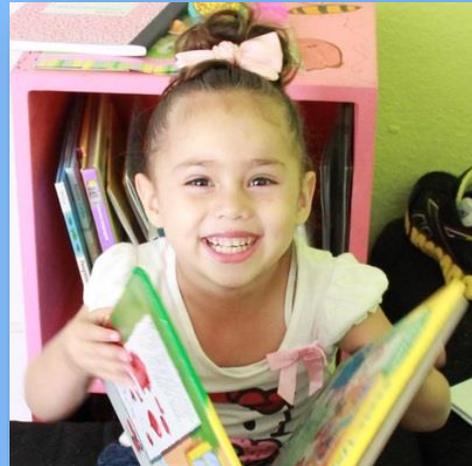


# 10 Books A Home School Readiness Study

November 2018



Helping People  
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## Study Overview

### STUDY PARTICIPANTS

- 24 children and their parents/caregivers participated in the full study
- Study participants were more likely to be from Spanish-speaking families and to live in the 94303 zip code.
- Children participating in the year follow-up were 4.3 years of age at their final assessment and 21 were also enrolled in preschool at that time.

### KEY FINDINGS

This study found that although study participants were on average behind in their school readiness skills at the start of the study, they made significant progress in reducing or eliminating the gaps in skills over the year.

- Participants increased their knowledge of academic concepts at a rapid rate, particularly colors and numbers. Accelerated learning over time reduced a large achievement gap found at baseline between 10BH study participants and other children their same age.
- Results suggest children in the study acquired new vocabulary words as well as accelerated their learning of new words compared to children their same age.
- Other assessment scores indicate that children's social and emotional protective factors were relatively low at baseline and that these skills also grew significantly compared to other children their same age.

## Background

### PROGRAM OVERVIEW

10 Books A Home (10BH) was founded in 2009 by Paul Thiebaut III with the goal of changing the academic trajectory of children in high-poverty communities where children are at risk of starting kindergarten behind grade level. The mission of 10BH is to address kindergarten readiness by tutoring low-income preschoolers based on their individual motivations to learn and framed through the lens of what each child is naturally passionate about. 10BH aims for all children served by the program to enter kindergarten ready to learn and perform at or above grade level in elementary school and beyond. Based on the concept of using children's Intrinsic Learning Motivations (ILMs, see Exhibit 1 below and at <http://www.10booksahome.org/whatwedo.html>), 10BH seeks to cultivate a love of learning that is fostered in the home and that persists over a lifetime.

#### EXHIBIT 1. ILM METHOD



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10BH sessions occur in the child's home once a week with at least one adult family member present and participating throughout. Because parents/caregivers participate in every tutoring session and are encouraged to reinforce their children's learning between sessions, children's motivation to learn can be continuously supported. Children range in age from two to five years old and generally spend two years in the program. In addition, the program serves children of all learning abilities, including children who are typically developing, children with special needs, and children who are English learners. 10BH currently serves approximately 200 families annually in the communities of East Palo Alto, CA and East Menlo Park, CA.

## STUDY METHODOLOGY

Applied Survey Research (ASR) was commissioned to perform an independent evaluation of 10BH by gathering outcome data that could speak to what children learn in the program to prepare them for a successful start to kindergarten. This report focuses on findings from the baseline and one-year follow-up assessments; a separate interim progress report, additionally, summarized findings from participants completing the six-month follow-up.

Study participants included families entering 10BH between February 2017 and July 2017 and were followed for one year. Families were asked to participate in home-based skill assessments within two weeks of enrolling into the program at baseline, and then again at six-month and one-year follow-ups. The purpose of these assessments was to evaluate learning of specific skills and knowledge by children enrolled in the 10BH school readiness study with a focus on: (1) knowledge of academic concepts and skills, including literacy, numeracy, language and executive function; and (2) social, emotional, and behavioral competencies, as these are important predictors of readiness for school and later academic success. A summary of all assessment tools and methods of administration can be found in Appendix A.

## PARTICIPANT DEMOGRAPHICS AT FOLLOW-UP

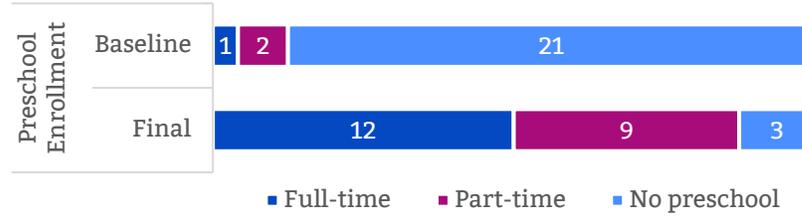
**Study participants were more likely to be from Spanish-speaking families and to live in the 94303 zip code.** The vast majority of the 24 children (92%) lived in the 94303 zip code. In addition, 79% of children were from families where Spanish was spoken either primarily or in combination with English (see Exhibit 2). Nearly three of every five children participating (58%) were male. The average time between the baseline and final evaluation was 13.5 months.

