The Big Lift Descriptive Analyses

Kindergarten Readiness and Elementary School Reading Outcomes for the 2016–2017 and 2017–2018 Kindergarten Classes

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Key findings

- Big Lift preschoolers in the 2017–2018 kindergarten class were more kindergarten-ready than demographically similar peers who did not attend preschool and less kindergarten-ready than children who attended other preschool programs.

- When comparing demographically similar peers, children in the 2017–2018 kindergarten class who attended two years of Big Lift were more kindergarten-ready than children who attended only one year of Big Lift preschool.

- Big Lift preschoolers in the 2016–2017 kindergarten class had higher reading scores at the end of kindergarten and start of first grade than children who did not go to preschool, and they had reading scores that were on par with children who went to other preschool programs, accounting for demographic characteristics. This suggests that the cognitive advantage that Big Lift preschoolers had over children who did not attend preschool at the start of kindergarten persisted into early elementary school.

- Children who attended the Big Lift Inspiring Summers program in the summer after kindergarten had reading levels at the start of first grade similar to children who went to other summer programs and children who did not attend any summer programs, accounting for demographic characteristics.

INTRODUCTION ◼ In 2012, the County of San Mateo, the Silicon Valley Community Foundation, and the San Mateo County Office of Education (SMCOE) launched The Big Lift™, a collective impact collaborative of more than 300 community organizations committed to boosting reading proficiency among the children of San Mateo County, California. The collaborative, which is led by SMCOE, the Silicon Valley Community Foundation, and the County of San Mateo, decided on four programmatic pillars to improve third-grade reading proficiency in the county, targeting 11 school districts with third-grade reading levels below the county average.[1] The four pillars of the Big Lift initiative (hereafter referred to as Big Lift) are as follows:

1. **High-Quality Preschool:** A comprehensive school-readiness strategy focused on high-quality preschool for three- and four-year-olds
2. **Summer Learning:** Inspiring summer learning opportunities for rising kindergartners, first-graders, and second-graders that enable children to maintain their academic and developmental gains from high-quality preschool through third grade
3. **Attendance:** A focus on reducing chronic absenteeism from preschool through third grade through interventions using evidence-based attendance reminders for families
4. **Family Engagement:** Strengthening family engagement through strategies that promote home literacy practices.

Through two rounds of a competitive review process, Big Lift selected seven of the 11 targeted school districts to be a part of two cohorts to implement Big Lift programs. In the spring of 2015, grants were awarded to four districts making up the first cohort (Cohort 1): Cabrillo Unified School District, La Honda-Pescadero Unified School District, Jefferson Elemen-

> This report is the second in the series of outcome studies that focus on two Big Lift pillars: High-Quality Preschool and Summer Learning.

tary School District, and South San Francisco Unified School District. These districts began implementing Big Lift services in the 2015–2016 school year. In spring of 2016, three additional school districts (Cohort 2) were awarded grants: Ravenswood City School District, Redwood City School District, and San Bruno Park School District. These districts began services in the 2016–2017 school year.

The RAND Corporation is conducting a multiphase evaluation of the initiative, including an implementation study of the four pillars—*The Big Lift Implementation Study: Final Report* (Faxon-Mills et al., 2018)—and a series of annual descriptive analysis focused on the outcomes of children who received Big Lift services. This report is the second in the series of outcome studies that focus on two Big Lift pillars: High-Quality Preschool and Summer Learning. The first report, *Big Lift Participation and School Entry Indicators: Findings for the 2016–2017 Kindergarten Class* (Gomez et al., 2017), focused on the early education experiences (prior to kindergarten entry) and kindergarten readiness outcomes of the 2016–2017 kindergarten class from the four Cohort 1 districts. In this report, we build on those analyses in two critical ways. First, this report features an analysis of the 2017–2018 kindergarten class, examining the kindergarten readiness outcomes of children from both Cohort 1 and 2 districts for the first time. Second, we follow up on the 2016–2017 kindergarten class by documenting their reading skills at the end of kindergarten and start of first grade.

OVERVIEW OF THE RESEARCH

In the following sections, we draw on information from the first report in the series to describe the four Big Lift pillars.[2] We then present the research questions addressed in this report, describe the data sources used to conduct our analyses, and describe the study population.

The Big Lift Pillars

The Big Lift–funded districts initiated services under each pillar, as appropriate. The pillars were designed so that families could add layers of different services as needed to support children's reading development. Although we discuss all four pillars in this overview,[3] the descriptive analyses that follow focus only on the High-Quality Preschool and Summer Learning pillars.

High-Quality Preschool

Under this pillar, Big Lift districts use funds to increase the number of center-based preschool slots available for three- and four-year-olds in the community and to increase the quality of preschool overall. *High-quality* is defined by the standards of the San Mateo County Quality Rating and Improvement System (QRIS), part of the California QRIS. To be eligible for Big Lift funds, centers must hold a QRIS Tier Level of 3 or above. Tier 3 represents the middle level of quality on the QRIS matrix, with Tier 1 representing minimal quality (meeting California licensing standards) and Tier 5 representing a rigorous level of quality across the seven elements assessed. All centers that received funding serve children from low-income families, although specific income requirements for enrollment vary by program, as do program fees.

As part of the initiative, all Big Lift preschool programs receive targeted coaching for teaching staff, professional development supports, and technical assistance from SMCOE or from internal staff paid with Big Lift funds. Big Lift preschool programs also have some discretion over how they use grant dollars to continue to improve program quality. Examples of how programs spend their discretionary funds include lowering teacher-child ratios by hiring additional teaching staff, hiring specialists to work with children and/or program staff (e.g., family engagement coordinators, early childhood mental health consultants, or behavior specialists), providing vision and dental screenings, purchasing equipment, and providing technology and learning materials to enhance the learning environment. In addition, Big Lift preschool centers partner with community-based organiza-

tions and local school districts to align, integrate, and maximize the effectiveness of all four Big Lift pillars.

When applying for Big Lift funds, the San Mateo County districts identified the preschool providers they would partner with if the grant were awarded; these programs became Big Lift preschools in the funded districts. Big Lift preschool programs represent a range of different center-based early care and education programs, including nonprofit providers, state-funded preschool programs, and Head Start centers. The programs vary in their recruitment practices, enrollment, hours (full or half day), months of programming (traditional school year or full calendar year), and curriculum. Some of the preschools are not tied to district enrollment processes or to geographic bounds. This means that children might enroll in preschool programs in districts other than the district where they will enroll in kindergarten. Preschools in the Cohort 1 districts began implementing Big Lift preschool programs in the 2015–2016 school year, and programs in the Cohort 2 districts began in the 2016–2017 school year.

Summer Learning

The Big Lift Inspiring Summers program (BLIS) is a five-week summer enrichment intervention for rising kindergartners, first-graders, and second-graders that is free of charge to families. BLIS is a joint program among Building Educated Leaders for Life (a national education service provider), the San Mateo County Library, and the seven Big Lift school districts. Children attend full-day camp from 8 a.m. to 4 p.m., Monday through Friday. The day begins with three hours of intensive language and literacy instruction in the morning based on the Building Educated Leaders for Life curriculum (Chaplin and Capizzano, 2006) and taught by credentialed teachers, followed by three hours of science, technology, engineering, and mathematics (STEM) learning activities in the afternoon provided by the San Mateo County Library. The Big Lift advertised for BLIS on the initiative's website, at elementary schools in Big Lift districts, and at Big Lift preschools. BLIS prioritizes enrolling families whose children had previously participated in BLIS or a Big Lift preschool program and families earning $100,000 or less.[4] Summer 2016 was the first year of BLIS; all four Cohort 1 districts implemented the program with slots for rising kindergartners and first-graders. In summers 2017 and 2018, the districts from Cohort 1 and Cohort 2 implemented the program with slots for rising kindergartners, first-graders, and second-graders (the grade levels that were served varied by district). The BLIS analysis in this

report focuses on children who were rising first-graders in the summer of 2017.

Attendance

In the 2015–2016 school year, 14 school districts in San Mateo County, including Big Lift Cohort 1 and Cohort 2 districts, participated in a program to deliver six attendance reminders during the school year to parents (of children in kindergarten through fifth grade) via postal mail as part of a Harvard University research study on the effectiveness of this approach to improve attendance rates. Following positive study results (Rogers et al., 2016), Big Lift provided attendance reminders starting in fall of 2017 to transitional kindergarten through second-grade students in Cohort 1; in January 2018, all preschoolers from both Cohorts 1 and 2 were added, along with transitional kindergarten through second-grade students in the Cohort 2 districts. The messages focus on the importance of good attendance from an early age and primarily target families whose students' attendance is in the bottom 50 percent of the district. This report does not provide data on students' receipt of these reminders.

Family Engagement

In all Big Lift preschool programs, the Raising a Reader (RAR) programs and Ready4K are the primary evidence-based family engagement strategies. The RAR programs are designed to support preschool children's literacy skills by engaging children and their parents in regular book reading practices (RAR, undated). As part of the standard RAR program, parents are invited to participate in an orientation in which staff present information about child development, early literacy skills, book reading, and home literacy practices. To ensure ready access to books, families receive a weekly bag of books to take home throughout the school year. Raising a Reader Plus (RAR+) is an augmented version of the standard program in which parents are offered a series of interactive education sessions focused on promoting home literacy practices. In the 2015–2016 school year, all preschools in one district and one preschool in a second Cohort 1 district implemented RAR+ (with the other schools using standard RAR). In the 2016–2017 school year, all Big Lift preschools in Cohort 1 implemented RAR+. In the Cohort 2 districts, only Redwood City was implementing RAR+; the programs in the other two communities—San Bruno Park and Ravenswood—were not using the RAR program at all. As a result, some of the children in the 2016–2017

and 2017–2018 kindergarten classes who attended Big Lift preschool also participated in these interventions.

Ready4K is an evidence-based text messaging program that sends weekly text messages to preschool families with information and tips to promote home reading practices (York and Loeb, 2014). The first year of implementation of Ready4K was the 2016–2017 school year. All Big Lift preschool programs in both Cohort 1 and Cohort 2 districts used the program. Because of data availability, we do not focus on the programs in the Family Engagement pillar in this report.

Research Questions Addressed in This Report

The goal of this evaluation is to provide an independent assessment of how well Big Lift is being implemented and whether it is achieving its objective of helping to prepare children for third-grade reading proficiency. This report is the second in a series of planned reports to present descriptive data and trends on children's program participation and achievement outcomes over multiple years. In this report, we focus on a new set of kindergartners served by Big Lift, the 2017–2018 kindergarten class, including Cohort 1 and Cohort 2 districts. We also follow-up on the 2016–2017 kindergarten class (children from Cohort 1 districts only) who were the focus of the first report. This report answers three sets of research questions, which we present here, along with a corresponding rationale for each:

1. Among the 2017–2018 kindergarten class, including children from the Cohort 1 and Cohort 2 districts, how does the kindergarten readiness of children who enrolled in Big Lift preschool compare with children who enrolled in non–Big Lift preschool or who did not attend preschool at all?

   a. Among Big Lift preschoolers in the 2017–2018 kindergarten class, how does the kindergarten readiness of children who had two years of Big Lift preschool compare with those who had only one year?

