Harrison County Community Foundation

Pre-K Program

Annual Evaluation Report

2019-2020

APPLIED RESEARCH AND EDUCATION CENTER

INDIANA UNIVERSITY SOUTHEAST

**APPLIED RESEARCH
AND EDUCATION CENTER**

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The Applied Research and Education Center (AREC) is an outreach project of Indiana University (IU) Southeast. The AREC provides research, consulting and technical assistance to nonprofit organizations, foundations, government agencies and local businesses. The student staff enhances classroom learning through applied research projects as it actively engages every stage of each community-based project. The AREC combines learning, teaching and doing to support and empower community organizations in the IU Southeast service region.

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Introduction

In 2013, the Harrison County Community Foundation began work on a pre-K pilot program, Jump Start. The program funds full-day pre-K for low-income children. The project provides a local supplement to the state's "On My Way Pre-K" (OMWPK) program that subsidizes four-year-old pre-K enrollment in quality pre-K programs. Blue River Services, which includes North Harrison Elementary, Morgan Elementary, and Rainbow's End, South Harrison Community School Corporation, Noah's Ark Preschool, St. John's Lutheran School, and St. Joseph Catholic School are all part of both the state of Indiana On My Way Pre-K (OMWPK) program and Jump Start.

Beginning in 2014, implementation of the Jump Start pilot occurred on a relatively small scale with a handful of providers and a small pool of students. The 2019-2020 school year was the sixth year of full implementation and the program included 76 students across nine programs, eight of which operated in area public or parochial elementary schools.

With instruments and data systems in place, data collection at the outset of the school year and at mid-year went smoothly, with the exception of the end of the school year being interrupted by COVID-19 closures and the abrupt switch to non-traditional instruction in March. 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. Align Southern Indiana's Kindergarten Readiness 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. The group developed a simplified tool that some area schools piloted at the beginning of the 2019 school year and a larger number are piloting this year. Existing Jump Start and OMWPK programs already using KR assessment to inform practice will be leaders as Align works to support improvements to pre-K throughout the region.

Figure 1: Percent of Students with Three or More Areas of Developmental Delay[1] within Each of the Three Broad Categories of Assessment (Pre and Post)

Pre (n=71)　Post (n=69)
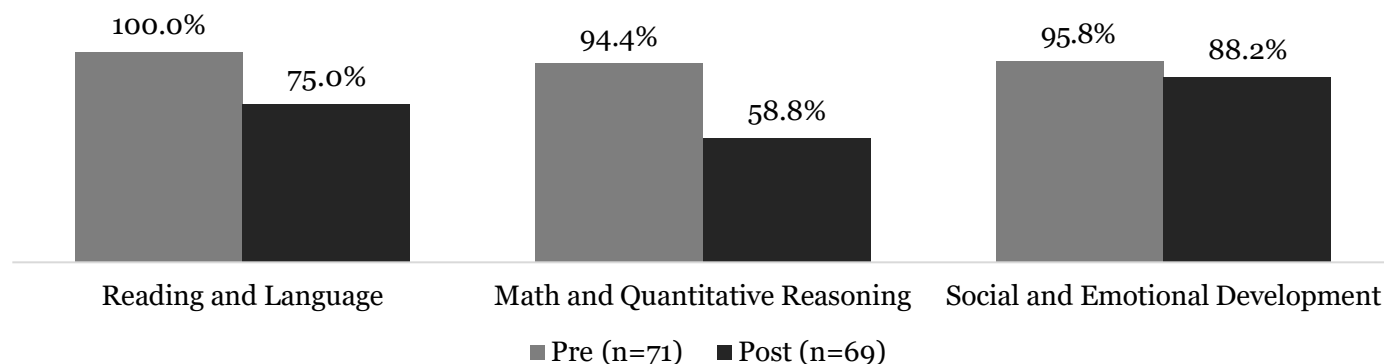
Findings confirm the significant immediate impact pre-K programs have on kindergarten readiness. This report presents findings from the 2019-2020 school year that illustrate a statistically significant increase in skills across the board for those enrolled in the program. Over the course of seven months in quality full-day pre-K, the program reduced the percent of students with three or more areas of delay in Reading and Language from 100.0 percent to 75.0 percent; Math and Quantitative Reasoning from 94.4 percent to 58.8 percent; and Social and Emotional Development from 95.8 percent to 88.2 percent (Figure 1).

More children qualify for than enroll in Jump Start. The Foundation continues to work with area schools and early care and education providers to spread the word about the available subsidy. The Foundation is willing to fund up to 200 children in an effort to increase enrollments and boost countywide kindergarten readiness.

All participating programs report the struggle to reach additional families remains a barrier to fully realizing the potential impact of the program. Providers work closely with the Harrison County Community Foundation to be sure people know where the program is available, and they 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. The Align Southern Indiana Kindergarten Readiness A-team will be engaging the Southern Indiana Early Learning Coalition in such a campaign (#SoIN4Early) over the next year.

In addition to failures to understand the value of high quality pre-K programs, 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. Three of the 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.

An additional challenge to this year's efforts was the sweeping impact of COVID-19, which caused schools to cease in-person instruction by mid-March of 2020. This presented a challenge to teachers to convert their lessons and interactions with students to an online format, learning a new system of teaching in as short as a few weeks. Harrison County is also largely rural, with many students' households unable to provide high-quality, stable internet connections or afford devices to keep up with the new digital classroom environment. For the sake of evaluation, post-

assessments occurred two months early, since in-person classes ended in March. Data still shows significant progress, but it is important to keep in mind that assessments usually reflect child assessments conducted in May. This means that improvement figures from this year are not comparable to those in previous years.

Teachers did their best to adapt to an online environment and engage students and parents in lessons, having to rethink their curriculum and come up with creative solutions. Some methods included posting educational videos and activities online for students and parents or guardians to do together, communicating with and instructing parents, dropping off paper packets and sharing photos of completed work. Some technology utilized for e-learning included Class Dojo, private Facebook groups, and Google Meet. Many students were unable to continue participating in school curriculum beyond March, due to barriers such as technology access, quality of internet, and the shift of teaching responsibilities to parents and guardians.

Even with the COVID-19 disruptions, as Jump Start concludes its 6th year, HCCF can report significant contributions to regional and state work on Early Care and Education. The Jump Start program contributes local data to the development of public education materials for use across the five-county Southern Indiana Louisville Metro region.

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 of Indiana added Harrison County to the statewide OMWPK pilot as a community that demonstrated "readiness" for success. Jump Start's success was a central indicator of the county's readiness.

Demographics

During the 2019-2020 school year, the Harrison County Jump Start program included 76 children across 9 programs (Figure 2). Of these children, 65 had pre and post data that could be used for statistical analysis of improvement.

Participating programs include public and parochial elementary schools with pre-K classes, private secular programs, and private faith-based organizations that provide pre-K outside the elementary school setting.