### EXHIBIT 2. PRIMARY LANGUAGE OF CHILDREN



**Children participating in the one-year follow-up were 4.3 years of age at their final assessment and most were also enrolled in preschool at that time.** Preschool attendance increased from 9% at baseline to 88% at the final follow-up evaluation (see Exhibit 3), and most children who were in preschool attended five days per week (86%).

**EXHIBIT 3. TYPE OF PRESCHOOL EXPERIENCE AT BASELINE AND FINAL ASSESSMENT**



*N=24. Note: Part-time preschool attendance is defined as 20 hours or less per week and full-time attendance as more than 20 hours per week.*

Forty families and their children completed assessments at baseline and 34 at the midpoint evaluation. At the final follow-up, 24 families completed assessments indicating a 60% retention rate over the year. Of the 10 families who did not participate, six were no longer in the program either due to relocation out of the area (n=3) or competing work schedules (n=3). Four of the 10 families declined to participate (n=3) or were temporarily unreachable (n=1). Finally, no significant differences were found between samples at baseline and the final follow-up, suggesting that the sample of 24 children assessed just over a year later approximates the demographics and performance measures of the original sample of 40 children (see Exhibit 4).

**EXHIBIT 4. STUDY SAMPLE COMPARISON CHART**

ASSESSMENT	ENTIRE SAMPLE AT BASELINE (N=40)	FOLLOW-UP SAMPLE AT BASELINE (N=24)
Gender – Male	65%	58%
BSRA-3 Standard Score	83	85
ROWPVT-4 Standard Score	96	100
DECA-P2 Total Protective Factors Standard Score	43	44

## Findings

Many children living in high-poverty areas enter school with more limited knowledge of important basic academic concepts commonly used in classroom directions and discussion. Having a vocabulary for common academic concepts is an important early literacy skill and improves a child's ability to read, communicate, and acquire new knowledge. Deficits in general vocabulary knowledge, as well as specific academic concepts, may be long-lasting and associated with negative academic outcomes if not addressed before entering school.

Finally, in addition to grounding an understanding of core academic concept knowledge and vocabulary skills, social and emotional readiness skills including learning motivation, and behavioral and emotional self-regulation are also critical for creating the right conditions for learning. Social, emotional, and behavioral regulation skills help children to more fully engage in learning activities by enabling behavior such as: following directions, paying attention to relevant stimuli, staying on task, and playing well with others.

The following sections present the assessment results associated with these areas of development when children entered the program and just over a year later.

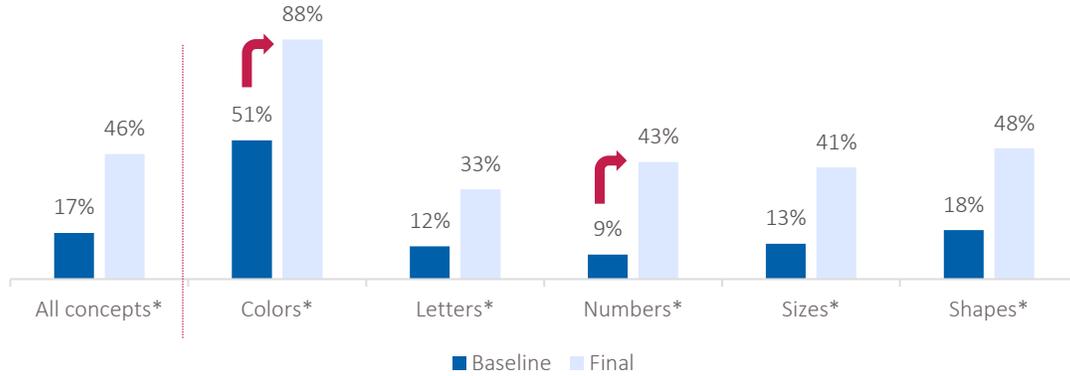
### SCHOOL READINESS SKILLS

#### Academic Concept Knowledge

**Children increased school readiness mastery in all academic concepts tested using the Bracken School Readiness Assessment (BSRA-3) in English, augmenting their overall mastery from 17% of the concepts to 46% a year later (see Exhibit 5).** Although knowledge increased significantly across all academic concepts, children were most familiar with and showed the largest gains in color recognition over the year. Substantially fewer children demonstrated number recognition at the first assessment but achieved the second largest gains over the year in this area.



