Early Learning Coalition of Duval

Report 2008-09:
Longitudinal Study Addendum

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EARLY LEARNING COALITION OF DUVAL REPORT

2008-09: LONGITUDINAL STUDY ADDENDUM

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During the 2004-2005 academic year, the Early Learning Coalition of Duval, Inc. (ELC) began a 5-year longitudinal study of reading achievement of prekindergarten children served by the ELC and the Jacksonville Early Literacy Partnership (JELP). A full report of the children's school readiness at kindergarten entry was presented in the *Early Learning Coalition of Duval Report 2005-06*. Reports of the achievement of a subset of the children who attended Duval County Public School (DCPS) Reading First schools were included in the *Early Learning Coalition of Duval Report 2006-07* and the *Early Learning Coalition of Duval Report 2007-08.* This year, the fifth and final year of the study, focuses on the following research question:

> **Longitudinal Study Question:** Did children who participated in ELC/JELP-supported prekindergarten classes during the 2004-2005 academic year and who attended a DCPS elementary school attain higher third-grade FCAT Reading scores than similar children who did not participate in ELC/JELP-supported prekindergarten classes?

Evaluation data were collected in 2004-2005 from all ELC/JELP-supported prekindergarten children with informed parental consent. These data were merged with the 2005-2006 School Readiness Uniform Screening System (SRUSS) data provided by DCPS. SRUSS measures included three assessments of school readiness, the Early Screening Inventory—Kindergarten and two scales from the Dynamic Indicators of Basic Early Literacy Skills.

The combined prekindergarten and DCPS kindergarten data also include an indicator for ELC/JELP participation in prekindergarten thereby providing a link to DCPS data for years to come. Participation indicators include "*?*" for children whose ELC/JELP participation remained uncertain, "*y*" for children who participated in ELC/JELP-supported

prekindergarten classes during the 2004-2005 academic year, and "*n*" for children who did not participate in 2004-2005 ELC/JELP-supported prekindergarten.

The 2004-2005 prekindergarten children who progressed typically through the primary grades were third graders during the 2008-2009 academic year and were assessed for the first time using FCAT. Third-grade FCAT includes two content areas, mathematics and reading, and three scores for each area. Scale scores are standardized scores with a mean of 300 and a standard deviation of 50. These scores are used to form five achievement levels with levels 3, 4, and 5 representing at least grade level achievement. Developmental scores result from vertical equating and can be used to measure longitudinal growth across grades. The DCPS 2009 third-grade FCAT data (n = 10,046) were combined with the prekindergarten/kindergarten data used in the 2005-2006 school readiness study of the ELC/JELP prekindergarten children (n = 9,178). These combined data were used to respond to the ELC/JELP longitudinal study question.

The resulting data included three distinct sets: (a) the 2005-2006 kindergarten children with scores on any of the SRUSS measures and with no 2009 FCAT scores (n = 4,116); (b) the 2005-2006 kindergarten children with scores on any SRUSS measure and with 2009 FCAT scores (n = 5,062); and (c) the third graders with no 2005-2006 SRUSS scores and with 2009 FCAT scores (n = 4,984). For the purposes of the longitudinal study, these numbers indicate attrition of 45% of the kindergarten children and 49% of the 2009 third-grade children. We refer to the Set 1 as *kindergarten only* and Set 3 as *third grade only*, and these sets represent data ultimately lost to the longitudinal study of FCAT Reading achievement. The second set (Set 2) represents children who were located as kindergarteners with SRUSS scores and as third graders with FCAT scores. Table 1

presents child characteristics and mean SRUSS and FCAT scores of the children in these three non-overlapping sets.

Table 1
Demographic Information and Average SRUSS and FCAT Achievement of Children in the Kindergarten Only, Kindergarten & Third Grade, and Third Grade Only Data