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

N=76

Program	Count
Corydon Elementary School	18
Heth-Washington Elementary	12
South Central Elementary	12
North Harrison Elementary	10
Morgan Elementary School Jumpstart	10
Noah's Ark Preschool	6
St. Joseph Catholic School	5
Rainbow's End Preschool and Childcare Center	2
St. John's Lutheran School	1
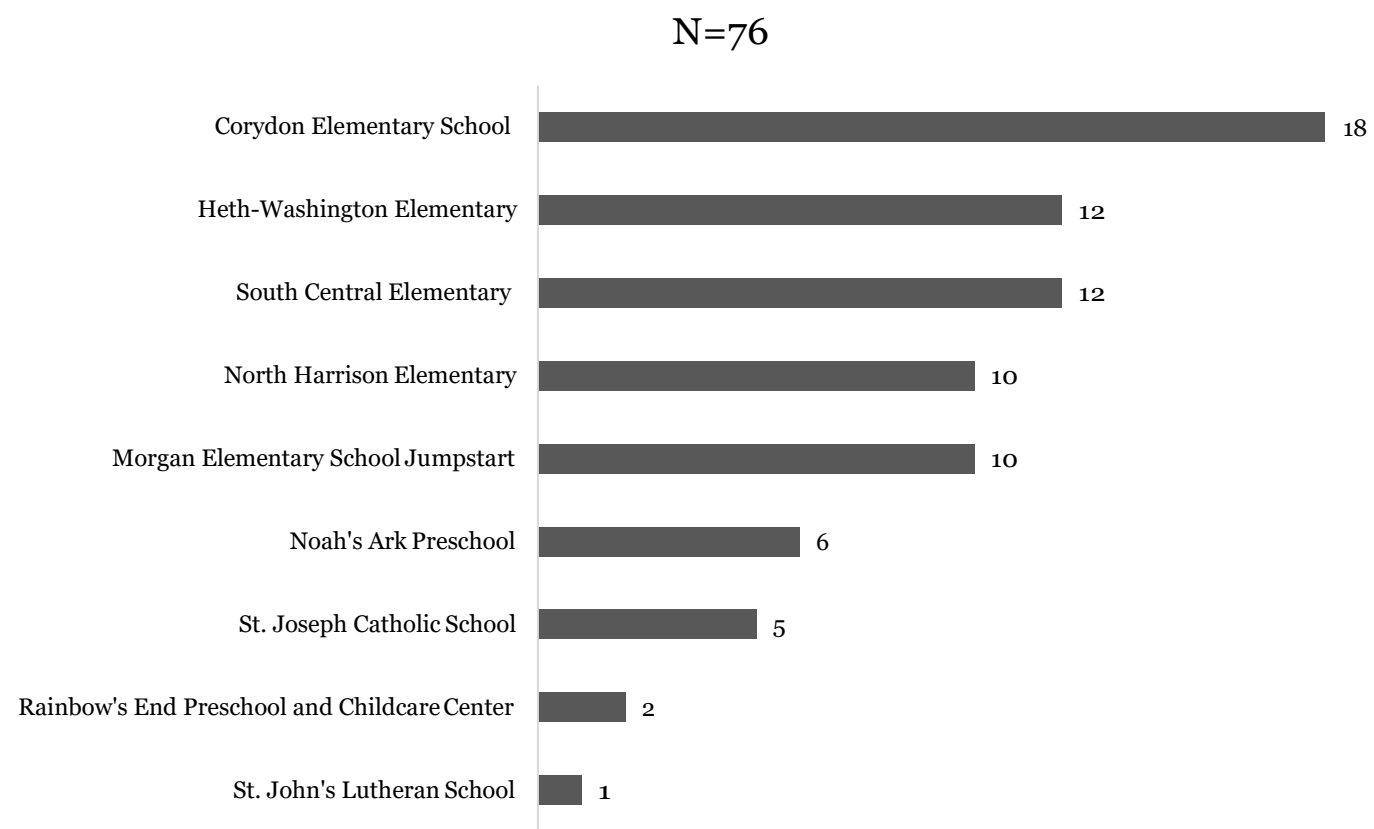
Teachers provide data on race and ethnicity based on student records or other sources. They can indicate more than one race, as was the case for four students. Hispanic origin is a separate ethnicity item not included in the race variable.

The students were predominately White (Figure 3), reflecting the demographics of the area, and 5.2 percent of students were Hispanic (Figure 4).

Figure 3: Race (n=76)

Race	Count
White	70
Other Race	4
Asian	2
Native American/Pacific Islander	2
Black	1
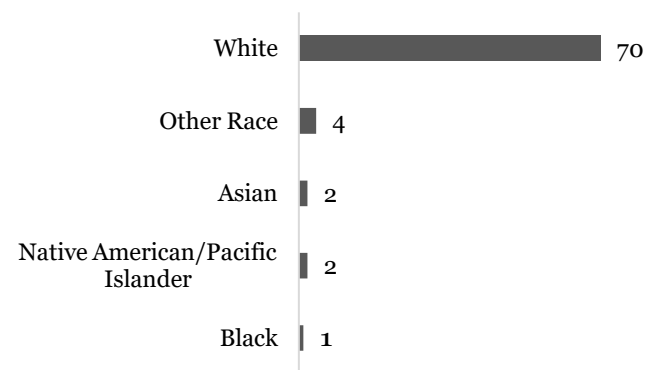
Figure 4: Hispanic Origin (n=76)

Hispanic	5.2%
Non-Hispanic	94.7%

Figure 5: Gender (n=76)
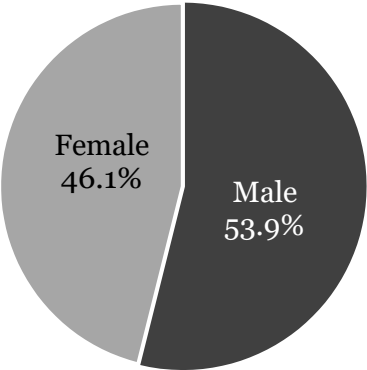
Of the students enrolled in the 2019-2020 program, 53.9 percent were male and 46.1 percent were female (Figure 5). The program targets low-income children and 96.3 percent of students reflected in these data qualified for free and reduced price meals (Figure 6). Some children completing the assessments do not qualify for free and reduced meals but have household incomes at or below 200% of the federal poverty line.

Figure 6: Qualify for Free and Reduced Lunch (n=76)
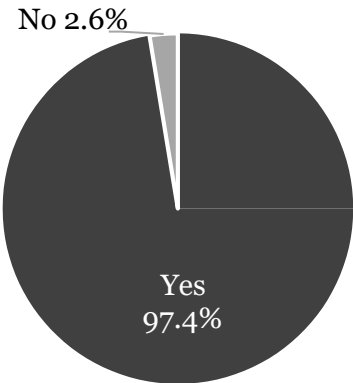
Of the 76 students in the program, 24.7 percent came from single-parent households, more than two-thirds (72.6 percent) from two-parent households and 2.7 percent from other household types (Figure 7).

Figure 7: Household Composition (n=76)
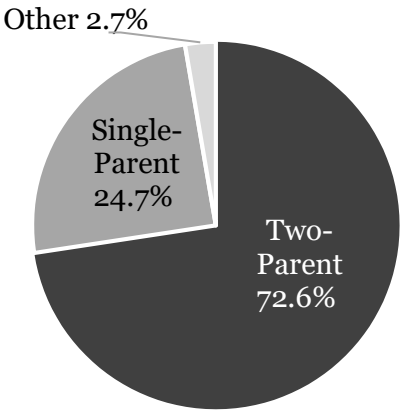
The role of family and home environment is an area the statewide pilot carefully explored but is beyond the scope of this work. However, the OMWPK evaluation uses attendance as an indicator of family engagement. The average attendance rate for 2019-2020 Jump Start was 92.3%.

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 program 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 17 and 23 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 7-month (abbreviated from the standard 9 months) school year, children progressed, on average, 17-23 months in terms of child development. Across the three domains, mean scores upon arrival at the pre-K programs were between 35.1 and 38.1 months—closer to three-year-old (36 months) than to four-year-old (48 months) development. By the end of the school year kids were much closer to the 5-year old level of development and their median age, for Reading and Language, and Math and Quantitative Reasoning. Due to COVID-19 closures, the school year of 2019-2020 reflects observations through March, but students still showed significant improvement in this shortened time.

While the Social Emotional post-assessment mean score is significantly lower than 60 months of development, the state does not have a Core Standard for Social and Emotional development by the end of Kindergarten or any other grade. Children vary far more in their social and emotional scores than in the other two areas and only the top end reach the level expected at age five. These figures suggest that while quality pre-K at age four has an impact, efforts will also need to address the importance of interaction-rich nurturing environments from birth through age three to better nurture social and emotional development in the years when these foundational patterns are formed. As the teachers say, "we can teach math and literacy skills, it is much harder to teach children to socially or emotionally respond to others and to their circumstances in new ways."

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	35.1 (n=71)	58.3 (n=69)	35.3 (n=65)	58.2*
Math and Quantitative Reasoning Total	38.1 (n=71)	59.2 (n=69)	38.1 (n=65)	59.3*
Social and Emotional Development Total	35.1 (n=71)	51.9 (n=69)	35.0 (n=65)	51.8*
Median Age	53.0	60.0		

*Denotes statistical significance at a level of p<.001

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 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.[2] 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.[3] Pre-K progress can reduce class time on remedial efforts and demand for special education.[4]

Among all providers mean scores for the reading and language category increased from 35.1 on the pre-test to 58.3 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
Full Data	**35.1** (n=71)	**58.3** (n=69)
Paired Samples	**35.3**	**58.2*** (n=65)
Median Age (months)	**53.0**	**60.0**

*Denotes statistical significance at a level of *p*<.001

Among students for whom we have both pre-and post-tests, performance on reading and language related tasks improved from a mean score of 35.3 at the beginning of the school year to 58.2 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 not likely 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=71)	Post Mean (n=69)	Pre Mean	Post Mean (n=65)
Reading and Language Total	**35.1**	**58.3**	**35.3**	**58.2***
Phonological Awareness	22.9	54.7	23.6	54.2*
Print Concepts, Phonics and Word Recognition	37.5	63.8	38.3	63.8*
Informational Texts	30.2	56.7	30.4	56.7*
Literature Texts	34.6	57.6	34.3	57.6*
Writing Standards	41.2	61.5	41.2	61.2*
Language Conventions	41.8	62.8	41.6	62.8*
Comprehension and Collaboration	30.7	51.6	30.6	51.8*
Presentation of Knowledge and Ideas	41.9	57.9	42.2	57.4*
Median Age (months)	**53.0**	**60.0**	**53.0**	**60.0**

