



Harrison County Community Foundation  
Pre-K Pilot  
Annual Evaluation Report  
2017-2018



**APPLIED RESEARCH AND  
EDUCATION CENTER**

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INDIANA UNIVERSITY SOUTHEAST



# APPLIED RESEARCH AND EDUCATION CENTER

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# Introduction

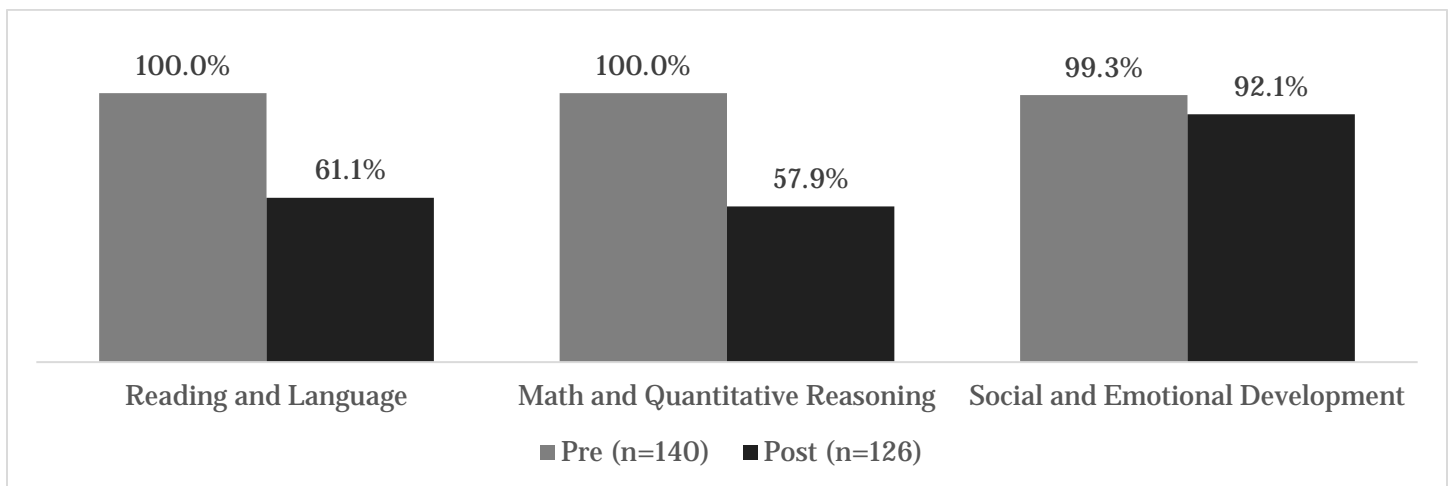
In 2013, the Harrison County Community Foundation began work on a five-year pre-K pilot program, Jump Start. The program funds full-day pre-K for up to 200 low-income or at-risk children. The project provides a local parallel to the limited statewide “On My Way Pre-K” pilot program that provides public subsidies for four-year-old pre-K enrollment in quality pre-K programs. Harrison County’s Blue River Services and South Harrison Community School Corporation are part of both the On My Way Pre-K (OMWPK) pilot and Jump Start. In 2018, Harrison County will become part of the statewide OMWPK pilot, providing additional pre-K slots for residents.

Beginning in 2014, implementation of the Jump Start pilot occurred on a relatively small scale with a handful of providers and a much smaller pool of students. The 2017-2018 school year was the fourth year of full implementation and the program included 149 students across ten programs, eight of which operated in area public and parochial elementary schools.

With instruments and data systems in place, data collection at the outset of the school year, at mid-year, and at the end of the school year went quite smoothly. Mid-year data provide formative feedback for pre-school programs and are not included here. All programs used the Indiana Standards Tool for Alternate Reporting of Kindergarten Readiness (ISTAR KR) assessment to record observations of student behavior and skills.

The evaluation team explored opportunities and limits in obtaining data on kindergarten readiness prior to and after pilot initiation. The key finding from this effort is that schools vary in their methods of recording these data, often do not include K-readiness assessment scores in the student record, and rarely maintain those records across years. The research team is still working on contacting kindergarten teachers to identify opportunities to access more data. As we approach the 2018-2019 school year, the emerging Align Southern Indiana Early Childhood action team has set uniform kindergarten readiness assessment, recording, and tracking as the first goal in moving all of Southern Indiana Louisville-Metro toward 100% kindergarten readiness.

**Figure 1: Percent of Students with Two or More Areas of Developmental Delay<sup>1</sup> within Each of the Three Broad Categories of Assessment (Pre and Post)**



Findings confirm the significant immediate impact that pre-K programs have on kindergarten readiness. This report presents findings from the 2017-2018 school year that illustrate a statistically significant increase in skills across the board for those enrolled in the pilot. Over the course of eight months in quality full-day pre-K, the program reduced the percent of students with two or more areas of delay in Reading and Language from 100 percent to 61.1 percent; Math and Quantitative Reasoning from 100 percent to 57.9 percent; and Social and Emotional Development from 99.3 percent to 92.1 percent (Figure 1).

During the 2017-2018 school year, the program did not meet the target of 200 full day pre-K slots. All participating programs report that reaching those not yet showing up remains a barrier to fully realizing the potential impact of the program. Providers are working closely with the Harrison County Community Foundation to be sure people know where the program is available and to refer potential participants to other options when waitlisted at a facility that is already full. Public education on the benefits of pre-K and the availability of this program are a priority for increasing enrollments.

Transportation remains a barrier for many. In some areas, school district transportation services incorporate the pre-K children into their bus routes without too much trouble. Four of the pilot programs have transportation through the school district bus system. However, other districts express concerns about preschool children riding the bus and do not offer this option. For private providers, transportation remains a persistent concern. Program and Foundation staff consistently

seek opportunities to overcome these barriers and maximize program reach and impact.

As Jump Start enters its 5<sup>th</sup> year, HCCF can report significant contributions to regional and state work on Early Care and Education. The HCCF pilot has contributed and will continue to contribute local data to the development of public education materials for use across the five-county Southern Indiana Louisville Metro region. The public education effort was launched by the early care and education coalition that operated as a precursor to the Align Southern Indiana (ASI) Early Care and Education Action Team and has become a task committee within that effort. Align Southern Indiana seeks to draw people from Clark, Floyd, Harrison, Scott and Washington counties to coordinate effort, share best practices, and move toward a common vision and common goals for regional prosperity and quality of life.

The Early Care and Education coalition received a grant to begin to address the public education needs identified in the first four years of HCCF's pilot. The group released "Early Care and Education: The Economic Case" in February 2018 and will release additional pieces on access, quality, and affordability in the next 6-8 weeks. A social media strategy will highlight Jump Start's success and will break research into bite-sized easy-to-understand graphics to reach a broad audience. In addition to valuable contributions to this regional effort, the state added Harrison County to the statewide OMWPK pilot as a community that demonstrated "readiness" for success. Jump Start's success is a central indicator of the county's readiness.

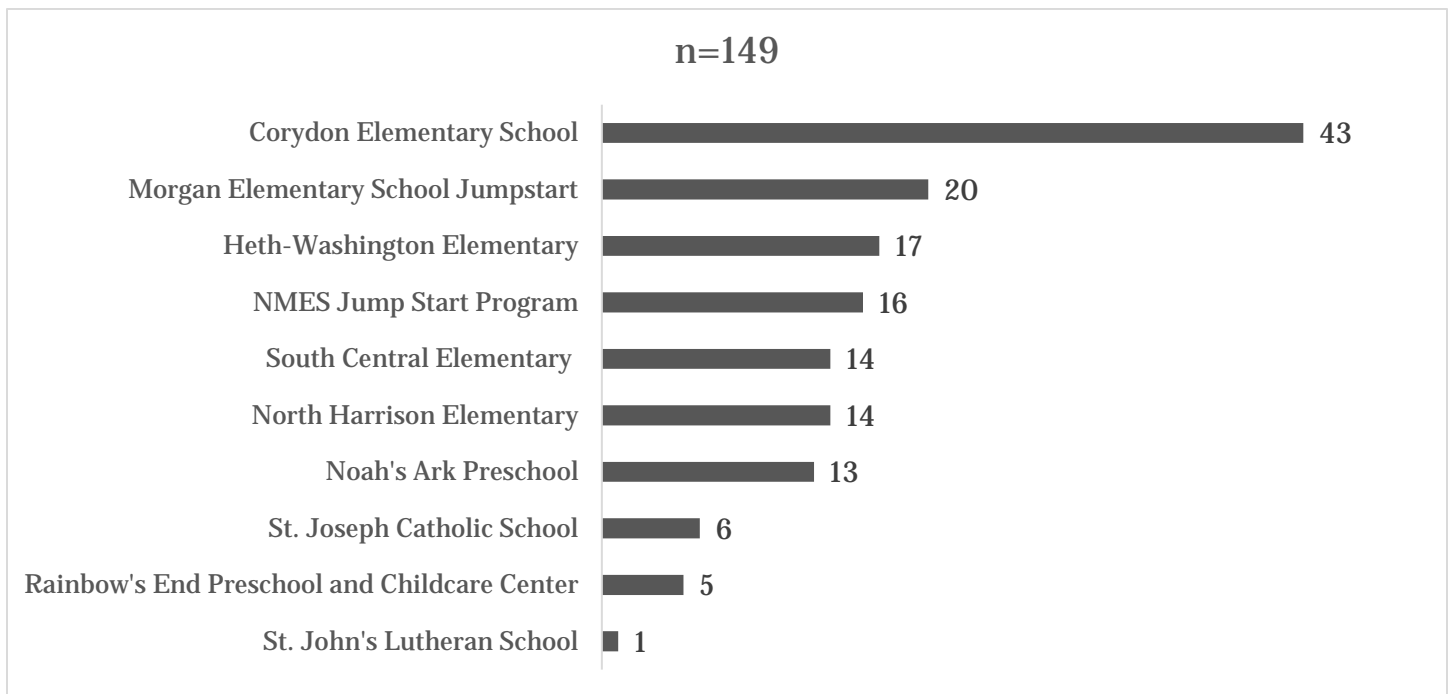
# Demographics

During the 2017-2018 school year, the Harrison County JumpStart Pilot included 151 children across 10 programs. Of these children, 149 were enrolled long enough to be surveyed for this report's analyses (Figure 2). The project would like to fund up to 200 slots, but participating programs may not have quite enough capacity to reach the

target, some struggle to reach families that might benefit, or find that transportation is a barrier.