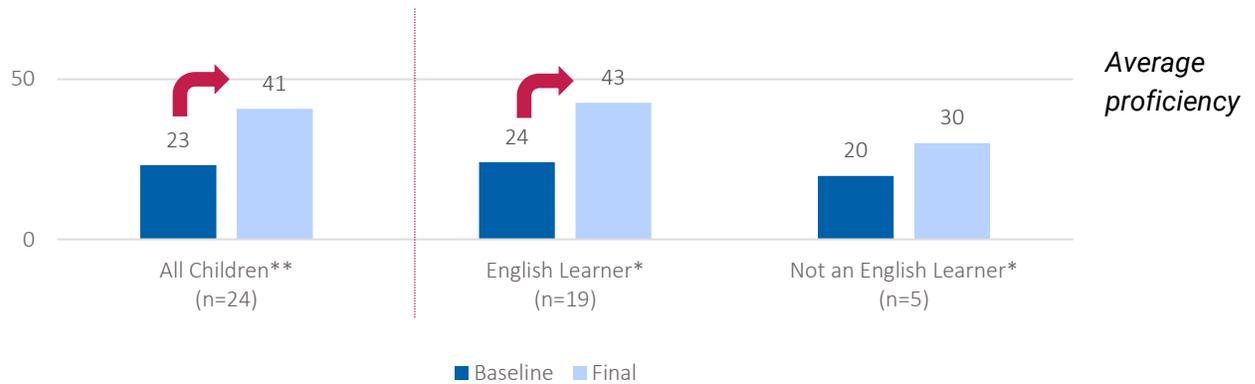
**EXHIBIT 5. CHANGE IN PERCENTAGE OF ACADEMIC CONCEPTS MASTERED**



Note: n=23; \* p < .01. Data were derived from the BSRA-3 assessment tool.

On average, children increased their knowledge of academic concepts in English at a rapid rate, reducing a large achievement gap found at baseline between 10BH study participants and other children their same age (see Exhibit 6). At the final follow-up, the average percentile rank nearly doubled from 23 to 41, indicating significant reduction in the knowledge gap between study participants and other children their same age at baseline.

**EXHIBIT 6. CHANGE IN ACADEMIC KNOWLEDGE PERCENTILE RANK OVERALL AND BY ENGLISH LEARNER STATUS**



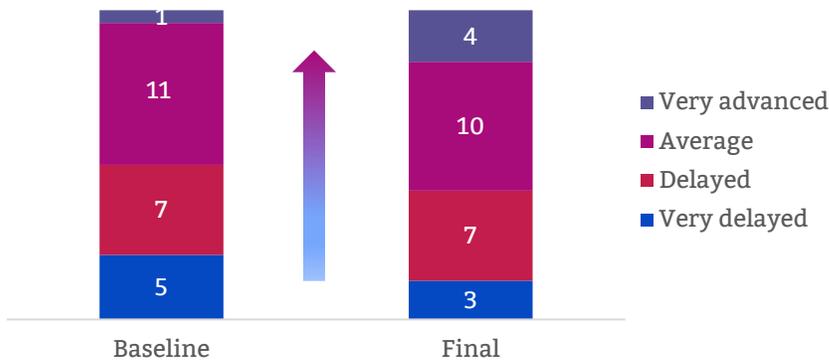
Note: n=24; \*\*p < .01; \*p < .05. Data were collected using the BSRA-3 assessment tool. Percentile rank (range 1-100) represents the skill level of children relative to the population of children of the same age. For example, a rank of 41 indicates that the skills children demonstrated at testing was better than 41% of children their same age. Statistical significance was determined using standardized t-scores.

Although the study group significantly accelerated their knowledge compared to their peers, children who were English learners showed the greatest average gain (19 percentage points).

Additional metrics for assessing skill development include observed change in a child’s descriptive skill category or percentile rank (see Baseline, Exhibit 7 & 8). At baseline, academic concept knowledge scores for half the children in the study (n=12) fell significantly below the average for children their same age (*Delayed* (n=7) or *Very Delayed* (n=5)). Additionally, of the 11 children considered in the average range, six children scored at or below 25% (bottom quartile) of children their same age. Thus, 18 of the 24 (75%) children’s academic concept knowledge scores lagged behind those of at least 75% of their peers at the beginning of the study. This suggests that a majority of children were already behind the skill curve at three years of age; furthermore, they would be at a significant disadvantage if they only advanced their skills at the same pace as their peers. Accelerated learning of academic concepts for these children would be the only way to reduce the achievement gap before starting kindergarten.