*Denotes statistical significance at a level of *p*<.001

Figure 11: Reading and Language Pre-Assessment Mean Development Level (months) (n=71) **Compared to Median Age (months)** (n=72)

Category	Value
Median Age	53.0
Phonological Awareness	22.9
Print Concepts, Phonics and Word Recognition	37.5
Informational Texts	30.2
Literature Texts	34.6
Writing Standards	41.2
Language Conventions	41.8
Comprehension and Collaboration	30.7
Presentation of Knowledge and Ideas	41.9
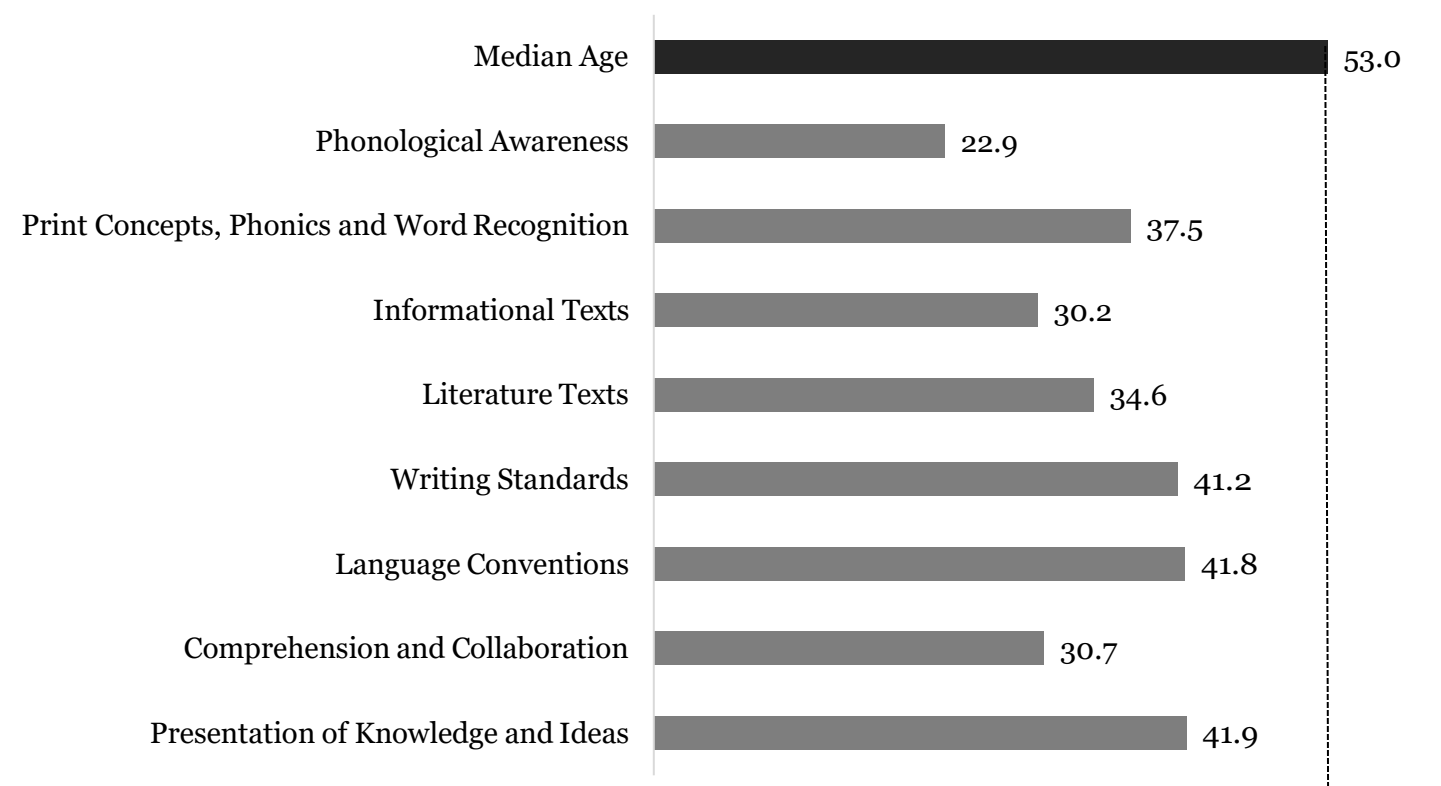
Students enrolled in the program began the school year well below expected levels of reading and language development for their age. The median age as of August 1 was 53.0 months and their average stages of development in reading and language skills ranged from 22.9 months to 41.9 months, placing them 12.2 to 25.8 months behind expected development (Figure 11). Phonological awareness develops 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=69) **Compared to Median Age** (n=69)

Category	Value
Median Age	60.0
Phonological Awareness	54.7
Print Concepts, Phonics and Word Recognition	63.8
Informational Texts	56.7
Literature Texts	57.6
Writing Standards	61.5
Language Conventions	62.8
Comprehension and Collaboration	51.6
Presentation of Knowledge and Ideas	57.9
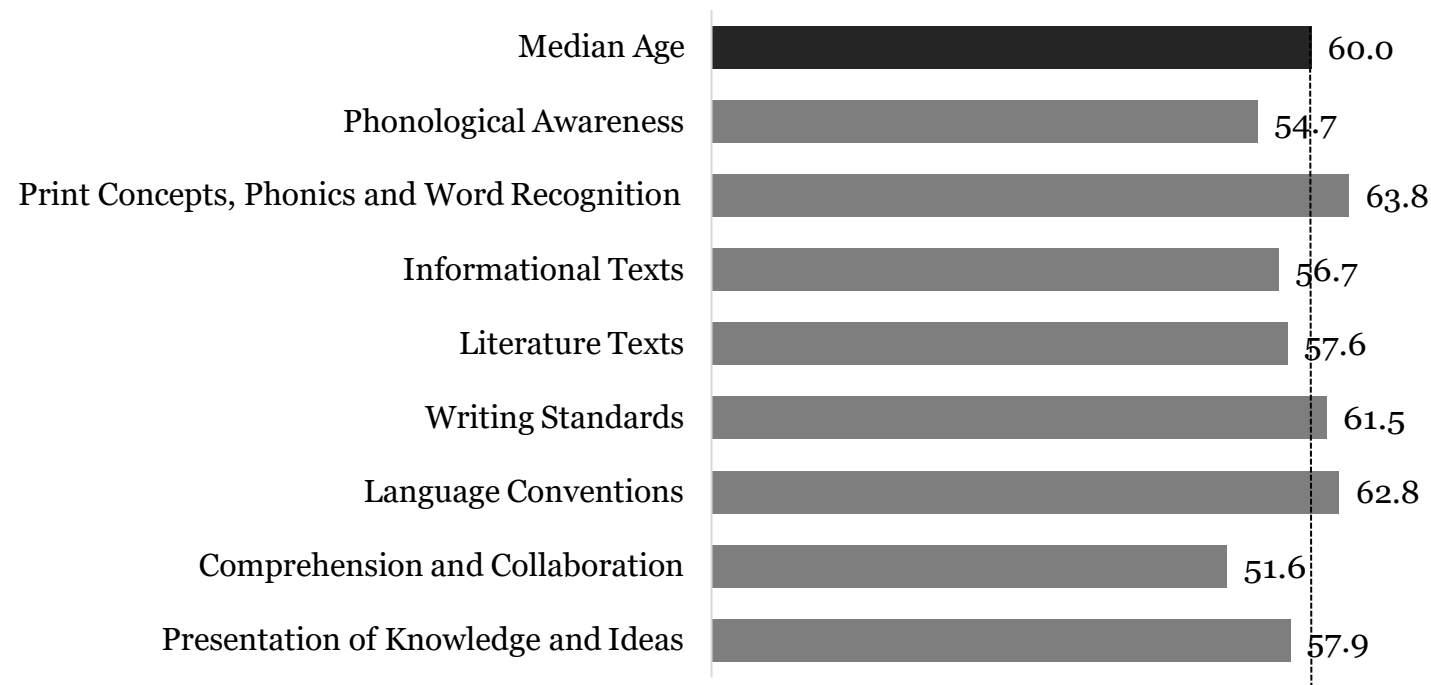
By the end of the year, students enrolled in Jump Start had narrowed or overcome the gaps in development in all categories of reading and language development (Figure 12).

