



THE LA 4 LONGITUDINAL STUDY

Findings from the High School Years
A Project of the Council for A Better Louisiana

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INTRODUCTION

During the last half of the 20th century, numerous basic research projects across the United States affirmed the benefits of early childhood education programs, particularly for children from low-income families and children with disabilities. Improvements were demonstrated in areas of school readiness, reduced special education enrollment, state test performance, dropouts, suspensions, expulsions, and higher graduation rates.

In response to that work, the Louisiana Legislature passed Act 1146 in 2001 creating the Cecil J. Picard LA 4 Early Childhood Program. Its goal was to provide widespread access to high-quality early childhood education for children from economically-disadvantaged households. This study looks at the impacts of the LA 4 program on its first three cohorts of students, and for the first time, traces their academic achievements through high school.

SETTING

In the fall of 2002, the Louisiana Department of Education (LDOE) began a statewide program of full-day public Pre-K known as LA 4 to serve four-year-olds from low-income families. The goal of the program was to improve academic performance of students from low-income families who are typically at elevated risk for poor school performance.

The LA 4 Longitudinal Study was conducted starting with the three initial cohorts which include 42,599 students entering kindergarten for the first time from the 2002-03, 2003-04, and 2004-05 school years. These initial research cohorts included all LA 4 participants qualifying for free or reduced-price meals who entered kindergarten immediately following their Pre-K year (referred to as LA 4) along with children entering kindergarten at the same time (for the first time) and in the same schools with no record of having participated in a publicly-funded Pre-K program (referred to as NPPK).

The high school findings presented here are for all students from the LA 4 and NPPK groups that could still be found in the student information system in the years when they would be expected to be in 12th grade if they had neither skipped nor repeated any grade. The demographics for these two groups are shown in the table on the next page for kindergarten and year in which they would be expected to arrive on-time in 12th grade (2015-16 school year for cohort 1, 2016-17 for cohort 2, and 2017-18 for cohort 3). Note that students included in the high school section of the table are counts of all students found in the year they were expected to have entered 12th grade on time, regardless of their actual grade placement, test performance, dropouts, suspensions, expulsions, and higher graduation rates.

Table 1. Demographics for all students included in the LA 4 Longitudinal High School Study

	Kindergarten (n=42,599)		High School (n=29,034)	
	LA 4	No Public Pre-K	LA 4	No Public Pre-K
TOTAL	9,864	32,735	7,155	21,879
FEMALE	50.5% (n=4,982)	47.1% (n=15,403)	52.4% (n=3,750)	48.5% (n=10,612)
MALE	49.5% (n=4,882)	52.9% (n=17,332)	47.6% (n=3,405)	51.5% (n=11,267)
BLACK	53.8% (n=5,309)	59.6% (n=19,502)	54.9% (n=3,928)	62.4% (n=13,644)
WHITE	40.2% (n=3,961)	35.9% (n=11,746)	39.0% (n=2,789)	33.6% (n=7,353)
HISPANIC	3.5% (n=343)	2.8% (n=922)	3.4% (n=240)	2.4% (n=519)
OTHER	2.5% (n=251)	1.7% (n=1,487)	2.8% (n=198)	1.7% (n=363)

PHASE 1 LA 4 LONGITUDINAL STUDY

Findings of Phase 1 of the LA 4 Longitudinal Study measured the relationship of participation in the LA 4 Pre-K program of children at the end of their Pre-K year and during their subsequent years within Louisiana public schools. Annual reports were produced for the first nine cohorts of LA 4 children and consistently demonstrated statistically significant growth in their kindergarten readiness as measured by the Developing Skills Checklist (DSC). Previous longitudinal reports have provided detailed findings on academic outcomes as measured by mandated statewide assessments, participation in special education, and their on-time arrival in subsequent grades from kindergarten through 8th grade. The full set of reports can be reviewed in the collection of annual and periodic longitudinal reports that can be accessed from the Louisiana Department of Education's website (<http://www.louisianabelieves.com>).