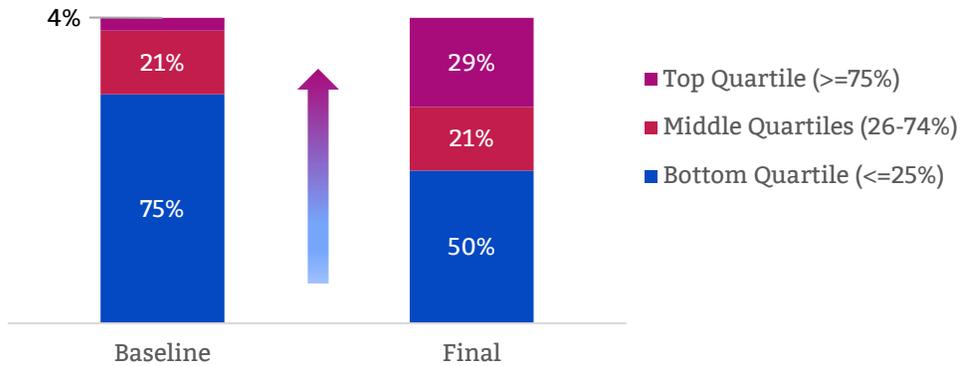
**At follow-up there was evidence of advancement in academic concept knowledge and accelerated learning.** Eight children raised their skill level category over time including: *Average to Advanced* (n=3), *Delayed to Advanced* (n=1), and *Very Delayed/Delayed to Average* (n=4, see Exhibit 7). In contrast to four percent at baseline, seven of 24 children (29%) scored in the top quartile (top 25%) in academic concept knowledge and six children advanced out of the bottom quartile (bottom 25%, see Exhibit 8). This demonstrates significant advancement or acceleration of academic concept knowledge for over half of the children in the study.

**EXHIBIT 7. CHANGE IN CONCEPT KNOWLEDGE DESCRIPTIVE CATEGORIES**



*Note: n=24; Data were collected using the BSRA-3 assessment tool. Descriptive categories are determined by using the cutoff scores specified in the BSRA-3 manual. These identify skill levels from significantly underdeveloped skills to significantly advanced skills compared to other children their same age.*

## EXHIBIT 8. CHANGE IN CONCEPT KNOWLEDGE PERCENTILE RANK BY QUARTILE



*Note: n=24; Data were collected using the BSRA-3 assessment tool. Percentile rank represents the skill level of children relative to the population of children of the same age.*

Overall, significant increases in academic concept knowledge indicate that gaps in academic concept knowledge detected at baseline diminished significantly during the time that the children participated in the 10 Books A Home program.

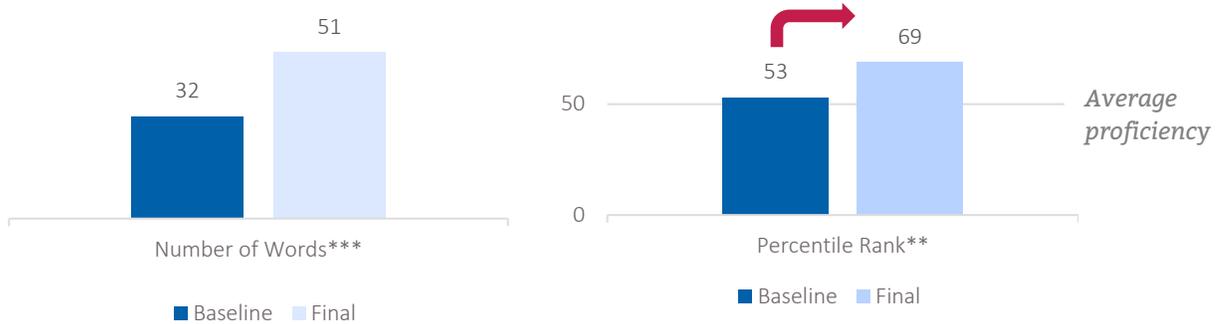
### Vocabulary Size

**English learners demonstrated gains in the number of vocabulary words in English or Spanish that they could identify using the Receptive One-Word Picture Vocabulary Test (ROWPVT-4) at final follow-up, increasing from 32 items to 52 items on average (see Exhibit 9).**

When compared to children their same age, study participants as a group scored well above average. This means that by the last follow-up, children had grown their vocabularies at an accelerated rate and were on average performing better than almost 70% of children their same age (see Exhibit 9).