In March, students' median age was 60.0 months and their mean assessed level of development in reading and language ranged from 51.6 months in comprehension and collaboration to 63.8 months in print concepts, phonics, and word recognition. The maximum negative gap was less than 9 months and average student development exceeded expected development in three categories.

The change from August to March reflects a significant closing of the gap for the target student population. Low-income kids came to pre-school with some deficits, as the research would predict, but seven months 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, 100.0 percent of students demonstrated three or more areas of delay in reading and language development. That number was reduced to 75.0 percent by March (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 Three or More Areas of Reading and Language (Pre and Post)

Pre (n=71): 100.0%
Post (n=69): 75.0%
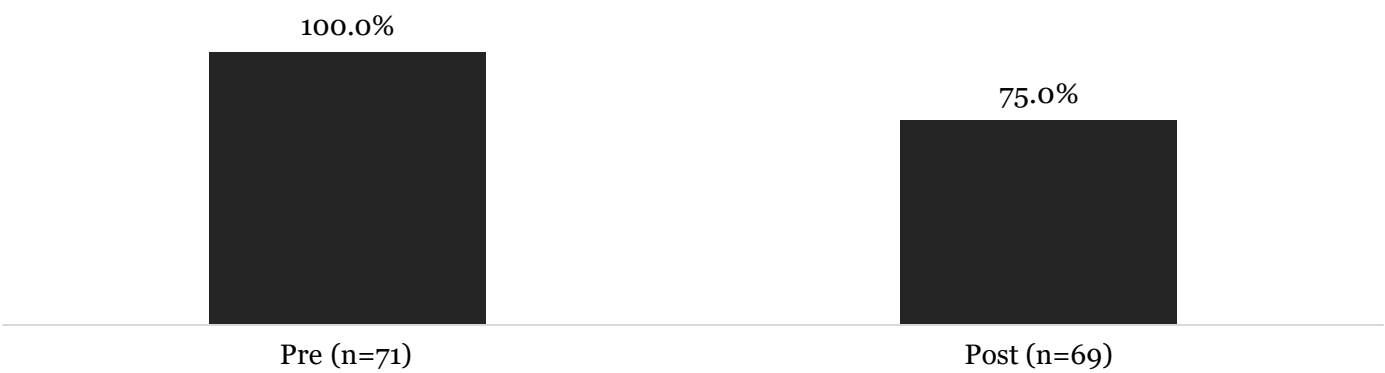
Math and Quantitative Reasoning

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 38.1 on the pre-test to 59.3 on the post-test (Figure 14). That means that on average, students accomplished nearly two years of development during the 8-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 21 months behind in math and quantitative reasoning development upon arrival at pre-K and caught up to nearly five-year old age level 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
Full Data	38.1 (n=71)	59.2 (n=69)
Paired Samples	38.1	59.3*
	(n=65)	
Median Age (months)	53.0	60.0

*Denotes statistical significance at a level of *p*<.001

Figure 15: ISTAR KR Math and Quantitative Reasoning Means

Subject	Full Data		Paired Samples	
	Pre Mean (n=71)	Post Mean (n=69)	Pre Mean (n=65)	Post Mean
Math and Quantitative Reasoning Total	**38.1**	**59.2**	**38.1**	**59.3***
Counting	39.2	57.5	39.7	57.9*
Algebraic Thinking	49.3	67.1	49.0	67.0*
Time	31.6	54.3	31.4	54.3*
Location	33.0	57.0	33.2	57.2*
Length, Capacity, Weight and Temperature	36.7	59.3	36.6	59.2*
Geometry	38.6	59.8	38.8	59.9*
Median Age (months)	**53.0**	**60.0**	**53.0**	**60.0**

*Denotes statistical significance at a level of $p<.001$

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

94.4%

58.8%

Pre (n=71)　　　Post (n=69)
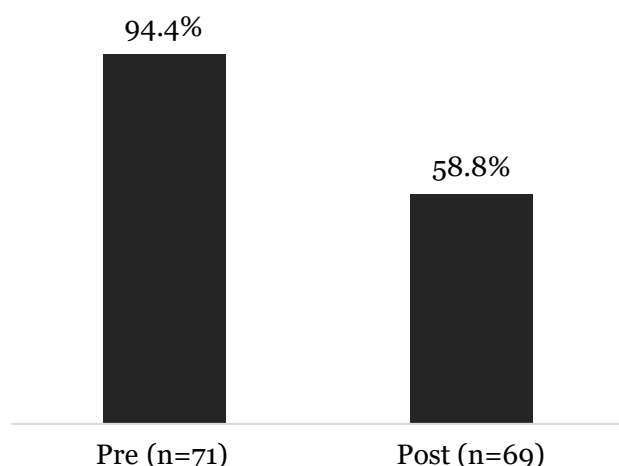
Student developmental deficits in math and quantitative reasoning at the beginning of the school year ranged from 4 to 21 months (Figure 15 and Figure 17). By March, student average development ranged from 2.2 to 6 months below median age, with the exception of "Algebraic Thinking" being 7 months beyond the median age and "Geometry" catching up to the 60.0 months of median age (Figure 15 and Figure 18).

At the beginning of the school year, 94.4 percent of students demonstrated delays in three or more areas of Math and Quantitative Reasoning. By March, that number declined to 58.8 percent (Figure 16).

Figure 17: Math and Quantitative Reasoning Pre-Assessment Mean Developmental Stage (n=71) **Compared to Median Age** (n=72)

Median Age	53.0
Counting and Quantity	39.2
Algebraic Thinking	49.3
Time	31.6
Location	33.0
Length, Capacity, Weight, and Temperature	36.7
Geometry	38.6
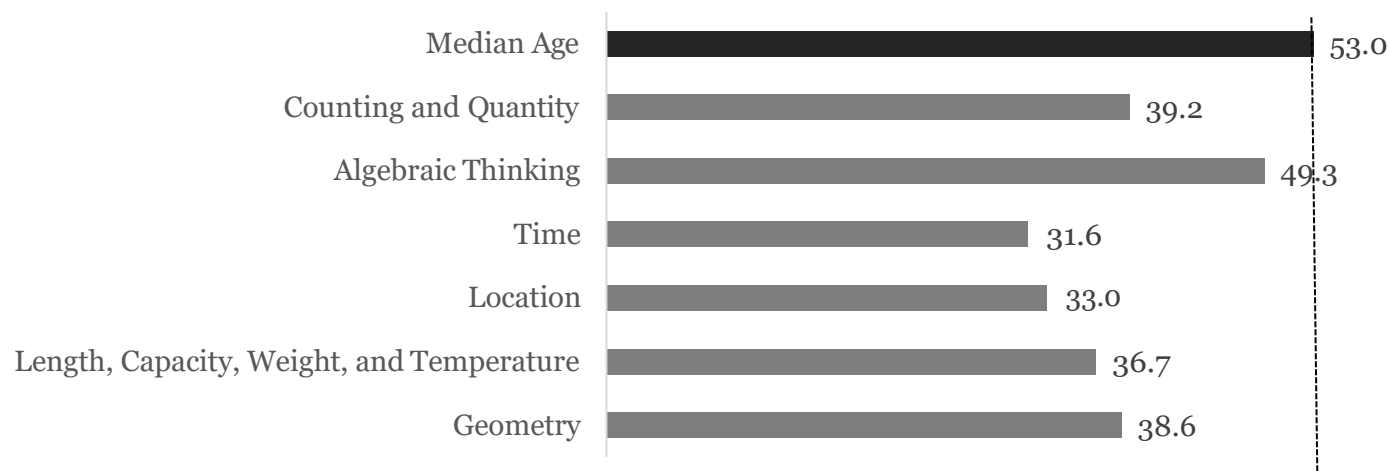
Figure 18: Math and Quantitative Reasoning Post-Assessment Mean Developmental Stage (n=69) **Compared to Median Age** (n=68)