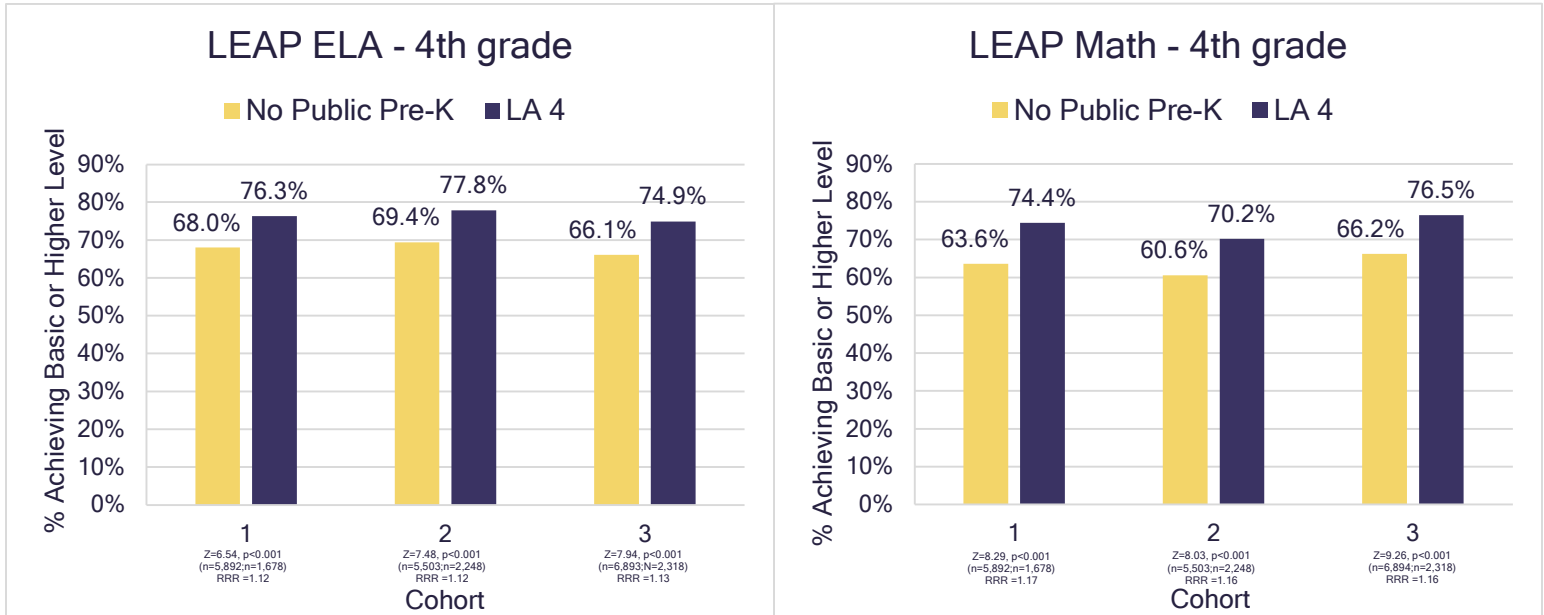
Increased 4th Grade Academic Performance

At the time that the first three cohorts from the LA 4 Longitudinal Study completed 4th grade, all students in Louisiana were required to take the Louisiana Educational Assessment Program (LEAP) tests in English Language Arts (ELA), mathematics, science, and social studies. These assessments were high stakes so that children were required to “pass” (scores categorized as Basic or Above) to be recommended for advancement to the next grade level.

LA 4 participants from all three cohorts demonstrated higher performance on all four LEAP subject areas. The differences between those students that participated in LA 4 were

uniformly positive and statistically significant. Figure 1 illustrates the higher performance of the LA 4 students compared to their same-school peers in English Language Arts and Mathematics.

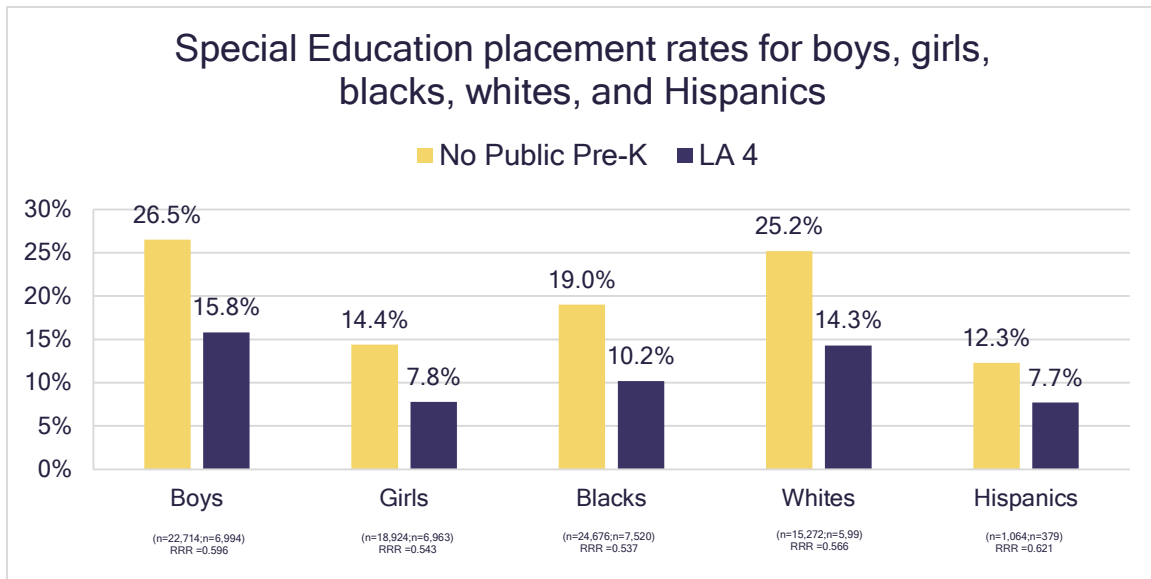
Figure 1. LEAP performance for the first three cohorts from the LA 4 Longitudinal Study (August 2011)



Decreased Special Education Rates

Based on prior research in early childhood programs, there was an expectation from the start of LA 4 that providing a high-quality Pre-K program could reduce the rate at which children were classified as students with disabilities. The previous longitudinal reports documented that these expectations were met. All analyses that were conducted related to special education placement found statistically significantly lower rates of placement in special education. Figure 2 on the next page demonstrates that not only were rates of special education placement lower for LA 4 students, but that these advantages also were found to accrue regardless of race or gender.