Participating programs include public and parochial elementary schools with pre-K classes, private secular programs, and private faith-based organizations.

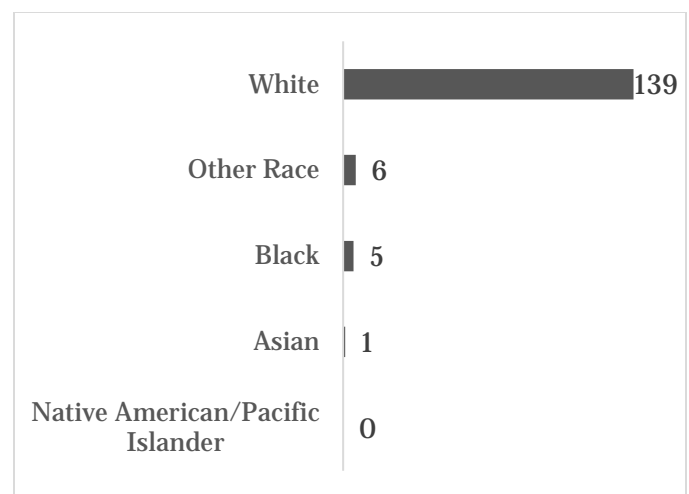
**Figure 2: Distribution of Pre-K Pilot Students across Participating Programs**



Teachers provide data on race and ethnicity based on student records or other sources. They can indicate more than one race, as was the case for three students. Hispanic origin is a separate ethnicity item not included in the race variable.

The students were predominately White (Figure 3), reflecting the demographics of the area, and 0.7 percent of students were Hispanic (Figure 4).

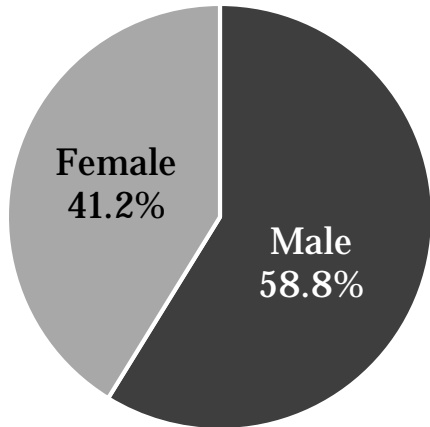
**Figure 3: Race (n=148)**



**Figure 4: Hispanic Origin (n=148)**

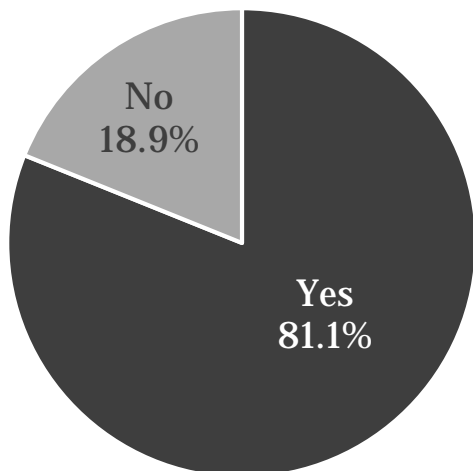
Hispanic	0.7%
Non-Hispanic	99.3%

**Figure 5: Gender (n=148)**



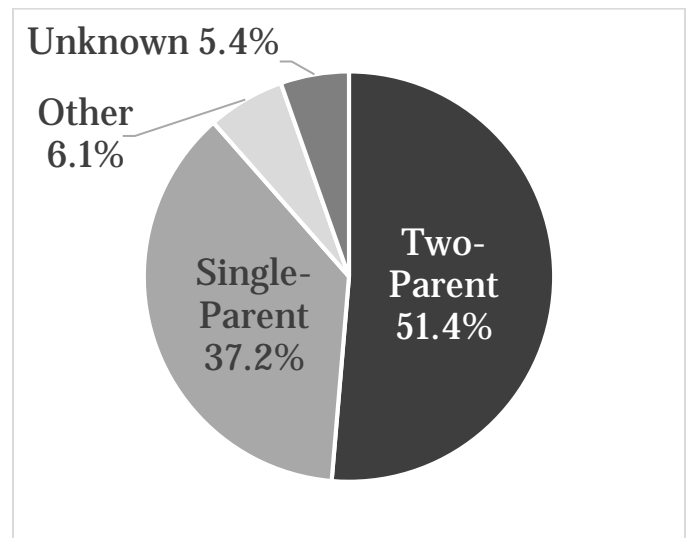
Of the students enrolled in the 2017-2018 pilot, 58.8 percent were male and 41.2 percent were female (Figure 5). The pilot program targets low-income children and 81.1 percent of students reflected in these data qualified for free and reduced meals (Figure 6). Some children completing the assessments do not qualify for free and reduced lunch, but have other risk factors that qualify them for the program.

**Figure 6: Qualify for Free and Reduced Lunch (n=148)**



Of the 149 students in the pilot, teachers did not know the household composition for 5.4 percent, 37.2 percent came from single-parent households, more than half (51.4 percent) from two-parent households and 6.1 percent from other household types (Figure 7).

**Figure 7: Household Composition (n=148)**



The role of family and home environment is an area the statewide pilot carefully explores, but is beyond the scope of this work. However, the OMWPK evaluation uses attendance as an indicator of family engagement. The average attendance rate for 2017-2018 Jump Start was 91.7%.



# Findings

## ISTAR KR Assessment Overview

The ISTAR KR assessment tool is a comprehensive observational record of a child’s functional capacities across the following areas of development: reading and language, math and quantitative reasoning, and social and emotional development. Teachers observe students carefully to determine and rate function level. Overall, findings suggest that pre-K programs improve kindergarten readiness.

Scores on the ISTAR KR assessments indicate where the child’s behaviors and skills fall in terms of average months of development. For example, a child scoring 38 on a particular dimension behaves at a level commonly seen in a 38 month-old child. Please note, however, children vary in their development and it is perfectly normal and expected for some kids to develop earlier and others later across dimensions. Our use of the term “delay” in reference to those whose development stage is below their age does not indicate a clinical delay—we are not qualified to make that assessment.

This coding is a change from the first couple years of pilot reports and reflects collaboration with the IU Early Education Center and its evaluation of the OMWPK program. We began using the new coding in the 2016-2017 annual report.

On average, student development increased between 19 and 28 months from pre-test to post-test in each of the three main ISTAR KR categories (Figure 8). That means that over the course of a 9-month school year, children progressed, on average, 19-28 months in terms of child development. Across the three domains, mean scores upon arrival at the pre-K programs were between 32.5 and 33.1 months—closer to three-year-old (36 months) than to four-year-old development (48 months). By the end of the school year kids were much closer to the 5-year old level of development, even with their median age, for Reading and Language, and Math and Quantitative reasoning.

While the Social Emotional post-assessment mean scores fall below 60 months development, the state does not have a Core Standard for Social and Emotional development by end of Kindergarten or any other grade. Children varied far more in their social and emotional scores than in the other two areas and only the top end reached the level expected at age five. These figures suggest that while quality pre-K is important, efforts will also need to address the importance of interaction-rich nurturing environments from birth through age three.

**Figure 8: Summary of Pre- and Post-Test Performance**

Subject	Full Data		Paired Samples	
	Pre Mean	Post Mean	Pre Mean	Post Mean
Reading and Language Total	33.1 (n=145)	61.4 (n=129)	33.5 (n=129)	61.4*
Math and Quantitative Reasoning Total	32.5 (n=145)	60.3 (n=129)	32.8 (n=129)	60.3*
Social and Emotional Development Total	33.0 (n=145)	52.2 (n=129)	33.0 (n=129)	52.2*
Median Age	55.0	63.0		

\*Denotes statistical significance at a level of  $p < .05$

## Data Details

Full data for pre- and post-tests include some children who only took one or the other. A student who took the pre-test but left before the post-test will be included in the pre-test data in these summary figures but not in the post. Similarly, a late arrival may show up only in the post-test data.

Paired samples tests allow us to assess the statistical significance of changes from pre- to post-test. Statistical significance means the observed changes from pre to post are not likely to have occurred by chance. The p-value of  $<.05$  means that there is a less than five percent likelihood that the kids in this study improved this much by chance.

The statistical significance test, however, requires a matching of each student's pre- to each student's post-test. Our "paired samples" include only students who have both pre- and post-test data. This distinction is important, as there will be larger sample sizes for figures listed under "Full Data" than under "Paired Samples" ("n" denotes the sample size).

The following sections report quantitative measures of performance across reading and language, math and quantitative reasoning, and social and emotional development portions of the ISTAR KR assessment. Following the initial data summary are breakdowns based on gender and household type.

## Reading and Language

While children do not usually learn how to "read" until about first grade, they actually begin

developing pre-literacy skills much earlier.<sup>2</sup> Quality pre-K programming helps children develop these important pre-literacy skills before they walk into kindergarten so that kindergarten teachers can move forward in developing reading and language skills.<sup>3</sup> Pre-K progress can reduce class time on remedial efforts and demand for special education.<sup>4</sup>

In the fall of 2017, the research team interviewed kindergarten teachers at Corydon Elementary school. Teachers noted the presence of pre-literacy skills as a key benefit of the JumpStart program, one teacher explained,

*Just having kids know which way is right side up for a book and what direction the pages turn—that makes a big difference.*

Among all providers mean scores for the reading and language category increased from 39.7 on the pre-test to 63.0 on the post-test (Figure 9). This means they went from well below average development for their age to within the normal distribution of ability for their age (less than 2 standard deviations from the mean).

The assessment includes eight English and Language Arts components. Kindergarten readiness is indicated by scores between one and seven, depending on the module, and these scores are transformed to match the age (in months) at which the average child demonstrates the corresponding skill or behavior. Teachers observe students over time and rate student ability based on specific tasks the student can complete independently.