   Big Lift is designed to help promote children's literacy skills, so it is informative to compare the outcomes of children who did and did not receive Big Lift services. Although our analyses do not allow us to test the causal impact of Big Lift preschool on children, these analyses provide insight into how children who attended Big Lift preschool fared compared with demographically similar peers. Question 1(a) narrows in on the experiences of Big Lift preschoolers only; we explore whether there is a relationship between the dos-

age of Big Lift preschool (one year or two) and children's kindergarten readiness outcomes. We explore two measures of kindergarten readiness, both measured at kindergarten entry: children's scores on the Brigance assessment and the frequency of home book reading.

2. Among the 2016–2017 kindergarten class (Cohort 1 districts only), how do reading outcomes measured at the spring of kindergarten and fall of first grade differ between children who enrolled in Big Lift preschool and children who enrolled in non–Big Lift preschool or who did not attend preschool at all?

   In the first report of this series, we compared the kindergarten readiness skills of children in the 2016–2017 kindergarten class who went to Big Lift preschool with those of children who enrolled in non–Big Lift preschool and children who did not attend preschool at all. We found that Big Lift preschoolers were more likely to be kindergarten-ready than children who did not go to preschool and equally likely to be kindergarten-ready as children who attended other preschool programs. In this report, we explore whether the patterns of differences between the groups observed at the start of kindergarten (when their readiness skills were measured) persisted through the end of kindergarten and the start of first grade.

3. Among the 2016–2017 kindergarten class (Cohort 1 districts only), how do reading outcomes from the fall of first grade compare for children who enrolled in BLIS in the summer following kindergarten with those of children who enrolled in non–Big Lift summer programs or who did not enroll in any summer programs at all in the summer following kindergarten?

   The analyses that address this research question provide the first opportunity to compare the outcomes of children who attended BLIS with demographically similar peers in Big Lift districts who had other summer experiences—either attending non–Big Lift summer programs or not attending any summer programs. Like the preschool comparisons, these analyses provide insight into the similarities or differences in reading skills of children who attended BLIS and demographically similar children who went to other summer programs or no program at all. Because of available data, we focus only on rising first-graders, or children in the 2016–2017 kindergarten class from some Cohort 1 districts who could have attended BLIS in the summer of 2017 following their kindergarten year. We exclude children who were rising kindergart-

ners and second-graders in the summer of 2017 (from the Cohort 1 and 2 districts) because we lack information on the experiences of children who did not attend BLIS and thus cannot construct a comparison group.

Study Population and Data Sources

As noted, the study population for this report consists of children in the Cohort 1 and Cohort 2 districts in the 2016–2017 and 2017–2018 kindergarten classes. Table 1 depicts the time line for Big Lift services across these cohorts in our study. Because the 2015–2016 school year was the first year of Big Lift preschool (in Cohort 1 districts only), the children in the 2016–2017 kindergarten class in Cohort 1 were the first to receive Big Lift services in the year before kindergarten. In the 2016–2017 school year, both Cohort 1 and Cohort 2 districts were offering Big Lift preschool. The children in the 2017–2018 kindergarten class consisted of children from Cohort 1 and Cohort 2 districts who could have attended Big Lift preschool in the 2016–2017 school year. These children were also eligible for Big Lift preschool in 2015–2016 (as three-year-olds, two years before kindergarten) in a Cohort 1 program. As we will explain in more detail, the preschool analyses in this report focus on the kindergarten entry outcomes of the children in the 2017–2018 kindergarten class (Cohorts 1 and 2) and the end-of-kindergarten and start-of-first-grade outcomes of the 2016–2017 kindergarten class (Cohort 1 only).

Similarly, the first summer of BLIS was in 2016 only in Cohort 1 districts and was available to rising kindergartners (the 2016–2017 kindergarten class) and rising first-graders (2015–2016 kindergarten class; children for whom we do not have data). In the summer of 2017, both Cohort 1 and Cohort 2 districts were implementing BLIS for rising kindergartners (i.e., the 2017–2018 kindergarten class), rising first-graders (2016–2017 kindergarten class) and rising second-

graders (2015–2016 kindergarten class; children for whom we do not have data). As we will explain in more detail, the BLIS analyses in this report focus only on the start of first-grade outcomes for children in the 2016–2017 kindergarten class (Cohort 1 only) who were eligible for BLIS in 2017 (the summer following their kindergarten year).

We rely on data from three sources collected as part of Big Lift's initiatives, described in the following sections. The data sources were collected throughout the 2016–2017 and 2017–2018 school years depending on the kindergarten class and cohort of interest.

Child Cognitive Assessments

As part of the work of the Big Lift pillars, all seven Cohort 1 and Cohort 2 Big Lift districts agreed to administer common early childhood assessments to their student population. The Brigance Early Childhood Screen III (Brigance and French, 2013) was selected to measure kindergarten readiness. As depicted in Table 1, the Cohort 1 districts began administering this tool in the 2016–2017 school year with the kindergarten class, and the Cohort 2 districts joined in the 2017–2018 school year. The Fountas and Pinnell Benchmark Assessment System (F&P) is a kindergarten–eighth-grade reading assessment that is being used by all seven school districts as their core elementary reading level assessment (Fountas and Pinnell, 2007).

Brigance Early Childhood Screen III

The Brigance tool consists of 13 items that measure three domains: (1) Academic/Cognitive Development, (2) Language Development, and (3) Physical Development. Because of Big Lift's interest in overall school readiness, we focus our analysis on the total score, a weighted average of all three domains. The tool is normed against a national sample of age-appropriate

Table 1. Timing for Big Lift Preschool and Big Lift Inspiring Summers Program by Kindergarten Class in Study Sample

Sample	School Year (Includes Summer Following)	
Kindergarten class	September 2015–August 2016	September 2016–August 2017
2016–2017 (Cohort 1 districts only)	One year before kindergarten	Kindergarten
	Preschool BLIS: Rising kindergarten	BLIS: Rising first grade
2017–2018 (Cohorts 1 and 2 districts)	Two years before kindergarten	One year before kindergarten
	Preschool (offered by Cohort 1 districts only)	Preschool BLIS: Rising kindergarten

children, and the total score is scaled for research purposes. Cohort 1 and Cohort 2 Big Lift districts administered the Brigance to all entering kindergartners in the first three to six weeks of school in the fall of 2017.[5] Teachers and other school staff assessed students from mid-August to the beginning of October. Although teachers administered the assessment early in the year, there was variation in when the assessment was completed across classrooms, schools, and districts. The variation likely does not influence the results, but it is important to note because children could have been in different developmental places when the assessment was administered.[6]

Additionally, because the Brigance is administered by classroom teachers, slight variation in assessment procedures could have been used, potentially biasing the results. However, all kindergarten teachers or assessors receive a standardized Brigance training by the national Brigance trainer, minimizing any potential bias. Any error introduced by variation in test administration is likely to be random because there was no evidence to suggest systematically different testing procedures across groups of children who received different services.

The Fountas and Pinnell Benchmark Assessment System

The F&P is a reading assessment that measures decoding, fluency, vocabulary, and comprehension skills for students in elementary and middle school. The distinctive feature of the assessment is a series of "little books," or Benchmark Assessment books (both fiction and nonfiction), that students read and interact with while being assessed. The assessment books (which were designed and written specifically for the tool), are assigned an A–Z categorization, with "A" books at the lowest level of difficulty for novice readers. The book levels become increasingly difficult at each letter level, with text characteristics aligned to children's growing reading skills (Fountas and Pinnell, 2014). Students are assigned an *independent level*—or the text level at which a student can read independently with minimal supports—based on their performances on the assessment. These levels serve as the outcome for some of the analyses in this report. The scores range from AA–Z; AA is assigned to students who are unable to read the A level book.[7] Psychometric properties of the assessment, including reliability and validity statistics, can be found in a publisher-conducted study (Fountas and Pinnell, 2012) and meet standards in the field with acceptable test-retest reliability and convergent validity with other measures of reading ability.

The assessment was administered by classroom teachers and other school staff to the 2016–2017 kindergarten classes at two points in time: the end of kindergarten (spring of 2017) and start of first grade (fall of 2017). Children were tested in the spring of 2017 between April and June.[8] There was more variation in assessment dates in the fall of 2017. The intention was to test students early in the school year, but the testing period ran from August through December in all districts. About 76 percent of first-graders in the sample were tested between August and October (what we characterize as *early fall*, or *early testers*) and 24 percent were tested in November or December (what we characterize as *late fall*, or *late testers*). The students with late fall testing dates were from one school district—South San Francisco Unified School District (SSFUSD). Students tended to be tested later in this district because of logistical and administrative decisions made by district leadership. However, not all children from SSFUSD had late testing dates; some children were tested in September.

The late testing dates have implications for our analyses of the BLIS summer program: For these analyses, we focus only on children whose testing dates were proximate to their summer experiences—the early testers. We explain this choice in more detail later in the report and in the online Technical Appendix.

Kindergarten and First-Grade Entry Forms

Data on home reading practices and most of the child and family demographic data were drawn from common kindergarten and first-grade entry forms used by the Big Lift districts. As part of the forms, children's parents or caregivers voluntarily filled out a one-page questionnaire during school registration. The forms included questions on family characteristics (e.g., family income, parent education level), the number of books present in the home, and how often families read to their children. The kindergarten entry form was used by all seven Cohort 1 and Cohort 2 districts in both the 2016–2017 and 2017–2018 school years. This form had questions about children's preschool experiences. For entering kindergartners who did not attend Big Lift preschool, data on their prior year of preschool attendance were based on the response on this entry form.

Because of resource constraints, only two Cohort 1 districts had the means to administer the first-grade entry form in the 2017–2018 school year—SSFUSD and Jefferson Elementary School District (JESD). This form had questions about children's educational experiences in the summer following kin-

dergarten. For entering first-graders who did not attend BLIS in the summer of 2017, data on their summer program enrollment were based on the response on this entry form.

A limitation of the kindergarten and first-grade entry forms is that self-reporting might not accurately capture preschool or summer program enrollment, reading practices, or family demographic information. Parents might feel pressured to answer a certain way, or they might forget or misremember program participation information. However, we have no evidence to suggest that data from the forms are not valid.

Cocoa Database and District Data

Information on Big Lift preschool and BLIS attendance is stored in SMCOE's Cocoa data system. Some demographic data was also drawn from data collected by the Big Lift school districts. All data—enrollment data on Big Lift programs, child assessment scores, and demographic data, were provided to RAND for the analyses, using a unique child-level identifier.

Organization of This Report

In the following sections, we first compare the kindergarten readiness scores and home reading practices of children in the 2017–2018 kindergarten class who attended Big Lift preschool with those of their peers who did not. We then turn to the analogous comparisons of the 2016–2017 kindergarten class, following up on those children's reading skills at the end of kindergarten and start of first grade. Finally, we present results

of the comparisons of children in the 2016–2017 kindergarten class who had different experiences in the summer of 2017, following their kindergarten year. We conclude by summarizing our findings and discussing implications for subsequent stages of the initiative and our evaluation efforts.