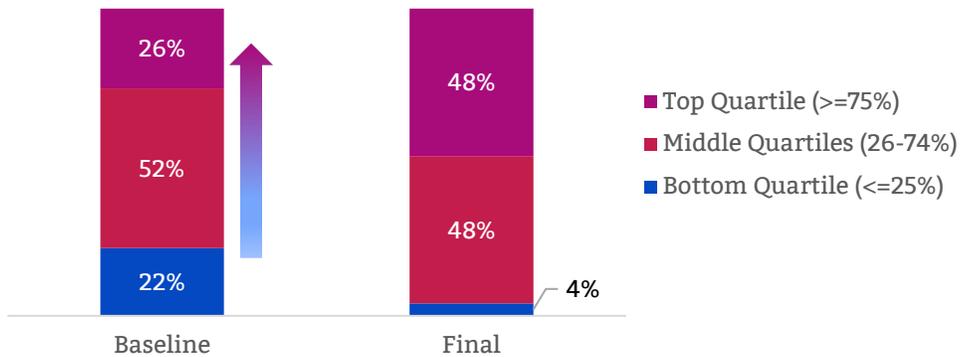
**EXHIBIT 9. CHANGE IN NUMBER OF WORDS CORRECTLY IDENTIFIED AND PERCENTILE RANK**



*Note: n=23; \*\*\*p< .001 and \*\*p< .01. Data were derived from the ROWPVT-4 assessment tool. Percentile rank represents the skill level of children relative to the population of children of the same age (range 1-100%). Statistical significance was determined using raw scores for the number of words correctly identified and standardized t-scores for change relative to other children.*

Individual children’s scores indicate considerable variability in vocabulary skills at baseline, and significant advancement over the year for many children (see Exhibit 10). Vocabulary scores for five of the 23 children (22%) fell in the bottom quartile and scores from six of 23 children fell in the top quartile at baseline. At follow-up, only one child scored in the bottom quartile and 11 children scored in the top quartile (48% of children assessed). This suggests significant acquisition and acceleration of learning by the children in the study over time compared to other children of the same age.<sup>1</sup>

**EXHIBIT 10. CHANGE IN VOCABULARY KNOWLEDGE PERCENTILE RANK BY QUARTILE**



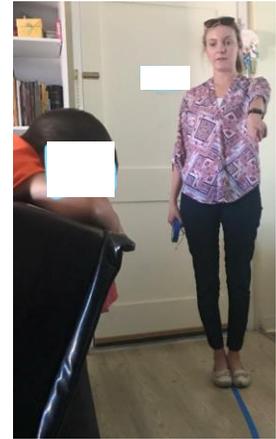
*Note: n=23. Data were derived from the ROWPVT-4 assessment tool. Percentages may not add to 100 due to rounding.*

<sup>1</sup> This assessment does not specify descriptive categories therefore only percentile rank is reported.

## SOCIAL, EMOTIONAL AND BEHAVIORAL READINESS

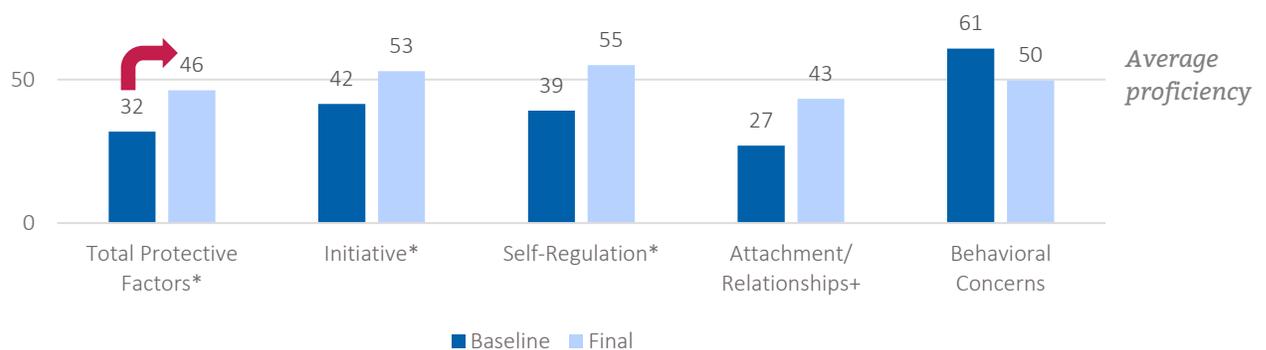
### Parent/Caregiver Reports

Child social and emotional resilience was quantified using parent/caregiver report of *Initiative* (independent thought and action), *Self-Regulation* (healthy expression of emotion), and *Attachment/Relationships* (positive relationships with peers and significant adults) on the DECA assessment tool. *Total Protective Factors* (TPF) is the combination of these three measures. *Behavioral Competency* measures the presence of behavioral issues or concerns.