**Figure 9: ISTAR KR Reading and Language Total Mean Scores**

Reading and Language Total	Pre Mean	Post Mean
<b>Full Data</b>	<b>33.1</b> (n=145)	<b>61.4</b> (n=129)
<b>Paired Samples</b>	<b>33.5</b> (n=129)	<b>61.4*</b>
<b>Median Age (months)</b>	<b>55.0</b>	<b>63.0</b>

\*Denotes statistical significance at a level of  $p<.05$

Among students for whom we have both pre-and post-tests, performance on reading and language related tasks improved from a mean score of 33.5 at the beginning of the school year to 61.4 at the end of the school year (Figure 9). Paired samples tests for statistical significance indicate that the

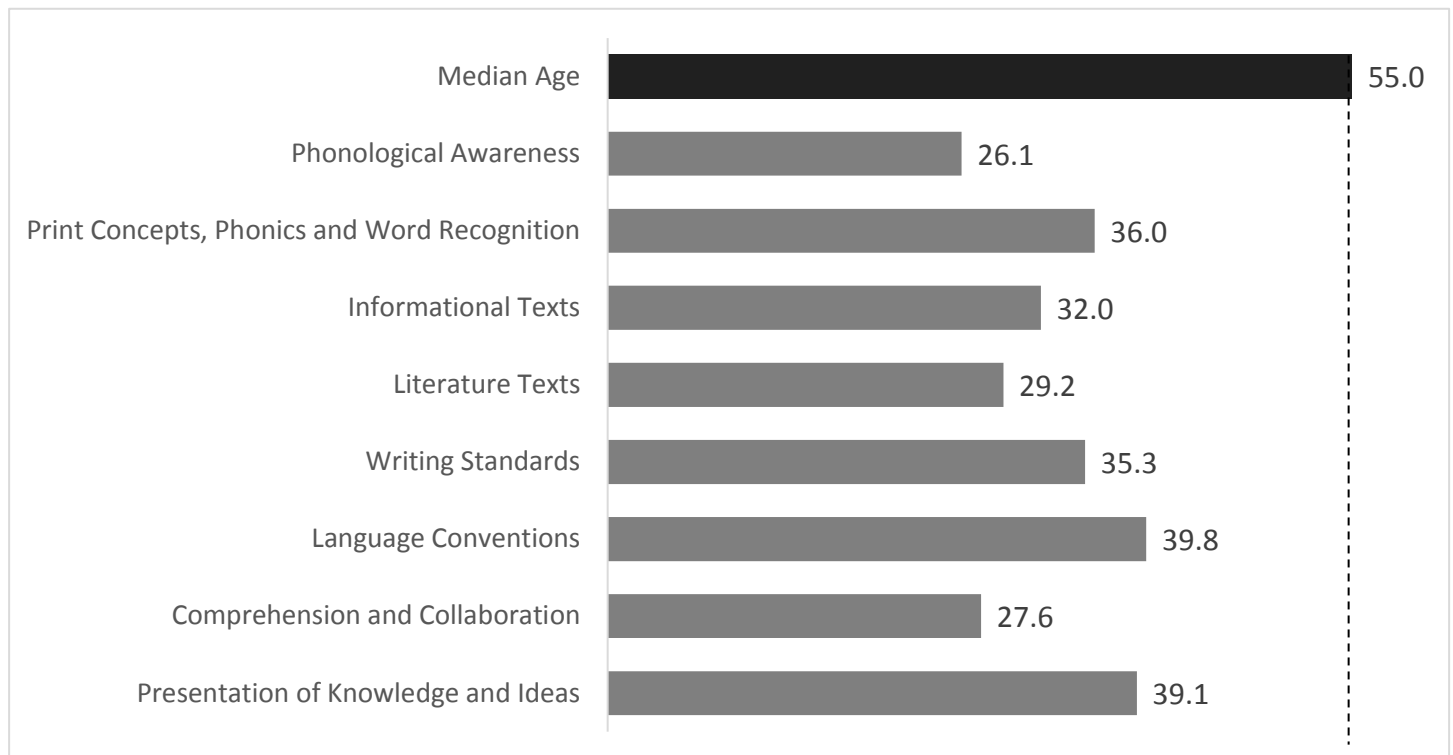
improvement in average score is statistically significant, meaning that the average level of improvement across participants is very unlikely to happen by chance. Improvements on every item in the reading and language category are statistically significant (Figure 10).

**Figure 10: ISTAR KR Reading and Language Means**

Subject	Full Data		Paired Samples	
	Pre Mean (n=145)	Post Mean (n=129)	Pre Mean (n=129)	Post Mean (n=129)
<b>Reading and Language Total</b>	<b>33.1</b>	<b>61.4</b>	<b>33.5</b>	<b>61.4*</b>
Phonological Awareness	26.1	60.7	26.7	60.7*
Print Concepts, Phonics and Word Recognition	36.0	65.3	36.4	65.3*
Informational Texts	32.0	58.9	32.4	58.9*
Literature Texts	29.2	60.4	29.5	60.4*
Writing Standards	35.3	63.4	35.6	63.4*
Language Conventions	39.8	63.4	40.4	63.4*
Comprehension and Collaboration	27.6	54.9	27.8	54.9*
Presentation of Knowledge and Ideas	39.1	64.5	39.0	64.5*
<b>Median Age (months)</b>	<b>55.0</b>	<b>63.0</b>	<b>55.0</b>	<b>63.0</b>

\*Denotes statistical significance at a level of  $p < .05$

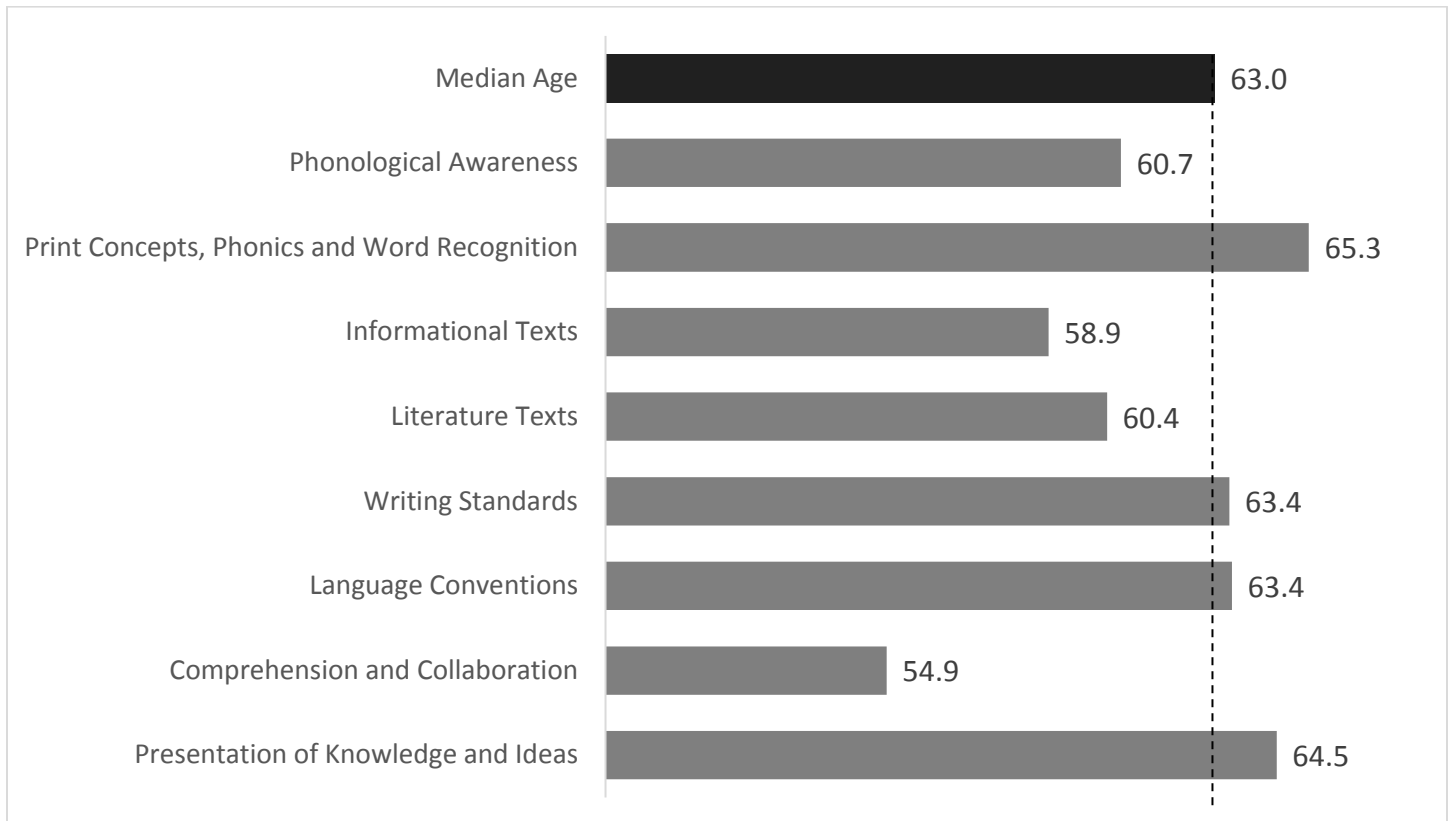
**Figure 11: Reading and Language Pre-Assessment Mean Development Level (months) (n=145) Compared to Median Age (months) (n=140)**



Students enrolled in the pilot began the school year well below expected levels of reading and language development for their age. The median age as of August 1 was 55.0 months and their average stages of development in reading and language skills ranged from 26.1 months to 39.8 months, placing them 15.2 to 28.9 months behind expected

development. Phonological awareness is developed through verbal interaction, having someone read developmentally appropriate books and poems aloud, call and response conversation from infancy forward, and recitation of songs and nursery rhymes.

**Figure 12: Reading and Language Post-Assessment Mean Developmental Stage (n=129) Compared to Median Age (n=126)**



By the end of the year, students enrolled in Jump Start had narrowed or overcome the gaps in development in all categories of reading and language development (Figure 12).