DIFFERENCES IN KINDERGARTEN READINESS AMONG THE 2017–2018 KINDERGARTEN CLASS

Describing the 2017–2018 Kindergarten Class

In this section, we address the first research question by examining the school readiness outcomes of children with different preschool experiences in the 2017–2018 kindergarten class. This analysis includes all seven Big Lift districts in Cohort 1 and Cohort 2. The total sample size is 2,701 children, 96 percent of the total kindergarten class. Of the 4 percent (n = 109) of 2017–2018 kindergartners excluded from this sample, 54 children were in special education classrooms and thus not administered the Brigance, and 55 children were absent during the test period. A 96-percent response rate represents a near census of kindergartners in the seven school districts.

As shown in Table 2, 774 students, or about 29 percent of students in the kindergarten class, attended Big Lift preschool. Most of these students, nearly 70 percent, attended only one year of Big Lift preschool—the year immediately preceding kindergarten. However, a small percentage attended Big Lift preschool

Table 2. About One-Third of 2017–2018 Kindergarten Class Attended Big Lift Preschool

Schooling	Number of Students	% of Big Lift Preschoolers	% Among the Comparison Group	% of 2017–2018 Kindergarten Class
Big Lift preschool	774	100.0	—	28.7
2015–2016 only	57	7.4	—	2.1
2016–2017 only	533	68.9	—	19.7
Both years	184	23.8	—	6.8
No Big Lift preschool (comparison groups)	1,927	—	100.0	71.3
Non–Big Lift preschool	1,331	—	69.1	49.3
No preschool	333	—	17.3	12.3
Non–Big Lift preschool unknown	263	—	13.6	9.7
Total	2,701	—	—	100.0

SOURCES: SMCOE Cocoa database; kindergarten entry forms.
NOTE: The sample includes children from the 2017–2018 kindergarten class in the Cohort 1 and Cohort 2 districts.

in the 2015–2016 school year only (two years before kindergarten), and about one-fourth of Big Lift preschoolers had two years of services. The comparison groups include 1,927 students, most of whom (69 percent) attended a non–Big Lift preschool program. This group also represents the largest share of the entire 2017–2018 kindergarten class, at nearly 50 percent. Of the remaining 22 percent of the kindergarten class, 12 percent did not attend preschool at all, and we lack information on the preschool experience of the last approximate 10 percent.[9]

In Table A.1 at the end of this report, we present descriptive statistics on the family and child demographic characteristics both for the full sample and disaggregated by Big Lift preschoolers, children who attended non–Big Lift preschool, and children who did not attend preschool. Similar to the patterns observed in the 2016–2017 kindergarten class (Gomez et al., 2017), Big Lift preschoolers in the 2017–2018 class came from families who faced more social disadvantages than their peers in the comparison groups. For example, 23 percent of Big Lift preschoolers came from single-parent homes compared with only 15 percent of non–Big Lift preschoolers. On average, parents of Big Lift preschoolers also had lower levels of education. More than 70 percent of Big Lift preschoolers came from homes with annual incomes of $50,000 or less; by comparison, less than one-third of non–Big Lift preschoolers came from comparably low-income homes. Big Lift preschoolers were also more disadvantaged than children who did not attend preschool at all, but these differences were not as pronounced as the comparisons with children who attended other preschool programs.

We explore two different measures of kindergarten readiness—children's scores on the Brigance assessment and their families' home reading practices. The Brigance assessment is scaled such that a total score of 100 is equivalent to the national average among kindergarten-aged children. Children who score between 90 and 110 are considered to be in the *average range*, and any child scoring 90 or above is thought to be "ready for kindergarten." Across the entire kindergarten class, the average Brigance score was 90.3, indicating that, on average, children in the seven Big Lift districts were kindergarten-ready but on the low end of the national average range. There was variation in the average Brigance scores of the three preschool groups of interest. Big Lift preschoolers had an average score of 85.2; non–Big Lift preschoolers scored an average of 96.5. These numbers suggest that, on average and before accounting for covariates, children who attended other community preschool programs outperformed their Big Lift preschool

peers. Children who did not attend preschool had the lowest average score among the three groups, at 82.4. Importantly, these unadjusted mean differences are descriptive in nature and cannot be interpreted causally.

We present information on the home reading practices of the 2017–2018 kindergarten class for the full sample and by preschool group in Figure 1. The top bar shows the percentage of children in the whole sample who fell into each category. Slightly more than half of families reported reading to their children between zero and four days a week (the total among the first three sections of the bar), and about half read to their children five or more days. As is the case with children's Brigance scores, there is variation among the preschool groups. Children in the non–Big Lift preschool group had the largest share of children who were read to daily—nearly 40 percent. By comparison, about 18 percent the Big Lift preschoolers and children who did not go to preschool were read to every day.

Adjusted Differences in Kindergarten Readiness by Preschool Group

Although these descriptive statistics indicate differences in children's outcomes across the three preschool groups, we have also noted that these children come from varying family backgrounds. On nearly all demographic indicators, children in the Big Lift preschool group were more disadvantaged than their peers. These demographic differences might help to explain some of the variation in outcomes across the groups. Thus, it is important to take demographic characteristics into account when comparing the preschool groups.

Here, we present the results of the adjusted comparisons of children's kindergarten readiness as measured by the Brigance. The adjusted differences are akin to comparing the Brigance scores of children in the three preschool groups who had similar family and demographic characteristics. These comparisons provide a more nuanced and accurate picture of how Big Lift preschoolers fared in relation to peers from similar home and family situations. However, it is important to note that, due to issues of selection, we cannot be sure that the adjusted differences were caused by preschool participation. As we explained in the first report in this series (Gomez et al., 2017), research indicates that there are a number of social and demographic factors, such as family income, that are related to children's preschool participation and their kindergarten readiness. Although our adjusted differences control for many important factors, there could be differences between the groups that are not

Figure 1. About Half of the 2017–2018 Kindergarten Class Was Read to Five Or More Days Per Week
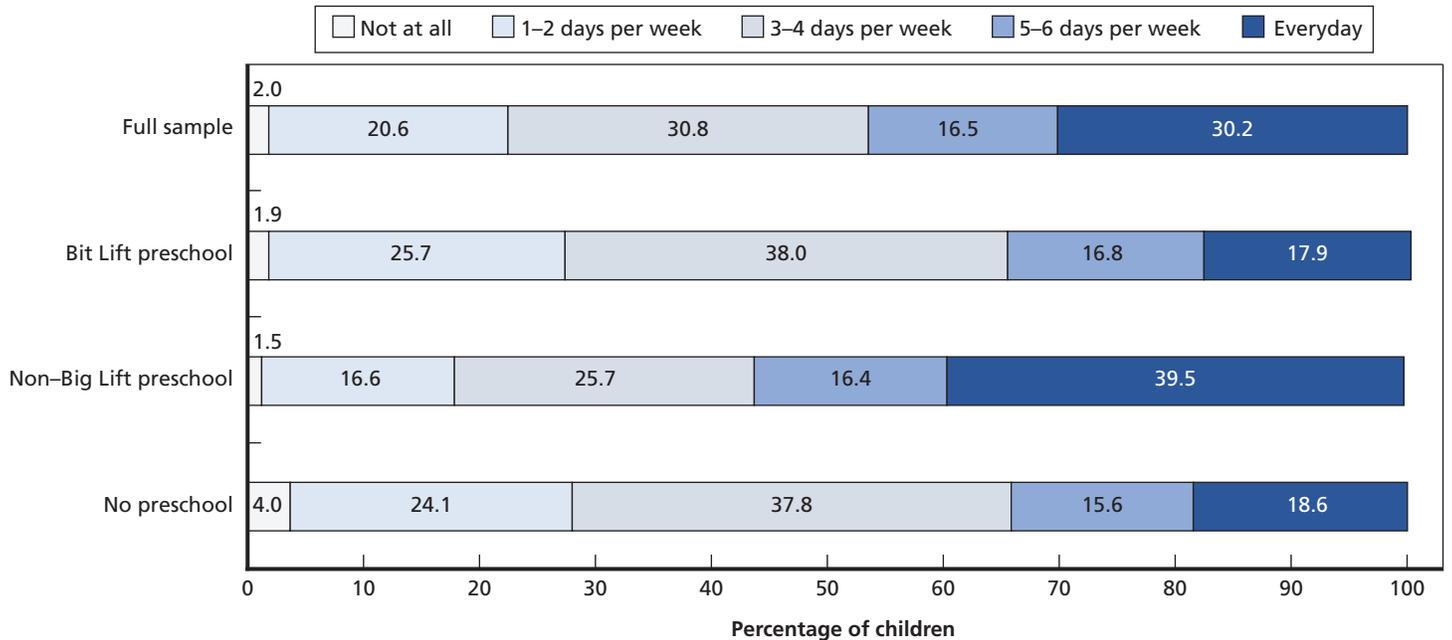
SOURCE: Kindergarten entry forms.

NOTES: Because of missing data on the outcome measure, the sample sizes for this figure are 2,255 for the full sample and 642, 1,276, and 328 for the Big Lift preschool, non–Big Lift preschool, and no preschool groups, respectively. Included in the full sample numbers are nine children with unknown preschool experiences. The sample includes children from the 2017–2018 kindergarten class in the Cohort 1 and Cohort 2 districts.

measured in the available data, such as parents' beliefs about education. Any estimated differences between the preschool groups could be caused by unmeasured factors, not preschool participation. For this reason, any results based on adjusted comparisons in this report should be viewed as descriptive, not causal, differences between the groups.

Brigance Scores

In Figure 2, we present predicted mean scores on the Brigance for each of the three preschool groups of interest. Here—and for all other group comparisons of children's Brigance and F&P outcomes in this report—the predicted mean scores were estimated using Ordinary Least Squares regression models (see the online Technical Appendix for details). The predicted mean score for each group can be thought of as the score for a child who had average values on all the demographic characteristics in Table A.1. We indicate whether the estimated differences between the adjusted means of each comparison group and the Big Lift preschool group are statistically significant with an asterisk (*). The adjusted means differences can be thought of as the differences between the groups, holding constant the demographic characteristics. If a result is statistically significant, we have confidence that the estimated dif-

ferences represent a true trend and are not because of chance or the idiosyncrasies of the particular sample or measurement occasion.

Key Finding: Big Lift preschoolers in the 2017–2018 kindergarten class scored higher on the Brigance than children who did not attend preschool and lower than children who attended other preschool programs, accounting for demographic characteristics.