Parents/caregivers reported that children grew in social, emotional, and behavioral readiness for kindergarten over the year of study participation (see Exhibit 11). For example, **scores indicate that children’s social and emotional protective factors were low at baseline (no better than 32% of children the same age), however these skills grew significantly to better than 46% of children the same age at the final follow-up.** The difference between baseline and final scores were statistically significant for *Total Protective Factors*, *Initiative*, and *Self-Regulation*, and approached statistical significance for the *Attachment/Relationship* domain, indicating strengthened interest and perseverance in learning, greater self-control, and stronger social connectedness.

**EXHIBIT 11. CHANGE IN SOCIAL, EMOTIONAL, AND BEHAVIORAL READINESS AVERAGE PERCENTILE RANK**

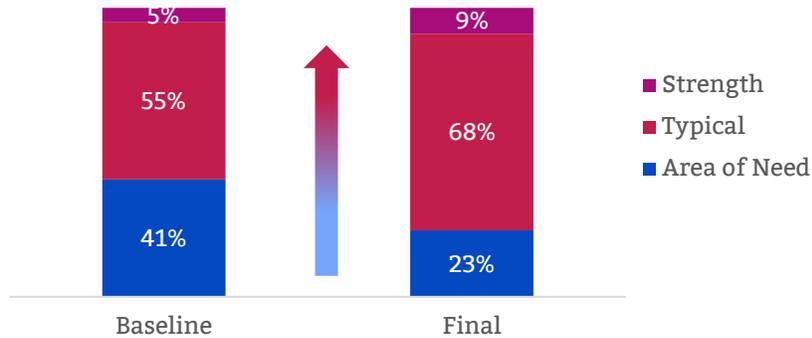


*Note: n=22; \*p < .02; \*p < .08. Data were derived from the DECA assessment tool. Two parents/caregivers did not complete enough survey items to score at baseline. Total Protective Factors combines Initiative, Self-regulation, and Attachment/Relationships scores together. Unlike the other items, a decline in Behavioral Concerns is desirable. Statistical significance was determined using standardized t-scores.*

In addition to increased social and emotional protective factors scores over the year as a whole, four of the nine the children who initially scored in an area of need brought their

scores up into the typical range (see Exhibit 12). Two children scored as having strength at the final assessment.

**EXHIBIT 12. CHANGE IN TOTAL PROTECTIVE FACTORS DESCRIPTIVE CATEGORIES**



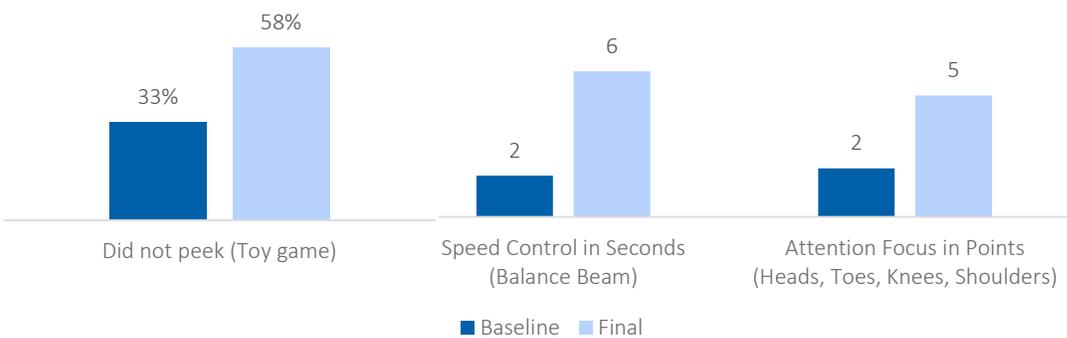
*Note: n=22. Data were derived from the DECA assessment tool. Total Protective Factors combines Initiative, Self-regulation, and Attachment/Relationships scores together. Descriptive categories are determined by using the cutoff scores specified in the DECA manual to identify the need for support (underdeveloped skills) or strength (advanced skills) compared to other children their same age.*

**Play-Based Measures**



**Children showed slight, however not statistically reliable, increases on other play-based measures of self-regulation.** For instance, they demonstrated higher speed and inhibition control, and a greater ability to focus attention and follow-through on complex instructions (see Exhibit 13). None of these increases were statistically significant however.