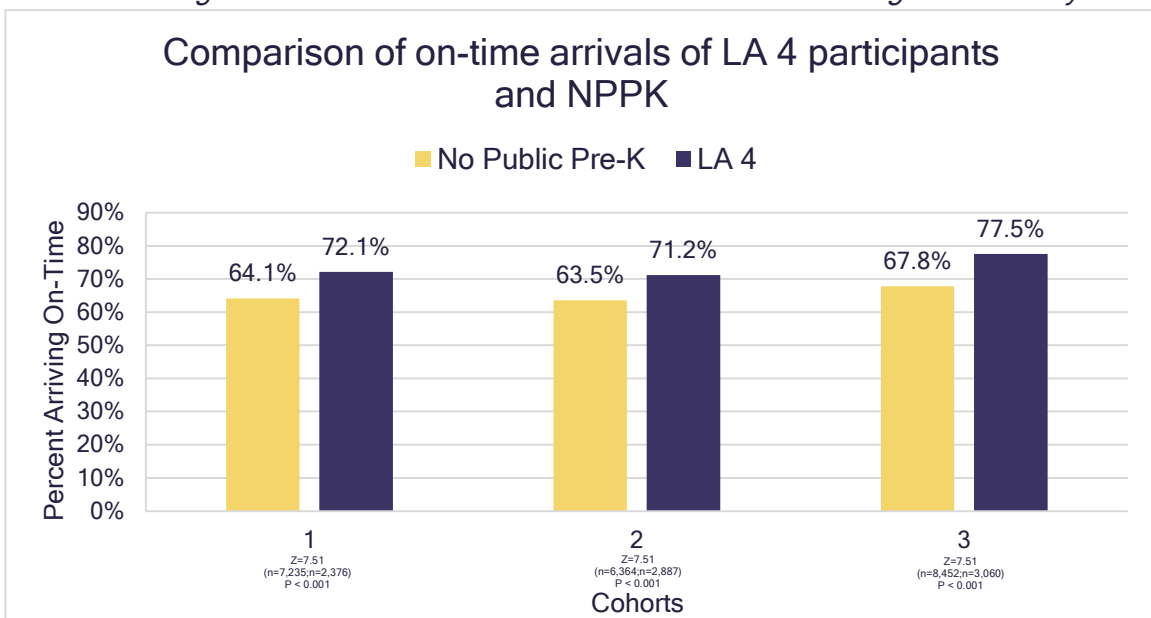
Figure 2. Special Education placement rates for boys, girls, blacks, whites, and Hispanics who received LA 4 Pre-K or No Public Pre-K



Increased On-time 4th Grade Arrival

In addition to improvement in academic performance and special educational placement, participation in LA 4 has also been found to be related to lower rates of students being retained in a grade and higher rates of on-time arrival in later grades. Figure 3 below illustrates this relationship for the first three cohorts on-time arrival rates for 4th grade.

Figure 3. On-time 4th grade arrival for the first three cohorts of the LA 4 Longitudinal Study