In May, students' median age was 63.0 months and their mean assessed level of development in reading and language ranged from 54.9 months in comprehension and collaboration to 65.3 months in print concepts, phonics, and word recognition. The maximum negative gap was just over 8 months and average student development exceeded expected development in four categories. In all but two categories, student averages were at or above that

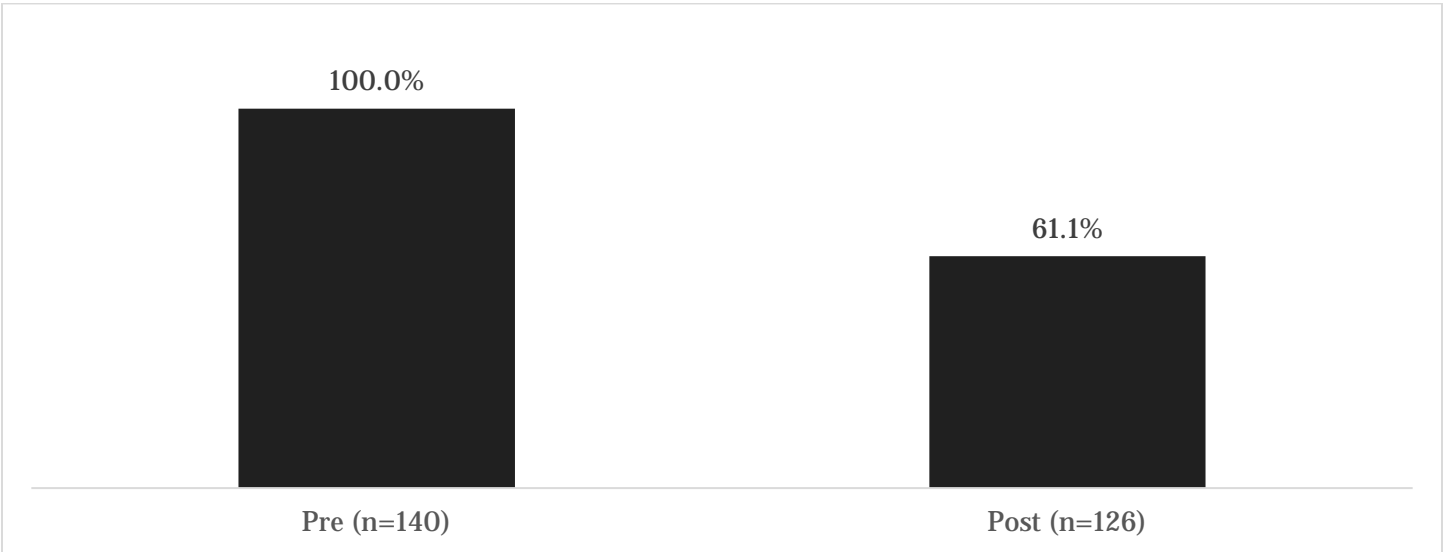
expected of a child who has just turned five (60 months, which is the age requirement for kindergarten).

The change from August to May reflects a significant closing of the gap for the target student population. Low-income and at-risk kids came to pre-school with some deficits, as the research would predict, but one year of full-day quality pre-K brought them into the range of reading and language development expected for their age. At the beginning of the school year, 100 percent of students demonstrated two or more areas of delay

in reading and language development. That number was reduced to 61.1 percent by the end of the school year (Figure 13). Comprehension and Collaboration is the weakest area in reading and language

development. The greater struggle in collaboration may be related to persistent delays in social and emotional development.

**Figure 13: Percent of Students Delayed in Two or More Areas of Reading and Language (Pre and Post)**



**Math and Quantitative Reasoning**

Children develop many quantitative and spatial skills before they start school. Shape-sorting infant and toddler toys are among the many ways that even very young children explore these concepts.

Mean scores for the math and quantitative reasoning category increased from 32.8 on the pre-test to 63.0 on the post-test (Figure 14). That means that on average, students accomplished two years of development during the 8-9 month school year.

Students exhibited significant improvement in the math and quantitative reasoning category as a whole as well as in all six modules (Figure 15). The median age student was roughly 22 months behind in math and quantitative reasoning development upon arrival at pre-K and caught up to 5 year old age level (60 months) by the end of the school year (Figures 17 and 18).

**Figure 14: ISTAR KR Math and Quantitative Reasoning Total Mean Scores**

Math and Quantitative Reasoning Total	Pre Mean	Post Mean
<b>Full Data</b>	<b>32.5</b> (n=145)	<b>60.3</b> (n=129)
<b>Paired Samples</b>	<b>32.8</b> (n=129)	<b>60.3*</b>
<b>Median Age (months)</b>	<b>55.0</b>	<b>63.0</b>

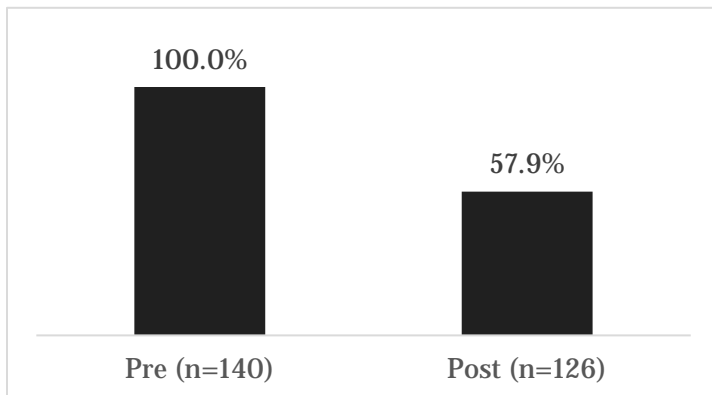
\*Denotes statistical significance at a level of  $p < .05$

**Figure 15: ISTAR KR Math and Quantitative Reasoning Means**

Subject	Full Data		Paired Samples	
	Pre Mean (n=145)	Post Mean (n=129)	Pre Mean (n=129)	Post Mean (n=129)
<b>Math and Quantitative Reasoning Total</b>	<b>32.5</b>	<b>60.3</b>	<b>32.8</b>	<b>60.3*</b>
Counting	33.7	60.1	33.9	60.1*
Algebraic Thinking	40.0	66.5	40.4	66.5*
Time	29.4	56.1	29.7	56.1*
Location	26.8	59.3	27.3	59.3*
Length, Capacity, Weight and Temperature	32.5	59.8	32.5	59.8*
Geometry	32.6	60.3	32.8	60.3*
<b>Median Age (months)</b>	<b>55.0</b>	<b>63.0</b>	<b>55.0</b>	<b>63.0</b>

\*Denotes statistical significance at a level of  $p < .05$

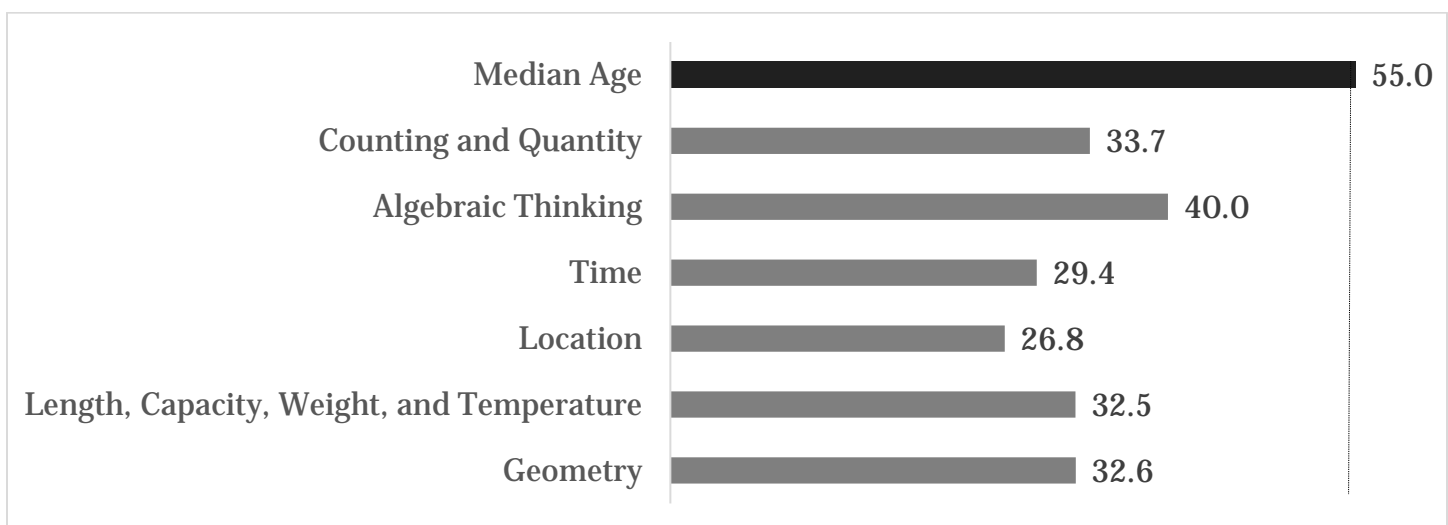
**Figure 16: Percent of Students with Developmental Delays in Two or More Areas of Math and Quantitative Reasoning (Pre and Post)**



