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The Big Lift Descriptive Analyses

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

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Preface

The Big Lift™ (Big Lift) is a preschool–third-grade collective impact initiative 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. 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. This Technical Appendix provides details of data analyses described in the second report in the series of outcome studies, in which 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.

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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Technical Appendix

This appendix provides additional details on the underlying data, statistical models, and results presented in the full report. We first describe how we created each control and outcome variable and its source (e.g., parent report), followed by an overview of the regression models employed, including our missing data techniques and sensitivity analyses. We then provide a full set of results, including all models presented in the full report and additional sensitivity analyses (Tables TA.1–TA.17).

Control Variables

We use control variables measured at two different times, fall 2016 and 2017.¹ Controls measured in the fall of 2016 were used for the preschool analyses with the 2016–2017 kindergarten class follow-up sample (Research Question 2). Controls measured in the fall of 2017 were used for the preschool analyses with the 2017–2018 kindergarten class (Research Question 1). The controls used for the Big Lift Inspiring Summers program (BLIS) analysis (using a subset of the 2016–2017 kindergarten class; Research Question 3) were also measured in the fall of 2017. Within a given analysis or model, we only use controls measured at a single point in time. We explain the nature of each variable in the following subsections.

Child Variables

Child age was calculated from information on child birthdate reported by parents on the kindergarten and first-grade entry forms and the date of assessment (assessor recorded on the Brigance and F&P assessment forms).

Child gender was reported by parents on the kindergarten and first-grade entry forms. We created a binary variable coded such that a value of 1 indicates a female child.

Child race/ethnicity was reported by parents on the kindergarten entry forms and recorded in district data. Parents were asked to report on whether their children were Hispanic and then on their children’s race. There were five race categories: Alaska Native/American Indian; Asian; Black/African-American; Native Hawaiian/other Pacific Islander; White/Caucasian. Parents could check all that applied. From this information, we created a single race/ethnicity variable specified as a vector of mutually exclusive binary indicators (reported in Appendix Table A.1 of the main report) that mirror the Census Bureau’s reporting on race/ethnicity. Children coded in our data set as Hispanic were marked as Hispanic on the kindergarten form and could be that and

¹ The only exception is “age at assessment,” which was also collected in the spring of 2017 for the end-of-kindergarten Fountas and Pinnell Benchmark Assessment System (F&P) assessment.

any other race on the form. For example, children marked as Hispanic and Black/African-American or Hispanic and White/Caucasian on the kindergarten entry form were coded as Hispanic for this study. Children marked as non-Hispanic and Black on the kindergarten entry form were coded as Black/African-American non-Hispanic. Children marked as non-Hispanic and either Asian or Native Hawaiian/other Pacific Islander on the kindergarten entry form were coded as Asian/Native Hawaiian/other Pacific Islander non-Hispanic. Children marked as non-Hispanic and White on the kindergarten entry form were coded as White/Caucasian non-Hispanic. Children marked non-Hispanic and Alaska Native/American Indian, or non-Hispanic and two or more race categories on the kindergarten entry form (i.e., multiracial) were coded as Other for this study.

The first-grade entry form did not include a question on child race. Thus, for the children in the 2016–2017 kindergarten class included in the BLIS analysis (Research Question 3), we draw race data from the school district data. The race data from the school districts were recorded and coded identically to the parent-reported data.

Home language was gathered from the school district data. Twenty-eight unique languages were recorded. From these data, we created a binary variable in which 1 indicates that a child spoke a language other than English in the home.

Assessment language was reported by assessors on the Brigance assessment form. We created two binary indicators from this variable. The first, “Assessed in Spanish” was coded such that a value of 1 indicates the child was assessed with the Spanish version of the Brigance (about 9 percent of the total sample). The second variable, “Not Assessed in Spanish or English,” was coded such that a value of 1 indicates that a translator assessed the child in a language other than Spanish or English (5.3 percent of the 2017–2018 kindergarten class sample; $n = 145$). Given that the Brigance has not been validated or officially translated for languages other than Spanish and English, the results for these children may vary from the rest of the sample.²

The F&P assessment was conducted only in English, so this variable applies only to the Brigance.

Assessment date was reported by the assessor on the Brigance and F&P assessment forms.

Time between F&P assessments was determined by calculating the number of days between two assessment points by subtracting the assessment date in the spring of kindergarten from the assessment date in the fall of first grade. (The analyses for Research Question 3 make use of children’s F&P assessments from these two different data collection points.)

² We ran the analyses both including and excluding the children who were not tested in Spanish or English; the results did not change with the presence or absence of these children. To preserve the sample size, we chose to leave them in the analytic sample.

Parent Variables

Parent country of birth was reported by parents on the kindergarten entry form. We created a binary variable where a value of 1 indicates that at least one parent reported being born in a country other than the United States. If data were missing for one parent but present for another, we recorded the information on the parent for which there was information ($n = 103$). If there were no data on either parent, the variable was marked as missing.

This variable was collected only on the kindergarten entry form in the 2016–2017 school year, not the kindergarten or first-grade entry forms in the 2017–2018 school year.

Mother age at child birth was created from the mother’s date of birth and the child’s date of birth (reported by parents on the kindergarten and first-grade entry forms). We created a binary variable where a value of 1 indicates that a mother was younger than 20 years old at the birth of her child.

Number of parents in the home was created from information reported by parents on the kindergarten and first-grade entry forms. Parents reported on the marital status of each parent (options were married, living with partner, separated, divorced, single—never married, and widowed) and whether each parent was living with the child. We created a binary variable, labeled “two-parent home,” where a value of 1 indicates the child lived with a parent who was either married or living with a partner.

Parent education was created from information reported by parents on the kindergarten and first-grade entry forms. When data were reported on both parents, we recorded the information on the parent with the highest level of education. The entry forms included six categories: less than high school diploma, high school diploma/GED (General Educational Development), associate’s degree (AA or AS), bachelor’s degree, master’s degree, doctorate/PhD/MD. We created a vector of four binary indicators by maintaining the first three categories and combining the last three into a “bachelor’s degree (or higher)” category.

Family income was created from information reported by parents on the kindergarten and first-grade entry forms. The categories reported in Table A.1 of the full report exactly mirror those reported on the kindergarten entry form.

Outcomes

Brigance scores. The Brigance assessment was administered at kindergarten entry (in August and September) by classroom teacher and other school staff. In this sample of children in the 2017–2018 kindergarten class ($n = 2,701$), the Brigance total score ranged from 63 to 131, with a mean of 90.3 and a standard deviation of 15.8. In the primary model specifications, the outcome was continuous. We also conducted sensitivity analyses in which we used a binary version of the outcome variable coded such that a value of 1 indicates that the child scored 90 or above. In this sample, 51.5 percent of children scored a 90 or higher.

F&P assessment. This assessment was administered by classroom teachers and other school staff at two times—the end of kindergarten (April–June) and the beginning of first grade (August–December). A total of 1,282 children in the 2016–2017 kindergarten class were administered the F&P at both points in time—the spring of 2017, at the end of kindergarten, and the fall of 2017, at the start of first grade. In this sample, the independent reading levels range from AA to P. We converted the reading levels into numeric equivalents—AA–P became 0–16—and treated the outcome as continuous. This is our preferred coding of the outcome. We note that by treating the outcome as continuous, we are assuming that the measure has the properties of an interval scale—or that the distances between the units are the same at every point in the scale. That is, we must assume that the difference in skill that is required between scoring a B and a C is the same as the distance between scoring an F and a G. Unfortunately, there is no way to directly test this assumption.

Book reading. The number of times per week children were read to was reported by parents on the kindergarten entry form. Parents were asked to select one of five responses: (1) Not at all, (2) 1 to 2 days, (3) 3 to 4 days, (4) 5 to 6 days, or (5) every day. We coded the outcome three ways. First, we treated the outcomes as ordinal, preserving the five categories recorded on the form. Second, following the reading recommendation of the American Academy of Pediatrics,³ we created a binary variable in which a value of 1 indicates that children were read to every day. Third, we created an additional binary variable in which a value of 1 indicates that children were read to five days a week or more. Five days a week of reading or more is an internal standard that Big Lift stakeholders use for family reading. This outcome was observed for 2,255 children in the 2017–2018 kindergarten class (missing data rate of 16.5 percent).

Regression Models

The comparisons between the preschool groups and between children who had different summer experiences were estimated from a set of regression models. First, we explain the missing data technique we employed in all models. Then we detail the specific modeling techniques used to address each research question.