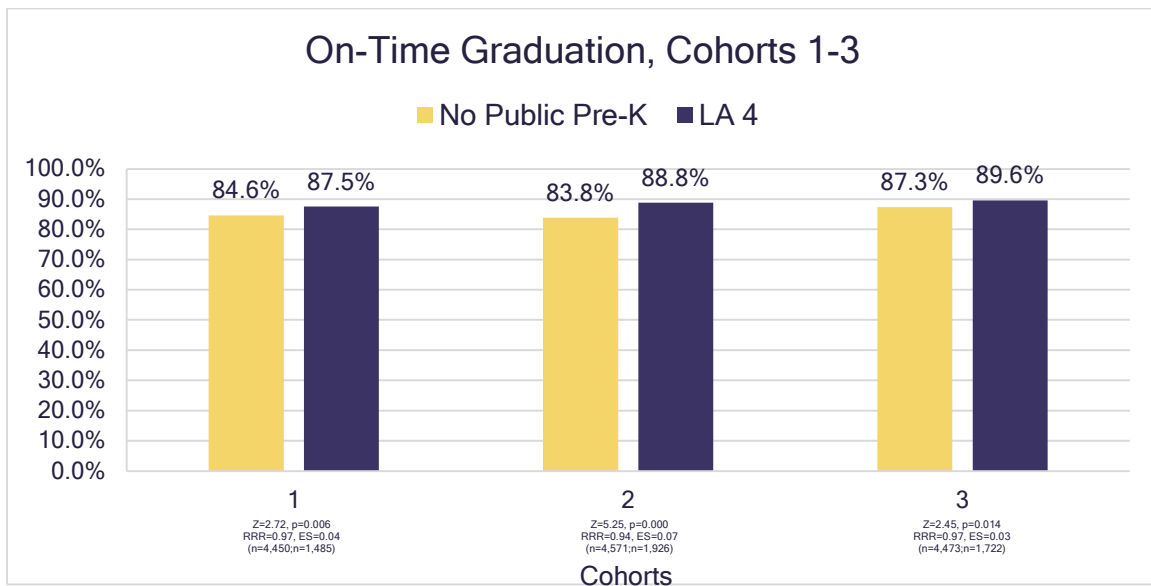
PHASE 2 LA 4 LONGITUDINAL STUDY

The second phase of the longitudinal study covers the same types of indicators (academic performance, special education, on-time matriculation) as the first phase, but also adds measures for graduation and qualifications for financial assistance programs for postsecondary education.

Increased High School Graduation Rates

LA 4 students' cohort graduation rate was 88.8%, exceeding the overall statewide graduation rate of 79.1% for the same years. Compared to other low-income peers who started in the same elementary schools, LA 4 students had on-time high school graduation rates 4.3% higher than those of their same school, economically-disadvantaged peers who received no public Pre-K. Figure 4 shows the findings for the first three cohorts. There are statistically significant differences between the students who participated in LA 4 and their same-school, income-matched peers.

Figure 4. Graduation rates for the first three cohorts in the LA 4 Longitudinal Study



Decreased Special Education Rates

Participating in LA 4 is associated with a 45% lower rate of special education. LA 4 students had high school placement rates in special education of 8.4%, compared to 15.2% for same-school, low-income peers who received no public Pre-K across all cohorts and high school grade placements.

Figure 5. Percentage of students by grade placement and cohort that were identified as students with disabilities