Each bar in Figure 2 represents the adjusted mean score for each of the three groups—dark blue for Big Lift preschoolers, medium blue for non–Big Lift preschoolers, and light blue for children who did not attend preschool. As the graph shows, the predicted mean score for the Big Lift preschool group was 89, just shy of the average range. The predicted mean score was approximately 84 for the children who did not go to preschool at all, well below the average range. For children who went to non–Big Lift preschool, the predicted mean was 93. The asterisks above the latter two bars indicate that these predicted means are statistically significantly different from the Big Lift preschool predicted mean score. Specifically, these

Figure 2. Big Lift Preschoolers in the 2017–2018 Kindergarten Class Scored Higher on the Brigance Than Children Who Attended No Preschool and Lower Than Children Who Attended Other Preschool Programs
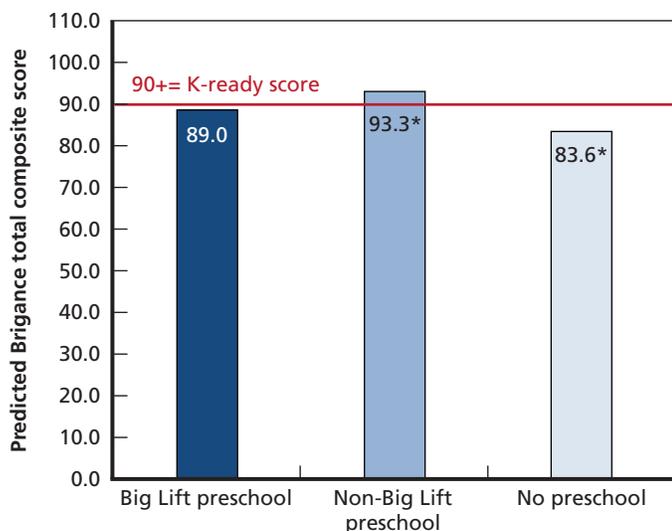
SOURCE: Authors' analysis of Big Lift data.
NOTES: Models control for demographic characteristics (presented in Table A.1). To calculate the predicted means, all covariates have been set to the sample means. See the online Technical Appendix for full model details and results. The sample includes children from the 2017–2018 kindergarten class in the Cohort 1 and Cohort 2 districts.
* = difference between comparison groups and Big Lift preschool is statistically significant at $p < 0.05$.

results suggest that Big Lift preschoolers scored an average of 5.4 points higher than children who did not attend preschool at all, demographic characteristics held constant.[10] This adjusted mean difference can equate to an effect size of 33 percent of a standard deviation.[11]

We also found that, when comparing demographically similar children, Big Lift preschoolers scored an average of 4.3 points lower than children who attended non–Big Lift preschool; this result is statistically significant. The effect size is approximately 27 percent of a standard deviation.[12]

This pattern of results is consistent in one way, and different in another, from the analogous preschool comparisons conducted for the 2016–2017 kindergarten class. Among the 2016–2017 kindergarten class, we found that Big Lift preschoolers outperformed similar peers who did not go to preschool; this result is consistent across the two kindergarten classes. However, the results for the 2016–2017 kindergarten class showed that Big Lift preschoolers performed on par with their demographically similar peers in other preschool programs. This finding is in contrast to that of the

2017–2018 kindergarten class presented here, in which Big Lift preschoolers scored lower than peers from other preschool programs.

What might explain this difference? The 2017–2018 kindergarten class sample includes both Cohort 1 and Cohort 2 districts. The three districts in Cohort 2 introduced a new population of families; they also introduced new Big Lift and non–Big Lift preschool programs. Differences between the Big Lift cohorts could explain the differences in the 2016–2017 and 2017–2018 kindergarten classes' results. We attempted to test this hypothesis by conducting the preschool comparisons for the 2017–2018 kindergarten class in a subsample of children that included only the Cohort 1 districts. If the Cohort 2 districts were driving the difference between the Big Lift preschoolers and non–Big Lift preschoolers, we would expect the pattern of results to be different in a sample of Cohort 1 by itself. This was not the case. Big Lift preschoolers in Cohort 1 still scored significantly higher than children who did not attend preschool and lower than children who went to non–Big Lift preschool. These data suggest that the addition of the Cohort 2 programs are not driving the divergent patterns for the 2017–2018 kindergarten class.

The divergent pattern could be caused by differences between the two kindergarten classes. Although the demographic characteristics presented in Table A.1 suggest that the two classes were similar, the differing pattern of results might be explained by idiosyncratic differences between the two classes not measured here.[13] It is possible that other unmeasured differences between the preschool or early life experiences of the groups differ. For example, we do not have access to data on the quality of Big Lift preschool programs or the other preschool programs that children in the comparison groups attended. The preschool programs that receive Big Lift funds are required to hold a QRIS Tier Level of 3 or above, but we have no information on the program quality of the non–Big Lift programs the comparison group attended. A change in the quality or nature of the preschool programs in the Big Lift districts could affect children's school readiness and help explain this pattern of results.

Reading Practices

To compare the home reading practices of children in the different preschool groups, we employed logistic regression and ordered logistic regression models (see the online Technical Appendix for details). We found no statistically significant differences between any of the groups, all demographic character-

> [R]esearch suggests that there could be added benefits for children who start preschool at age three and experience two years of early education before starting kindergarten.

istics held equal. This pattern of results also differs from those observed in the 2016–2017 kindergarten class, in which our analyses showed that Big Lift preschoolers were read to more often than children who went to no preschool at all. These disparate patterns continue to suggest that the 2017–2018 kindergarten class differs from the 2016–2017 kindergarten class in an underlying, unmeasured way.

One Year of Big Lift Preschool Versus Two

In this subsection, we explore the relationship between variation in the dosage of Big Lift preschool and children's kindergarten readiness skills. Most preschool interventions target four-year-old children in the year before kindergarten; this is particularly true of publicly funded programs (Ackerman et al., 2009). However, research suggests that there could be added benefits for children who start preschool at age three and experience two years of early education before starting kindergarten. Because younger children have greater neural plasticity (Shonkoff, 2011), children who start preschool at age three and stay for two years might reap greater cognitive benefits than those who experience only one year as four-year-olds (Domitrovich et al., 2013). Children who spend two years in preschool have more time to learn the school routines and kindergarten readiness skills that might help them be successful once they start elementary school (Domitrovich et al., 2013). Indeed, research suggests that children who attend two years of preschool have higher reading and early math skills at kindergarten entry than do children who had only one year of preschool (Domitrovich et al., 2013; Lee, 2011; Wen et al., 2012).

All Big Lift–funded preschool programs have slots for three-year-olds (children who are two school years away from entering kindergarten) and four-year-olds (children who are one school year away from entering kindergarten). The 2015–2016 school year was the first year of Big Lift–funded preschool. Thus, some children in the 2017–2018 kindergarten class in Cohort 1 districts had the opportunity to attend two years of Big Lift preschool, first as three-year-olds, and then again as four-year-olds in the year before kindergarten.[14]

As shown in Table 2, 184 children—or approximately one-quarter (24 percent) of Big Lift preschoolers in the 2017–2018 kindergarten class—received two consecutive school years of Big Lift preschool before starting kindergarten. We compared these 184 children with children who enrolled in only one year of Big Lift preschool and did not report attending any other early childhood program. We excluded those children who reported attending one year of Big Lift preschool and another year of some other early childhood program prior to entering kindergarten (n = 231).[15] We excluded these children to correctly isolate the comparison of one year of Big Lift preschool (and no other preschool intervention) with two years of Big Lift preschool. Our final sample included of 359 children who attended just one year of Big Lift preschool.[16]

> Key Finding: On average, children who attended two years of Big Lift preschool scored higher on the Brigance than demographically similar children who attended for one year.

When we compared children with either one or two years of Big Lift preschool, accounting for key demographic characteristics,[17] children who attended two years scored significantly higher on the Brigance than children who attended only one year of Big Lift–funded preschool. Specifically, children who attended two years of Big Lift preschool before entering kindergarten scored 3.2 points higher than demographically similar peers who attended only one year of Big Lift preschool (see the online Technical Appendix for full results). This 3-point difference represents an effect size of 20 percent of a standard deviation.[18] This finding is aligned with previous research indicating that children who spend more time in early childhood settings prior to entering kindergarten start school better prepared to

learn. There were no statistically significant differences on the home reading practices outcome between the two groups.

Importantly, there is a confound between attending two years of Big Lift preschool and starting preschool at an earlier age. Generally speaking, children who started preschool earlier attended for two years; nearly all those in the sample who attended Big Lift preschool at age three also attended at age four. It is possible that there is something uniquely important about a preschool year for a three-year-old that differs from one for a four-year-old. However, our sample does not allow us to test for a difference between the correlation of attending one year of preschool at age three and children's outcomes versus the correlation of attending one year of preschool at age four and children's outcomes.

FOLLOW-UP ON THE 2016–2017 KINDERGARTEN CLASS: DIFFERENCES IN READING SKILLS AT THE END OF KINDERGARTEN AND START OF FIRST GRADE

We now turn to research question 2 and the follow-up on the 2016–2017 kindergarten class. In the first report in this series, we described the kindergarten readiness skills of children in the 2016–2017 class. We compared the outcomes of children who went to Big Lift preschool with those of children who went to non–Big Lift preschool or did not attend preschool at all. We found that Big Lift preschoolers scored on par with demographically similar peers who attended non–Big Lift preschool. Big Lift preschoolers and non–Big Lift preschoolers were equally likely to start school scoring kindergarten-ready (as measured by the Brigance). We also found that Big Lift preschoolers had a statistically significant advantage over children who did not attend preschool at all, with demographic characteristics held constant (Gomez et al., 2017). The question is whether these patterns persisted through the end of kindergarten and the start of first grade.

There is a large, growing literature that explores whether preschool effects persist beyond kindergarten entry; however, the evidence base does not provide a simple answer. Recent research syntheses indicate that some of the small preschool demonstration projects from the 1960s and 1970s—such as the Perry Preschool project in Michigan—showed large short-term preschool effects on child's cognitive outcomes *and* long-term impacts on academic achievement and other

health and social outcomes, such as criminal justice behavior into adulthood (Barnett, 2011; Yoshikawa et al., 2013; Phillips et al., 2017). Some retrospective studies of adults who participated in Head Start in past decades also suggest long-term effects of the program on adult educational attainment (Deming, 2009).

The evidence of long-term effects for more-recent studies of preschool programs taken to scale are mixed (Karoly and Auger, 2016). Some studies show that the preschool advantage (as measured by academic or cognitive test scores) at kindergarten entry does not always persist through elementary school (Barnett, 2011; Yoshikawa et al., 2013; Phillips et al., 2017). The literature suggests that children's preschool gains can "fade out" over time as the children who did not attend preschool "catch up" to peers to who did (Phillips et al., 2017). For example, recent causal evaluations of Head Start and state-funded and locally funded preschool programs show modest positive effects of preschool on children's academic outcomes at the end of preschool or the start of kindergarten that disappear or diminish substantially by third grade (Bassok, Gibbs, and Latham, 2018; Puma et al., 2012). Still other evaluations of preschool programs show some evidence that children who attended preschool continue to outscore their peers on standardized achievement assessment tests well into third, fourth, or fifth grade (Karoly and Auger, 2016).

There is evidence to suggest that contextual factors, such as characteristics of elementary school education, might affect whether preschool effects persist. For example, Magnuson, Rhum, and Wadfogel's work (2004) indicates that children who went to preschool and transitioned into kindergarten classrooms with high levels of literacy instruction maintained their advantage over children who did not go to preschool. Additionally, one theory motivating interventions from preschool through third grade, such as the Big Lift pillars, is that aligned interventions during children's early years might help to sustain preschool benefits (Reynolds, Magnuson, and Ou, 2010).

The following analyses provide insight into which patterns from literature on the persistence of preschool effects apply in Big Lift districts. Specifically, we explore whether the pattern of results observed when comparing the kindergarten entry outcomes of children in Big Lift districts who had different preschool experiences persisted through to the end of kindergarten year and the start of first grade. The analyses we present here are descriptive (not causal, as is the case in much of the literature previously cited), but these results are useful for understanding how Big Lift preschoolers compare with peers as they progress through elementary school.