Missing Data

In an effort to include all children with outcome data in the models, we employed a “missing data indicator” strategy and created such an indicator for all the controls. That is, we created a binary indicator for each control variable in which a value of 1 indicates a missing value on the control variable, and a value of 0 indicates that the control variable was observed. Note that only one indicator was created for each categorical variable that is represented by a vector of binary

³ Pamela C. High and Perri Klass, “Literacy Promotion: An Essential Component of Primary Care Pediatric Practice,” Policy Statement, *Pediatrics*, Vol. 134, No. 2, 2014, pp. 404–409. As of August 23, 2017: <http://pediatrics.aappublications.org/content/pediatrics/early/2014/06/19/peds.2014-1384.full.pdf>

indicators (e.g., income). All of our control variables with missing data are binary (e.g., gender) or categorical (i.e., race/ethnicity). For all instances of missing data, we imputed a 0 for the control variable, creating a data set in which all observations had nonmissing values of each variable. All the missing data indicators and the control variables with imputed 0s were included in the models. Essentially, the missing data indicators allow us to treat the fact that the observations are missing data on some variables as useful information that could explain variation in the outcome. Given that we had only a limited number of controls available, we chose this missing data technique over other options—specifically, multiple imputation—that rely on having large number of control variables and over analytic assumptions that our data did not meet.⁴ The rates of missingness for the sample used to address each research question are presented in Tables TA.1–TA.3.

Predicted Mean Scores

In the full report, we present predicted mean scores for each of the preschool or summer groups for each of the main models below. To calculate the predicted means in all cases, we set the covariates to their means in the analytic sample. Note that the covariates are categorical in nature, so the sample means equate to the percentage of children in the sample represented by each category. To calculate the predicted mean, the percentages were converted to decimal form.

Research Question 1: Preschool Group Comparisons in the 2017–2018 Kindergarten Class

The analytic sample for this analysis includes the entire 2017–2018 kindergarten class for whom we have Brigance outcome data ($n = 2,701$). For the comparisons of preschool groups, we used ordinary least squares regression (OLS) to model the continuous version of the Brigance outcome. We modeled the outcome as a function of a vector of binary indicators describing children’s preschool experiences: Big Lift preschool, non–Big Lift preschool, no preschool, and preschool unknown. In all models, Big Lift preschool is the reference category. The unadjusted models include only the preschool enrollment variables. The adjusted models include the preschool enrollment variables and the control variables already listed. We used all demographic controls listed except for the immigrant parent control because this variable was not collected for the 2017–2018 kindergarten class. All controls were measured at the start of children’s kindergarten year in the fall of 2017. The results of these models (with and without demographic controls) are presented in Table TA.4. We present, raw unstandardized coefficients.

As a secondary model, we used logistic regression to model the binary version of the Brigance outcome. The results of these models (with and without demographic controls) are

⁴ Roderick J. A. Little and Donald B. Rubin, *Statistical Analysis with Missing Data*, 2nd. ed., Hoboken N.J.: John Wiley & Sons, 2014.

presented in Table TA.5. The coefficients are presented as odds ratios. Odds are an alternative way of expressing the probability p and are defined as $\frac{p}{1-p}$. An odds ratio is a way of expressing an association between a predictor and the probability that a binary outcome will occur. *Odds ratio* refers to the odds that an outcome will occur versus the odds that it will not in relation to the predictor of interest. All odds ratios have a lower bound of 0. Odds ratios that are less than 1 indicate a negative relationship between the predictor and the probability the outcome will occur; odds ratios greater than 1 indicate a positive relationship between the predictor and the probability the outcome will occur. Both model specifications—OLS and logistic regression—yield the same pattern of results.

In Table TA.6, we present results from the preschool group comparisons for the reading frequency outcome. We present results from three different model specifications. First, we fit an ordered logistic regression in which we model the categorical version of the outcome as a function of children’s preschool experiences. We then fit two different logistic regression models for the two binary versions of the outcome. For each model specification, we present an adjusted and unadjusted model, and coefficients are presented as odds ratios.

We also conducted one sensitivity analysis to determine whether the pattern of results was the same when fit on a sample of children from only the Cohort 1 districts. We fit identical OLS, logistic regression, and ordered logistic regression models to those described for the Brigance and reading frequency outcomes. The results of these models for the Brigance outcomes are presented in Table TA.7, and reading outcomes are presented in Table TA.8. There are some slight differences in the pattern of results worth noting:

- For the 2017–2018 kindergarten classes in the Cohort 1 districts only, Big Lift preschoolers scored 7.2 points higher on the Brigance than children who did not attend preschool and were 25 percentage points more likely to be kindergarten-ready. Note that this 25-percentage point difference is very similar to the estimate for the Cohort 1 districts in the 2016–2017 kindergarten class.⁵

Big Lift preschoolers scored 3.6 points lower on the overall Brigance score than children who attended non–Big Lift preschools and were 5 percentage points less likely to be kindergarten-ready. Note that when comparing rates of kindergarten readiness, the 5-percentage point difference between Big Lift preschoolers and non–Big Lift preschoolers was not statistically significant, meaning that Big Lift preschoolers and non–Big Lift preschoolers in the Cohort 1 district were equally likely to be kindergarten-ready. This is the same pattern of results observed from the 2016–2017 kindergarten class. Taken together, in the Cohort 1 districts in the 2017–2018 kindergarten class, Big

⁵ Celia J. Gomez, Jill S. Cannon, Anamarie Whitaker, and Lynn A. Karoly, *Big Lift Participation and School Entry Indicators: Findings for the 2016–2017 Kindergarten Class*, Santa Monica, Calif.: RAND Corporation, RR-2131-SVCF, 2017. As of August 22, 2018: https://www.rand.org/pubs/research_reports/RR2131.html

Lift preschoolers scored significantly lower on the Brigance than children who attended non-Big Lift preschool; however, these two groups were equally likely to be kindergarten-ready (i.e., have a score at or above 90). This pattern occurred because both Big Lift preschoolers and non-Big Lift preschoolers had predicted mean scores at or above 90 points, but the non-Big Lift preschoolers had significantly higher scores (a predicted mean score of approximately 95 for non-Big Lift preschoolers and 91 for Big Lift preschoolers).

In sum, when looking across the 2016–2017 and 2017–2018 kindergarten classes in Cohort 1 districts, we found in both kindergarten classes that Big Lift preschoolers and non-Big Lift preschoolers were equally likely to be kindergarten-ready. However, in 2017–2018, non-Big Lift preschoolers scored significantly higher on the Brigance than Big Lift preschoolers. The models suggest that, across the two kindergarten classes, Big Lift preschoolers had approximately the same predicted mean score in both years but non-Big Lift preschoolers in the 2017–2018 kindergarten class had a higher predicted mean score than non-Big Lift preschoolers in the 2016–2017 kindergarten class.

- The reading outcome comparisons for the Cohort 1 districts are mostly consistent with the full sample. However, in the logistic regression model using the binary version of the outcome that measures whether children were read to every day, the models indicate that children who attended non-Big Lift preschool were significantly more likely to be read to daily than children who attended Big Lift preschool. Non-Big Lift preschoolers were 11 percentage points more likely to be read to daily than children who attended Big Lift preschool. This is a different pattern than was observed for the 2016–2017 kindergarten class in the Cohort 1 districts, where we found no differences in the reading practices of Big Lift preschoolers and non-Big Lift preschoolers.

Research Question 1a: One Versus Two years of Big Lift Preschool

In Table TA.9, we present demographic statistics for children included in this analysis, disaggregated by whether children participated in one or two years of Big Lift preschool. To address Research Question 1a, we used OLS and logistic regression to model the Brigance and reading frequency outcomes as a function of a binary variable indicating whether children attended Big Lift preschool for two years or one year. The results of these models (with and without demographic controls) are presented in Tables TA.10 and TA.11.

Research Question 2: Follow-Up Preschool Group Comparisons in the 2016–2017 Kindergarten Class

The analytic sample for this analysis includes children from the 2016–2017 kindergarten class who were included in analyses presented in the first report in this series and assessed on the

F&P at both the end of kindergarten and the start of first grade ($n = 1,282$).⁶ For the comparisons of preschool groups, we used OLS to model the continuous version of the F&P outcome as a function of a vector of binary indicators describing children’s preschool experiences: Big Lift preschool, non–Big Lift preschool, no preschool, and preschool unknown. In all models, Big Lift preschool is the reference category. The unadjusted models include only the preschool enrollment variables. The adjusted models include the preschool enrollment variables and the control variables we have already listed. We used all controls already listed, and all were measured at the start of children’s kindergarten year in the fall of 2016 (apart from the assessment dates, which were measured at the time of each assessment). The results of these models (with and without demographic controls) are presented in Table TA.12, with raw, unstandardized coefficients.

Research Question 3: Summer Experiences Group Comparisons in the 2016–2017 Kindergarten Class

The analytic sample for this analysis includes children in the 2016–2017 kindergarten class who attended South San Francisco Unified School District (SSFUSD) and Jefferson Elementary School District (JESD)—the only two districts that collected a first-grade entry form and thus have information on children’s summer experiences if they did not attend BLIS. These children were rising first-graders in the summer of 2017, when they could have attended BLIS. We excluded children from the 2017–2018 kindergarten class, who were rising kindergartners in the summer of 2017, because we lacked information on the summer experiences of children who did not attend BLIS. We also excluded the rising second-graders (the 2015–2016 kindergarten class) because we have no data on these children (neither outcomes and demographic data nor summer experience data).