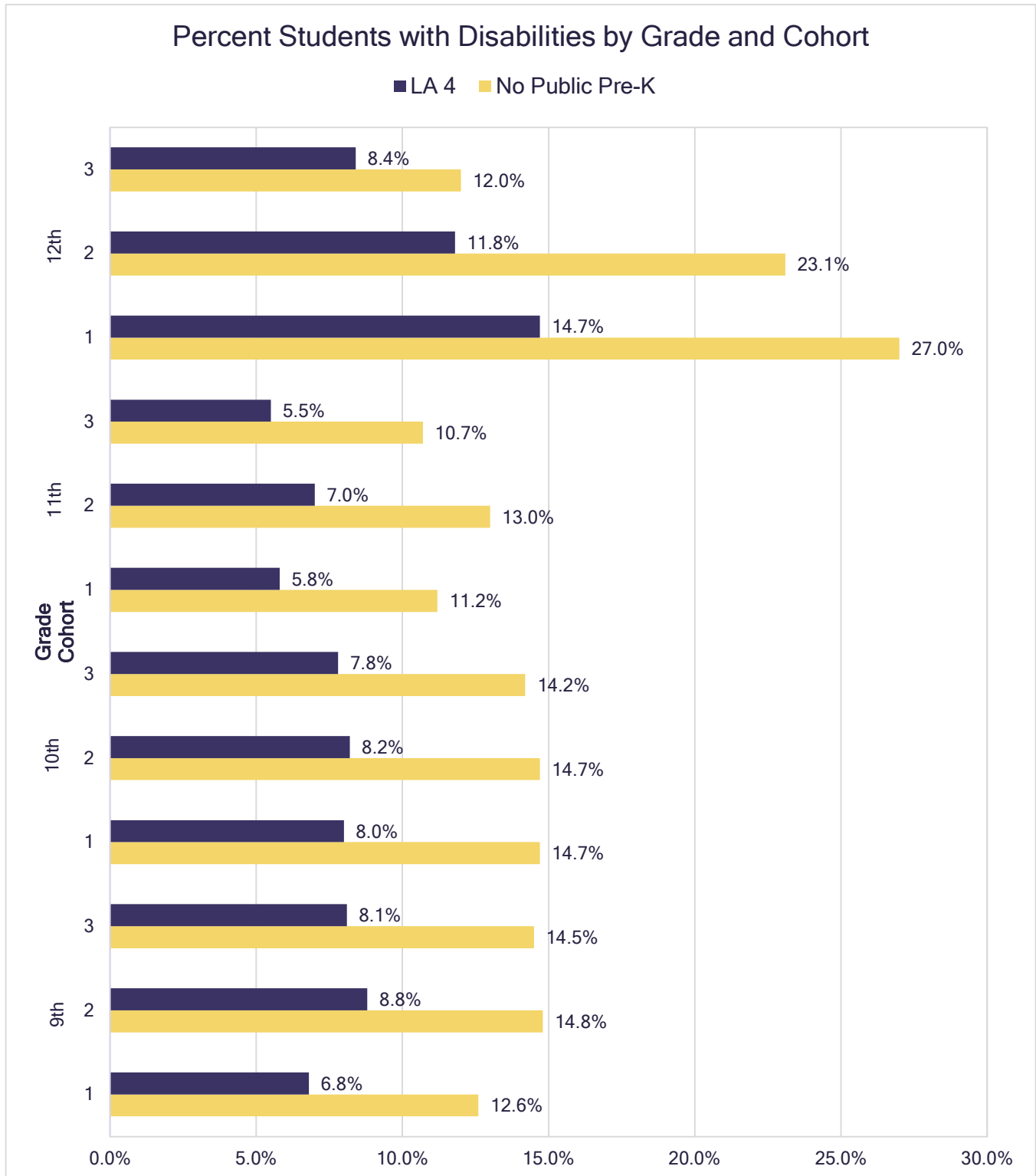


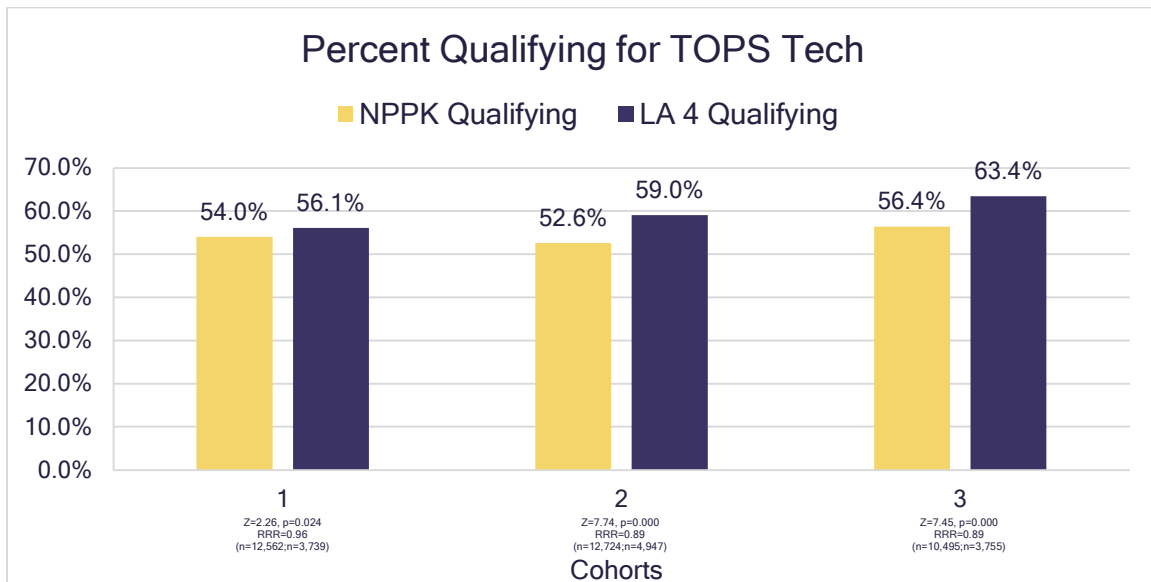
Table 2. Statistical results by grade placement and cohort for students identified as students with disabilities

Cohort	Grade	No Public Pre-K Total	No Public Pre-K in Special Ed	LA 4 Total	LA 4 in Special Ed	Relative Risk Ratio	z-stat	p-value	No Public Pre-K % Special Ed	LA 4 % Special Ed
1	9	8420	1057	2342	160	0.54	7.73	0.000	12.6%	6.8%
2	9	8968	1324	3068	270	0.60	8.41	0.000	14.8%	8.8%
3	9	8336	1206	2619	212	0.56	8.47	0.000	14.5%	8.1%
1	10	8405	1239	2340	188	0.54	8.46	0.000	14.7%	8.0%
2	10	8706	1278	3225	264	0.56	9.39	0.000	14.7%	8.2%
3	10	7844	1111	2600	203	0.55	8.47	0.000	14.2%	7.8%
1	11	6057	678	1745	102	0.52	6.56	0.000	11.2%	5.8%
2	11	6584	857	2409	168	0.54	7.99	0.000	13.0%	7.0%
3	11	5749	613	1948	108	0.52	6.70	0.000	10.7%	5.5%
1	12	1402	378	307	45	0.54	4.52	0.000	27.0%	14.7%
2	12	1167	270	399	47	0.51	4.87	0.000	23.1%	11.8%
3	12	458	55	178	15	0.70	1.30	0.195	12.0%	8.4%