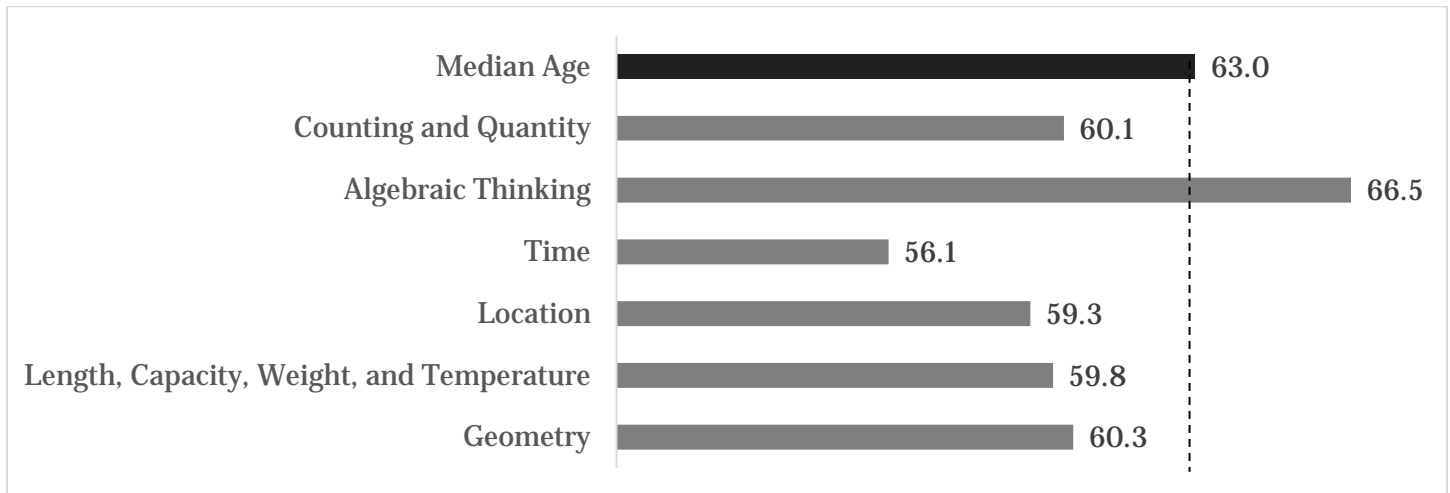
Student developmental deficits in math and quantitative reasoning at the beginning of the school year ranged from 15 to 28.2 months (Figure 15 and Figure 17). By May, student average development ranged from 2.7 to 6.9 months below median age, with the exception of “Algebraic Thinking” being 3.5 months beyond the median age (Figure 15 and Figure 18).

At the beginning of the school year, 100 percent of students demonstrated delays in two or more areas of Math and Quantitative Reasoning. By the end of the school year, that number declined to 57.9 percent (Figure 16).

**Figure 17: Math and Quantitative Reasoning Pre-Assessment Mean Developmental Stage (n=145) Compared to Median Age (n=140)**



**Figure 18: Math and Quantitative Reasoning Post-Assessment Mean Developmental Stage (n=129) Compared to Median Age (n=126)**



### Social and Emotional Development

Schools provide important opportunities for social and emotional development of students. School readiness includes demonstrating the ability to manage one’s self in the presence of others, manage emotions, engage in social exchange with fellow students, take responsibility in the classroom community and for one’s own schoolwork, and engage in problem solving and in learning more broadly. Pre-schools often pay close attention to how children interact with objects and with each other in order to target needed social and emotional

development in preparation for the kindergarten environment.<sup>v</sup> However, the state of Indiana does not have a core standard for social and emotional development at any grade level.

Students increased their total mean scores on indicators of social and emotional development from 33.0 months to 52.2 months. The average performance progressed 19.2 months of development over an eight to nine month period (Figure 19).

**Figure 19: ISTAR KR Social and Emotional Development Total Mean Scores**

Social and Emotional Development Total of Means	Pre-Mean	Post-Mean
<b>Full Data</b>	<b>33.0</b> (n=145)	<b>52.2</b> (n=129)
<b>Paired Samples</b>	<b>33.0</b>	<b>52.2*</b> (n=129)
<b>Median Age (months)</b>	<b>55</b>	<b>63</b>

\*Denotes statistical significance at a level of p<.05.

For students who stayed at the same school the whole year, the pre-test score made a statistically significant improvement. (Figure 19). Each module shows a significant improvement as well (Figure 20).

This means the group of students went from an average score that was roughly 22 months behind

appropriate development for their median age to an average score roughly 11 months behind their median age at post-assessment. The gap between these kids and their average peers narrowed by 11 months over the course of the 9-month pre-K program. Had these children not enrolled and their development continued at the same pace as their first four or more years, the predicted average post-



test score would have been 37.8 (about 25 months behind average development for their average age). At the start of the school year 99.3 percent of students demonstrated two or more areas of delay

in social and emotional development and by the end of the school year, 92.1 percent demonstrated two or more areas of delay.

**Figure 20: ISTAR KR Social and Emotional Development Means**

Subject	Full Data		Paired Samples	
	Pre Mean (n=145)	Post Mean (n=129)	Pre Mean (n=129)	Post Mean
<b>Social and Emotional Development Total</b>	<b>33.0</b>	<b>52.2</b>	<b>33.0</b>	<b>52.2*</b>
Sense of Self and Others	39.0	56.9	38.8	56.9*
Manages Emotions	31.4	52.6	31.2	52.6*
Interpersonal Skills	32.2	47.9	32.2	47.9*
Responsibility	32.7	46.5	32.8	46.5*
Problem Solving	32.1	55.0	32.2	55.0*
Approaches to Learning	30.7	54.1	31.1	54.1*
<b>Median Age (months)</b>	<b>55.0</b>	<b>63.0</b>	<b>55.0</b>	<b>63.0</b>

\*Denotes statistical significance at a level of p<.05

These findings suggests that the pilot targeting low-income kids is narrowing the gap between at-risk children and average expected development for kindergarten readiness. The pilot pre-K programs close the gap almost completely for Math and Reading, and achieve some, albeit less dramatic, success with social and emotional development.

While these programs may not have been the sole cause of score improvements, it is clear students enrolled in these programs leave ready for kindergarten. Some of this development would have occurred without the program, but the findings are significant and, in some places, quite dramatic. The tables in the appendix list the skills assessed in each module. The more difficult skills are toward the bottom of each table. As you look through those tables, think about whether children would be likely to develop those skills at home.

### Gender and Pre-K Inputs and Outcomes

Gender differences in education have long been an important topic of inquiry. Historically, teachers neglected girls in the classroom. Boys received the lion’s share of attention resulting in better outcomes and higher levels of education for boys. However, today’s girls stay in school and achieve higher levels of education at higher rates than today’s boys achieve. With this in mind, we examine gender differences in pre- and post-test performance across all categories of assessment.

Upon entry into pre-school, no evaluation items revealed significant or marginally significant differences between girls and boys during the *pre-test* phase of the 2017-2018 evaluation.



**Figure 21: ISTAR KR Reading and Language Total Mean Post Scores by Gender (n=129)**

Reading and Language Score by Gender	Male	Female
Total Subject Mean	60.0	63.5*

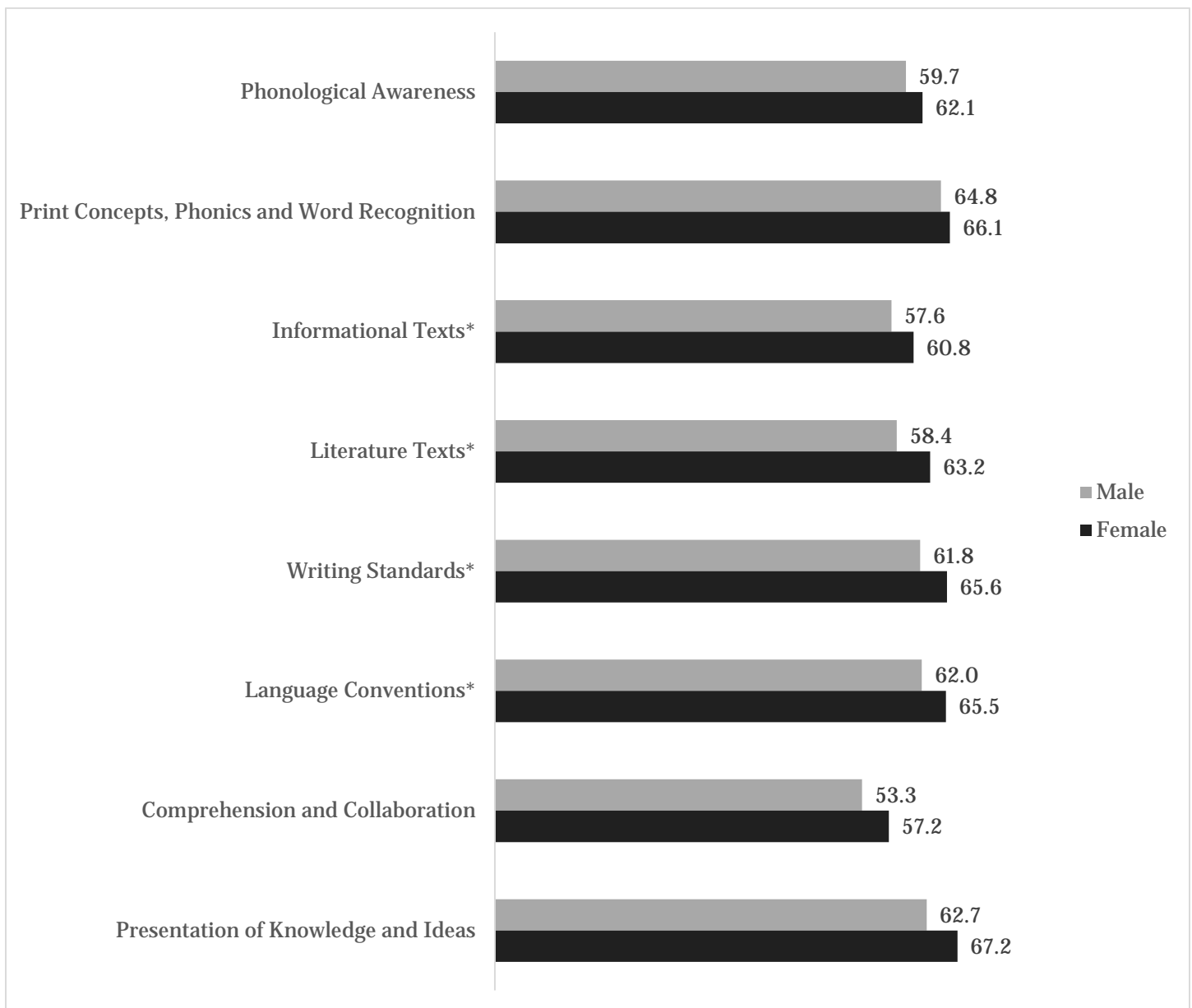
\*The difference in mean score by gender for this domain was significant ( $p=.008$ ).