Median Age	60.0
Counting and Quantity	57.5
Algebraic Thinking	67.1
Time	54.3
Location	57.0
Length, Capacity, Weight, and Temperature	59.3
Geometry	59.8
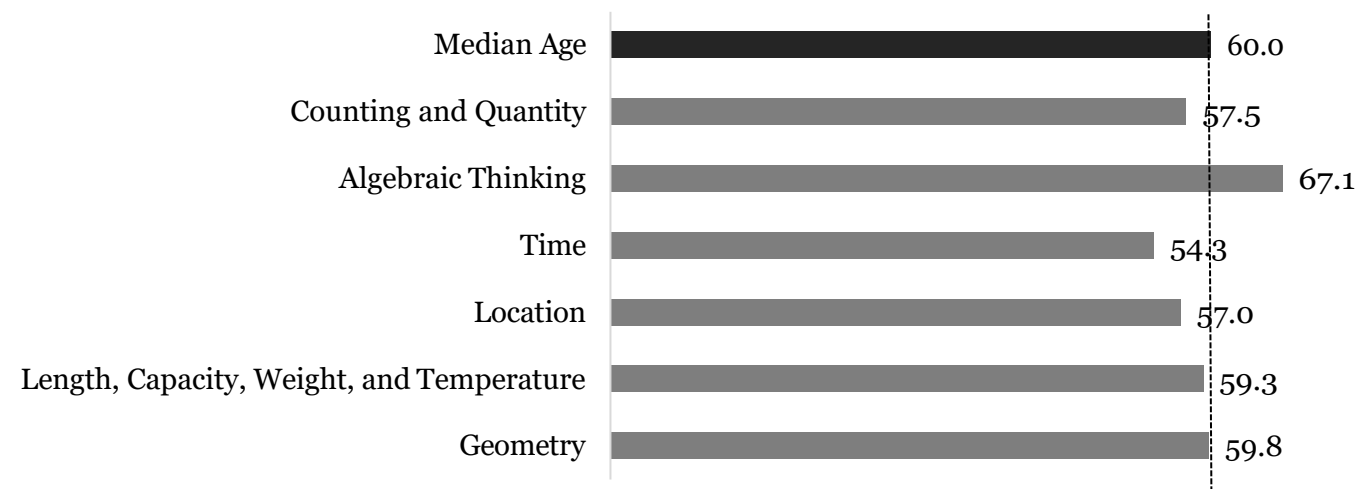
Social and Emotional Development

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.[5] 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 35.0 months to 51.8 months. The average performance progressed 16.8 months of development over an eight-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
Full Data	35.1 (n=71)	51.9 (n=69)
Paired Samples	35.0	51.8* (n=65)
Median Age (months)	53.0	60.0

*Denotes statistical significance at a level of p<.001

For students who stayed at the same school the whole year, the change in overall assessed ability from pre-test to post-test was statistically significant (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 20 months behind appropriate development for their median age to an average score roughly 10 months behind their median age at post-assessment. The gap between these kids and their average peers narrowed by 10

months over the course of the 8-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 40.2 (about 20 months behind average development for their average age).

At the start of the school year 95.8 percent of students demonstrated three or more areas of delay in social and emotional development and by the end of the school year, 88.2 percent demonstrated three or more areas of delay.

Figure 20: ISTAR KR Social and Emotional Development Means

Subject	Full Data		Paired Samples	
	Pre Mean (n=71)	**Post Mean** (n=69)	**Pre Mean**	**Post Mean** (n=65)
Social and Emotional Development Total	**35.1**	**51.9**	**35.0**	**51.8***
Sense of Self and Others	42.1	56.8	42.1	56.9*
Manages Emotions	33.1	52.4	33.4	52.1*
Interpersonal Skills	34.1	48.0	34.0	47.9*
Responsibility	35.3	45.9	35.1	45.9*
Problem Solving	32.5	55.5	32.3	55.3*
Approaches to Learning	33.5	52.9	33.1	52.9*
Median Age (months)	**53.0**	**60.0**	**53.0**	**60.0**

*Denotes statistical significance at a level of p<.001

These findings suggest that targeting low-income kids is narrowing the gap between at-risk children and average expected development for kindergarten readiness. These quality pre-K programs close the gap almost completely for Math and Reading, and achieve some success, albeit less dramatic, 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.[6] Historically, teachers neglected girls in the classroom.[7] Boys received the lion's share of attention resulting in better outcomes and higher levels of education for boys.[8] However, today's girls stay in school and achieve higher levels of education at higher rates than today's boys achieve.[9] With this in mind, we examine gender differences in pre- and post-test performance across all categories of assessment.

Upon entry into pre-school (pre-test), there was only one significant difference between boys and girls in the sub-category "Language Conventions." Girls had a higher average score of 45.0 months (n=37), while boys had a score of 38.3 (*p*=.011, n=34).

Figure 21: ISTAR KR Reading and Language Total Mean Post Scores by Gender (n=69)

Reading and Language Score by Gender	Male	Female
Total Subject Mean	58.6	58.0

* The difference between these means was not significant at a level of *p*=.726.

For Reading and Language assessments, by the end of the school year, there was no significant difference in scores by gender (*p*=.726). The average girl post-test score was 58.0 (n=34), and the average boy score was 58.6 (n=35) (Figure 21). There were also no significant differences in scores by gender in any of the sub-categories of Reading and Language.

Figure 22: ISTAR KR Reading and Language Mean Post Scores by Gender (n=69)

Category	Male	Female
Phonological Awareness	55.5	53.8
Print Concepts, Phonics and Word Recognition	63.1	64.5
Informational Texts	57.1	56.4
Literature Texts	56.5	58.8
Writing Standards	62.4	60.6
Language Conventions	62.9	62.8
Comprehension and Collaboration	51.9	51.3
Presentation of Knowledge and Ideas	59.8	56.0
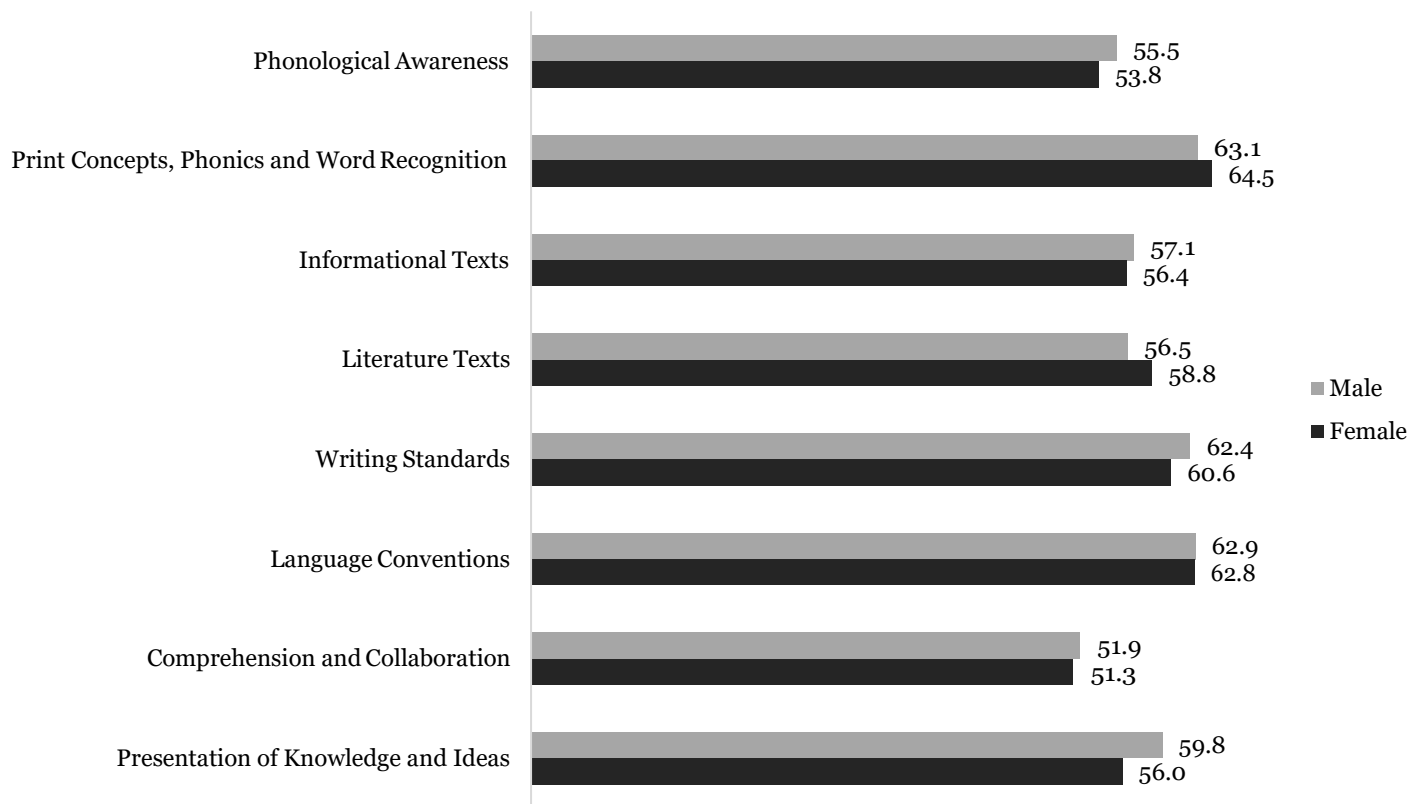
* No items were statistically significant at a level of *p*<.05.