Increased TOPS Award Qualification Rates

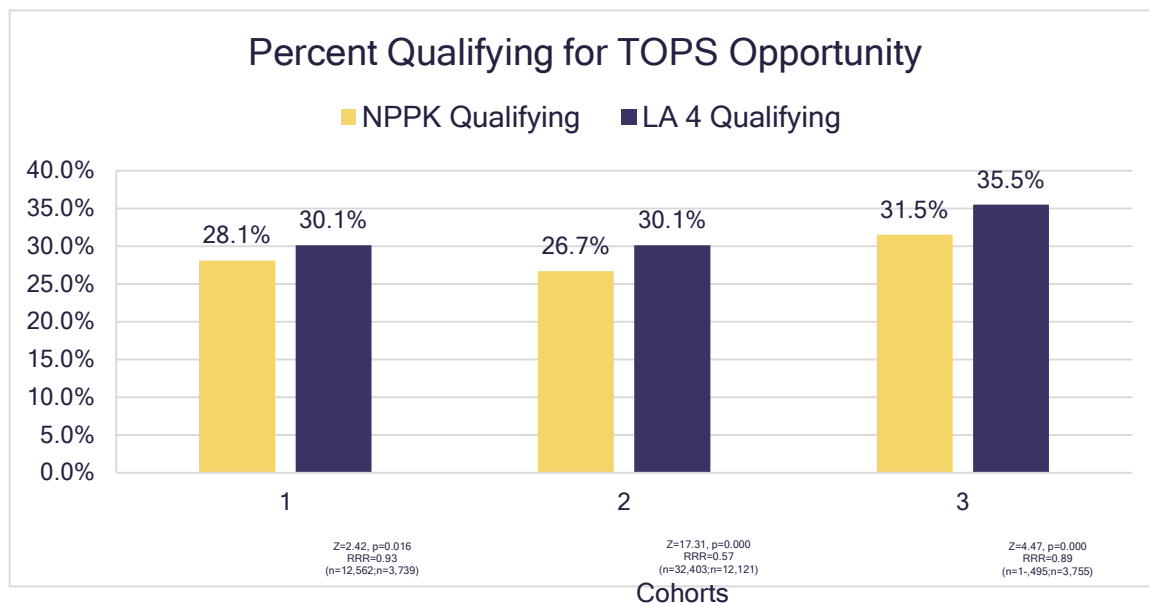
More LA 4 students qualified for TOPS Tech awards, a Louisiana program that covers post-secondary tuition for state technical schools and two-year colleges, than their same-school, economically-disadvantaged peers who received no public Pre-K. An additional 2.1% to 9.0% of LA 4 students qualified for the Tech award, depending on the cohort

Figure 6. Comparison of TOPS Tech (two-year institutions) qualification, Cohorts 1-3



More LA 4 students qualified for TOPS Opportunity awards, a Louisiana program that covers post-secondary tuition for state four-year colleges, than those of the same-school, economically-disadvantaged peers who received no public Pre-K. An additional 2.0% to 4.0% of LA 4 students qualified for the Opportunity award, depending on the cohort.

Figure 7. Comparison of TOPS Opportunity (four-year institutions) qualification, Cohorts 1-3



Increased Academic Performance

Louisiana High School students are required to take five subject-matter-specific end-of-course (EOC) assessments. Based on their scores, students are categorized into four performance levels: Needs Improvement, Fair, Good, and Excellent. The results here focus on the primary or original objective of the LA 4 program, to prevent low levels of school achievement. (See below for findings about increasing high levels of achievement). Overall, for four of the five subjects, the LA 4 students showed significantly decreased rates of low achievement, the exception being English 3. All comparisons are between peers from low-income families who entered the same elementary schools.

Although high academic achievement was not an explicit goal of LA 4, the standardized test performance results show a consistent long-term benefit at the high end for four of the five academic subjects, with English 3 being the only subject for which statistically-significant differences did not appear between LA 4 students and other low-income, same-school peers.

Table 3. Proportion of LA 4 students scoring Good or Excellent in comparison to NPPK students.

Algebra	12.1% higher
English 2	7.8% higher
English 3	Did not differ significantly
Geometry	8.4% higher
Biology	9.3% higher

Figure 8. Comparison of academic performance on high school End-of-Course assessments, cohorts 1-3