Child Characteristics and Scores	Set 1 Kindergarten Only		Set 2 Kindergarten & Third Grade		Set 3 Third Grade Only	
	n	*%*	*n*	*%*	*n*	*%*
Number	4,116		5,062		4,984	
Sex						
Missing	10	<1	0	0	0	0
Boys	2,225	54	2,384	47	2,645	53
Girls	1,881	46	2,678	53	2,339	47
Ethnicity						
Missing	813	20	0	0	0	0
Black	1,452	35	2,055	41	2,390	48
Non-Black	1,851	45	3,007	59	2,594	52
Poverty Status						
Missing	814	20	0	0	0	0
Free lunch	1,651	40	1,936	38	2,754	55
Reduced-priced lunch	280	7	438	9	453	9
Full-priced lunch	1,371	33	2,688	53	1,777	36
Over-aged children		4		3		54
Treatment						
?	261	6	351	7		
No	3,268	79	3,787	75		
Yes	587	14	924	18		
Kindergarten						
SRUSS ESI-K						
Ready	2,994	73	4,486	88		
Missing	46	1	36	1		
SRUSS Letter Naming						
Ready	2,260	55	4,004	79		
Missing	119	3	140	3		
SRUSS Initial Sounds						
Ready	2,067	50	3,278	65		
Missing	332	8	362	7		
Third Grade						
FCAT Reading						
Level 3, 4, or 5			4,878	77	2,982	60
Missing			1	2	5	<1
FCAT Mathematics						
Level 3, 4, or 5			4,070	80	3,342	69
Missing			12	<1	28	1

Set 1 includes considerable missing data and represents children who were not in the third-grade FCAT data. The comparison of information in Set 1 and Set 2 shows that in

contrast to Set 1, girls represents the majority in Set 2 and that the percentage of 2004-2005 ELC/JELP prekindergarten children is slightly higher in Set 2. A comparison of ethnicity and poverty status across these two sets is complicated by the large percentage of missing values in Set 1. In general, the 2005-2006 kindergarten children who were not in the third-grade FCAT data were boys and children with lower SRUSS scores.

Over 50% of the third graders who were not in the 2005-2006 SRUSS data were older than the model age range for third-grade children indicating that the children were likely retained at least once as they progressed from kindergarten to third grade. Comparison of Set 2 and Set 3 shows that, in contrast to Set 2, the majority of children in Set 3 were boys, the majority lived in poverty, and fewer of the Set 3 children had FCAT scores that represented at least grade level reading achievement.

In general, the 5,062 Set 2 observations—children with both SRUSS and third-grade FCAT scores—represent children who progressed typically through the primary grades and whose data were used in responding to the ELC/JELP longitudinal study question. At least 11% more of the children in Set 2 than in Set 3 were achieving at grade-level or higher in reading and in mathematics, and at least 15% more of the children in Set 2 than in Set 1 were *Ready* for school at kindergarten entry.

Propensity score methodology was used in the analyses. This methodology reduces a set of background characteristics to a single variable that summarizes the background characteristics and adjusts for differences. The propensity score represents the likelihood that an individual would be part of an intervention, which in our study is the 2004-2005 participation in an ELC/JELP-supported prekindergarten class. The Set 1 and Set 2 data were used together to estimate the propensity scores; however, observations with

questionable participation in ELC/JELP were removed. Gender, ethnicity (defined as Black, White or Other), poverty status, English language learners (ELLs), age on September 1 of the kindergarten year, and living within a Reading First school attendance boundary were used to estimate the propensity scores. Because of the large amount of missing data in Set 1, only 7,152 observations (1,453 treatment and 5,699 comparison children) were assigned propensity scores. Observations that also had FCAT Reading scores were ranked by their propensity score, and the ranked data were divided into 10 equally sized strata. Table 2 provides the mean scores on the background characteristics disaggregated by stratum. Stratum 1 represents the 715 DCPS kindergarten children who were most likely to have participated in an ELC/JELP-supported preschool class in 2004-2005.

Table 2
Summary Statistics Disaggregated by Stratum for Some of the Variables Used to Form the Propensity Scores

Stratum	*ELC/JELP n*	*Comparison n*	% ELL	% Free Lunch	% Reduced Lunch	% Reading First School	% Black	% Boys	Mean Propensity Score
1	298	417	0	94	6	100	100	50	.40
2	234	481	0	79	6	19	100	34	.34
3	263	452	0	79	20	0	100	59	.32
4	168	548	0	13	3	8	92	54	.29
5	76	638	0	71	16	16	0	37	.14
6	82	635	0	46	27	0	0	51	.12
7	91	622	0	1	0	0	0	30	.18
8	92	626	0	0	0	0	0	49	.11
9	84	629	0	0	0	0	0	57	.11
10	65	651	36	17	5	8	3	79	.08

The mean scores of the background characteristics used to estimate the propensity scores of the ELC/JELP children by probability stratum indicate that ELC/JELP children were more likely to be economically disadvantaged, Black, attend Title I Reading First schools, and not classified as ELLs. Furthermore, 66% of the data from the ELC/JELP

children is located in the first four strata. The 963 ELC/JELP children in these four strata were mostly Black, and the children in the first three strata were very likely living in poverty.