**For Reading and Language assessments, by the end of the school year, the average girl *post-test* score of 63.5 (n=53) was significantly higher ( $p=.008$ ) than the average boy score of 60.0 (n=76) (Figure 21). Girls scored higher on every dimension, and four of the individual items are significantly different, with girls scoring higher: “Informational Texts” “Literature**

**Texts,” “Writing Standards,” and “Language Conventions” (**

**Figure 22). The item “Comprehension and Collaboration” is marginally significant ( $p=.071$ ).**

**Figure 22: ISTAR KR Reading and Language Mean Post Scores by Gender (n=129)**



\*Denotes statistical significance at a level of  $p<.05$

**Figure 23: ISTAR KR Math and Quantitative Reasoning Total Mean Post Scores by Gender (n=129)**

Math and Quantitative Reasoning Score by Gender	Male	Female
Total Subject Mean	59.1	62.1*

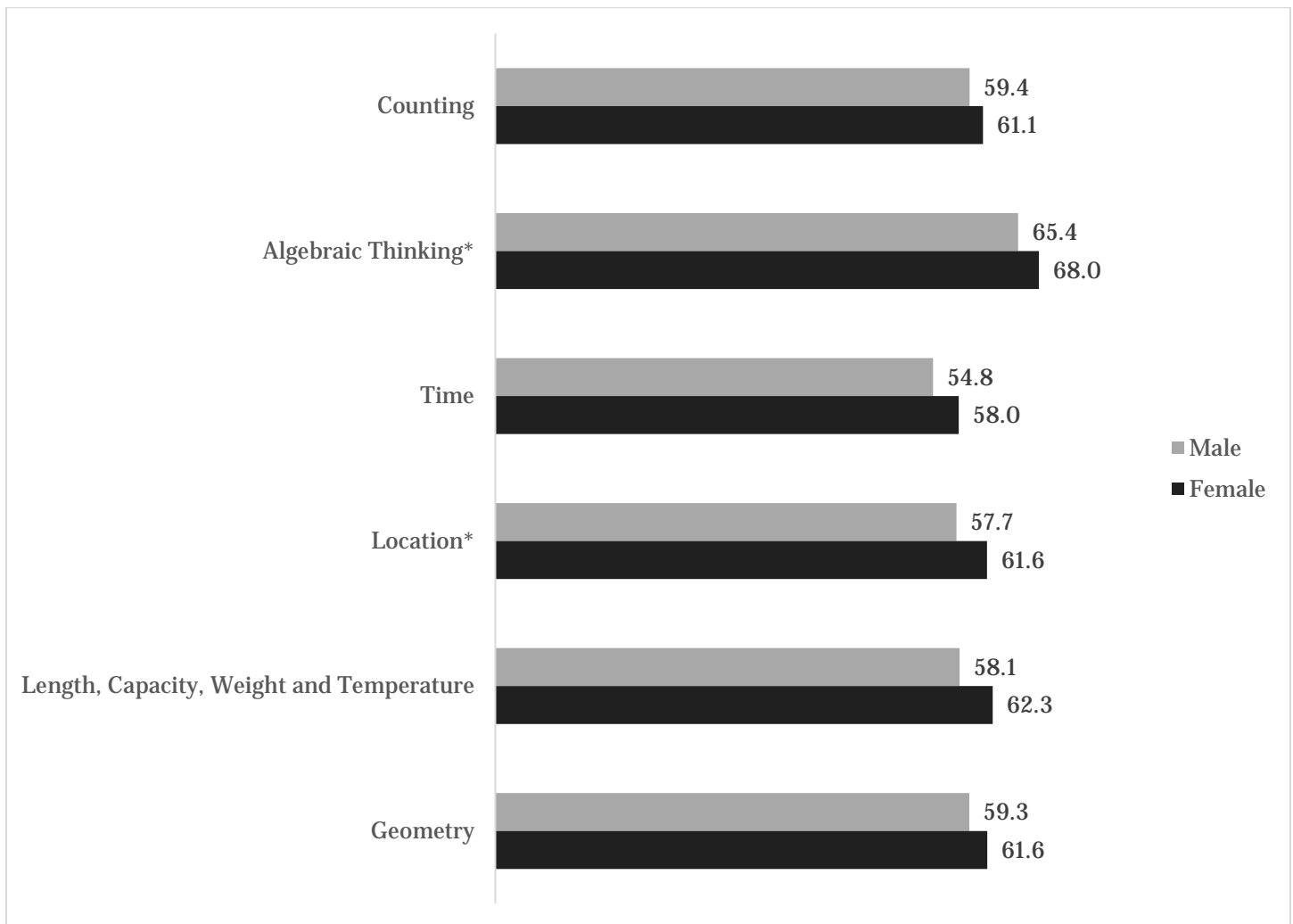
\*The difference in mean score by gender for this domain was significant ( $p=.022$ ).

In the Math and Quantitative Reasoning category there was a significant difference ( $p=.022$ ) between the girls mean score of 62.1 (n=53) and the boys mean score of 59.1 (n=76) (Figure 23).

Analyses of the items comprising the Math and Quantitative Reasoning domain indicate that girls

scored higher than boys on all items on the *post-test*. These higher scores are statistically significant for “Algebraic Thinking” and “Location” (Figure 24). Girls’ scores are almost significantly higher than boys’ for “Time” ( $p=.081$ ) and “Length, Capacity, Weight, and Temperature” ( $p=.053$ ).

**Figure 24: ISTAR KR Math and Quantitative Reasoning Mean Post Scores by Gender (n=129)**



\*Denotes statistical significance at a level of  $p<.05$

**Figure 25: ISTAR KR Social and Emotional Development Total Mean Post Scores by Gender (n=129)**

Social and Emotional Development Scores by Gender	Male	Female
Total Subject Mean	51.3	53.4*

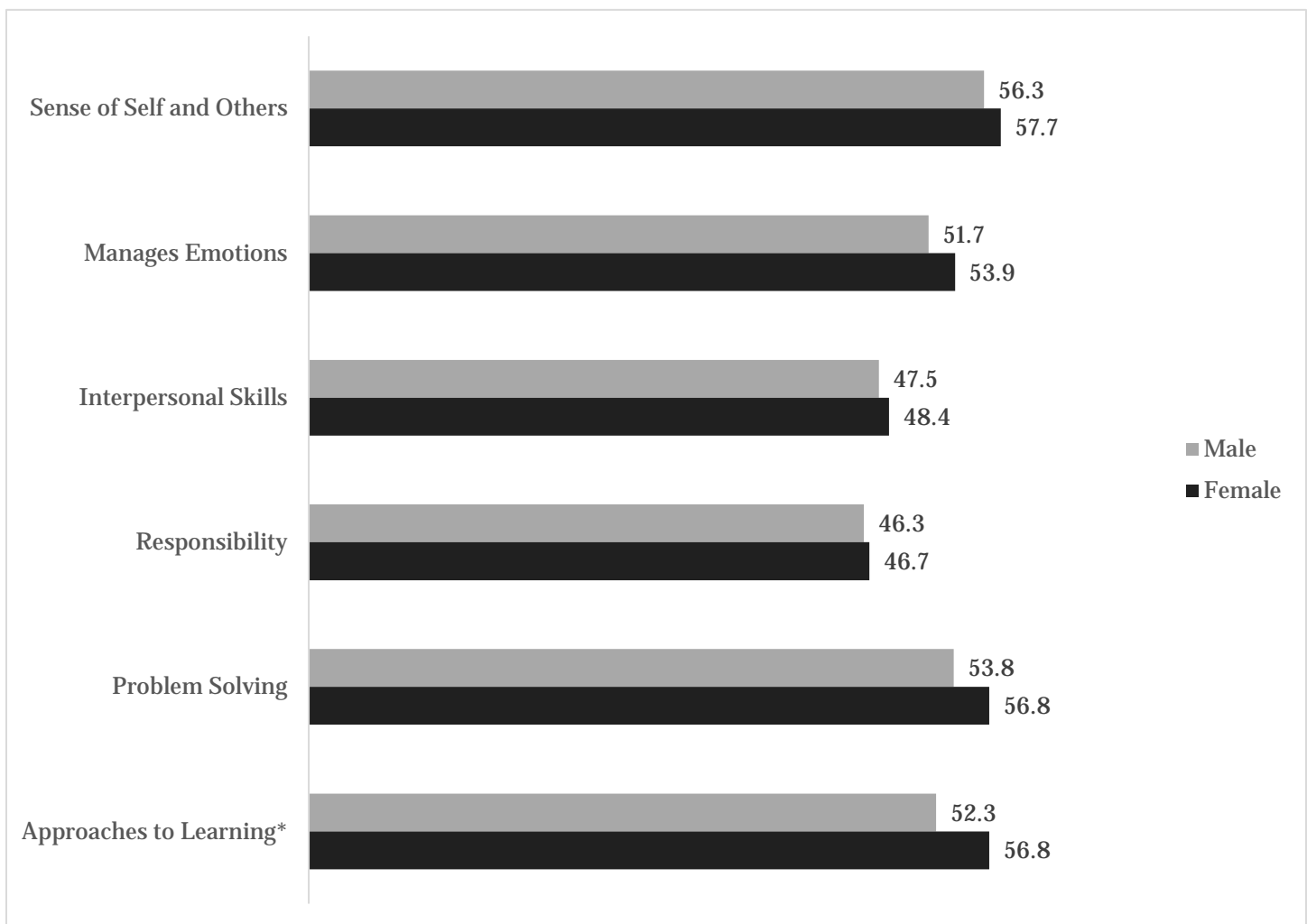
\*The difference in mean score by gender for this domain was significant ( $p=.042$ ).

In the Social and Emotional Development domain of the *post-test* girls averaged a score of 53.4 (n=53) while boys averaged 51.3 (n=76) (Figure 25). The difference in these scores is significant ( $p=.042$ ).

The difference between girls' and boys' scores is marginally statistically significant for one item in this domain of the assessment, "Problem Solving" ( $p=.069$ ) (Figure 26).

In prior years, girls were slightly ahead of boys in this domain at the beginning of the school year, and seemed to develop more quickly. The 2017-2018 assessment analyses illustrate more balanced mean scores between girls and boys in this domain for both the *pre-test* and *post-test*. The notable exception of fewer significant differences in scores is "Approaches to Learning" ( $p=.001$ ).