**EXHIBIT 13. CHANGE IN MEASURES OF SELF-REGULATION**



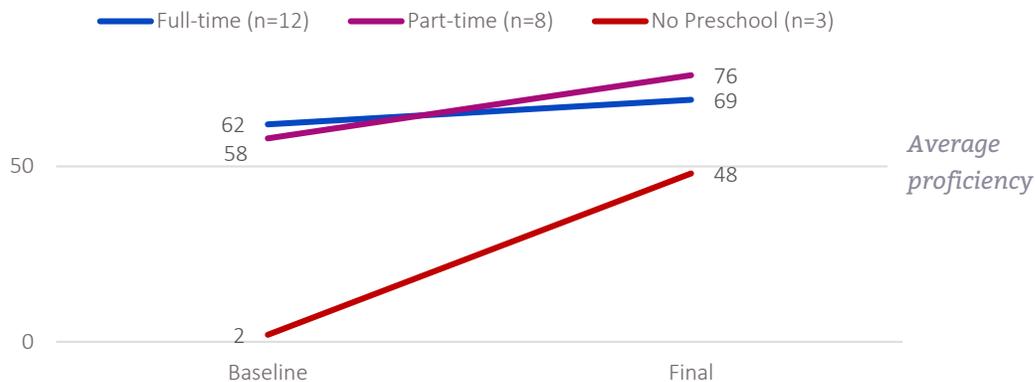
*Note: n=24 for Peek Game, n=24 for Balance Beam, and n=16 for Head, Toes, Knees, Shoulders task.*

## PRESCHOOL EXPERIENCE

The degree of participation in preschool varied from never attending preschool (n=3), attending part-time (up to 20 hours, n=9), and attending full-time (n=12). Comparisons of assessment scores in academic concept knowledge, vocabulary size and parent/caregiver report of social and emotional skills by level of preschool experience were performed to understand how preschool experience was associated with these outcomes. The results suggest that children who never attended preschool started 10BH with significantly lower academic concept knowledge and vocabulary skills compared to children who attended preschool, however no difference was found in social and emotional skills between these groups.

Investigations of whether preschool experience was related to accelerated acquisition of skills were also performed. If found, this would suggest a substantial effect of preschool on skill development. However, the results of the statistical tests found no evidence that children in full-time preschool in the study learned more skills than children in preschool part-time or those who never attended preschool. The only difference found in the speed of skill acquisition was for vocabulary size (see Exhibit 14). Children without preschool experience advanced their skills much faster than other groups, indicating that they were reducing the large skill gap between the groups detected at baseline.

**EXHIBIT 14. CHANGE IN VOCABULARY KNOWLEDGE BY PRESCHOOL EXPERIENCE**



Overall, there are limitations of the data. Failure to find an effect can be influenced by small sample sizes, particularly for children not attending preschool. Therefore, further investigation is recommended with a larger sample or control group of 10BH nonparticipants.

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## Conclusion

### SUMMARY OF KEY FINDINGS

This is the first study of its kind to measure specific skills associated with school readiness in 10BH participants before accessing services and again after one year in the program. The study quantified the degree to which children entered the program behind in the basic academic, social, and emotional building blocks of school readiness. Study findings also indicated that after just over one year in the program, significant advances were observed in children's academic concept knowledge, vocabulary size, self-regulation skills, and social, emotional, and behavioral competencies.

The evidence suggests that a majority of the children in the study, regardless of primary language, are reducing or eliminating achievement gaps detected at the beginning of the study. This study recognizes certain limitations, such as a small sample size and that other factors outside of 10BH could help drive advances in readiness. Altogether, the data suggest that increases in school readiness skills are associated with engagement in the 10BH program after a year of participation. Further studies can help delineate the role that preschool plays with the 10BH program, as well as looking at gains in skills by certain subpopulations such as children with advanced skills for their age, dosage levels of services, and presenting issues that may have made other programs and services not as successful. Additional recommendations are to interview parents/caregivers on their experiences in the program.

## Appendix A

### METHODOLOGY

During 10BH program enrollment, families were provided information about the study and given a consent form to complete. 10BH staff provided signed consent forms to ASR who then scheduled families for their first set of assessments to take place within 2 weeks of starting visits with their 10BH Role Model. At the appointed time, ASR staff arrived at the family's home and began the assessments detailed below. The entire assessment period lasted about 45 minutes to an hour. Children exhibiting disinterest or displeasure in all tasks were rescheduled. The same process was repeated at 6-month and 12-month follow-ups.