Describing the 2016–2017 Kindergarten Class Follow-Up Sample

In the first report of this series, we had a sample of 1,496 children from the four Cohort 1 districts. Our sample for these follow-up analyses included children in the first analysis who were still present in the districts to be assessed at both the end of kindergarten and the start of first grade—a total of 1,282 children, or 85.7 percent of the original sample. In Table 3, we present a breakdown of the number of children in the follow-up sample by preschool group and note the percentage of the original sample that the follow-up sample represents. Sample retention was highest among Big Lift preschoolers (more than 90 percent) and lowest for children whose preschool experience was not known. We also compared the follow-up sample with the original sample on key demographic differences; the two groups are nearly identical, suggesting that the follow-up sample is a valid representation of the original kindergarten class.[19]

The outcome of interest here is children's independent reading scores on the F&P. As described in the Data Sources section, children's scores on the assessment reflect the level of difficulty of the assessment book they are able to read independently. Table 4 presents the distribution of children's reading scores at the end of kindergarten for the full sample and by preschool group. For the purposes of these analyses, it is useful to convert the reading levels into numeric values. The scores of AA to Z, with AA being the lowest reading level and Z being the highest, can be thought of as values 0–26 (see the online Technical Appendix for a discussion of this analytic choice). This conversion yielded an average F&P score among the sample of just over 3—equivalent to a level C score. The published F&P materials indicate that level C is the estimated grade-level reading score for children at the end of kindergarten.[20] Thus, on average, children in the Big Lift Cohort 1 districts scored at the estimated grade-level standard. However, scores varied widely across the sample. Notably, nearly 12 percent of children scored an AA, meaning they could not read the A level book. The majority of the sample (more than 70 percent) scored between an A and a D. About 17 percent of children scored an E or above, exceeding the estimated expected reading level for children at the end of kindergarten.

Table 4 also suggests descriptive unadjusted differences between the preschool groups. Slightly more than 37 percent of Big Lift preschoolers scored at level C or above, compared with nearly 60 percent of children who attended non–Big Lift preschool and about 43 percent of children who did not go to preschool. Although the majority of children in all groups scored between AA and D, more children in the non–Big Lift preschool group scored at higher levels. For example, about 20 percent of children from the non–Big Lift preschool scored an F or above; only 7 percent of children from the Big Lift preschool group scored at these higher levels, and the number was only 6 percent among children who did not attend preschool.

In Table 5, we present identical information for children's scores measured at the start of first grade. At this point in time, the average score was 3.8, almost a level D, higher than the estimated expected score of a C for the start of first grade.[21] Similar to the scores at the end of kindergarten, children who went to non–Big Lift preschool scored higher, on average, than children who attended Big Lift preschool.

In addition to variation in the F&P outcome, there are also demographic differences between the preschool groups, as presented in Table A.1. We discussed these differences at length for the original 2016–2017 kindergarten class in the first report in this series. The differences persist here in the follow-up sample, and also mirror those in the 2017–2018

Table 3. Preschool Experiences of the 2016–2017 Kindergarten Class Follow-Up Sample

Schooling	Number of Children in Follow-Up Sample	Percentage of 2016–2017 Follow-Up Sample	Percentage of Original Sample That Remains
Big Lift preschool	318	24.8	90.9
No Big Lift preschool	964	75.2	84.1
Non–Big Lift preschool	686	53.5	80.7
No preschool	197	15.4	83.8
Non–Big Lift preschool unknown	81	6.3	76.4
Total	1,282	100.0	85.7

SOURCE: SMCOE database

NOTE: The sample includes children from the 2016–2017 kindergarten class in the Cohort 1 districts.

Table 4. At the End of Kindergarten, the Majority of the 2016–2017 Kindergarten Class Scored Between Level A and D

Level	Full Sample		Big Lift Preschool		Non–Big Lift Preschool		No Preschool	
	Number of Children	%	Number of Children	%	Number of Children	%	Number of Children	%
AA	152	11.9	50	15.7	48	7.0	45	22.8
A	212	16.5	55	17.3	100	14.6	40	20.3
B	300	23.4	94	29.6	145	21.1	41	20.8
C	212	16.5	49	15.4	118	17.2	31	15.7
D	191	14.9	42	13.2	116	16.9	21	10.7
E	54	4.2	6	1.9	36	5.3	8	4.1
F	43	3.4	13	4.1	27	3.9	1	0.5
G	25	2.0	4	1.3	19	2.8	2	1.0
H	23	1.8	1	0.3	21	3.1	1	0.5
I	24	1.9	3	0.9	19	2.8	—	—
J	5	0.4	1	0.3	4	0.6	—	—
K	6	0.5	—	—	4	0.6	2	1.0
L+	35	2.7	—	—	29	4.2	5	2.6
Total	1,282	100.0	318	100.0	686	100.0	197	100.0

SOURCE: SMCOE database

NOTE: The sample includes children from the 2016–2017 kindergarten class in the Cohort 1 districts. Included in the full sample numbers are 81 children with unknown preschool experiences.

kindergarten class. On nearly all demographic characteristics, children who attended Big Lift preschool face more social disadvantage than their peers who attended other preschool programs, and children who did not go to preschool at all. For example, Big Lift preschoolers were more likely to come from lower-income homes.

Adjusted Differences in Reading Levels at the End of Kindergarten and Start of First Grade by Preschool Group

Consistent with our analysis in the first report of this series and the comparisons conducted for the 2017–2018 kindergarten class, we estimated adjusted differences in children's F&P scores that account for demographic characteristics. These adjusted comparisons allow us to test how Big Lift preschoolers fared in early elementary school compared with peers who had similar home and family circumstances. Table 6 presents results from the adjusted comparisons of the preschool groups in the 2016–2017 kindergarten class at the end of kindergarten and start of first grade.

> Key Finding: In the 2016–2017 kindergarten class, Big Lift preschoolers had reading levels at the end of kindergarten and start of first grade that were on par with demographically similar children who attended other preschool programs and higher than children who did not go to preschool.

At the end of kindergarten, the predicted mean scores for both the Big Lift preschool group and the non–Big Lift preschool group was about a 3, equivalent to a level C. We found an adjusted difference of 0.2 reading levels between the groups, which was not statistically significant. Thus, when comparing demographically similar peers, Big Lift preschoolers and non–Big Lift preschoolers ended kindergarten reading at the same level. The predicted reading level for children who did not go to preschool was 2.5, between levels B and C and lower than both of the preschool groups. On average, children who attended Big Lift preschool scored 0.6 reading levels higher than demographically similar peers who did not attend preschool, a statistically significant difference.

Table 5. At The Start of First Grade, the Majority of the 2016–2017 Kindergarten Class Continued to Score Between Levels AA and D

Level	Full Sample		Big Lift Preschool		Non-TBL Preschool		No Preschool	
	Number of Children	%	Number of Children	%	Number of Children	%	Number of Children	%
AA	198	15.4	70	22.0	67	9.8	52	26.4
A	166	13.0	55	17.3	69	10.1	26	13.2
B	188	14.7	58	18.2	88	12.8	24	12.2
C	153	11.9	41	12.9	77	11.2	26	13.2
D	138	10.8	31	9.8	81	11.8	14	7.1
E	102	8.0	22	6.9	59	8.6	17	8.6
F	78	6.1	14	4.4	46	6.7	13	6.6
G	66	5.2	12	3.8	45	6.6	6	3.1
H	56	4.4	10	3.1	39	5.7	6	3.1
I	46	3.6	1	0.3	40	5.8	3	1.5
J	31	2.4	2	0.6	27	3.9	2	1.0
K	22	1.7	1	0.3	19	2.8	2	1.0
L+	38	3.0	1	0.3	29	4.2	6	3.1
Total	1,282	100.0	318	100.0	686	100.0	197	100.0

SOURCE: SMCOE database
NOTE: The sample includes children from the 21016–2017 kindergarten class in the Cohort 1 districts. Included in the full sample numbers are 81 children with unknown preschool experiences.

Table 6. End-of-Kindergarten and Start-of-First-Grade Reading Scores Were Higher for Children in the 2016–2017 Kindergarten Class Who Attended Preschool

Schooling	End of Kindergarten		Start of First Grade	
	Predicted Mean Score	Adjusted Difference Compared with Big Lift Preschool	Predicted Mean Score	Adjusted Difference Compared with Big Lift Preschool
Big Lift preschool	3.1	—	3.8	—
Non–Big Lift preschool	3.3	0.2	4.0	0.2
No preschool	2.5	–0.6*	3.2	–0.6*

SOURCE: Authors' analysis of Big Lift data.
NOTES: The sample includes children from the 21016–2017 kindergarten class in the Cohort 1 districts.
The table presents predicted mean scores and adjusted differences between groups. Models control for demographic characteristics presented in Table A.1. To calculate the predicted means, all covariates have been set to the sample means See the online Technical Appendix for full model details and results.
* = the difference between groups is statistically significant at $p < 0.05$.

We present these results in Figure 3, with the dark blue bar representing the predicted mean score for Big Lift preschoolers, the medium blue bar for non–Big Lift preschoolers, and the light blue bar for children who did not attend preschool. The lower height of the light blue bar shows that Big Lift preschoolers significantly outperformed children who did not attend preschool; the relatively equal height of the dark and medium blue bars indicates that Big Lift preschoolers performed on par with children who went to other preschools.

Table 6 also shows the predicted mean score and adjusted mean differences for each of the preschool groups at the start of first grade. As the descriptive statistics in Tables 5 and 6 would suggest, the adjusted mean scores for each group are higher than the end of kindergarten, indicating some learning over the summer. The adjusted differences show an identical pattern of results at the start of first grade as the end of kindergarten. Accounting for demographics, Big Lift preschoolers outperformed children who did not attend preschool at all and performed on par with children who went to non–Big Lift preschool. Importantly, this is the same pattern of results we observed for these groups of children when we compared their Brigance scores at kindergarten entry. Thus, it appears that the advantage that Big Lift preschoolers had over children who did not attend preschool persisted through the end of kindergarten and the start of first grade.[22] Big Lift preschoolers also continued to keep pace with students who attended other preschool programs. Notably, the difference between the groups on the F&P at the end of kindergarten and start of first grade are identical, suggesting the groups moved in lock step over this period.

In sum, these results indicate that Big Lift preschoolers' performance on kindergarten readiness and early reading assessments remained relatively constant in comparison with their peers from the start of kindergarten through to the start of first grade. These results suggest that the preschool advantage—for Big Lift preschoolers and non–Big Lift preschoolers—had not faded out by the end of kindergarten or start of first grade.

