage of children who participated in ELC/JELP sponsored preschool classes and the percentage comparison children who met the benchmark goal. The second row of the Table 9 shows the percentages of children in each group who were identified by their DIBELS PSF score as possibly needing intensive instructional support.

Table 9
Benchmark Results for DIBELS PSF Scores

	Percent of Children	
	ELC/JELP	Comparison
Met Mid-Year Benchmark Goal	55.8	52.7
Below Support Benchmark	14.0	21.2

The difference between the percentage of children who participated in ELC/JELP sponsored preschool classes and the percentage comparison children who met the PSF benchmark goal is 3% with a smaller percentage of comparison children attaining the goal. Additionally, the difference between the percentages of children whose PSF score indicates they possibly need intensive instructional support to attain first-grade reading goals is 7% with a greater percentage of comparison children identified for intensive instructional support.

Summary of Results and Limitations of the Study

Table 10 summarizes the results for each DIBELS scale by showing the p-values and effect size for each scale across the three first-grade time points.

Table 10
Summary of DIBELS Scales

DIBELS Scale	Fall	Winter	Spring
LNF	12.6% (.0129)	N/A	N/A
NWF	6.9% (.1550)	12.4% (.0173)	17.9% (.0095)
ORF	-1.9% (.7120)	11.0% (.0692)	23.9% (.0022)
PSF	0.6% (.9067)	6.4% (.1169)	8.8% (.0122)

Note: Top row numbers are effect sizes and numbers in parentheses are p-values from the statistical tests. Bold-faced numbers indicate statistically significant effects at $\alpha = .05$ for a two-tailed test.

The children who participated in ELC/JELP sponsored preschool during the 2004-2005 school year achieved higher levels of DIBELS Nonsense Word Fluency, Oral Reading Fluency,

and Phonemic Segmentation Fluency skills by the end of the first grade than comparison children in the same DCPS Reading First schools but who did not participate in ELC/JELP sponsored preschool classes. Additionally the children who participated in ELC/JELP sponsored preschool had higher levels of DIBELS Letter Naming Fluency skills at the beginning of the first grade. Figures 1 and 2 clearly show that the growth trajectories for Nonsense Word and Oral Reading fluencies of the children who participated in the ELC/JELP sponsored preschool are steeper than those of the comparison children. The difference in steepness indicates differential growth. In other words, the ELC/JELP children acquired the literacy skills faster than the comparison children. This finding also is supported by the increasing effect sizes across the three time points for both measures.

The findings of this study are limited by the lack of matching the children who participated in ELC/JELP sponsored preschool in 2004-2005 with similar children in the DCPS Reading First data. Using the 2006-2007 first-grade data automatically matches the children on neighborhood. Omitting data from children whose kindergarten readiness was not assessed by DCPS in 2005-2006 indicates the children in this study were enrolled in DCPS for kindergarten and first grade. However, these are the only conditions used in the study that match the children or control for other possible causes of the differences in the distributions of the children's literacy skills. Therefore, this study does not support the finding that participation in ELC/JELP sponsored preschool classes during the 2004-2005 school year caused the higher first-grade literacy skills of the children when compared to other children in the same Reading First schools who did not attend ELC/JELP sponsored preschool in 2004-2005. However, the findings of this study encourage the pursuit of more rigorous, detailed analyses of all similar data that may be available from Duval County Public Schools.

Studies similar to this study are possible for the upcoming 2007-2008 school year. DCPS Reading First schools will use DIBELS measures across three second-grade time points. Table 11 shows the assessment schedule for the DCPS Reading First schools for kindergarten, first grade, and second grade.

Table 11
Schedule of DIBELS Assessments for DCPS Reading First Schools

DIBELS Scale	Kindergarten (2005-2006)			First Grade (2006-2007)			Second Grade (2007-2008)		
	Fall	Winter	Spring	Fall	Winter	Spring	Fall	Winter	Spring
LNF	√	√	√	√	-	-	-	-	-
NWF	-	-	-	√	√	√	√	√	√
ORF	-	-	-	√	√	√	√	√	√
PSF	-	-	-	√	√	√	-	-	-

Note: Check mark indicates the assessment is used.