**Figure 26: ISTAR KR Social and Emotional Development Mean Post Scores by Gender (n=129)**



\*Denotes statistical significance at a level of  $p<.05$

## Household Composition and Pre-K Inputs and Outcomes

Household composition, particularly in low-income households, gets a lot of attention as a causal factor in shaping outcomes. The IU Southeast AREC asks providers to indicate each student's household composition. Providers were unsure of 5.4 percent of students' home situations and 6.1 percent hail from household types other than single-parent or two-parent (Figure 7).

In the 2017 *pre-test* there are a few significant differences found between those from two-parent households and those from single-parent households. Children from single parent families demonstrated significantly higher development on the items "Comprehension and Collaboration," "Presentation of Knowledge and Ideas," "Location," "Sense of Self and Others" and "Interpersonal Skills." In the *post-test* assessment, student performance reflected no significant differences in performance by household type. Kids from one-parent households performed marginally better ( $p=.087$ ) on "Informational Texts."

## Classroom Observations

In addition to the quantitative pre- and post-test data, the research team conducts field observations in all participating programs. The evaluation team uses the Classroom Assessment Scoring System (CLASS)<sup>TM</sup> (the same classroom assessment tool used for the state OMWPK pilot) to evaluate teacher-student interactions at every program in the pilot. Each site visit consists of four to six consecutive 30-minute cycles—a 20-minute observation period followed by a ten-minute period used to summarize the collected information into scores from one to seven. Low scores consist of ones and twos, moderate scores include threes, fours and fives, and high scores are comprised of sixes and sevens.

Researchers averaged related scores within the general categories of *Emotional Support*, *Classroom Organization*, and *Instructional Support*.

*Emotional Support* includes the subcategories:

- Positive climate.
- Negative climate.
- Regard for student perspectives.
- Teacher sensitivity.

*Emotional Support* dimensions focus on whether the program creates a welcoming atmosphere that allows students to grow at their own pace. Scores in this domain range from 4.1 to 6.1. Regard for student perspectives was the strongest of the emotional support domains: four classrooms had high scores and an additional seven earned a moderate score in the "regard for student perspectives" dimension (four in the five range).

All classes (11 in total) had at least a moderate score in "positive climate," with three classrooms achieving high scores for the category. All classes had a moderate score in "teacher sensitivity" (range =3.0-5.8). In general, providers scored well in *Emotional Support* with an overall average of 5.5, the highest average score of the three domains. Emotional support in the classroom also contributes to stronger child outcomes in social and emotional development.

The category *Classroom Organization* includes:

- Instructional learning formats.
- Productivity.
- Behavior management.

The *Classroom Organization* domain focuses on whether teachers make the most of their time with students. The strongest performance in this category for the group of programs is "Instructional Learning Formats" (ILFs), where five programs achieved scores at the top end of moderate. The other items, "Productivity" (a measure of effective use of class time) and "Behavior management" (a measure of effective dismantling of undesirable behaviors) both reflect moderate scores throughout all programs, alongside the ILFs item. However, one program served as an exception to this with a low score of 2.5 in "Productivity."

The widest range of performance occurred in the "behavior management" indicator (2.5-5.8).

Overall, *Classroom Organization* scores averaged about 4.5 on the 7-point scale, suggesting moderate performance with some room for improvement.

The category *Instructional Support* includes:

- Concept development.
- Quality of feedback.
- Language modeling.

Scores across these items ranged from 2.8 to 5.7. Teachers who score high in this category ask students to explain the logic of their answers, and provide the appropriate amount of help to allow students to arrive at their own answers. All programs achieved a moderate score in “concept development” and all but two earned at least moderate scores in “quality of feedback” and “language modeling.” The weakest of the three areas was “language modeling,” suggesting room for growth. “Quality of feedback” had two strong performers who may be able to lead the way to bringing all classrooms up to a higher level of instructional support.

Examining the average of all providers’ scores for each domain reveals that as a whole, programs in the pilot scored mostly in the moderate range. Providers tend to be strongest in the *Emotional Support* domain, and weakest in the *Instructional Support* domain, though the mean scores are within a little more than one point of each other.

These findings are instructive, but also based on very limited observation. These findings indicate

opportunities for growth, but are not a definitive assessment of program quality.

In the case of students’ performance on the social-emotional post-assessment items, both pre-assessment performance and instructional support had a significant impact on post-assessment performance. This means that when we assume the same level of instructional support, performance on the pre-assessment is the best predictor of performance on post-assessment. When we assume the same level of performance at the beginning of the school year, the level of instructional support is the best predictor of performance on the end of year assessment.

The finding suggests that strong instructional support (as measured by the CLASS observation tool) should be a central focus of professional development for pre-K instructors. Social and Emotional development is the area where the programs are making the least amount of progress. While a pre-K program cannot completely counter-balance what happens at home in this area, these findings suggest that teachers with strong instructional support can effect positive outcomes.

Teacher performance in Emotional Support, Instructional Support, and Classroom Organization did not appear to have an impact on student performance.

# Conclusions

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Findings from year four of the Harrison County Community Foundation Pre-K Pilot indicate positive program impacts. Children attend full-day programs in nurturing and constructive environments.

Student performance on tasks related to language, math, and quantitative reasoning, and social and emotional development progresses significantly during the pre-K year.

The full pilot program report will combine data from multiple years for a closer look at these dynamics. The higher number of cases will make our findings more reliable and will allow for greater statistical power. But the preliminary findings still indicate some interesting patterns.

## *Reading and Language Arts*

Reading and language arts development is a function of a variety of factors. Girls tend to perform better on the reading and language arts assessments. Age at post-assessment does not maintain significance when other factors are considered. Attendance rate, English and language development at the start of the program, emotional support, classroom organization, and instructional support all maintain significance even when we control for the other listed factors.

All of these factors contribute to language and literacy development. But the overall level of development is still shaped by what happens before age 4. These findings suggest that regular attendance at a quality pre-K program makes a difference. All three dimensions of the classroom environment matter. Language rich environments before the 4 year old pre-K year, however, still shape overall level of development by the end of the pre-K year. Even in a high quality environment, some of the differences kids come in with at age four persist after sharing a language rich, developmentally appropriate classroom for eight to nine months.

## *Math and Quantitative Reasoning*

Math development, like language arts, reflects the girl advantage at this early age. Pre-test performance on math, attendance rate and both classroom organization and emotional support in the classroom shape outcomes on the post-program math and quantitative reasoning assessment. Again, the first four years prior to pre-K shape outcomes and gaps created in those years are difficult to completely overcome. Consistent attendance in a quality program that provides emotional support and strong classroom organization, however, can give kids a good opportunity to close the gap and accelerate development in math and quantitative reasoning.

## *Social and Emotional Development*

Social and emotional development is the area where one year of full day quality pre-K at age 4-5 is able to do the least (of the three areas examined). The progress of the pre-K year, however, is important and it largely depends on the quality of the pre-K program. When we control for other factors, a few key components maintain significance as predictors and produce a model that explains more than half of the variation in kids' end of year social and emotional development. First, it's important to understand that among young kids, a few months difference in age makes a significant difference in development. Age at the time of the post-assessment shapes outcomes. Girls experience some development ahead of boys. Girls, for example, demonstrate a more advanced level of social and emotional development than do boys. Importantly, level of development at pre-test, attendance rate, and the rating of the teacher on instructional support are all significant predictors of the social and emotional development demonstrated by the end of the school year.

## *Program Take-Aways*

Overall, year four findings confirm positive program impacts and suggest avenues for further exploration in the year ahead. Full-day quality pre-K is closing the developmental gap between at-risk

kids and population averages. Children make significant strides in reading and language, and math and quantitative reasoning, achieving as much as 28 months of development in just nine months. Children who come to pre-k with higher levels of development continue to experience the cumulative advantages of a stronger base. Regular attendance and various aspects of classroom structure and organization shape outcomes across language, math, and social and emotional development.

While pre-K does narrow the gap between at-risk kids and the general population of children, developmental differences shaped by experiences in the first four years of life continue to have an impact on progress and outcomes.

# Appendices

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The ISTAR KR assessment instruments offer progressive responses within each assessment item, meaning that the difficulty or skill level increases further down the table. The percentage for each item reflects the percent of students who mastered that skill level. Students advance upon mastery of each level of the module. As a result, we expect fewer students to master items in the lower portions of the tables.

Indiana has no Common Core Standard for the ISTAR category Social and Emotional Development, so this category of the kindergarten readiness assessment does not describe when students have mastered skills that prepare them for kindergarten schooling. Instead, this category measures social and emotional skill development with general child development as a reference and features no precise indicator of what is expected by the end of Kindergarten.

Note: These data tables do not match the 2015-2016 tables. The evaluation team believes this format is easier to read. Take care not to compare these tables to those in the 2015-2016 academic year's report. The data do not look appreciably different from that academic year. Data for all years will appear in a common format for the final Pilot report.