CHILDREN'S SUMMER EXPERIENCES AND READING LEVELS FOLLOWING KINDERGARTEN

In this section, we present results on the relationship between children's summer experiences following kindergarten and their F&P reading scores at the start of first grade. We focus on the

Figure 3. End-of-Kindergarten Reading Scores Favor Big Lift Preschoolers Compared with Similar Peers Who Did Not Attend Preschool
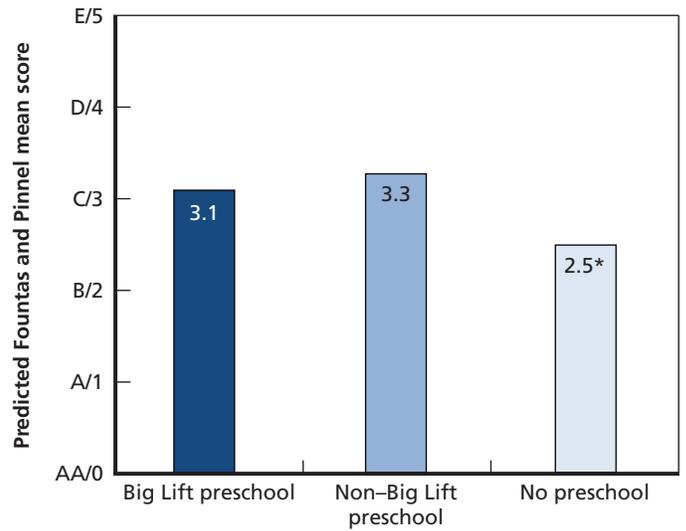
SOURCE: Authors' analysis of Big Lift data.
NOTES: The sample includes children from the 2016–2017 kindergarten class in the Cohort 1 districts. Models control for demographic characteristics presented in Table A.1. To calculate the predicted means, all covariates have been set to the sample means. See the online Technical Appendix for full model details and results.
* Difference between this group and the Big Lift preschool group is statistically significant at $p < 0.05$.

second pillar of the Big Lift services, Summer Learning, and explore how children from two Cohort 1 districts in the 2016–2017 kindergarten class who attended BLIS as rising first-graders in the summer of 2017 compared with other children in the same kindergarten class who attended other summer programs or who did not attend any summer program at all. We do not include the rising kindergartners who attended BLIS in the summer of 2017 (from the 2017–2018 kindergarten class) because we lack information on the summer experiences of the comparison group (i.e., the children who did not attend BLIS). It is for similar reasons that we only include two districts from Cohort 1—SSFUSD and JESD. These are the only two districts that collected the first-grade entry form and thus had information on summer program enrollment for non–BLIS families.

We limit our sample further to the children who were tested at both the end of kindergarten and the start of first grade. Finally, we exclude those children with first-grade testing dates from late fall (November or December 2017; $n = 275$ excluded children from SSFUSD; this represents 67 percent of children from that district). BLIS was designed to help prevent summer learning loss and give children a learning advantage at the start of the school year. Assessment scores

from November and December reflect three to four months of schooling and, likely, learning that took place after the end of summer. Thus, it is not appropriate to use these scores to determine the extent to which children learned over the summer. We include only those children whose scores were proximate to their summer experiences (see the online Technical Appendix for a detailed discussion of this choice). Although this choice is most appropriate for the research question on summer learning, excluding these children decreases the sample size and limits the generalizability of the findings. This issue is particularly sensitive to SSFUSD because all of the late testers attended this district. The final analysis sample included a total of 668 children—534 from JESD (80 percent) and 134 from SSFUSD (20 percent).

Of the children in this sample, 190, or about one-quarter, attended BLIS (Table 7). These 190 BLIS enrollees represent just under half (48 percent) of the 392 children in the 2016–2017 kindergarten class who attended BLIS across all districts in 2017. Fifty percent of children in the sample did not attend any summer program; these children make up the majority of the comparison group. Slightly more than 100 children in the sample attended another summer program.

The average reading score for students at the start of first grade was 3.3, just over level C (Table 8). The distribution of scores are relatively similar across the three groups, with some variation. Children who attended non–BLIS summer programs scored slightly higher than children who attended BLIS and children who attended other summer programs. For example, compared with children who attended BLIS, a higher proportion of children who attended non–BLIS summer programs scored an F or above (exceeding the estimated expected reading level for the start of first grade).

Increasing our focus on summer learning change between the end of kindergarten and start of first grade, Table 9 demonstrates the percentage of children who lost at least one reading level, maintained their reading level, or gained at least one reading level over the summer following kindergarten. Among the sample, a little more than one-fourth of students lost at least one level, about 25 percent saw no change over the summer, and slightly less than 40 percent gained at least one reading level. Thus, the large majority of children in the sample (73 percent) either maintained their reading score or displayed some growth over the summer months. For both BLIS students and children who went to a non–BLIS summer program, a large share of children (compared with the full sample) gained at least one level. Indeed, for both groups, the largest share of children fell into this category, at 41 percent and 53 percent, respectively. On the other hand, approximately one-fourth or more of children in each group lost at least one reading level over the summer.

Similar to the patterns found among the preschool groups, kindergarten children who attended BLIS were more economically disadvantaged than children who attended other community summer programs (see Table A.1 at the end of this report). For example, no children in the BLIS group came from homes earning $150,000 or more, whereas nearly one-third of children who attended other summer programs fell in this category. This stark difference could be related to the fact that many other summer programs in the county are fee-based. BLIS was offered to families free of charge, and the program targeted children from lower-income homes. Children who attended BLIS were also less-advantaged than children who did not attend any summer programs. Children who attended BLIS were less likely to live in two-parent homes and had parents with slightly lower levels of education.

Table 7. Most Children in the Available Sample Did Not Attend Any Summer Program Following Kindergarten

Education	Number of Students	% of the Sample	% Among the Comparison Groups
BLIS	190	28.4	—
Not BLIS (comparison groups)	478	71.6	100.0
Non–BLIS summer program	107	16.0	22.4
No summer program	349	52.3	73.0
Summer experience unknown	22	3.3	4.6
Total	668	100.0	

SOURCE: SMCOE database

NOTE: The sample includes children from the 2016–2017 kindergarten class from the Cohort 1 districts.

Table 8. At the Start of First Grade, Children with Different Summer Experiences Had Similar Reading Scores

Score	Full Sample		BLIS		Non–BLIS Summer Program		No Summer Program	
	Number of Children	%	Number of Children	%	Number of Children	%	Number of Children	%
AA	143	21.4	41	21.6	12	11.2	85	24.4
A	73	10.9	23	12.1	7	6.5	37	10.6
B	124	18.6	36	19.0	22	20.6	63	18.1
C	79	11.8	12	6.3	17	15.9	49	14.0
D	76	11.4	19	10.0	16	15.0	39	11.2
E	41	6.1	16	8.4	6	5.6	18	5.2
F	23	3.4	11	5.8	4	3.7	7	2.0
G	27	4.0	4	2.1	6	5.6	16	4.6
H	31	4.6	12	6.3	4	3.7	14	4.0
I	10	1.5	2	1.1	5	4.7	3	0.9
J	13	2.0	4	2.1	2	1.9	7	2.0
K	10	1.5	3	1.6	3	2.8	4	1.2
L+	18	2.7	7	3.7	3	2.8	7	2.0
Total	668	100.0	190	100.0	107	100.0	349	100.0

SOURCE: SMCOE database
NOTE: The sample includes children from the 2016–2017 kindergarten class from the Cohort 1 districts. Included in the full sample numbers are 22 children with unknown summer experiences.

Table 9. The Majority Of BLIS Children Maintained or Increased Their Reading Level During the Summer Following Kindergarten

Reading Level Gain/Loss	Full Sample		BLIS		Non–BLIS Summer Program		No Summer Program	
	Number of Children	%	Number of Children	%	Number of Children	%	Number of Children	%
Lost at least one reading level	179	26.8	44	23.2	27	25.2	98	28.1
No change	233	34.9	69	36.3	23	21.5	132	37.8
Gained at least one reading level	256	38.3	77	40.5	57	53.3	119	34.1

SOURCE: SMCOE database
Included in the full sample numbers are 22 children with unknown summer experiences.

Adjusted Differences in Reading Levels by Children's Summer Experiences

Given the demographic differences among the children who had various summer experiences, it is important to account for child and family characteristics when comparing the outcomes of children who did and did not attend BLIS. The adjusted comparisons we present in this report not only account for demographic characteristics but also control for children's scores at the end of kindergarten. This is akin to comparing the first-grade reading scores of demographically similar peers who had the *same reading level* at the start of the preceding summer.

> Key Finding: Children who attended BLIS in the summer following kindergarten had reading levels at the start of first grade that were on par with children who did not attend BLIS, accounting for demographic characteristics.

The predicted mean scores at the start of first grade across the three groups are all similar, between 3.3 and 3.5 (Table 10). Although the predicted mean for the BLIS group is slightly higher than the other groups, the differences are not statistically significant. When comparing demographically similar peers who began the summer reading at the same level, children who attended BLIS scored on par with children who attended other community summer programs and those who did not attend any summer programs.

We conducted additional tests to further explore this result. First, the BLIS developers designed the program to be five weeks long, including 25 days of instruction. The program developers set 21 days of attendance (84 percent) as a threshold for high attendance. Research indicates that higher dosage and regular attendance at a summer program is important for children to reap the benefits of the program (McCombs, Whitaker, and Yoo, 2018). About one-quarter of children who attended BLIS in this sample (n = 52; 27.3 percent) attended fewer than 21 days and thus did not receive the full dosage. We estimated the adjusted summer group comparisons excluding these children to assess effects for children who received full dosage only. In this subsample, we find the same pattern: Children who received a high dosage of BLIS scored on par with their demographically similar peers at the start of first grade.

Second, we estimated the adjusted comparison for all children, including those children who were tested in December and November. Although these children were demographically similar to those tested earlier, excluding them could bias the results if the children remaining were different in unmeasured ways. In addition, limiting the sample size can make it harder to detect statistically significant results. Accounting for demographic characteristics and children's scores at the end of kindergarten, children who attended BLIS scored statistically significantly higher than children who attended no summer programs; there were no statistically significant differences between BLIS children and those who attended other summer programs (we present a full set of results in the online Technical Appendix). This finding could suggest that children who attended BLIS might have had a learning advantage during first grade over their peers who did not attend any summer programs. However, the inclusion of children with the late testing dates well into first grade makes it difficult to interpret these results as a true association between children's summer experiences and their learning during the summer months because their F&P scores also represent several months of learning since the start of the school year.

Table 10. At the Start of First Grade, Children Who Attended BLIS Scored on Par with Demographically Similar Children Who Attended Other Summer Programs and Peers Who Attended No Summer Program

Schooling	Predicted Mean Score	Adjusted Difference Compared with Big Lift Preschool
BLIS	3.5	—
Non–BLIS summer program	3.3	–0.2
No summer program	3.3	–0.2

SOURCE: Authors' analysis of Big Lift data.
NOTES: The sample includes children from the 2016–2017 kindergarten class from the Cohort 1 districts. Models control for demographic characteristics presented in Table A.1. To calculate the predicted means, all covariates have been set to the sample means. See the online Technical Appendix for full model details and results.

SUMMARY, IMPLICATIONS AND FUTURE DIRECTIONS

In this report, we analyzed data on two of the four pillars in the Big Lift initiative—High-Quality Preschool and Summer Learning—for children in the Cohort 1 and Cohort 2 districts. We introduced new data on the 2017–2018 kindergarten class and followed up on the outcomes of the 2016–2017 kindergarten class. We compared the outcomes of children with different early childhood experiences before and after their kindergarten year. Our analyses account for important demographic characteristics, such as home language and family income, allowing us to compare children with similar home and family situations. However, these comparisons cannot be viewed as causal estimates of the effect that children's experiences in preschool or summer learning programs had on their kindergarten readiness or reading levels. These analyses cannot tell us whether Big Lift improved child outcomes or whether the programs work. Rather, this report presents a set of descriptive findings meant to shed light on how children who received Big Lift services performed compared with their peers. As we will explain in more detail, these findings can be used to track trends over time and help Big Lift stakeholders make decisions on how best to serve their communities.