Figure 23: ISTAR KR Math and Quantitative Reasoning Total Mean Post Scores by Gender (n=69)

Math and Quantitative Reasoning Score by Gender	Male	Female
Total Subject Mean	59.6	58.8

The difference between these means was not significant, *p*=.642.

In the Math and Quantitative Reasoning category there was no significant difference (*p*=.642) between the girls' mean score of 58.8 (n=34) and the boys' mean score of 59.6 (n=35) (Figure 23).

None of the categories in the Math and Quantitative Reasoning domain had statistically significant or marginally significant differences between boys and girls on the post-test.

Figure 24: ISTAR KR Math and Quantitative Reasoning Mean Post Scores by Gender (n=69)

Category	Male	Female
Counting	57.5	57.5
Algebraic Thinking	66.7	67.6
Time	55.2	53.4
Location	58.8	55.1
Length, Capacity, Weight and Temperature	59.7	58.8
Geometry	59.5	60.1
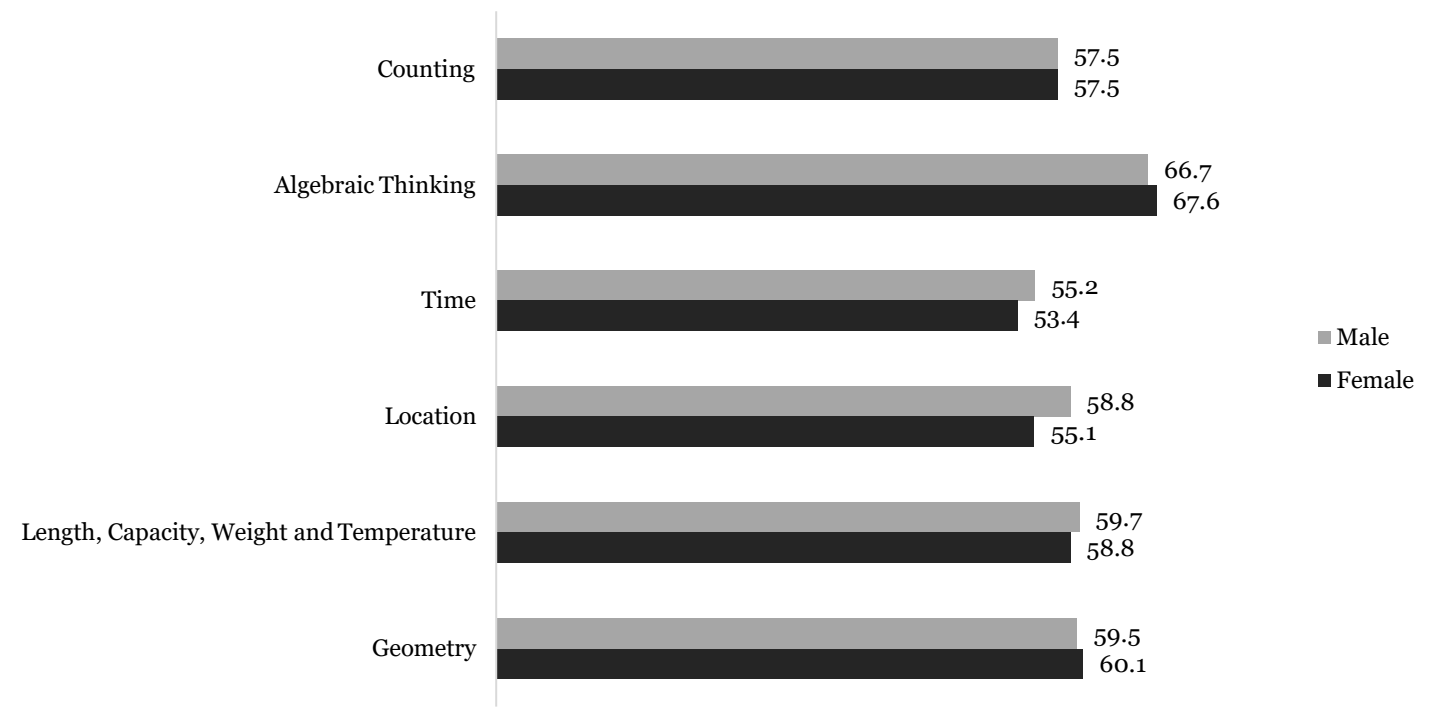
Figure 25: ISTAR KR Social and Emotional Development Total Mean Post Scores by Gender (n=69)

Social and Emotional Development Scores by Gender	Male	Female
Total Subject Mean	52.0	51.8

The difference between these means was not significant, *p*=.872.

In the Social and Emotional Development domain of the post-test girls averaged a score of 51.8 (n=34) while boys averaged 52.0 (n=35) (Figure 25). The difference in these scores is not significant (*p*=.872).

The difference between girls' and boys' scores is also not statistically significant for any items in this domain of the assessment (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. In the 2018-2019 report, girls showed significantly higher scores for social and emotional development. This year, pre-test performance showed no statistically significant

difference between boys and girls and no significant differences by the end of the school year.

Figure 26: ISTAR KR Social and Emotional Development Mean Post Scores by Gender (n=69)
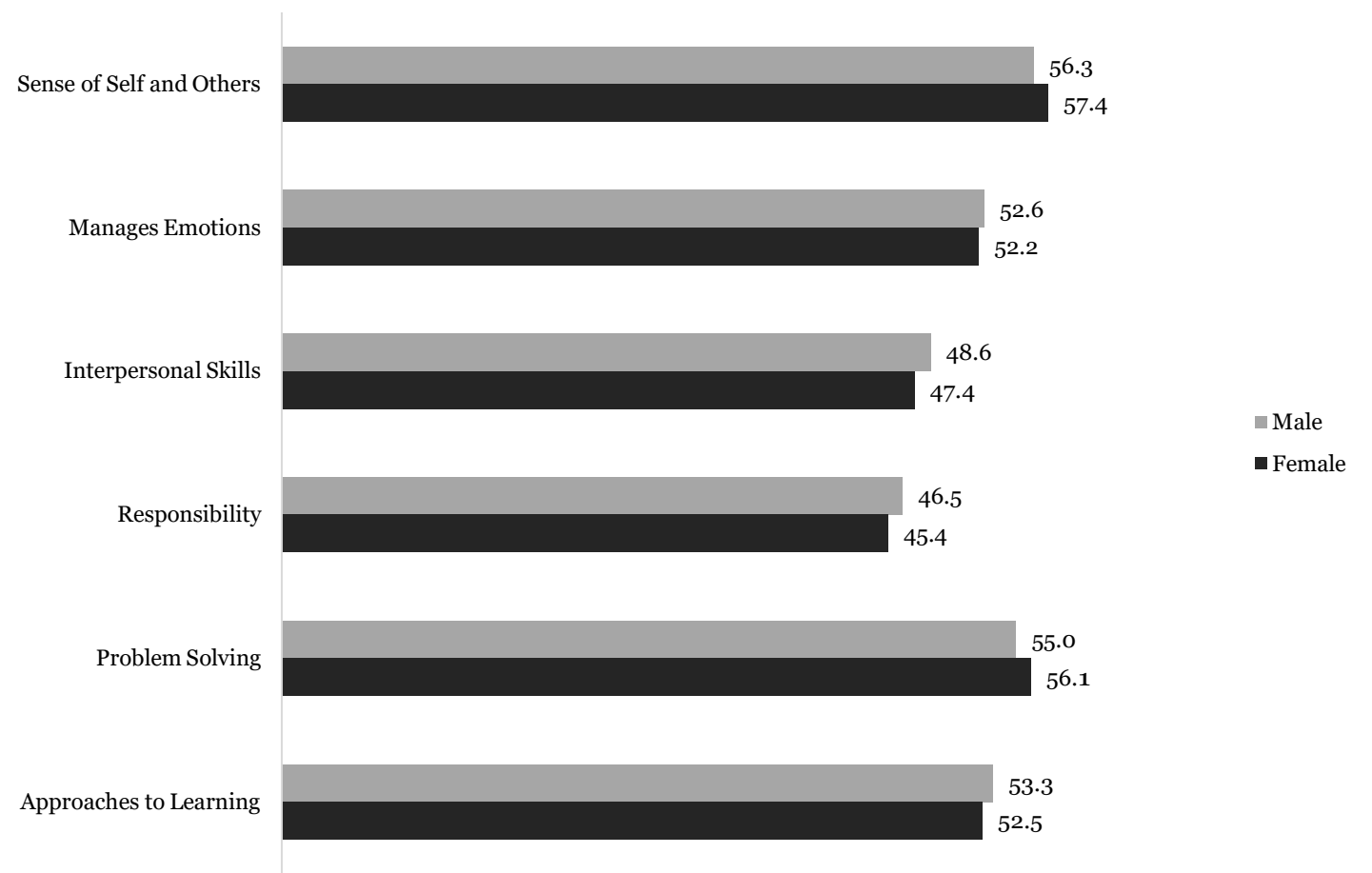
*No items were statistically significant at a level of *p*<.05.