## Appendix A: Language and Reading, Full Frequency Percentages

Figure 27: ISTAR KR Phonological Awareness

Phonological Awareness	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	26.1	60.7	
No evidence	NA	NA	4
Responds to sounds in the environment	100.0%	100.0%	10
Produces a variety of sounds	83.4%	99.2%	22
Produces and blends the sounds of letter patterns into recognizable words	25.5%	93.8%	46
Compares sounds of different words	0.0%	72.9%	67
KG Standards: Distinguishes sounds within words (to be mastered by end of KG)	0.0%	19.4%	72

Figure 28: ISTAR KR Print Concepts, Phonics and Word Recognition

Print Concepts, Phonics and Word Recognition	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	36.0	65.3	
No evidence	1.4%	NA	7
Responds to familiar pictures	98.7%	100.0%	25
Labels familiar pictures	64.2%	99.3%	37
Recognizes familiar symbols	14.5%	98.5%	61
Compares, combines, and orders letters and letter sounds	0.7%	63.6%	67
KG Standard: Recognizes that letters make words and words make sentences (to be mastered by the end of KG)	0.0%	19.4%	72

Figure 29: ISTAR KR Informational Texts

Informational Texts	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	32.0	58.9	
No evidence	1.4%	NA	7
Engages with a book	98.5%	100.0%	16
Imitates proper handling of books	75.1%	100.0%	34
Distinguishes print from pictures	16.5%	99.2%	46
Orients to print in books	4.1%	73.6%	61
KG Standard: Chooses reading activities for meaning (to be mastered by end of KG)	0.0%	17.8%	72

Figure 30: ISTAR KR Literature Texts

Literature Texts	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	29.2	60.4	
No evidence	13.8%	NA	16
Reacts to a story or event	86.2%	100.0%	22
Identifies details from a story or picture	43.4%	100.0%	37
Talks about characters and settings	10.3%	97.6%	49
Retells familiar stories	3.4%	82.1%	58
KG Standard: Comprehends and responds to stories (to be mastered by end of KG)	0.0%	30.2%	72

Figure 31: ISTAR KR Writing Standards

Writing Standards	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	35.3	63.4	
No evidence	1.4%	NA	13
Intentionally makes marks or scribbles	98.7%	100.0%	28
Associates writing with purpose	42.1%	99.2%	43
Creates writing with the intention of communicating	5.5%	84.5%	64
Produces recognizable writing that conveys meaning	0.0%	44.2%	70

KG Standard: Gathers ideas for writing for a purpose (to be mastered at the end of KG)	0.0%	3.9%	72
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Figure 32: ISTAR KR Language Conventions

Language Conventions	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	39.8	63.4	
No evidence	NA	NA	13
Grasps writing tools	100.0%	100.0%	31
Imitates specific writing strokes to make a picture	55.2%	100.0%	37
Copies specific writing marks	28.3%	95.3%	52
Approximates writing strings of letters	8.3%	76.7%	67
KG Standard: Writes from left to right spacing letters correctly (to be mastered by end of KG)	0.0%	12.4%	72

Figure 33: ISTAR KR Comprehension and Collaboration

Comprehension and Collaboration	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	27.6	54.9	
No evidence	0.7%	NA	4
Responds to cues in the environment	99.3%	100.0%	13
Responds to familiar gestures and words	75.9%	100.0%	25
Follows a familiar verbal or signed direction	33.1%	100.0%	40
Follows unfamiliar direction	4.8%	77.5%	52
KG Standard: Follows directions with steps and descriptors (to be mastered by end of KG)	0.0%	28.7%	72

Figure 34: ISTAR KR Presentation of Knowledge and Ideas

Presentation of Knowledge and Ideas	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	39.1	64.5	
No evidence	NA	NA	10
Uses gestures or sounds to communicate	100.0%	100.0%	19
Uses single words to communicate	95.1%	100.0%	28
Uses two-word phrases or signs	80.6%	100.0%	37
Uses simple phrases and sentences with simple grammatical rules	23.4%	94.6%	52
Uses varied grammar in expression	4.1%	72.1%	70

KG Standard: Shares information and ideas to describe, explain, predict (to be mastered by end of KG)	0.0%	18.6%	72
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## Appendix B: Mathematics and Spatial Reasoning, Full Frequency Percentages

Figure 35: ISTAR KR Counting

Counting	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	33.7	60.1	
No evidence	3.4%	NA	4
Demonstrates awareness of the presence of objects	96.6%	100.0%	22
Identifies more	62.8%	100.0%	40
Uses numbers to compare	10.4%	96.9%	49
Names and orders quantities	0.7%	76.0%	61
KG Standard: Describes relationships between numbers and quantity (to be mastered by end of KG)	0.0%	20.2%	72

Figure 36: ISTAR KR Algebraic Thinking

Algebraic Thinking	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	40.0	66.5	
No evidence	9.7%	NA	13
Manipulates objects for a purpose	90.4%	100.0%	31
Matches objects and sets	62.8%	99.3%	46
Makes a set of objects smaller or larger	6.9%	96.2%	64
Follows models of addition or subtraction situations	0.7%	52.8%	70
KG Standard: Describes the application of addition and subtraction to situations (to be mastered by end of KG)	0.0%	7.8%	72

Figure 37: ISTAR KR Time

Time	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	29.4	56.1	
No evidence	6.2%	NA	13
Anticipates a routine	93.8%	100.0%	22
Uses vocabulary to identify events in a routine	55.9%	99.2%	34
Sequences events	9.7%	95.3%	46
Uses measuring vocabulary for time	0.7%	57.3%	64
KG Standard: Uses measuring units for time (to be mastered by end of KG)	0.0%	5.4%	72

Figure 38: ISTAR KR Location

Location	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	26.8	59.3	
No evidence	1.4%	NA	7
Demonstrates an awareness of location of objects	98.7%	100.0%	19
Identifies location	69.0%	100.0%	25
Follows directions involving location	21.4%	100.0%	37
Communicates with location words	6.2%	90.7%	58
KG Standard: Uses prepositions to describe location (to be mastered by end of KG)	0.0%	23.3%	72

Figure 39: ISTAR KR Length, Capacity, Weight and Temperature

Length, Capacity, Weight and Temperature	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	32.5	59.8	
No evidence	13.1%	NA	13
Explores measurement attributes	86.9%	100.0%	25
Distinguishes between big and little, hot and cold	68.3%	100.0%	37
Differentiates gradients of size and weight	7.6%	90.7%	49
Uses common measuring tools in correct context	0.0%	56.6%	70

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KG Standard: Makes direct measurement comparisons (to be mastered by end of KG)	0.0%	2.3%	72
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Figure 40: ISTAR KR Geometry

Geometry	Pre-Test (n=145)	Post-Test (n=129)	Development (in months) when commonly demonstrated
<b>Mean</b>	32.6	60.3	
No Evidence	15.2%	NA	10
Explores attributes (e.g. shape, size, color)	84.8%	100.0%	22
Matches same attributes	64.8%	100.0%	40
Matches opposites	6.2%	98.5%	46
Sorts and patterns by one attribute	2.8%	85.3%	58
KG Standard: Sorts and patterns by more than one attribute (to be mastered by end of KG)	0.0%	29.5%	72

## Appendix C: Social and Emotional Development, Full Frequency Percentages

Figure 41: ISTAR KR Sense of Self and Others

Sense of Self and Others	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	39.0	56.9	
No Evidence	NA	NA	4
Demonstrates self-awareness	100.0%	100.0%	22
Demonstrates independence	84.9%	99.2%	34
Engages with others	35.2%	97.6%	52
Demonstrates respect for self and others	5.5%	67.4%	60
Uses strategies consistent with children over the age of 5	0.0%	0.0%	

Figure 42: ISTAR KR Manages Emotions

Manages Emotions	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	31.4	52.6	
No Evidence	2.8%	NA	4
Expresses a variety of emotions	97.2%	100.0%	10
Responds to a variety of emotions	80.0%	100.0%	28
Manages emotions with adult assistance	35.2%	93.8%	46
Uses strategies to manage emotions	6.2%	55.0%	60
Uses strategies consistent with children over the age of 5	0.0%	0.0%	

Figure 43: ISTAR KR Interpersonal Skills

Interpersonal Skills	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	32.2	47.9	
No Evidence	NA	NA	7
Interacts with caregiver	100.0%	100.0%	13
Engages in parallel play	93.7%	100.0%	25
Interacts with others	49.6%	99.3%	40



Engages in cooperative interactions	4.1%	66.7%	52
Uses strategies consistent with children over the age of 5	0.0%	0.0%	

Figure 44: ISTAR KR Responsibility

Responsibility	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	32.7	46.5	
No Evidence	0.0%	NA	7
Recognizes steps in familiar routines	100.0%	100.0%	19
Follows familiar routines	67.0%	99.3%	34
Follows rules	30.4%	94.6%	46
Applies rules to situations	2.1%	62.0%	48
Uses strategies consistent with children over the age of 5	0.0%	0.0%	

Figure 45: ISTAR KR Problem Solving

Problem Solving	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	32.1	55.0	
No Evidence	13.8%	NA	7
Initiates an action to get a desired effect	86.3%	100.0%	22
Uses trial and error to manipulate objects	57.3%	95.3%	40
Searches for possible solutions	10.4%	82.9%	58
Finds alternative strategies and solutions	1.4%	45.7%	60
Uses strategies consistent with children over the age of 5	0.0%	0.0%	

Figure 46: ISTAR KR Approaches to Learning

Approaches to Learning	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=145)	(n=129)	
<b>Mean</b>	30.7	54.1	
No Evidence	9.0%	0.0%	4
Demonstrates curiosity	91.0%	100.0%	22
Sustains attention to preferred activities	52.4%	98.4%	40
Sustains attention to a challenging activity	6.2%	82.9%	52

Applies creativity to activities	2.1%	55.8%	60
Uses strategies consistent with children over the age of 5	0.0%	0.0%	

<sup>1</sup> The term “Developmental Delay” does not necessarily indicate a clinically relevant delay. Child development varies within a range. Our use of this term simply indicates that the observed level of development falls short of average development as determined in the validation studies for the ISTAR KR assessment.

<sup>2</sup> Whitehurst, Grover J. and Christopher J Lonigan. 1998. “Child Development and Emergent Literacy.” *Child Development* 69(3):848-872.

<sup>3</sup> Howes, Carollee, Margaret Burchinal, Robert Pianta, Donna Bryant, Diane Early, Richard Clifford, and Oscar Barbarin. 2008. “Ready to Learn? Children’s pre-academic achievement in pre-Kindergarten programs.” *Early Childhood Research Quarterly* 23(2008): 27-50.

<sup>4</sup> Temple, Judy A. and Arthur J. Reynolds. 2005. “Benefits and costs of investments in preschool education: Evidence from the Child-Parent Centers and related programs.” *Economics of Education Review* 26: 126-144; Heckman, James and

<sup>v</sup> Denham, Susanne A. Kimberly A. Blair, Elizabeth DeMulder, Jennifer Levitas, Katherine Sawyer, Sharon Auerback-Major, and Patrick Queenan. 2003. “Preschool Emotional Competence: Pathway to Social Competence.” *Child Development* 74(1):238-256.