Preschool Groups in the 2017–2018 Kindergarten Class

Our analysis of the school readiness outcomes of the 2017–2018 kindergarten class indicates that, when comparing demographically similar children, Big Lift preschoolers were significantly more likely to start school kindergarten-ready than children who did not attend preschool at all. **On average, Big Lift preschool children in the 2017–2018 kindergarten class scored five points higher on the Brigance and were significantly more likely to start school kindergarten-ready than children who did not attend preschool before starting kindergarten**. This finding is consistent with existing literature suggesting that preschool enrollment can support the development of young children compared with those experiencing care only at home with a parent or relative (Feller et al., 2016; Magnuson et al., 2004). This pattern is the same as previously found for the 2016–2017 kindergarten class (Gomez et al., 2017).

We also found that Big Lift preschoolers in the 2017–2018 kindergarten class had lower scores on the kindergarten entry assessment than demographically similar children who attended other non–Big Lift preschool programs. On average,

Big Lift preschoolers in the 2017–2018 kindergarten class scored four points lower on the Brigance than children who attended other early education programs. This pattern differs from our findings for the 2016–2017 kindergarten class, where Big Lift preschoolers scored on par with demographically similar children who went to other summer programs. Unfortunately, the available data do not offer much explanation for this divergent pattern. The 2017–2018 kindergarten class included children from both Cohort 1 and Cohort 2. Although our analyses suggest that the pattern of results was not driven by either cohort, the inclusion of all seven districts differs from the analysis in the last report of the 2016–2017 kindergarten class.

The different results could be caused by temporal changes across the two kindergarten classes. As noted, the two classes are similar on the measured demographic characteristics presented in Table A.1. However, it is possible that unmeasured differences between the two groups might drive the divergent patterns in the kindergarten readiness results. For example, we do not have available data on parents' educational expectations for their children. If this characteristic (or other traits) differs systematically across the preschool groups and/or the kindergarten classes, it could explain the differences in outcomes. And, as we have noted, we also lack information on the quality of children's early childhood experiences. If the quality of the non–Big Lift or Big Lift preschool programs changed between the two kindergarten classes, these changes could be reflected in children's kindergarten readiness.

Finally, our analyses show that **children who attended two years of Big Lift preschool started kindergarten scoring significantly higher than children who attended only one year,** accounting for child and family characteristics. This finding is consistent with literature suggesting that children who spend more years in formal early childhood settings—particularly children from lower-income families—start kindergarten with stronger cognitive skills (Wen et al., 2012).

Following Up on the 2016–2017 Kindergarten Class

We conducted analyses to test whether the findings for the 2016–2017 kindergarten class persisted through the end of kindergarten and start of first grade. Indeed, we found evidence that this was the case. Our results suggest that children in the 2016–2017 kindergarten class who attended Big Lift preschool continued to score higher at both the end of kindergarten and start of first grade compared with children

who did not attend preschool. Demographic characteristics held constant, **Big Lift preschoolers in the 2016–2017 kindergarten class scored more than half a reading level higher at both points in time, on average, than children who did not attend preschool.** We also found that **Big Lift preschoolers continued to score on par with children who attended other preschool programs.** Given that some research suggests that preschool benefits "fade out" over time (Duncan and Magnuson, 2013), these results are encouraging. The findings suggest that the cognitive advantage that preschool children showed when they began kindergarten was still present a year later. Furthermore, Big Lift preschoolers continued to keep pace with peers who attended other preschool programs.

Comparing Children with Different Summer Experiences

After adjusting for demographic characteristics, we found that **children in the 2016–2017 kindergarten class who attended BLIS in the summer following kindergarten had reading scores on par with peers who did not attend BLIS**. Regardless of their summer experience, children started first grade at approximately the same reading level, accounting for students' reading level at the end of kindergarten and for child and family characteristics.[23] However, across the whole sample—all children who attended BLIS, other summer programs, and no summer programs—the majority of children, nearly 75 percent, either maintained or improved their reading level over the summer. Thus, only about one-quarter of children experienced summer learning loss.

Although differences between groups were not statistically significant, it is noteworthy that BLIS offered a free, academically enriching summer program to low-income families in the county. Recent research suggests there are significant socioeconomic gaps in young children's access to enriching summer experiences; low-income children are less likely than more–economically advantaged peers to have a formal, center-based care arrangement, such as BLIS, during the summer months (Redford, Burn, and Hall, 2018). Although we lack data on how many children had access to summer programs prior to the

summer of 2016 (the first summer of BLIS), BLIS provided a free opportunity for summer enrichment that some low-income families likely would not have had access to otherwise. 2017 was only the second year of implementation for BLIS in the Cohort 1 districts. Our analyses of BLIS participation in future years could reflect how the program changes and matures. In addition, the only outcome available was children's scores on the F&P, a reading assessment. Although a significant portion of the BLIS curriculum focused on early literary skills, the program also included STEM instruction and might have promoted skills in math or science, but we were unable to test for an association between BLIS participation and STEM-related outcomes.

Future Directions

These results suggest both progress and room for growth for Big Lift services and programs. In both the 2016–2017 and 2017–2018 kindergarten classes, Big Lift preschoolers outperformed students who did not have the benefit of preschool. For the 2016–2017 kindergarten class, this advantage persisted through the start of first grade. These results might indicate that Big Lift preschool can promote kindergarten readiness and success throughout early elementary school. Future analyses will explore whether the same pattern persists for the 2018–2019 kindergarten class (and beyond) and will follow up on the earlier kindergarten classes as they progress through school. We also found that children who attended two years of Big Lift preschool started kindergarten with higher Brigance skills that children who attended only one year. Future analyses will test whether this pattern is replicated in the next class.

In the 2017–2018 kindergarten class, Big Lift preschoolers began school with lower kindergarten readiness skills than children who attended other preschool programs. RAND's continued analysis will explore whether this pattern persists as the students age. Notably, we did not observe this pattern in the 2016–2017 kindergarten class. Future analyses of additional kindergarten classes will allow us to track this trend over time and across multiple kindergarten classes, providing insight into how Big Lift preschoolers compare with similar peers who attended other preschools.

These results suggest both progress and room for growth for Big Lift services and programs.

Future analyses will also continue to explore BLIS participation, capturing the program in later stages of maturity in the coming years. Available data in future years could also allow for the inclusion of a higher percentage of BLIS participants in our comparative models. Finally, future analyses will also allow us to track children's trajectories of learning over multiple points in time. By 2019, for example, there will be three school years of data on the 2016–2017 kindergarten class. Longitudinal data of this nature provides unique analytic opportunities to explore how children's skills grow over time. We intend to explore trends in the Big Lift districts, drawing comparisons between students who received different combinations of Big Lift services.

In this report, we were limited in our ability to explore whether children who received different combinations of services within the Big Lift pillars had different outcomes. For example, as of the fall of 2017, children in the 2016–2017 kindergarten class had the opportunity to attend two summers of BLIS (2016 and 2017) and Big Lift preschool. However, the sample sizes of the various subgroups covering all possible combinations of services (e.g., children who attended Big Lift preschool only, children who attended Big Lift preschool, and BLIS in the summer of 2016 but not the summer of 2017) were too small for valid statistical comparisons. As more children age into the Big Lift services, larger sample sizes will allow for comparisons across different combinations of services. In addition, we lacked complete data on families' participation in the family engagement and attendance pillar programs. In the future, we might have access to more-complete data on families' participation in these interventions. These data will allow for more-nuanced analysis of whether participation in multiple pro-

grams is associated with more-positive outcomes for children. Together, these research efforts will provide the information needed regarding Big Lift programs' reach and effectiveness and allow community stakeholders to make informed decisions as the initiative moves forward.

APPENDIX

In Table A.1, we present the demographic characteristics for the analytic samples used in each of the three research questions: the 2017–2018 kindergarten class (research question 1), the follow-up sample for the 2016–2017 kindergarten class (research question 2) and the summer learning sample from the 2016–2017 kindergarten class (research question 3). We have disaggregated each sample by children's early learning experiences relevant to the research question.

Table A.1 Demographic Characteristics for Children from the 2016–2017 and 2017–2018 Kindergarten Classes

| | Sample for Research Question 1 | | | | Sample for Research Question 2 | | | | Sample for Research Question 3 | | | |
| | | | No Big Lift PreK | | | | No Big Lift PreK | | | | No BLIS | |
Variable	2017–2018 K Class	Big Lift PreK	Non–Big Lift PreK	No PreK	2016–2017 K Class: Follow–Up Sample	Big Lift PreK	Non–Big Lift PreK	No PreK	2016–2017 K Class: Summer Sample	BLIS	Non–BLIS Program	No Summer Program
Child age (years)	5.6	5.5	5.6	5.5	5.5	5.4	5.6	5.5	6.6	6.6	6.5	6.6
Child gender												
Female	49.1	48.5	48.3	52.0	44.0	45.9	45.3	52.8	51.1	49.0	40.2	55.3
Male	50.9	51.6	51.7	47.8	46.4	52.8	48.0	46.7	48.7	51.1	58.9	44.4
Missing	0.0	0.0	0.0	0.3	9.6	1.3	6.7	0.5	0.3	0.0	0.9	0.3
Race/ethnicity[a]												
Hispanic	51.1	76	34.8	53.8	40.1	73.0	29.3	38.6	46.7	52.6	31.8	47.9
Black/African-American non-Hispanic	1.3	0.8	1.4	0.9	0.9	1.3	1.2	0.0	1.2	0.0	2.8	1.2
White/Caucasian non-Hispanic	16.1	5.4	25.2	7.8	9.3	4.1	13.4	6.6	6.6	4.7	5.6	7.5
Asian/Native Hawaiian/ other Pacific Islander non-Hispanic	26.0	14.3	31.7	31.5	31.1	18.6	37.3	41.6	39.1	37.9	43.9	39.3
Other race	4.6	1.9	6.3	5.1	4.9	1.3	7.4	4.1	6.1	4.2	15.9	4.0
Missing	1.0	1.6	0.5	0.9	13.7	1.9	11.4	9.1	0.3	0.5	0.0	0.3
Home language												
English	47.7	22.0	62.7	45.7	48.6	25.5	59.5	44.2	35.0	28.4	57.00	32.4
Not English	52.3	78.0	37.3	54.4	50.8	73.9	40.4	55.8	65	71.6	43	67.6
Missing	0.1	0.0	0.1	0.0	0.6	0.6	0.2	0.0	0	0	0	0
Parent country of birth	na	na	na	na					na	na	na	na
United States					22.5	13.5	29.5	21.8				
Outside United States					54.9	58.5	56	66.0				
Missing					22.5	28.0	14.6	12.2				
Mother age at child birth												
Younger than 20	4.7	7.1	3.2	8.4	3.2	7.9	1.8	2.0	4.0	5.3	1.9	4.3
Older than 20	78.2	85.5	85.8	84.1	83.2	90.0	86.0	94.4	89.7	88.4	93.5	89.4
Missing	17.01	7.4	11.0	7.5	13.6	3.1	12.2	3.6	6.3	6.3	4.7	6.3