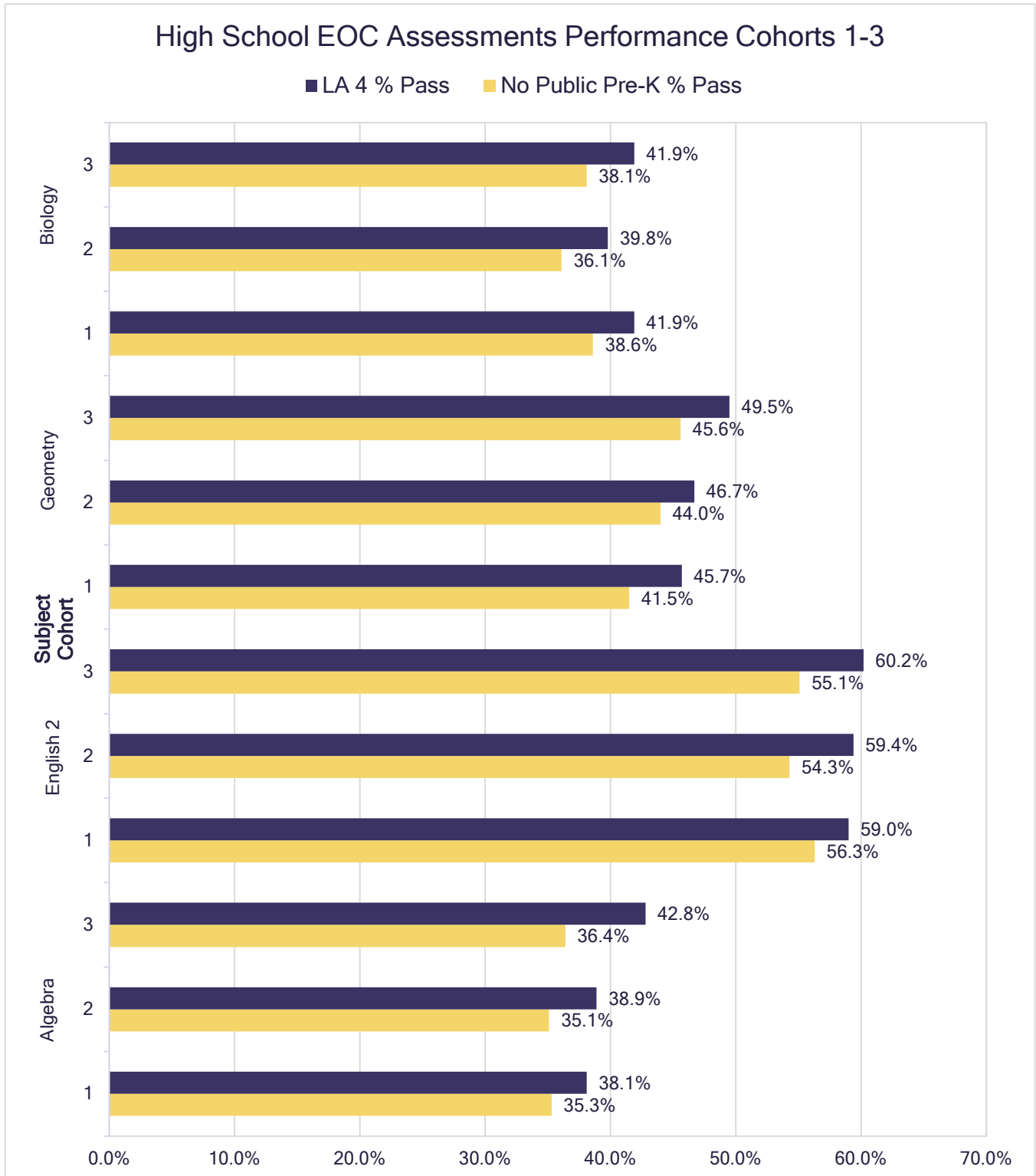


Table 4. Statistical results for comparison of academic performance on high school End-of-Course assessments, cohorts 1-3

Cohort	Measure	No Public Pre-K Total	No Public Pre-K Not Passing	LA 4 Total	LA 4 Not Passing	Relative Risk Ratio	z-stat	p-value	No Public Pre-K % Pass	LA 4 % Pass
1	Algebra	10118	6549	2475	1533	0.93	2.59	0.010	35.3%	38.1%
2	Algebra	11058	7172	3509	2145	0.90	4.01	0.000	35.1%	38.9%
3	Algebra	9722	6186	2758	1578	0.85	6.13	0.000	36.4%	42.8%
1	English 2	7697	3363	1910	783	0.95	2.13	0.033	56.3%	59.0%
2	English 3	8352	3815	2645	1075	0.92	4.54	0.000	55.1%	60.2%
3	English 4	7713	3464	2237	891	0.92	4.26	0.000	55.1%	60.2%
1	English 3	6286	3057	1577	754	0.98	0.58	0.560 ¹	51.4%	52.2%
2	English 4	6213	3023	2125	1013	0.98	0.78	0.433 ¹	51.3%	52.3%
3	English 5	5132	2286	1586	697	0.99	0.42	0.676 ¹	55.5%	56.1%
1	Geometry	7051	4122	1754	953	0.91	3.13	0.002	41.5%	45.7%
2	Geometry	7073	3960	2387	1272	0.94	2.29	0.022	44.0%	46.7%
3	Geometry	6162	3354	1865	942	0.92	2.97	0.003	45.6%	49.5%
1	Biology	8429	5175	2062	1199	0.92	2.71	0.007	38.6%	41.9%
2	Biology	8939	5715	2858	1721	0.91	3.58	0.000	36.1%	39.8%
3	Biology	8188	5067	2355	1369	0.91	3.29	0.001	38.1%	41.9%

DISCUSSION

The LA 4 Program was developed primarily to improve school readiness for four-year-old children from low-resource families (identified based on receiving free or reduced-price lunches [FRPL]). The program was continuously monitored, and professional development was provided by the state Department of Education. LA 4 was judged to be of high-quality by systematic observation by independent university-based researchers. During program participation, measured gains in academic readiness were reported for three successive cohorts of children (N=9,864).