Among the JESD and SSFUSD children from the 2016–2017 kindergarten class, we included children who had scores from both the spring of kindergarten and the fall of first grade. As noted in the full report, we chose to limit the primary analytic sample to children who were tested in early fall—August and September. We excluded students tested in late fall—November and December. We made this choice because these analyses are intended to explore the relationship between summer program participation and child outcomes at the start of the school year as a way of understanding summer learning. Including the November and December test dates do not allow us to address summer learning because these scores might represent substantial learning during the school year. Therefore, our analytic sample excludes 275 children from SSFUSD who were tested in November and December 2017.

There are likely observed and unobserved selection processes that affected who was tested at which time in the fall. If the children we excluded from the analyses are substantially different from children who we included, our comparisons of the summer groups could be biased. We

⁶ Gomez et al., 2017.

attempt to explore some of these processes here as a way of assessing the risk of bias. First, in Table TA.13, we present a breakdown of the number of children with different summer experiences in the sample both including and excluding the late fall testers. Overall, the sample proportions are relatively similar. None of summer groups are substantially over- or underrepresented in the sample excluding the later testing dates. This suggests that our primary analytic sample is a good representation of all eligible children. In Table TA.14, we present the distribution of reading levels among the sample that includes the late testers. (In Table 9 in the full report, we present the reading levels for the analytic sample of early testers.) As would be expected, this sample including the late testers had a higher percentage of children who scored in the higher levels than did the primary analytic sample. This is logical, given that children tested in November and December were not only older when tested but also had more months of first-grade learning experiences. However, this pattern is true across all three summer groups. That is, among children who attended BLIS, those with late-fall testing dates scored higher than children with early-fall testing dates; this is also true among children who attended other summer programs and children who attended no summer programs. Given that the pattern is consistent across groups, the exclusion of the late-fall testers should not bias the comparisons of outcomes across groups.

In Table TA.15, we present side-by-side demographic characteristics of the sample in which we include and exclude the late-fall testers. As noted in the full report, there are demographic differences between the children with different test dates; these differences are reflected in the comparisons of the two samples. The sample that includes the late-fall testers has children who were from families with higher incomes and had parents with higher levels of education. In addition, they were less likely to be Hispanic and more likely to be Asian. However, the patterns are present in all three summer groups. There do not appear to be systematic differences between the respective summer groups across the two possible samples. Similar to the logic described above, the exclusion of the late-fall testers should not bias the comparisons across the groups.

In sum, there is little evidence to suggest that the primary analytic sample, which excludes the late-fall testers, will present biased results when comparing children with different summer experiences.

For the comparisons of children with different summer experiences, we used OLS regression to model the continuous version of the F&P outcome measured in the fall of first grade as a function of a vector of binary indicators describing children's summer experiences: enrolled in BLIS, enrolled in a non-BLIS summer program, not enrolled in any summer program, and summer program unknown. All models control for children's F&P scores at the end of kindergarten. The unadjusted models include only the summer experiences variables and children's end-of-kindergarten scores. The adjusted models include the summer experiences variables, children's end-of-kindergarten scores, and the control variables. We used all controls listed previously except for the immigrant parent control because this variable was not collected on the first-grade entry form. All controls were measured at the start of children's first-grade

year in the fall of 2017. Full model results are presented in the first set of columns in Table TA.16, with unstandardized coefficients.

As noted in the full report, we conducted two sensitivity analyses. First, we fit the primary OLS models on a sample of children who received the full BLIS dosage (21 days or more of instruction; $n = 616$). We present the results of these models (with and without controls) in the second set of columns of Table TA.16.

Second, we fit our primary model specification (OLS using the continuous F&P outcome) on the sample of children that included the late-fall testers. The results from this model are presented in the third set of columns of Table TA.16. These models suggest that, when controlling for demographic characteristics, children who attended BLIS scored on par with children who attended other summer programs—an identical result to that in the analytic sample. This model suggests that children who attended BLIS scored statistically significantly higher than children who did not attend summer programs. Specifically, the model suggests that BLIS children scored about one-third of a reading level higher than children who did not attend a summer program. This result differs from that of analytic sample. We found that children who attended BLIS had a higher predicted mean score, on average, than children who attended no summer program, but the difference was not statistically significant in the analytic sample.

Table TA.1. Rates of Missingness for the 2017–2018 Kindergarten Class Analytic Sample (Research Question 1)

Variable	Missingness Rate
Child age	0.0
Child gender	0.04
Race/ethnicity	1.0
Home language	0.1
Mother age at child birth	17.1
Parents in the home	14.3
Parent education	11.8
Family income	16.4

NOTE: $n = 2,701$.

Table TA.2. Rates of Missingness for the 2016–2017 Kindergarten Class Follow-Up Analytic Sample (Research Question 2)

Variable	Missingness Rate
Child age	0.0
Child gender	9.6
Race/ethnicity	13.7
Home language	0.6
Parent country of birth	22.5
Mother age at child birth	13.6
Parents in the home	12.8
Parent education	11.8
Family income	23.6

NOTE: $n = 1,282$.

Table TA.3. Rates of Missingness for the 2016–2017 Kindergarten Class BLIS Analytic Sample (Research Question 3)

Variable	Missingness Rate
Child age	0.0
Child gender	0.3
Race/ethnicity	0.3
Home language	0.0
Mother age at child birth	6.3
Parents in the home	3.7
Parent education	2.7
Family income	5.4

NOTE: $n = 668$.

Table TA.4. Unadjusted and Adjusted OLS Models Predicting Children's Brigance Scores by Children's Preschool Experiences for the 2017–2018 Kindergarten Class

Predictor	Unadjusted Model	Adjusted with Demographic Controls
Preschool experience [reference is Big Lift preschool]		
Non–Big Lift preschool	11.38*** (0.66)	4.30*** (0.72)
No preschool	–2.77** (0.96)	–5.35*** (0.88)
Preschool unknown	–0.59 (1.04)	–0.72 (1.48)
Child age (months)		–0.34*** (0.07)
Child gender [reference is male]		
Female		2.35*** (0.50)
Missing		6.59 (12.94)
Home language [reference is English]		
Language other than English		–4.06*** (0.62)
Missing		–3.43 (9.21)
Assessed in Spanish		–4.62*** (0.94)
Not assessed in Spanish or English		–3.20** (1.23)
Race/ethnicity [reference is White/Caucasian non-Hispanic]		
Hispanic		–0.21 (0.86)
Black/African-American non-Hispanic		4.82* (2.36)
Asian/Native Hawaiian/other Pacific Islander non-Hispanic		5.09*** (0.88)
Other race		2.34~ (1.36)
Missing		–2.67 (2.58)

Predictor	Unadjusted Model	Adjusted with Demographic Controls
Family income [reference is \$10,000 or less]		
\$10,001–\$25,000		2.77* (1.09)
\$25,001–\$50,000		4.41*** (1.08)
\$50,001–\$100,000		3.86** (1.21)
\$100,001–\$150,000		5.52*** (1.38)
More than \$150,000		8.42*** (1.39)
Missing		3.60** (1.34)
Mother age at child birth [reference is mother age > 20]		
Teen mom		–1.86 (1.21)
Missing		–0.93 (0.99)
Parents in the home [reference is single-parent home]		
Two-parent home		0.76 (0.73)
Missing		1.00 (1.36)
Parent education [reference is less than high school diploma]		
High school diploma/GED		1.73~ (0.91)
Associate's degree		3.07** (1.17)
Bachelor's degree (or higher)		6.40*** (1.13)
Missing		0.87 (1.78)

Predictor	Unadjusted Model	Adjusted with Demographic Controls
District [reference is CUSD]		
JESD		3.71** (1.14)
LHPUSD		14.67*** (2.71)
SSFUSD		3.41** (1.14)
RCSD		3.54*** (1.05)
RVCSD		-2.97* (1.38)
SBPSD		2.04~ (1.21)
Assessment date		0.06~ (0.03)
Constant	85.15*** (0.53)	-1,151.35 (721.22)
Observations	2701	2701

SOURCE: Authors' analysis of Big Lift data.

NOTES: CUSD = Cabrillo Unified School District; LHPUSD = La Honda-Pescadero Unified School District; RCSD = Redwood City School District; RVCSD = Ravenswood City School District; SBPSD = San Bruno Park School District.

~ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. For the OLS models, the coefficients are raw, unstandardized point estimates with standard errors in parentheses. For the logistic regression and ordered logistic regression, the coefficients are presented as odds ratios with standard errors in parentheses.