### ACADEMIC CONCEPTS

The **Bracken School Readiness Assessment (BSRA-3)** is an evidence-based, standardized, and age-normed assessment tool that measures a child's understanding of 85 foundational academic concepts within the following five categories: colors, letters, numbers/counting, sizes/comparisons, and shapes. The BSRA-3 is an individually administered, direct assessment that takes 10-15 minutes to complete. All children were assessed in English to test concept proficiency in English, the primary language of instruction in most kindergarten classrooms. However, test directions were stated in English and Spanish if needed for children who were English language learners. The test yields a raw score (number correct) and percent mastery (proportion of the number of correct items to the number of total items) on the entire test and on each of the subtests. The total number of correct answers is then converted to a standard score ranging from 40-160. A standard score of 100 represents average performance of children within a given age group; standard scores that range between 85 and 115 represent average development, and standard scores of 85 and below may indicate delayed development.

### RECEPTIVE VOCABULARY

The **Receptive One-Word Picture Vocabulary Test (ROWPVT-4)** is an evidence-based, standardized assessment that is normed in English and Spanish. It tests an individual's ability to match a spoken word with an image of an object, action, or concept. With the ROWPVT-4, the child identifies one of four illustrations that depict the meaning of a stimulus word presented. The test targets the ability to understand the meaning of 180 spoken words, in English or Spanish, and name what is depicted on a test plate without context. The ROWPVT-4 measures the total vocabulary of English learners, is provided in a combination of English and Spanish, and takes 15-25 minutes to complete. Because examinees are permitted to respond in either language, the test measures total acquired vocabulary. The ROWPVT-4 provides a raw score (total correct responses), standard scores with an average of 100 used for statistical analysis, and percentile ranks with an average of 50.

## SOCIAL, EMOTIONAL, AND BEHAVIORAL READINESS

The **Devereux Early Childhood Assessment for Preschoolers** (DECA-P2) is an evidence-based and standardized 38-item parent/caregiver self-report behavior rating scale of child protective factors central to social and emotional health and resilience, as well as behavioral concerns. Protective factor subscales include initiative (independent thought and action), self-regulation (healthy expression of emotion), and attachment/relationships (promote and maintain positive relationships with peers and significant adults). The survey form is provided in English or Spanish and takes about 5-10 minutes to complete. A higher percentile rank indicates greater strength in the protective factor or greater behavior concern. Score descriptions are also provided as follows: a “Typical” area of need indicates that a child is showing a typical amount of behaviors related to resilience; the “Area of Strength” indicates that the child exhibits an unusually high amount of desirable behaviors; and the “Area of Need” indicates that the child can be considered at risk for exhibiting or developing social and emotional problems.

The **Head, Toes, Knees, Shoulders** (HTKS) task is an evidence-based tool that assesses performance on a game that requires working memory, inhibitory control, and attention focusing. Children are asked to produce the opposite response to a request (e.g., touch their toes when asked to touch their head). Part 1 of the test alternates between heads and toes and contains 10 items. Part 2 of the test incorporates shoulders and knees in addition to heads and toes and contains an additional 10 items. The test is provided in the child’s preferred language and takes about 5 minutes to complete.

Two activity tasks and a set of assessor ratings were adopted from the **Preschool Self-Regulation Assessment** (PSRA) behavioral rating tool. The **Balance Beam** and **Toy Wrap** tasks assess child behavioral and emotional expression and inhibition. For the balance beam task, the assessor places six feet of masking tape on the floor. The child participates in three trials to walk the balance beam normally, slowly, and as slow as possible (exaggerated slowly). The toy wrap task has two phases: 1) wrapping/peeking, and 2) waiting/touching. For each phase, children are asked to stay seated and not peek or touch for one minute each. Both activities are timed in seconds. The Preschool Self-Regulation Assessor Report is a 26 item rating scale for the child assessor to rate child behavioral state during the assessments described above. The assessor report takes 3 to 5 minutes to complete (not included in child assessment time) by both assessors conducting the assessment. The framework and descriptors of the assessor report provide a global picture of children’s emotions, attention, and behavior throughout the assessor-child interaction. Items were coded using a Likert scale ranging from 0 to 3. Items were summed or aggregated to create 2 scales, the Attentive/Impulse Control Scale and the Positive Emotion Scale. Higher scores indicate more impulse control or positive emotion.