At kindergarten entry the comparison group of children entering the same schools as the LA 4 participants were identified (N=32,735). Both groups of children were followed through elementary school and high school using the state's Longitudinal Student Database, the

Student Information System (SIS) which includes all students who continue to reside in Louisiana. LA 4 students evidenced enhanced performance in reading, mathematics, social studies, and science during the elementary school years and performed above state averages in those subjects. LA 4 participation was also associated with significantly lower placement in special education and retention in grade. Results also showed significantly better performance during high school in algebra, English 2, biology, and geometry and on-time graduation and qualifying for financial assistance for post-high school education. These results were remarkably consistent across the three cohorts during the expansion of the program with benefits accruing to boys and girls and blacks and whites. Overall, this pattern of results is consistent with smaller, more intensive randomized controlled Pre-K experiments, but more modest in magnitude.

The largest statistically significant benefits were reduced special education rates (lower by 45% averaged across three successive cohorts) and on-time graduation rates (improved by 4.5% averaged across three successive cohorts). The on-time high school graduation rates for FRPL students who received LA 4, 89%, were even higher than the statewide average on-time graduation rate of 79% during those same three successive years.

Academic achievement scores on statewide standardized tests were higher for children who received LA 4 than for their economically-disadvantaged peers who had no public Pre-K in four of the five subject areas. These differences were statistically significant, although relatively modest. (Note: during elementary school years, the students with and without public Pre-K had differed to a larger degree.)

IMPLICATIONS: A statewide Pre-K program in the future is likely to realize similar benefits for children from low-income families who would otherwise not receive a high-quality, full-day, year-long education program as four-year-olds.

Because the LA 4 children receiving FRPL still performed lower than the statewide averages on most academic achievement tests, it is likely that one year of Pre-K education cannot suffice to prepare children optimally for school entry levels on par with students from middle class families. Other research indicates that high-quality early childcare and education interventions that begin much earlier, ideally in the first three years of life, are likely to yield even larger benefits in terms of educational outcomes, extending into postsecondary benefits and with likely corresponding benefits into adulthood workforce participation and earnings and health (cf. Ramey, 2017).

FUTURE WORK: In addition to the overall positive impact this longitudinal report acknowledges, it should be noted that achieving these results required a focused public policy effort over an extended period of time.

The Legislature identified early childhood education as a priority in 2001. Louisiana's Department of Education worked over many years to develop and refine the necessary tools to achieve success. This included curricula, professional development, assessment, and

ongoing monitoring. And advocates continued to work to expand access to LA 4, so much so that high-quality, publicly-funded Pre-K is now available to virtually every economically-disadvantaged child in the state.

Louisiana should now consider further expansion of quality early education to include children from birth to age three. It is the aspiration of this report that by enriching our children, we create greater opportunities for their success, strengthen our workforce, and improve the overall wellbeing of our state

BIBLIOGRAPHY

There is a substantial literature of reports that were presented to the Louisiana Department of Education beginning with the first year's annual report that evaluated the implementation and results achieved by students during their year in the Pre-K program. There were also several longitudinal reports detailing the longer-term results related to participation in the LA 4 program. Those listed here are still readily available at the links listed for each.

Annual Reports

2006-07 LA 4/Starting Points Evaluation Report - Executive Summary,

Last accessed 5/3/2021 from

<https://picardcenter.louisiana.edu/sites/picardcenter/files/LA%204%20Executive%20Summary%202006-07.pdf>

2007-08 LA 4/Starting Points Evaluation Report - Full Report,

Last accessed 5/3/2021 from

<https://picardcenter.louisiana.edu/sites/picardcenter/files/LA%204%20Annual%20Report%202007-08.pdf>

2008-09 LA 4/Starting Points Evaluation Report - Full Report

Last accessed 5/3/2021 from

<https://picardcenter.louisiana.edu/sites/picardcenter/files/LA%204%20Annual%20Report%202008-09.pdf>

LA 4 Annual Report 2010-11

Last accessed 5/3/2021 from

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LA 4 Program Evaluation 2006-07,

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LA 4 Program Evaluation 2008-09,

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<https://picardcenter.louisiana.edu/sites/picardcenter/files/LA%204%20Annual%20Report%202008-09.pdf>

Longitudinal Reports

LA 4 Longitudinal Study: The impact of LA 4 participation on academic achievement in 3rd and 4th grade: iLEAP and LEAP performance for cohorts 1-4

Last accessed 5/3/2021 from

<https://picardcenter.louisiana.edu/sites/picardcenter/files/LA%204%20iLEAP%20and%20LEAP%20Report.pdf>

LA 4 Longitudinal Report

Last accessed 5/3/2021 from

<https://picardcenter.louisiana.edu/sites/picardcenter/files/LA%204%20Longitudinal%20Report%202007-08.pdf>

Acknowledgements

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