Table TA.5. Unadjusted and Adjusted Logistic Regression Models Predicting the Likelihood That Children Would Score Average or Above on the Brigance by Children’s Preschool Experiences for the 2017–2018 Kindergarten Class

Predictor	Unadjusted Model	Adjusted with Demographic Controls
Preschool experience [reference is Big Lift preschool]		
Non–Big Lift preschool	3.66*** (0.35)	1.56*** (0.20)
No preschool	0.82 (0.11)	0.49*** (0.08)
Preschool unknown	0.86 (0.13)	0.59~ (0.16)
Child age (months)		0.96*** (0.01)
Child gender [reference is male]		
Female		1.32** (0.12)
Missing		na
Home language [reference is English]		
Language other than English		0.58*** (0.06)
Missing		1.23 (2.00)
Assessed in Spanish		0.41*** (0.08)
Not assessed in Spanish or English		0.62* (0.14)
Race/ethnicity [reference is White/Caucasian non-Hispanic]		
Hispanic		0.81 (0.12)
Black/African-American non-Hispanic		1.52 (0.62)
Asian/Native Hawaiian/other Pacific Islander non-Hispanic		1.75*** (0.29)
Other race		1.61~ (0.41)
Missing		0.40~ (0.19)

Predictor	Unadjusted Model	Adjusted with Demographic Controls
Family income [reference is \$10,000 or less]		
\$10,001–\$25,000		1.59* (0.34)
\$25,001–\$50,000		2.09*** (0.43)
\$50,001–\$100,000		1.81** (0.41)
\$100,001–\$150,000		2.79*** (0.73)
More than \$150,000		4.00*** (1.10)
Missing		1.51 (0.38)
Mother age at child birth [reference is mother age > 20]		
Teen mom		0.76 (0.17)
Missing		0.88 (0.16)
Parents in the home [reference is single-parent home]		
Two-parent home		1.18 (0.15)
Missing		1.43 (0.35)
Parent education [reference is less than high school diploma]		
High school diploma/GED		1.30 (0.23)
Associate's degree		1.74** (0.37)
Bachelor's degree (or higher)		2.27*** (0.48)
Missing		1.60 (0.53)

Predictor	Unadjusted Model	Adjusted with Demographic Controls
District [reference is CUSD]		
JESD		1.84** (0.39)
LHPUSD		8.59*** (4.54)
SSFUSD		1.79** (0.38)
RCSD		2.00*** (0.40)
RVCS		0.79 (0.21)
SBPSD		1.41 (0.31)
Assessment date		1.00 (0.01)
Observations	2,701	2,700 ^a

SOURCE: Authors' analysis of Big Lift data.

NOTES: na = variable excluded due to change in missingness from dropped observations.

~ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. For the OLS models, the coefficients are raw, unstandardized point estimates with standard errors in parentheses. For the logistic regression and ordered logistic regression, the coefficients are presented as odds ratios with standard errors in parentheses.

^a One observation dropped due to collinearity between the outcome and covariates.

Table TA.6. Unadjusted and Adjusted Logistic Regression and Ordered Logistic Regression Models Predicting the Reading Frequency Outcome by Children’s Preschool Experiences for the 2017–2018 Kindergarten Class

Predictor	Ordered Logistic Regression: Categorical Reading Frequency		Logistic Regression: Binary Outcome—Everyday Reading vs. Not		Logistic Regression: Binary Outcome—Reading 5 Days or More vs. Not	
	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls
Preschool experience [reference is Big Lift preschool]						
Non–Big Lift preschool	2.27*** (0.20)	1.04 (0.11)	2.99*** (0.35)	1.18 (0.18)	2.41*** (0.24)	1.14 (0.15)
No preschool	0.97 (0.12)	0.87 (0.11)	1.05 (0.18)	0.85 (0.16)	0.97 (0.14)	0.88 (0.14)
Preschool unknown	0.36* (0.17)	0.47 (0.23)	1.31 (0.75)	1.74 (1.06)	0.54 (0.31)	0.86 (0.52)
Child age (months)		0.98* (0.01)		0.97~ (0.01)		0.97* (0.01)
Child gender [reference is male]						
Female		1.13 (0.09)		1.09 (0.11)		1.12 (0.11)
Missing		3.92 (6.10)		na		na
Home language [reference is English]						
Language other than English		0.62*** (0.06)		0.60*** (0.08)		0.61*** (0.07)
Missing		2.21 (3.58)		na		na
Assessed in Spanish		0.70* (0.11)		0.72 (0.17)		0.69* (0.13)
Not assessed in Spanish or English		0.86 (0.17)		0.95 (0.28)		0.64~ (0.16)

Predictor	Ordered Logistic Regression: Categorical Reading Frequency		Logistic Regression: Binary Outcome—Everyday Reading vs. Not		Logistic Regression: Binary Outcome—Reading 5 Days or More vs. Not	
	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls
	Race/ethnicity [reference is White/Caucasian non-Hispanic]					
Hispanic		0.77~ (0.11)		0.61** (0.10)		0.70* (0.11)
Black/African-American non-Hispanic		0.64 (0.24)		0.55 (0.30)		0.36* (0.18)
Asian/Native Hawaiian/other Pacific Islander non-Hispanic		0.60*** (0.08)		0.58*** (0.10)		0.57*** (0.09)
Other race		0.90 (0.19)		0.87 (0.21)		0.70 (0.17)
Missing		1.89 (0.91)		2.09 (1.09)		1.51 (0.80)
Family income [reference is \$10,000 or less]						
\$10,001–\$25,000		1.23 (0.21)		0.86 (0.21)		1.18 (0.24)
\$25,001–\$50,000		1.23 (0.20)		0.76 (0.18)		1.13 (0.23)
\$50,001–\$100,000		1.23 (0.22)		0.71 (0.18)		1.08 (0.24)
\$100,001–\$150,000		1.45~ (0.30)		0.90 (0.25)		1.26 (0.31)
More than \$150,000		2.40*** (0.51)		1.26 (0.35)		2.34*** (0.60)
Missing		1.41 (0.31)		0.95 (0.28)		1.09 (0.29)

Predictor	Ordered Logistic Regression: Categorical Reading Frequency		Logistic Regression: Binary Outcome—Everyday Reading vs. Not		Logistic Regression: Binary Outcome—Reading 5 Days or More vs. Not	
	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls
Mother age at child birth [reference is mother age > 20]						
Teen mom		0.90 (0.16)		0.74 (0.22)		1.02 (0.23)
Missing		1.14 (0.18)		1.62* (0.31)		1.20 (0.22)
Parents in the home [reference is single-parent home]						
Two-parent home		1.25* (0.14)		1.44* (0.23)		1.24 (0.17)
Missing		1.27 (0.28)		1.50 (0.47)		1.08 (0.29)
Parent education [reference is less than high school diploma]						
High school diploma/GED		1.71*** (0.25)		1.14 (0.26)		1.46* (0.27)
Associate's degree		1.99*** (0.36)		1.31 (0.36)		1.79** (0.40)
Bachelor's degree (or higher)		3.68*** (0.67)		3.01*** (0.77)		3.20*** (0.70)
Missing		2.97** (0.99)		2.21~ (0.97)		2.50* (0.98)

Predictor	Ordered Logistic Regression: Categorical Reading Frequency		Logistic Regression: Binary Outcome—Everyday Reading vs. Not		Logistic Regression: Binary Outcome—Reading 5 Days or More vs. Not	
	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls
	District [reference is CUSD]					
JESD		0.52*** (0.09)		0.52** (0.12)		0.54** (0.11)
LHPUSD		1.29 (0.51)		1.10 (0.57)		1.16 (0.56)
SSFUSD		0.71~ (0.13)		0.62* (0.14)		0.66~ (0.14)
RCSD		1.12 (0.18)		0.85 (0.17)		1.42~ (0.29)
RVCSD		0.48** (0.11)		0.62 (0.20)		0.53* (0.15)
SBPSD		0.69~ (0.13)		0.67~ (0.16)		0.60* (0.14)
Assessment date		0.99 (0.01)		1.00 (0.01)		0.99 (0.01)
Observations	2,255	2,255	2,255	2,253 ^a	2,255	2,253 ^a

SOURCE: Authors' analysis of Big Lift data.

NOTES: na = Variable excluded needed due to change in missingness from dropped observations.

~ $p < 0.10$, $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. For the OLS models, the coefficients are raw, unstandardized point estimates with standard errors in parentheses. For the logistic regression and ordered logistic regression, the coefficients are presented as odds ratios with standard errors in parentheses.

^a Two observations dropped due to collinearity between the outcome and covariates.