Variable	Sample for Research Question 1				Sample for Research Question 2				Sample for Research Question 3			
			No Big Lift PreK		2016–2017		No Big Lift PreK		2016–2017		No BLIS	
	2017–2018 K Class	Big Lift PreK	Non–Big Lift PreK	No PreK	K Class: Follow–Up Sample	Big Lift PreK	Non–Big Lift PreK	No PreK	K Class: Summer Sample	BLIS	Non–BLIS Program	No Summer Program
Parents in the home												
Two-parent	69.0	70.8	78.4	74.5	70.2	69.2	75.5	78.7	76.8	69.5	79.4	80.5
Single-parent	16.8	23.0	15.0	20.1	17.0	26.4	14.0	19.3	19.5	24.2	16.8	17.5
Missing	14.3	6.2	6.6	5.4	12.8	4.4	10.5	2.0	3.7	6.3	3.7	2.0
Parent education												
Less than high school diploma	11.1	22.2	5.0	15.3	9.8	21.3	5.1	11.2	8.1	8.4	0.9	9.5
High school diploma/ GED	31.7	52.6	21.1	46.3	30.3	50.9	22.3	36.0	38.9	44.7	25.2	40.4
Associate's degree	11.4	12.0	12.0	15.9	13.7	11.3	15.2	18.3	17.1	14.7	15.9	19.2
Bachelor's degree (or higher)	34.0	12.0	56.7	19.2	34.3	15.1	47.7	32.0	33.2	29.0	57.0	28.1
Missing	11.8	1.2	5.2	3.3	11.8	1.3	9.8	2.5	2.7	3.2	0.9	2.9
Family income												
Less than $10,000	8.2	13.1	5.3	13.8	5.9	11.6	3.8	6.6	7.9	10.5	2.8	8.0
$10,001–25,000	15.9	32.3	8.9	16.5	15.3	32.1	8.6	16.8	14.8	20.0	7.5	14.0
$25,001–50,000	20.3	35.3	13.8	24.6	25.0	42.1	19.0	28.4	33.2	37.9	12.2	37.8
$50,001–100,000	16.2	12.0	19.3	23.4	11.2	6.0	13.9	13.7	26.6	23.7	18.7	23.5
$100,001–150,000	9.8	1.8	16.2	9.9	10.7	0.3	16.8	10.2	9.6	2.6	24.3	8.6
More than $150,000	13.3	0.5	25.9	3.0	8.4	0.3	14.4	3.0	6.4	0.0	28.0	3.2
Missing	16.4	5.0	10.7	8.7	23.6	7.6	23.6	21.3	5.4	5.3	6.5	4.9
N	2,701	774	1,331	333	1,282	318	686	197	668	190	107	349

SOURCES: SMCOE database; Kindergarten and First Grade Entry Form.

NOTES: na = not collected for sample in question; GED = General Educational Development; K = kindergarten; preK = pre-kindergarten. The controls for research question 1 were measured at the start of kindergarten for the 2017–2018 kindergarten class (fall of 2017); the controls for research question 2 were measured at the start of kindergarten for the 2016–2017 kindergarten class (fall of 2016); and the controls for research question 3 were measured at the start of first grade for the 2016–2017 kindergarten class (fall of 2017).

[a] The race/ethnicity variables are mutually exclusive categories; see the online Technical Appendix for more detail on variable creation.

NOTES

[1] *Collective impact* is a process through which individuals and organizations from a diverse range of sectors commit to a common agenda for solving a complex problem (Preskill, Parkhurst, and Juster, 2014).

[2] See Gomez et al. (2017) for a review of the research literature that helped to motivate the Big Lift initiative and its pillars.

[3] The information presented in this section is drawn from Gomez et al. (2017).

[4] This income criteria was set based on the 2015 median household income for San Mateo County of $101,272.

[5] Cohort 1 districts also administered the tool to the 2016–2017 kindergarten class in the fall of 2016. Results from these data are reported in Gomez et al. (2017).

[6] To address this issue, we controlled for assessment date in all group comparisons presented later in the report.

[7] The F&P assessment has two different systems: System 1 is for kindergarten through second grade, and System 2 is for third through eighth grades and higher. Although the full range of scores is AA–Z, System 1 scores typically range from AA to N.

[8] To address this issue, we controlled for assessment date in all group comparisons presented later in the report.

[9] Note that we intentionally exclude "non–Big Lift preschool unknown" from the description of outcomes because we do not know which of the three categories applies. We do include this category in our predictive models, however; see the online Technical Appendix for details.

[10] The Big Lift preschool group includes children who attended any Big Lift preschool—in 2015–2016, 2016–2017, or both school years.

[11] The effect sizes are Cohen's d calculated with full sample standard deviation, 15.8. Effect sizes are often used to compare the magnitude of effects across studies. For context, Karoly and Auger's review (2016) of primarily causal evaluations of preschool programs found that most programs with positive statistically significant effects on children's school readiness had effect sizes that ranged from 17 percent to 120 percent of a standard deviation, with most between 20 and 50 percent. Thus, 34 percent of a standard deviation, the difference between Big Lift preschoolers and children who did not attend preschool, is within this range. We can also think of the comparison between preschool groups in terms of the likelihood of children scoring in or above the kindergarten-ready range—the results in the first report in this series were presented in these terms. Among the 2017–2018 kindergarten class, including Cohort 1 and Cohort 2 districts, Big Lift preschoolers were 17 percentage points more likely to be kindergarten-ready than children who did not attend preschool at all. This statistic was estimated from a logistic regression that compared the three preschool groups model with a binary outcome measuring whether children were kindergarten ready (earned a score of 90 or above). See the online Technical Appendix for details of this model.

The reader also should note that the percentage point difference in kindergarten readiness is a different kind of statistic than the effect size presented in the text. The effect size presented in the text is the difference in points on the Brigance represented as a percentage of a standard deviation. Both statistics— the percentage point difference and the effect size—are used to compare the groups, but they are on different metrics and are estimated using different statistical models.

[12] As already discussed, this result can also be put in terms of the likelihood of children scoring in or above the kindergarten-ready range. Non–Big Lift preschoolers were 11 percentage points more likely to be kindergarten-ready than their peers who attended Big Lift preschool.

[13] There are a few consistent differences between the two kindergarten classes worth noting. The 2017–2018 kindergarten class had a higher percentage of Hispanic students (about 50 percent, compared with 40 percent in the 2016–2017 kindergarten class) and a higher proportion of families earning in the highest income bracket. However, we control for these factors in our analyses, so they likely do not explain the different findings.

[14] Because the first year of Big Lift preschool implementation was in the 2015–2016 school year, children in the 2016–2017 kindergarten class were only able to attend one year of Big Lift preschool before kindergarten; therefore, we could not conduct a comparison of one versus two years of Big lift preschool for the 2016–2017 kindergarten class. However, it is likely that some children in the 2016–2017 kindergarten class who attended a Big Lift preschool in the 2015–2016 school year also attended that same center in 2014–2015 as three-year-olds (prior to the Big Lift funding). Although these children were only able to receive one year of Big Lift–funded services, some might have had two years of preschool education.

[15] The 231 children we excluded consist of 53 who attended Big Lift preschool in 2015–2016 as three-year-olds but attended transitional kindergarten in 2016–2017 as four-year-olds and 178 who reported attending a non–Big Lift preschool in 2015–2016 as three-year-olds and Big Lift preschool as four-year-olds.

[16] Nearly all (*n* = 355; 99 percent) of the children who attended just one year of Big Lift preschool did so in 2016–2017 as four-year-olds.

[17] We present full demographic statistics for children who attended one and two years of Big Lift preschool in the online Technical Appendix. The groups are fairly similar on all characteristics with the exception of race and ethnicity. Children who attended two years of Big Lift preschool were more likely to be of Asian descent and less likely to be Hispanic than children who attended only one year.

[18] Our analyses also suggested that, compared with children who attended only one year of Big Lift preschool, a higher percentage of children who attended two years scored in or above the kindergarten-ready range. However, this difference was significant at the trend level (*p* = 0.07).

[19] Although we do not present demographic statistics for the original 2016–2017 kindergarten class sample in this report, they are available in Gomez et al. (2017).

[20] The F&P has two different reading level scores: independent and instructional. The *independent* level is the one at which a child can read without support; the *instructional* level indicates an ability to read with appropriate scaffolding. The publishers issue grade-level benchmark standards only for the instructional reading level. We have available only the independent reading level data for analysis. Based on the publisher's estimated relationship between the instructional and independent reading levels, level C is an estimated but not validated benchmark for end-of-kindergarten independent reading level.

[21] Although we use the term *start of first grade*, the reader should keep in mind that 297 children (or 23.3 percent of the sample) were tested in November or December, well into the first-grade year. The children who were tested later had higher average scores and thus raise the overall sample average. The estimated expected reading level for November and December is higher than a C—approximately an E. Therefore, the sample average reading level does not give a truly accurate picture of the percentage of children reading on grade level in the early months of first grade. We do not account for testing dates here but do account for the differences in testing dates in our comparative models (see the online Technical Appendix for details).

[22] It is worth noting that the F&P and the Brigance school readiness assessment measure difference skills. The F&P measures reading ability only; the Brigance measures a range of skills, including early literacy. The F&P results suggest that children's advantages in reading or literacy skills persisted; these results do not address the other skills measured by the Brigance.

[23] See the online Technical Appendix for a more detailed discussion of these results and related sensitivity analyses with slightly different findings.

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About This Report

The Big Lift™ (Big Lift) is a collective impact initiative extending from first through third grade in San Mateo County, California. The initiative is a partnership of the County of San Mateo, San Mateo County Office of Education, and the Silicon Valley Community Foundation.

Launched in 2012, the initiative aims to boost children's reading proficiency by third grade through four different types of activities, called *pillars*: (1) High-Quality Preschool, (2) Summer Learning, (3) Attendance, and (4) Family Engagement.

The RAND Corporation is conducting a multiphase evaluation of the initiative, including an implementation study of the four pillars that underlie Big Lift—*The Big Lift Implementation Study: Final Report*—and a series of annual descriptive analyses focused on the outcomes of children who received Big Lift services. This report is the second in the series of outcome studies. The first report, *Big Lift Participation and School Entry Indicators: Findings for the 2016–2017 Kindergarten Class*, focused on the early education experiences (prior to kindergarten entry) and kindergarten readiness of the 2016–2017 kindergarten class. In this report, we follow up on the 2016–2017 kindergarten class by presenting data on their reading outcomes measured at the end of kindergarten and start of first grade. We also describe the experiences and outcomes of the 2017–2018 kindergarten class measured at kindergarten entry. An online Technical Appendix provides details of the data analyses and is available at: www.rand.org/t/rr2729.

This research was commissioned by The Big Lift with generous funding from the County of San Mateo. The report should be of interest to Big Lift stakeholders, including San Mateo County policymakers, educators, parents, and community members. Practitioners, policymakers, advocates, and researchers in other parts of the United States might find the information on this initiative useful for work related to the planning, implementation, or evaluation of other early childhood programs.

This research was conducted jointly by the RAND Education and RAND Labor and Population units of the RAND Corporation. Both units have built an international reputation for conducting objective, high-quality, empirical research to support and improve policies and organizations around the world. For more information on RAND Education, visit www.rand.org/education. For more information on RAND Labor and Population, visit www.rand.org/labor.

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