A *t*-test was used to determine whether the observed differences between the ELC/JELP and comparison children's mean FCAT Reading scores occurred by chance or represent true differences. A statistically significant *p*-value ($p \leq .05$) indicates a true difference in the mean scores of the two populations for the particular stratum. FCAT Reading and propensity scores were available for 1,452 ELC/JELP and 4,156 comparison children. Table 3 provides the comparisons across treatment levels of the FCAT Reading mean scores.

Table 3
Comparisons across Treatment Levels for the FCAT Reading Scores by Stratum

	Status	*n*	*M*	*p*-value
1	Com	198	279	.379
	Trt	154	283	
2	Com	253	296	.524
	Trt	143	298	
3	Com	253	298	.354
	Trt	171	293	
4	Com	308	311	.798
	Trt	120	310	
5	Com	307	329	.081
	Trt	41	313	
6	Com	323	338	.111
	Trt	44	327	
7	Com	392	345	.340
	Trt	64	339	
8	Com	392	345	.837
	Trt	61	346	
9	Com	432	351	.134
	Trt	58	341	
10	Com	394	343	.613
	Trt	48	339	

No statistically significant differences in the mean FCAT Reading scores of the ELC/JELP and comparison children were detected for any of the 10 strata. Thus, among children equally likely to have participated in the 2004-2005 ELC/JELP-supported

prekindergarten classes and who progressed typically through the primary grades, no differences were detected in the mean FCAT Reading scores of the children who participated in ELC/JELP prekindergarten and those who did not.

Analysis of data using the FCAT achievement levels rather than the FCAT scale scores provides further evidence supporting the results reported in Table 3. FCAT achievement levels were dichotomized as below grade-level achievement (levels 1 and 2) and at or above grade-level achievement (levels 3, 4, and 5). Within each stratum, the percentage of children with grade-level or better FCAT Reading achievement was statistically compared across those children who participated in ELC/JELP prekindergarten and those who did not participate. Table 4 shows the percentage of stratum children with at least grade-level FCAT Reading achievement and the *p*-values indicating whether any differences in percentage by ELC/JELP participation were statistically significant.

Table 4
Comparisons across Treatment Levels and Stratum of Grade-Level FCAT Reading

Strata	***% At or Above Grade-Level***	***p*-value**
1	50.8	.118
2	62.0	.782
3	62.1	.514
4	71.3	.985
5	80.6	.845
6	86.4	.881
7	88.4	.893
8	90.3	.625
9	89.5	.898
10	85.4	.991

No statistically significant differences were detected in the percentage of children with at least grade-level FCAT reading achievement across the ELC/JELP and comparison children. These findings support the findings of no statistically significant mean differences in FCAT Reading achievement reported in Table 3 for children equally likely

to have participated in the 2004-2005 ELC/JELP-supported prekindergarten classes and who progressed typically through the primary grades.

Summary Longitudinal Study

Summary Bullets

- Almost half of the observations in the original kindergarten SRUSS data and in the third-grade FCAT data were lost to the longitudinal study of ELC/JELP participants and their third-grade FCAT Reading achievement.
- The final data represent children who progressed in the typical fashion through primary school (without grade retention) and included more girls, more ethnic diversity, and fewer economically disadvantaged children than in the kindergarten SRUSS or third-grade FCAT data.
- A larger percentage of children in the final data were judged *Ready* for kindergarten than kindergarten children without third-grade FCAT scores, and a larger percentage of children in the final data were reading at least at grade level than third-grade children without fall 2005 SRUSS data.
- No statistically significant differences were detected between the mean FCAT Reading scores of children who participated in ELC/JELP-supported prekindergarten in 2004-2005 and comparison children who did not.
- No statistically significant differences were detected in the percentage of children with at least grade-level FCAT Reading achievement between children who participated in ELC/JELP-supported prekindergarten in 2004-2005 and comparison children who did not.