Table TA.7. Adjusted OLS and Logistic Regression and Ordered Logistic Regression Models Predicting the Brigrance by Children’s Preschool Experiences for the 2017–2018 Kindergarten Class (Cohort 1 Districts Only)

Predictor	Unadjusted Model	Adjusted with Demographic Controls
Preschool experience [reference is Big Lift preschool]		
Non–Big Lift preschool	3.65*** (1.00)	1.25 (0.21)
No preschool	–7.16*** (1.20)	0.36*** (0.08)
Preschool unknown	–2.63 (2.06)	0.48* (0.18)
Child age (months)	–0.38*** (0.10)	0.95** (0.02)
Child gender [reference is male]		
Female	2.54*** (0.70)	1.26~ (0.16)
Missing	na	na
Home language [reference is English]		
Language other than English	–4.04*** (0.84)	0.59*** (0.09)
Missing	–1.73 (9.97)	1.72 (3.26)
Assessed in Spanish	–7.65*** (1.53)	0.33*** (0.11)
Not assessed in Spanish or English	–6.64* (2.76)	0.35~ (0.19)
Race/ethnicity [reference is White/Caucasian non-Hispanic]		
Hispanic	0.92 (1.25)	1.01 (0.22)
Black/African-American non-Hispanic	6.66~ (3.73)	1.66 (1.02)
Asian/Native Hawaiian/other Pacific Islander non-Hispanic	6.27*** (1.25)	2.33*** (0.51)
Other race	3.27* (1.62)	2.00* (0.59)
Missing	–5.58 (7.10)	0.23 (0.31)

Predictor	Unadjusted Model	Adjusted with Demographic Controls
Family income [reference is \$10,000 or less]		
\$10,001–\$25,000	4.58** (1.69)	2.46** (0.79)
\$25,001–\$50,000	6.11*** (1.61)	2.82*** (0.87)
\$50,001–\$100,000	6.02*** (1.75)	2.98*** (0.98)
\$100,001–\$150,000	8.26*** (1.94)	5.41*** (2.00)
More than \$150,000	10.32*** (2.04)	5.85*** (2.29)
Missing	7.80*** (2.06)	3.47** (1.32)
Mother age at child birth [reference is mother age > 20]		
Teen mom	-1.23 (1.98)	0.96 (0.33)
Missing	-1.81 (1.39)	0.68 (0.16)
Parents in the home [reference is single-parent home]		
Two-parent home	0.29 (1.00)	0.98 (0.17)
Missing	-0.75 (1.96)	1.20 (0.42)
Parent education [reference is less than high school diploma]		
High school diploma/GED	1.91 (1.45)	1.90* (0.55)
Associate's degree	2.47 (1.71)	2.10* (0.68)
Bachelor's degree (or higher)	4.95** (1.66)	2.53** (0.81)
Missing	0.53 (2.67)	1.76 (0.86)

Predictor	Unadjusted Model	Adjusted with Demographic Controls
District [reference is CUSD]		
JESD	2.96* (1.29)	1.52~ (0.36)
LHPUSD	13.44*** (2.82)	7.53*** (4.15)
SSFUSD	2.84* (1.29)	1.62* (0.37)
RCSD	na	na
RVCSD	na	na
SBPSD	na	na
Assessment date	0.08 (0.06)	1.01 (0.01)
Constant	-1,489.69 (1,208.06)	
Observations	1,443	1,443

SOURCE: Authors' analysis of Big Lift data.

NOTES: na = Variable excluded needed due to change in missingness from dropped observations, or due to cohort 1 only sample.

~ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. For the OLS models, the coefficients are raw, unstandardized point estimates with standard errors in parentheses. For the logistic regression and ordered logistic regression, the coefficients are presented as odds ratios with standard errors in parentheses.

Table TA.8. Adjusted Ordered Logistic Regression and Logistic Regression Models Predicting the Reading Frequency Outcome by Children’s Preschool Experiences for the 2017–2018 Kindergarten Class (Cohort 1 Districts Only)

Predictor	Ordered Logistic	Logistic Regression:	Logistic Regression: Binary
	Regression: Categorical	Binary Outcome—	Regression: Binary
	Reading Frequency	Everyday Reading vs. Not	Outcome—Reading 5 Days or More vs. Not
	Adjusted with Controls	Adjusted with Controls	Adjusted with Controls
Preschool experience [reference is Big Lift preschool]			
Non–Big Lift preschool	1.31~ (0.19)	1.85** (0.39)	1.31 (0.23)
No preschool	0.95 (0.16)	1.03 (0.28)	0.81 (0.17)
Preschool unknown	0.67 (0.34)	3.02~ (1.94)	1.06 (0.67)
Child age (months)	0.98~ (0.01)	0.98 (0.02)	0.96* (0.02)
Child gender [reference is male]			
Female	1.05 (0.11)	1.10 (0.16)	1.09 (0.14)
Missing	na	na	na
Home language [reference is English]			
Language other than English	0.68** (0.09)	0.65* (0.11)	0.58*** (0.09)
Missing	1.84 (3.00)	1.00 (.)	1.00 (.)
Assessed in Spanish	0.52** (0.13)	0.52 (0.22)	0.54~ (0.17)
Not assessed in Spanish or English	1.10 (0.44)	0.99 (0.61)	0.69 (0.36)
Race/ethnicity [reference is White/Caucasian non-Hispanic]			
Hispanic	0.84 (0.17)	0.63* (0.15)	0.78 (0.18)
Black/African-American non-Hispanic	0.47 (0.25)	0.18 (0.20)	0.08* (0.09)
Asian/Native Hawaiian/other Pacific Islander non-Hispanic	0.53*** (0.10)	0.50** (0.12)	0.52** (0.12)
Other race	0.93 (0.23)	0.77 (0.22)	0.72 (0.21)
Missing ^b	na	na	na

Predictor	Ordered Logistic	Logistic Regression:	Logistic Regression: Binary
	Regression: Categorical	Binary Outcome—	Regression: Binary
	Reading Frequency	Everyday Reading vs. Not	Outcome—Reading 5 Days
	Adjusted with Controls	Adjusted with Controls	Adjusted with Controls
			or More vs. Not
Family income [reference is \$10,000 or less]			
\$10,001–\$25,000	1.21 (0.31)	1.43 (0.57)	1.16 (0.37)
\$25,001–\$50,000	1.22 (0.29)	1.02 (0.39)	1.27 (0.39)
\$50,001–\$100,000	1.20 (0.31)	0.98 (0.39)	1.11 (0.36)
\$100,001–\$150,000	1.34 (0.39)	1.16 (0.49)	1.28 (0.45)
More than \$150,000	2.11* (0.64)	1.62 (0.69)	1.87~ (0.70)
Missing	1.15 (0.37)	1.06 (0.49)	1.02 (0.40)
Mother age at child birth [reference is mother age > 20]			
Teen mom	1.42 (0.41)	1.19 (0.54)	2.00* (0.70)
Missing	1.30 (0.27)	1.69~ (0.46)	1.39 (0.35)
Parents in the home [reference is single-parent home]			
Two-parent home	1.04 (0.15)	1.05 (0.22)	1.05 (0.19)
Missing	0.77 (0.23)	0.59 (0.31)	0.47~ (0.20)
Parent education [reference is less than high school diploma]			
High school diploma/GED	1.98** (0.46)	1.52 (0.62)	1.76~ (0.55)
Associate's degree	2.20** (0.58)	1.46 (0.66)	1.78 (0.63)
Bachelor's degree (or higher)	4.58*** (1.20)	4.14** (1.79)	4.02*** (1.38)
Missing	3.04* (1.42)	2.17 (1.57)	2.65~ (1.57)

Predictor	Ordered Logistic	Logistic Regression:	Logistic Regression: Binary
	Regression: Categorical	Binary Outcome—	Regression: Binary
	Reading Frequency	Everyday Reading vs. Not	Outcome—Reading 5 Days
	Adjusted with Controls	Adjusted with Controls	Outcome—Reading 5 Days
			or More vs. Not
			Adjusted with Controls
District [reference is CUSD]			
JESD	0.47*** (0.09)	0.51* (0.13)	0.48** (0.12)
LHPUSD	1.27 (0.52)	1.29 (0.72)	1.16 (0.58)
SSFUSD	0.75 (0.15)	0.65~ (0.16)	0.73 (0.17)
RCSD	na	na	na
RVCSD	na	na	na
SBPSD	na	na	na
Assessment date	1.00 (0.01)	1.00 (0.01)	1.00 (0.01)
Observations	1,255	1,253 ^a	1,253 ^a

SOURCE: Authors' analysis of Big Lift data.

NOTES: na = Variable excluded due to change in missingness from dropped observations, or due to cohort 1 only sample.

~ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. For the OLS models, the coefficients are raw, unstandardized point estimates with standard errors in parentheses. For the logistic regression and ordered logistic regression, the coefficients are presented as odds ratios with standard errors in parentheses.

^a Two observations dropped due to collinearity between the outcome and covariates.

^b In the ordinal logistic regression model sample, only one child was missing on the race/ethnicity control; the coefficient for the missingness indicator was estimated but not reported because of the small sample.