Household Composition and Pre-K Inputs and Outcomes

Household composition, particularly in low-income households, gets a lot of attention as a causal factor shaping outcomes. The IU Southeast Applied Research and Education Center asks providers to indicate each student's household composition. Household types other than single-parent or two-parent comprised 2.7 percent of the sample (Figure 7). We suspect this reflects the recent rise in grandparents and other family members raising children whose parents are unable to do so.

In the 2019 pre-test there are no significant or marginally significant differences found between those from two-parent households and those from single-parent households. There was one significant difference in the post-test in the Algebraic Thinking category, with children in single-parent households (n=16) scoring 69.9 months of development on average compared to children from two-parent households' score of 67.0 months (n=49, p<.001).

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)™ (the same classroom assessment tool used for the state OMWPK pilot) to evaluate teacher-student interactions at every program in the program.

Due to early school closures caused by COVID-19, the research team observed only seven of nine schools using the CLASS™ system during the 2019-2020 reporting period. 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.
- Regard for student perspectives.
- Teacher sensitivity.
- Negative climate.[x]

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 3.8 to 6.8. Teacher sensitivity and positive climate both had strong scores: three classrooms had high scores in each category, and all earned a moderate score in both dimensions (six in the five range, and four in the six range).

All but one class had a moderate or high score in "regard for student perspectives" (range =3.8-6.3). "Regard for student perspectives" and "positive climate" had the highest scores across all domains. In general, providers scored well in *Emotional Support* with an overall average of 5.7, the highest average score of the three domains. Emotional support in the classroom contributes to stronger child outcomes in English Language Arts, even

when we control for other factors (pre-test scores, age at post-test, attendance rate, and the other aspects of classroom environment).

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. Behavior Management, an important component of classroom organization, had a mean score of 4.7 with a high score of 6.0. Productivity had the most recurring high scores across classrooms, with 4 classrooms scoring 5's. Most programs performed in the moderate range.

The widest range of performance occurred in the "behavior management" indicator (3.5-6.0). Overall, *Classroom Organization* scores averaged about 4.6 on the 7-point scale, suggesting moderate performance with some room for improvement.

Classroom Organization was not a significant predictor of performance on math and quantitative reasoning, English language arts, or social and emotional development assessments based on observations in March.

The category *Instructional Support* includes:

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

Scores across these items ranged from 3.0 to 5.5. 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. Most programs achieved a moderate score in "concept development," one of which was in the high moderate range and three that were in the moderate range. "Quality of feedback" had one high moderate score and four others in the moderate range. There were no low scores in this domain, which shows improvement from previous years. All scores in Instructional Support were moderate,

varying from high moderate to low moderate. The mean score of this domain was 4.2 out of 7.

Examining the average of all providers' scores for each domain reveals that as a whole, programs in the program 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.

Instructional Support contributes to stronger child outcomes in math and quantitative reasoning, and English Language Arts, even when we control for other factors (pre-test scores, age at post-test, attendance rate, and the other aspects of classroom environment).

These findings are instructive, but also based on very limited observation. Observations indicate opportunities for growth but are not a definitive assessment of program quality. This year, the research team was unable to visit every program.

The finding suggests that strong instructional support is vital to student success and emotional support is important to child development toward literacy. These findings are noticeably different from other years. The abbreviated school year and unanticipated need to assess students based on recollection rather than a deliberate set of end of year observations mean the data are not comparable to other years.

Conclusions

Findings from year six of the Harrison County Community Foundation Pre-K Program indicate positive impacts. Children who attend full-day programs in nurturing and constructive environments develop faster than they did prior to their arrival in these programs.

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 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. The annual findings still indicate some interesting patterns, even in this disrupted school year.

Reading and Language Arts
Positive emotional support in the classroom and instructional support both significantly shape reading and language arts development.

Even in a high-quality environment, however, 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. Level of development at pre-assessment is a robust predictor of level of development at the end of the program.

Math and Quantitative Reasoning
Level of development at the start of the school year, rate of attendance, and quality of instructional support significantly shaped math and quantitative reasoning development at post-assessment. [xi]

Consistent attendance in a quality program that provides strong instructional support 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). In the case of students' performance on the social-emotional post-assessment items, none of the indicators we examined are significant predictors of post-assessment outcomes. This suggests that neither age nor school based factors reliably affect

social and emotional development. Alternatively, this may reflect that assessment of social and emotional development is either not valid (i.e. not measuring the idea it is intended to measure), and/or is not reliable (i.e. teachers are not assessing this type of development in a way that is consistent across teachers or across children).

Program Take-Aways

Overall, the findings confirm positive program impacts. Full-day quality pre-K is closing the developmental gap between low-income kids and population averages. Children make significant strides in reading and language, and math and quantitative reasoning. 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 low-income 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

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 report.

Appendix A: Language and Reading, Full Frequency Percentages

Figure 27: ISTAR KR Phonological Awareness

Phonological Awareness	Pre-Test (n=71)	Post-Test (n=69)	Development (in months) when commonly demonstrated
Mean	22.9	54.7	
No evidence	NA	NA	4
Responds to sounds in the environment	100.0%	100.0%	10
Produces a variety of sounds	80.3%	97.1%	22
Produces and blends the sounds of letter patterns into recognizable words	11.3%	94.2%	46
Compares sounds of different words	2.8%	47.8%	67
KG Standards: Distinguishes sounds within words (to be mastered by end of KG)	0.0%	7.2%	72

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

Print Concepts, Phonics and Word Recognition	Pre-Test (n=71)	Post-Test (n=69)	Development (in months) when commonly demonstrated
Mean	37.5	63.8	
No evidence	NA	NA	7
Responds to familiar pictures	100.0%	100.0%	25
Labels familiar pictures	54.9%	98.4%	37
Recognizes familiar symbols	23.9%	94.1%	61
Compares, combines, and orders letters and letter sounds	2.8%	63.7%	67
KG Standard: Recognizes that letters make words and words make sentences (to be mastered by the end of KG)	0.0%	10.1%	72

Figure 29: ISTAR KR Informational Texts

Informational Texts	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=71)	(n=69)	
Mean	30.2	56.7	
No evidence	1.4%	NA	7
Engages with a book	98.6%	100.0%	16
Imitates proper handling of books	70.4%	100.0%	34
Distinguishes print from pictures	14.1%	100.0%	46
Orients to print in books	0.0%	65.2%	61
KG Standard: Chooses reading activities for meaning (to be mastered by end of KG)	0.0%	8.7%	72

Figure 30: ISTAR KR Literature Texts

Literature Texts	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=71)	(n=69)	
Mean	34.6	57.6	
No evidence	1.4%	NA	16
Reacts to a story or event	98.6%	100.0%	22
Identifies details from a story or picture	70.4%	100.0%	37
Talks about characters and settings	16.9%	98.6%	49
Retells familiar stories	1.4%	75.4%	58
KG Standard: Comprehends and responds to stories (to be mastered by end of KG)	0.0%	14.5%	72

Figure 31: ISTAR KR Writing Standards

Writing Standards	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=71)	(n=69)	
Mean	41.2	61.5	
No evidence	NA	NA	13
Intentionally makes marks or scribbles	100.0%	100.0%	28
Associates writing with purpose	66.2%	98.5%	43
Creates writing with the intention of communicating	15.5%	78.2%	64
Produces recognizable writing that conveys meaning	0.0%	36.2%	70
KG Standard: Gathers ideas for writing for a purpose (to be mastered at the end of KG)	0.0%	5.8%	72

Figure 32: ISTAR KR Language Conventions

Language Conventions	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=71)	(n=69)	
Mean	41.8	62.8	
No evidence	NA	NA	13
Grasps writing tools	100.0%	100.0%	31
Imitates specific writing strokes to make a picture	74.7%	100.0%	37
Copies specific writing marks	32.4%	95.6%	52
Approximates writing strings of letters	9.9%	73.9%	67
KG Standard: Writes from left to right spacing letters correctly (to be mastered by end of KG)	0.0%	7.2%	72