Table TA.9. Demographic Characteristics for Children Who Attended One or Two Years of Big Lift Preschool

Characteristic	Big Lift Preschool	
	1 Year Big Lift Preschool	2 Years Big Lift Preschool
Child age (years)	5.5	5.6
Child gender		
Female	49.9	54.4
Male	50.1	45.7
Missing	0.0	0.0
Race/ethnicity^a		
Hispanic	77.7	69.0
Black/African-American non-Hispanic	0.8	1.1
White/Caucasian non-Hispanic	5.3	7.1
Asian/Native Hawaiian/other Pacific Islander non-Hispanic	11.7	20.1
Other	2.2	2.2
Missing	2.2	0.5
Home language		
English	23.4	20.7
Not English	76.6	79.4
Missing	0.0	0.0
Mother age at child birth		
Younger than 20 (teen mom)	8.6	5.4
Older than 20	83.8	84.8
Missing	7.5	9.8
Parents in the home		
Two-parent home	70.8	66.3
Single-parent home	22.6	27.2
Missing	6.7	6.5
Parent education		
Less than high school diploma	23.1	18.5
High school diploma/GED	53.2	53.8
Associate's degree	10.9	15.8
Bachelor's degree (or higher)	12.0	11.4
Missing	0.8	0.5

Characteristic	Big Lift Preschool	
	1 Year Big Lift Preschool	2 Years Big Lift Preschool
Family income		
Less than \$10,000	12.5	12.5
\$10,001–25,000	32.9	30.4
\$25,001–50,000	31.2	38.6
\$50,001–100,000	12.8	14.1
\$100,001–150,000	2.8	1.1
More than \$150,000	0.0	0.5
Missing	7.8	2.7
<i>N</i>	359	184

SOURCES: San Mateo County Office of Education (SMCOE) Cocoa database; kindergarten entry forms.

^a The race and ethnicity variables are mutually exclusive categories; see the Control Variables section of this appendix for more detail on variable creation.

Table TA.10. Unadjusted and Adjusted OLS and Logistic Regression Models Predicting Children's Brigance Outcomes by Number of Years of Big Lift Preschool for the 2017–2018 Kindergarten Class (Big Lift Preschool Participants Only)

Predictor	OLS: Continuous Brigance Score		Logistic Regression: Brigance Score 90+	
	Unadjusted Model	Adjusted with Demographic Controls	Unadjusted Model	Adjusted with Demographic Controls
Preschool experience [reference is attended one year of Big Lift preschool]				
Attended 2 years of Big Lift preschool	3.95** (1.20)	3.20* (1.33)	1.76** (0.33)	1.63~ (0.41)
Child age (months)		-0.69*** (0.18)		0.89** (0.03)
Child gender [reference is male]				
Female		0.97 (1.05)		0.91 (0.19)
Missing		na		na
Home language [reference is English]				
Language other than English		-2.72~ (1.45)		0.55* (0.15)
Missing		na		na
Assessed in Spanish		-3.61* (1.68)		0.32** (0.14)
Not assessed in Spanish or English		-2.48 (2.19)		0.98 (0.46)
Race/ethnicity [reference is White/Caucasian non-Hispanic]				
Hispanic		-2.27 (2.43)		1.01 (0.45)
Black/African-American non-Hispanic		8.61 (5.93)		1.62 (1.76)
Asian/Native Hawaiian/other Pacific Islander non-Hispanic		4.30 (2.61)		3.16* (1.50)
Other race		2.01 (4.20)		2.52 (1.95)
Missing		-2.74 (4.76)		0.30 (0.36)

Predictor	OLS: Continuous Brigance Score		Logistic Regression: Brigance Score 90+	
	Unadjusted Model	Adjusted with Demographic Controls	Unadjusted Model	Adjusted with Demographic Controls
Race/ethnicity [reference is White/Caucasian non-Hispanic]				
\$10,001–\$25,000		1.82 (1.78)		1.08 (0.41)
\$25,001–\$50,000		4.78** (1.81)		1.28 (0.49)
\$50,001–\$100,000		2.70 (2.27)		0.81 (0.37)
\$100,001–\$150,000		2.42 (4.10)		1.28 (1.02)
More than \$150,000		–0.00 (12.38)		na
Missing		3.81 (2.68)		0.73 (0.46)
Mother age at child birth [reference is mother age > 20]				
Teen mom		–4.53* (2.03)		0.30* (0.16)
Missing		–0.37 (1.99)		0.66 (0.29)
Parents in the home [reference is single-parent home]				
Two-parent home		–1.60 (1.31)		0.98 (0.25)
Missing		–1.32 (2.37)		1.06 (0.53)
Parent education [reference is less than high school diploma]				
High school diploma/GED		1.51 (1.39)		1.67~ (0.52)
Associate's degree		0.95 (2.05)		2.15~ (0.88)
Bachelor's degree (or higher)		5.21* (2.21)		2.70* (1.20)
Missing		–7.86 (6.33)		na

Predictor	OLS: Continuous Brigance Score		Logistic Regression: Brigance Score 90+	
	Unadjusted Model	Adjusted with Demographic Controls	Unadjusted Model	Adjusted with Demographic Controls
District [reference is CUSD]				
JESD		4.30~ (2.42)		1.99 (1.02)
LHPUSD		9.73* (4.26)		3.81~ (3.02)
SSFUSD		2.80 (2.51)		1.18 (0.62)
RCSD		3.44 (2.48)		1.24 (0.68)
RVCS		1.05 (3.62)		1.58 (1.17)
SBPSD		1.71 (2.81)		1.46 (0.85)
Assessment date		-0.03 (0.07)		0.99 (0.01)
Constant	82.78*** (0.70)	885.21 (1498.83)		
Observations	543	543	543	538 ^a

SOURCE: Authors' analysis of Big Lift data.

NOTES: na = Variable excluded due to change in missingness from dropped observations, or due to Big Lift preschool-only sample.

~ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. For the OLS models, the coefficients are raw, unstandardized point estimates with standard errors in parentheses. For the logistic regression and ordered logistic regression, the coefficients are presented as odds ratios with standard errors in parentheses.

^a Five observations dropped due to collinearity between the outcome and covariates.

Table TA.11. Unadjusted and Adjusted Ordered Logistic Regression and Logistic Regression Models Predicting the Reading Frequency Outcome by Number of Years of Big Lift Preschool for the 2017–2018 Kindergarten Class (Big Lift Participants Only)

Predictor	Ordered Logistic Regression: Categorical Reading Frequency		Logistic Regression: Binary Outcome—Everyday Reading vs. Not		Logistic Regression: Binary Outcome—Reading 5 Days or More vs. Not	
	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls
Preschool experience [reference is attended one year of Big Lift preschool]						
Attended 2 years of Big Lift preschool	0.82 (0.15)	1.02 (0.23)	0.81 (0.22)	1.13 (0.42)	0.89 (0.19)	1.23 (0.35)
Child age (months)		0.91** (0.03)		0.94 (0.05)		0.92* (0.04)
Child gender [reference is male]						
Female		0.90 (0.17)		0.81 (0.23)		0.94 (0.21)
Missing		na		na		na
Home language [reference is English]						
Language other than English		0.82 (0.21)		0.80 (0.30)		0.72 (0.22)
Missing		na		na		na
Assessed in Spanish		0.58~ (0.18)		0.38~ (0.20)		0.65 (0.25)
Not assessed in Spanish or English		0.94 (0.40)		1.42 (0.79)		0.73 (0.37)

Predictor	Ordered Logistic Regression: Categorical Reading Frequency		Logistic Regression: Binary Outcome—Everyday Reading vs. Not		Logistic Regression: Binary Outcome—Reading 5 Days or More vs. Not	
	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls
	Race/ethnicity [reference is White/Caucasian non-Hispanic]					
Hispanic		2.67* (1.11)		1.55 (1.10)		2.93~ (1.67)
Black/African-American non-Hispanic		1.71 (1.79)		1.00 (.)		1.00 (.)
Asian/Native Hawaiian/other Pacific Islander non-Hispanic		2.64* (1.18)		2.63 (1.87)		1.94 (1.12)
Other race		5.81* (4.08)		6.66* (6.31)		3.17 (2.68)
Missing		1.32 (1.10)		0.42 (0.58)		1.52 (1.64)
Family income [reference is \$10,000 or less]						
\$10,001–\$25,000		1.46 (0.45)		0.94 (0.45)		1.08 (0.41)
\$25,001–\$50,000		1.40 (0.44)		0.79 (0.40)		1.27 (0.50)
\$50,001–\$100,000		1.41 (0.54)		0.67 (0.39)		1.09 (0.51)
\$100,001–\$150,000		1.24 (0.80)		0.39 (0.38)		1.30 (1.00)
More than \$150,000		5.99 (9.21)		na		na
Missing		1.37 (0.95)		1.45 (1.48)		0.60 (0.56)

Predictor	Ordered Logistic Regression: Categorical Reading Frequency		Logistic Regression: Binary Outcome—Everyday Reading vs. Not		Logistic Regression: Binary Outcome—Reading 5 Days or More vs. Not	
	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls
Mother age at child birth [reference is mother age > 20]						
Teen mom		2.90** (1.04)		2.02 (1.03)		3.23** (1.41)
Missing		1.43 (0.50)		2.01 (0.98)		1.51 (0.61)
Parents in the home [reference is single-parent home]						
Two-parent home		0.85 (0.20)		1.33 (0.50)		1.21 (0.36)
Missing		0.78 (0.33)		0.36 (0.39)		0.77 (0.45)
Parent education [reference is less than high school diploma]						
High school diploma/GED		1.49 (0.41)		0.87 (0.37)		1.52 (0.54)
Associate's degree		2.09* (0.79)		1.26 (0.74)		1.52 (0.73)
Bachelor's degree (or higher)		4.27*** (1.76)		2.94~ (1.66)		5.84*** (2.90)
Missing ^b		na		na		na

Predictor	Ordered Logistic Regression: Categorical Reading Frequency		Logistic Regression: Binary Outcome—Everyday Reading vs. Not		Logistic Regression: Binary Outcome—Reading 5 Days or More vs. Not	
	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls
	District [reference is CUSD]					
JESD		0.60 (0.24)		0.43 (0.28)		1.12 (0.59)
LHPUSD		0.71 (0.45)		0.39 (0.48)		0.68 (0.63)
SSFUSD		0.62 (0.26)		0.43 (0.29)		0.97 (0.52)
RCSD		1.43 (0.59)		1.34 (0.88)		2.32 (1.23)
RVCSD		0.60 (0.42)		1.06 (1.01)		0.85 (0.74)
SBPSD		0.82 (0.40)		0.79 (0.59)		0.92 (0.57)
Assessment date		0.98 (0.01)		0.99 (0.02)		0.98 (0.02)
Observations	419	419	419	414 ^a	419	414 ^a

SOURCE: Authors' analysis of Big Lift data.

NOTES: na = Variable excluded to change in missingness from dropped observations, or due to Big Lift preschool only sample.

~ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. For the OLS models, the coefficients are raw, unstandardized point estimates with standard errors in parentheses. For the logistic regression and ordered logistic regression, the coefficients are presented as odds ratios with standard errors in parentheses.

^a Five observations dropped due to collinearity between the outcome and covariates.

^b In the ordinal logistic regression model sample, only one child was missing on the parent education variable; the coefficient on the missingness indicator was estimated but not reported because of the small sample.

Table TA.12. Unadjusted and Adjusted OLS Models Predicting Children’s F&P Scores at the End of Kindergarten and Start of First Grade by Children’s Preschool Experiences for the 2016–2017 Kindergarten Class (Follow-Up Sample)

Predictor	End of Kindergarten		Start of First Grade	
	Unadjusted Model	Adjusted with Demographic Controls	Unadjusted Model	Adjusted with Demographic Controls
Preschool experience [reference is Big Lift preschool]				
Non-Big Lift preschool	1.31*** (0.18)	0.19 (0.21)	2.09*** (0.22)	0.19 (0.25)
No preschool	-0.02 (0.24)	-0.61* (0.25)	0.48~ (0.29)	-0.63* (0.28)
Preschool unknown	0.28 (0.33)	-0.63 (0.46)	0.45 (0.40)	-0.21 (0.52)
Child age (months)		1.63*** (0.25)		1.80*** (0.28)
Child gender [reference is male]				
Female		0.20 (0.15)		0.41* (0.17)
Missing		0.76 (0.57)		0.73 (0.65)
Home language [reference is English]				
Language other than English		-0.05 (0.18)		-0.13 (0.20)
Missing		1.39 (0.91)		1.05 (1.04)
Race/ethnicity [reference is White/Caucasian non-Hispanic]				
Hispanic		-0.13 (0.30)		-0.16 (0.34)
Black/African-American non-Hispanic		0.20 (0.79)		0.02 (0.90)
Asian/Native Hawaiian/other Pacific Islander non-Hispanic		0.64* (0.30)		0.94** (0.35)
Other race		0.09 (0.41)		0.57 (0.47)
Missing		-0.01 (0.42)		-0.01 (0.48)

Predictor	End of Kindergarten		Start of First Grade	
	Unadjusted Model	Adjusted with Demographic Controls	Unadjusted Model	Adjusted with Demographic Controls
Family income [reference is \$10,000 or less]				
\$10,001–\$25,000		0.17 (0.34)		0.39 (0.39)
\$25,001–\$50,000		0.30 (0.33)		0.56 (0.38)
\$50,001–\$100,000		0.55 (0.40)		1.15* (0.45)
\$100,001–\$150,000		0.83* (0.41)		1.50** (0.47)
More than \$150,000		1.17** (0.44)		1.68*** (0.50)
Missing		1.18** (0.37)		1.41*** (0.43)
Parent country of birth [reference is parent born in United States]				
Outside United States		0.20 (0.21)		0.17 (0.24)
Missing		-0.17 (0.28)		-0.44 (0.32)
Mother age at child birth [reference is mother age > 20]				
Teen mom		-0.72~ (0.41)		-0.31 (0.47)
Missing		0.20 (0.37)		0.40 (0.42)
Parents in the home [reference is single-parent home]				
Two-parent home		-0.27 (0.21)		-0.38 (0.24)
Missing		0.01 (0.43)		-0.45 (0.50)
Parent education [reference is less than high school diploma]				
High school diploma/GED		0.22 (0.27)		0.40 (0.31)
Associate's degree		0.52 (0.33)		0.80* (0.37)
Bachelor's degree (or higher)		0.95** (0.31)		1.06** (0.36)
Missing		-0.66 (0.52)		-0.28 (0.59)

Predictor	End of Kindergarten		Start of First Grade	
	Unadjusted Model	Adjusted with Demographic Controls	Unadjusted Model	Adjusted with Demographic Controls
District [reference is CUSD]				
JESD		-0.29 (0.25)		0.55~ (0.29)
LHPUSD		0.92 (0.59)		2.77*** (0.67)
SSFUSD		0.23 (0.26)		0.71* (0.28)
Assessment date		0.03*** (0.01)		0.02*** (0.00)
Constant	2.32*** (0.15)	-681.85*** (153.94)	2.61*** (0.18)	-458.16*** (77.49)
Observations	1,282	1,282	1,282	1,282

SOURCE: Authors' analysis of Big Lift data.

NOTES: ~ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. For the OLS models, the coefficients are raw, unstandardized point estimates with standard errors in parentheses. For the logistic regression and ordered logistic regression, the coefficients are presented as odds ratios with standard errors in parentheses.

Table TA.13. Summer Experiences of Children in the Analytic BLIS Sample (Early Testers Only) and the Early and Late Testers Sample (2016–2017 Kindergarten Class)

Summer Experience	Analytic Sample (Early Testers Only)			Early and Late Testers		
	Number of Students	% of the Sample	% Among	Number of Students	% of the Sample	% Among
			Comparison Group			Comparison Group
BLIS	190	28.4	—	251	26.6	—
Not BLIS (comparison groups)	478	71.6	100.0	692	73.4	100.0
Non-BLIS summer program	107	16.0	22.4	202	21.4	29.2
No summer program	349	52.3	73.0	468	49.6	67.6
Summer experience unknown	22	3.3	4.6	22	2.3	3.2
Total	668	100.0	—	943	100.0	—

SOURCE: SMCOE database.

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

Table TA.14. F&P Independent Reading Levels at the Start of First Grade for the Early and Late Testers BLIS Sample (2016–2017 Kindergarten Class)

Level	Full Sample		BLIS		Non-BLIS Summer Program		No Summer Program	
	Number of Students	% of Group	Number of Students	% of Group	Number of Students	% of Group	Number of Students	% of Group
AA	152	16.1	42	16.7	14	6.9	91	19.4
A	94	10.0	29	11.6	12	5.9	47	10.0
B	139	14.7	41	16.3	23	11.4	72	15.4
C	110	11.7	17	6.8	25	12.4	67	14.3
D	103	10.9	26	10.4	23	11.4	52	11.1
E	72	7.6	24	9.6	16	7.9	31	6.6
F	58	6.2	21	8.4	15	7.4	21	4.5
G	54	5.7	9	3.6	18	8.9	26	5.6
H	47	5.0	15	6.0	14	6.9	17	3.6
I	34	3.6	7	2.8	14	6.9	13	2.8
J	27	2.9	6	2.4	8	4.0	13	2.8
K	23	2.4	5	2.0	13	6.4	5	1.1
L+	30	3.2	9	3.6	7	3.5	13	2.8
Total	943	100.0	251	100.0	202	100.0	468	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 22 children with unknown preschool experiences.