Figure 33: ISTAR KR Comprehension and Collaboration

Comprehension and Collaboration	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=71)	(n=69)	
Mean	30.7	51.6	
No evidence	NA	NA	4
Responds to cues in the environment	100.0%	100.0%	13
Responds to familiar gestures and words	84.4%	100.0%	25
Follows a familiar verbal or signed direction	45.0%	100.0%	40
Follows unfamiliar direction	7.0%	65.2%	52
KG Standard: Follows directions with steps and descriptors (to be mastered by end of KG)	0.0%	18.8%	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=71)	(n=69)	
Mean	41.9	57.9	
No evidence	NA	NA	10
Uses gestures or sounds to communicate	100.0%	100.0%	19
Uses single words to communicate	98.5%	100.0%	28
Uses two-word phrases or signs	78.8%	100.0%	37
Uses simple phrases and sentences with simple grammatical rules	39.4%	82.6%	52
Uses varied grammar in expression	5.6%	46.4%	70
KG Standard: Shares information and ideas to describe, explain, predict (to be mastered by end of KG)	0.0%	8.7%	72

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=71)	(n=69)	
Mean	39.2	57.5	
No evidence	NA	NA	4
Demonstrates awareness of the presence of objects	100.0%	100.0%	22
Identifies more	81.7%	100.0%	40
Uses numbers to compare	18.3%	95.7%	49
Names and orders quantities	7.0%	63.8%	61
KG Standard: Describes relationships between numbers and quantity (to be mastered by end of KG)	0.0%	11.6%	72

Figure 36: ISTAR KR Algebraic Thinking

Algebraic Thinking	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=71)	(n=69)	
Mean	49.3	66.8	
No evidence	NA	NA	13
Manipulates objects for a purpose	100.0%	100.0%	31
Matches objects and sets	80.3%	98.5%	46
Makes a set of objects smaller or larger	33.8%	95.6%	64
Follows models of addition or subtraction situations	2.8%	66.6%	70
KG Standard: Describes the application of addition and subtraction to situations (to be mastered by end of KG)	0.0%	7.2%	72

Figure 37: ISTAR KR Time

Time	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=71)	(n=69)	
Mean	31.6	53.8	
No evidence	NA	NA	13
Anticipates a routine	100.0%	100.0%	22
Uses vocabulary to identify events in a routine	64.8%	98.5%	34
Sequences events	15.5%	97.1%	46
Uses measuring vocabulary for time	0.0%	47.8%	64
KG Standard: Uses measuring units for time (to be mastered by end of KG)	0.0%	2.9%	72

Figure 38: ISTAR KR Location

Location	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=71)	(n=69)	
Mean	33.0	57.0	
No evidence	NA	NA	7
Demonstrates an awareness of location of objects	100.0%	100.0%	19
Identifies location	88.8%	100.0%	25
Follows directions involving location	55.0%	100.0%	37
Communicates with location words	9.9%	82.6%	58
KG Standard: Uses prepositions to describe location (to be mastered by end of KG)	0.0%	18.8%	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=71)	(n=69)	
Mean	36.7	59.3	
No evidence	2.8%	NA	13
Explores measurement attributes	97.3%	100.0%	25
Distinguishes between big and little, hot and cold	88.8%	100.0%	37
Differentiates gradients of size and weight	11.3%	91.3%	49
Uses common measuring tools in correct context	0.0%	53.6%	70
KG Standard: Makes direct measurement comparisons (to be mastered by end of KG)	0.0%	1.4%	72

Figure 40: ISTAR KR Geometry

Geometry	Pre-Test (n=71)	Post-Test (n=69)	Development (in months) when commonly demonstrated
Mean	38.6	59.8	
No Evidence	NA	NA	10
Explores attributes (e.g. shape, size, color)	100.0%	100.0%	22
Matches same attributes	80.3%	80.3%	40
Matches opposites	16.9%	97.0%	46
Sorts and patterns by one attribute	9.9%	89.8%	58
KG Standard: Sorts and patterns by more than one attribute (to be mastered by end of KG)	0.0%	24.6%	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 (n=71)	Post-Test (n=69)	Development (in months) when commonly demonstrated
Mean	42.1	56.8	
No Evidence	NA	NA	4
Demonstrates self-awareness	100.0%	100.0%	22
Demonstrates independence	95.7%	100.0%	34
Engages with others	45.0%	98.6%	52
Demonstrates respect for self and others	5.6%	63.8%	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 (n=71)	Post-Test (n=69)	Development (in months) when commonly demonstrated
Mean	33.1	52.4	
No Evidence	NA	NA	4
Expresses a variety of emotions	100.0%	100.0%	10
Responds to a variety of emotions	88.7%	100.0%	28
Manages emotions with adult assistance	35.2%	97.1%	46
Uses strategies to manage emotions	5.6%	49.3%	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 (n=71)	Post-Test (n=69)	Development (in months) when commonly demonstrated
Mean	34.1	48.0	
No Evidence	NA	NA	7
Interacts with caregiver	100.0%	100.0%	13
Engages in parallel play	98.7%	100.0%	25
Interacts with others	55.0%	100.0%	40
Engages in cooperative interactions	8.5%	66.7%	52
Uses strategies consistent with children over the age of 5	0.0%	0.0%	

Responsibility	Pre-Test	Post-Test	Development (in months) when commonly demonstrated
	(n=71)	(n=69)	
Mean	35.3	45.9	
No Evidence	NA	NA	7
Recognizes steps in familiar routines	100.0%	100.0%	19
Follows familiar routines	84.5%	100.0%	34
Follows rules	29.6%	89.9%	46
Applies rules to situations	4.2%	58.0%	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=71)	(n=69)	
Mean	32.5	55.5	
No Evidence	NA	NA	7
Initiates an action to get a desired effect	100.0%	100.0%	22
Uses trial and error to manipulate objects	47.8%	100.0%	40
Searches for possible solutions	9.8%	82.6%	58
Finds alternative strategies and solutions	4.2%	33.3%	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=71)	(n=69)	
Mean	33.5	52.9	
No Evidence	NA	NA	4
Demonstrates curiosity	100.0%	100.0%	22
Sustains attention to preferred activities	55.0%	100.0%	40
Sustains attention to a challenging activity	11.3%	78.3%	52
Applies creativity to activities	2.8%	45.5%	60
Uses strategies consistent with children over the age of 5	0.0%	0.0%	

[1] 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.

[2] Whitehurst, Grover J. and Christopher J Lonigan. 1998. "Child Development and Emergent Literacy." *Child Development* 69(3):848-872.

[3] 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.

[4] 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 Stefano Mosso. 2014. "The Economics of Human Development and Social Mobility." National Bureau of Economic Research Working Paper 19925 (http://www.nber.org/papers/w19925).

[5] 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.

[6] Fennema, Elizabeth, Ed and Gilah C. Leder, Ed. *Mathematics and Gender*. Wiliston, FT: Teachers College Press; Tinkler, Penny and Carolyn Jackson. 2014. "The Past in the present: historicizing contemporary debates about gender and education." *Gender and Education* 26(1): pp. 70-86; Mendez, Linda M. Raffaele, Stephanie T. Mihalas, and Robin Hardesty. 2006. "Gender Differences in Academic Development and Performance." *Children's Needs III: Development, prevention, and intervention* pp. 443-565. National Association of School Psychologists.

[7] Myra and David Sadker. 1995. *Failing at Fairness: How Our Schools Cheat Girls*. New York: Touchstone.

[8] IBID.

[9] Mendez, Linda M. Raffaele, Stephanie T. Mihalas, and Robin Hardesty. 2006. "Gender Differences in Academic Development and Performance." *Children's Needs III: Development, prevention, and intervention* pp. 443-565. National Association of School Psychologists; Autor, David, David Figlio, Krzysztof Karbownik, Jeffrey Roth, and Melanie Wasserman. 2019. "Family Disadvantage and the Gender Gap in Behavioral and Educational Outcomes." *American Economic Journal: Applied Economics* 11(3); 338-381.

[x] We observed and assessed negative climate but did not include it in the index for emotional support. For the negative climate variable low scores mean good and high scores mean bad. The mean score for negative climate was 1.29, with the lowest score of 1.00 and highest of 2.25. When added to models for social and emotional development, the factor was not significant in predicting end of year assessment.

[xi] Note: these models include only those cases for which we had full data for all variables