Table TA.15. Demographic Statistics for the Analytic BLIS Sample (Early Testers Only) and the Early and Late Testers Sample (2016–2017 Kindergarten Class)

Characteristic	Analytic Sample (Early Testers Only)				Early and Late Testers			
	Total Sample	BLIS	No BLIS		Total Sample	BLIS	No BLIS	
			Non-BLIS Program	No Summer Program			Non-BLIS Program	No Summer Program
Child age (years)	6.6	6.6	6.5	6.6	6.6	6.6	6.6	6.6
Child gender								
Female	51.1	49	40.2	55.3	49.6	48.6	45.1	51.9
Male	48.7	51.1	58.9	44.4	49.8	51	53.5	47.9
Missing	0.3	0	0.9	0.3	0.5	0.4	1.5	0.2
Race/ethnicity ^a								
Hispanic	46.7	52.6	31.8	47.9	41.8	51.4	28.2	42.1
Black/African-American non-Hispanic	1.2	0	2.8	1.2	1.4	0.4	3	1.1
White/Caucasian non-Hispanic	6.6	4.7	5.6	7.5	7.1	6	8.4	6.8
Asian/Native Hawaiian/other Pacific Islander non-Hispanic	39.1	37.9	43.9	39.3	44.9	38.3	52	46.4
Other	6.1	4.2	15.9	4	4.6	3.6	8.4	3.2
Missing	0.3	0.5	0	0.3	0.3	0.4	0	0.4

Characteristic	Analytic Sample (Early Testers Only)				Early and Late Testers			
	Total Sample	BLIS	No BLIS		Total Sample	BLIS	No BLIS	
			Non-BLIS Program	No Summer Program			Non-BLIS Program	No Summer Program
Home language								
English	35.0	28.4	57.00	32.4	46.8	37.5	68.3	43.38
Not English	65	71.6	43	67.6	53.2	62.6	31.7	56.62
Missing	0	0	0	0	0.6	0	0	0
Mother age at child birth								
Younger than 20 (teen mom)	4	5.3	1.9	4.3	3.5	5.2	1.5	3.6
Older than 20	89.7	88.4	93.5	89.4	89.93	89.2	90.6	90.2
Missing	6.3	6.3	4.7	6.3	6.6	05.6	7.9	6.2
Parents in the home								
Two-parent home	76.8	69.5	79.4	80.5	78.7	68.9	84.2	82.1
Single-parent home	19.5	24.2	16.8	17.5	17.6	25.1	13.4	15.2
Missing	3.7	6.3	3.7	2	3.7	6	2.5	2.8
Parent education								
Less than high school diploma	8.1	8.4	0.9	9.5	6.3	7.6	0.5	7.5
High school diploma/GED	38.9	44.7	25.2	40.4	34.5	43.4	17.8	37
Associate's degree	17.1	14.7	15.9	19.2	16.5	15.1	11.4	19.9
Bachelor's degree (or higher)	33.2	29	57	28.1	40.2	31.5	67.8	33.1
Missing	2.7	3.2	0.9	2.9	2.6	2.4	2.5	2.6

Characteristic	Analytic Sample (Early Testers Only)				Early and Late Testers			
	Total Sample	BLIS	No BLIS		Total Sample	BLIS	No BLIS	
			Non-BLIS Program	No Summer Program			Non-BLIS Program	No Summer Program
Family income								
Less than \$10,000	7.9	10.5	2.8	8	6.3	9.2	1.5	6.6
\$10,001–25,000	14.8	20	7.5	14	12.2	18.3	4.5	12
\$25,001–50,000	33.2	37.9	12.2	37.8	28.7	36.3	10.9	32.7
\$50,001–100,000	22.6	23.7	18.7	23.5	25	27.1	20.8	26.1
\$100,001–150,000	9.6	2.6	24.3	8.6	13.5	4.4	27.7	12.2
More than \$150,000	6.4	0	28	3.2	9.1	0	29.2	5.3
Missing	5.4	5.3	6.5	4.9	5.2	4.8	5.5	5.1
<i>N</i>	668	190	107	349	943	251	202	468

SOURCES: SMCOE Cocoa database; first-grade entry forms.

^a The race/ethnicity variables are mutually exclusive categories; see the Control Variables section for more detail on variable creation.

Table TA.16. Unadjusted and Adjusted OLS Models Predicting Children’s F&P Scores at the Start of First Grade by Children’s Summer Experiences for the 2016–2017 Kindergarten BLIS Samples

Predictor	Analytic Sample (Early Testers Only)		Analytic Sample (Early Testers with Full Dosage)		Early and Late Testers	
	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls
Preschool experience [reference BLIS program]						
Non-BLIS program	0.25 (0.21)	-0.17 (0.22)	0.17 (0.22)	-0.21 (0.24)	0.93*** (0.21)	0.13 (0.21)
No summer program	-0.15 (0.15)	-0.22 (0.15)	-0.24 (0.17)	-0.27 (0.17)	-0.21 (0.17)	-0.35* (0.16)
Unknown summer program	-1.47*** (0.38)	-1.21** (0.37)	-1.54*** (0.40)	-1.23** (0.39)	-1.93*** (0.49)	-1.42** (0.44)
Spring kindergarten F&P score	0.96*** (0.02)	0.96*** (0.02)	0.95*** (0.02)	0.95*** (0.03)	0.91*** (0.03)	0.86*** (0.03)
Child age		0.24 (0.21)		0.20 (0.22)		0.35 (0.22)
Child gender [reference is male]						
Female		0.02 (0.13)		-0.00 (0.14)		0.18 (0.13)
Missing		0.81 (1.16)		0.84 (1.18)		-0.48 (0.89)
Home language [reference is English]						
Language other than English		-0.35* (0.15)		-0.36* (0.16)		-0.23 (0.15)
Missing		na		na		na
Race/ethnicity [reference is White non-Hispanic]						
Hispanic		0.59* (0.27)		0.58~ (0.29)		0.34 (0.27)
Black/African-American non-Hispanic		-0.43 (0.64)		-0.44 (0.65)		-0.32 (0.60)
Asian/Hawaiian/other Pacific Islander		0.97*** (0.27)		0.99*** (0.29)		0.63* (0.26)
Other race		1.34*** (0.37)		1.39*** (0.39)		1.07** (0.39)
Missing		-0.44 (1.20)		-0.43 (1.22)		-0.38 (1.17)

Predictor	Analytic Sample (Early Testers Only)		Analytic Sample (Early Testers with Full Dosage)		Early and Late Testers	
	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls
Family income [reference is \$10,000 or less]						
\$10,001–\$2,5000		0.05 (0.28)		0.10 (0.30)		–0.02 (0.32)
\$25,001–\$50,000		0.38 (0.26)		0.35 (0.28)		0.36 (0.29)
\$50,001–\$100,000		–0.16 (0.29)		–0.18 (0.31)		0.07 (0.32)
\$100,001–\$150,000		0.13 (0.34)		–0.01 (0.36)		0.20 (0.35)
More than \$150,000		0.54 (0.40)		0.47 (0.41)		0.36 (0.39)
Missing		0.09 (0.36)		0.12 (0.40)		–0.07 (0.39)
Mother age at child birth [reference is mother age > 20]						
Teen mom		0.07 (0.33)		0.05 (0.35)		0.34 (0.36)
Missing		0.21 (0.27)		0.25 (0.30)		0.68* (0.27)
Parents in the home [reference is single-parent home]						
Two-parent home		0.28 (0.18)		0.33~ (0.18)		0.42* (0.18)
Missing		–0.00 (0.36)		–0.00 (0.39)		–0.04 (0.37)
Parent education [reference is less than high school diploma]						
High school diploma/GED		0.13 (0.26)		0.12 (0.28)		0.29 (0.29)
Associate's degree		0.40 (0.30)		0.40 (0.32)		0.74* (0.33)
Bachelor's degree or higher		0.40 (0.29)		0.41 (0.31)		0.58~ (0.32)
Missing		0.98* (0.45)		0.57 (0.50)		1.18* (0.49)
District [reference is JESD]						
SSFUSD		–0.40* (0.18)		–0.45* (0.20)		–0.04 (0.20)
Assessment date		–0.03* (0.01)		–0.03* (0.01)		0.02** (0.01)

Predictor	Analytic Sample (Early Testers Only)		Analytic Sample (Early Testers with Full Dosage)		Early and Late Testers	
	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls	Unadjusted Model	Adjusted with Controls
Days between F&P assessments		0.04*** (0.01)		0.04*** (0.01)		0.01 (0.01)
Constant	0.58*** -0.14	563.94* (234.66)	0.68*** -0.17	613.45* (246.53)	1.24*** -0.16	-435.41** (155.99)
Observations	668	668	616	616	943	943

SOURCE: Authors' analysis of Big Lift data.

NOTES: $\sim p < 0.10$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$. For the OLS models, the coefficients are raw unstandardized point estimates with standard errors in parentheses. For the logistic regression and ordered logistic regression, the coefficients are presented odds ratios with standard errors in parentheses.