

First 5 Fresno County School Readiness Longitudinal Study

Final Report

June 2020





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Executive Summary

First 5 Fresno County (F5FC) envisions a world in which all children and their families are healthy, loved, and nurtured. In pursuit of this goal, F5FC works with its community members and partners to create a seamless system of quality, accessible services that supports the well-being of every child and family. F5FC launched the School Readiness Longitudinal (SRL) Study—in partnership with Harder+Company Community Research—to identify and document how F5FC-funded services influence children and families over time. The SRL Study launched in 2013 and followed children who received services from age three or four through the third grade.

This final SRL report summarizes findings from six years' worth of data collected from parent respondents and participating school districts. The report emphasizes statistically significant connections between early childhood experiences, home- and school-based practices, and school readiness and achievement. In addition to outlining compelling findings, this report also includes actionable recommendations for leveraging the data toward informed decision making.

Key Findings

Portrait of Child and Family Participants

Data on participant families' household dynamics, access to high quality childcare and education, medical care, and developmental services from early childhood to school age provide important context for the interpretation of this report's findings:

- Families of children in the study are living under the federal poverty line at more than twice the rate of Fresno County as a whole (75 percent compared to 29 percent).
- Eighty percent of children in the study are Hispanic/Latinx, compared to 65 percent of children in Fresno County. Sixty-six percent of families in the study speak Spanish as a primary language, compared to 35 percent in the County. Nearly half (40%) of all parents in the study report that language barriers prevented them from participating in certain school activities.
- Most children in the study attended a formal childcare center (69%), and one quarter (25%) received care from a relative before entering kindergarten.
- Although 95 percent of parents in the study responded that their child had a checkup or other routine care within the last year, only about a third report being aware of a developmental or behavioral screening having ever been conducted with their child (31-36% over the course of six years). These findings suggest that parents may not receive comprehensive information about—or be aware of—developmental screenings conducted with their children.

Academic Performance in the Third Grade

Understanding the relationship between early childhood services and academic performance is a foundational component of the SRL study. Findings from this study provide evidence that children who receive supportive services from F5FC in their early years may be better prepared for long-term academic success, when

Guiding Research Questions

- What are the outcomes of children and families receiving F5FC-funded services?
- What practices have lasting positive effects on school readiness and school achievement?
- How involved are parents in their children's early learning?
- How do F5FC child and family outcomes compare to those of families who did not participate in F5FC services?

Nearly half of parents report that that language barriers prevented them from participating in certain school activities at their child's school.

compared to a comparable group of students in Fresno County in the third grade.

Study group children who received F5FC-funded services were almost twice as likely to meet the California Assessment of Student Performance and Progress (CAASPP) English Language Arts (ELA) standard and almost three times more likely to meet the Math standard than the comparison group of local students.

Other individual- and household-level factors appear also to influence study children's likelihood of meeting the ELA and Math standards:

- Children who receive a free lunch at school were less than half as likely to meet the CAASPP ELA and Math standards.
- English Language Learners (ELLs) were one-third as likely to meet the CAASPP ELA standard and half as likely to meet the Math standard.
- Children enrolled in special education were less than one tenth as likely to meet the CAASPP ELA and Math standard.

Predictors of Academic Success

The SRL study also utilized extensive first-hand data from parents to better understand the factors influencing differences in academic performance among children enrolled in the study. Factors such as parent involvement in their child's learning, home-based practices, early childhood care setting, and success in kindergarten were found to be crucial determining factors in a child's long-term academic success:

- Children whose parents frequently asked what their child was learning at school were three times more likely to meet the CAASPP ELA standard than children whose parents infrequently asked. Similarly, children whose parents participated in PTA were almost twice as likely to meet the CAASPP ELA standard than those whose parents did not.
- Children who read to themselves for 35 minutes or more per sitting were over 50 percent more likely to meet the CAASPP ELA standard, though study group children only spent an average of 27 minutes per sitting reading to themselves.
- Children who attended either private or center-based care before entering kindergarten were 4 times more likely to meet the CAASPP Math standard than children who received care from a relative.
- Children whose kindergarten readiness results were categorized as "quarterly monitor" or "ready to go" were over 7 times more likely to meet the CAASPP ELA standard and over 4 times more likely to meet the CAASPP Math standard later in life, compared to their peers whose results indicated lower kindergarten readiness.

Recommendations and Considerations

The findings of this report provide substantial evidence that enriching learning environments and supports in early childhood, and strong connections between a parent and their child's school, are crucial factors in academic performance. The recommendations below outline areas where F5FC and its community partners can utilize the findings of this report to inform their ongoing work. These

Children who participated in the SRL study and received First 5 Fresno County services are more likely to meet both ELA and Math standards in the third grade than their non-study counterparts.

Children who attended private or center-based care were four times more likely to meet Math standards than children who received care from a relative.

recommendations are based on F5FC's pivot from direct services to a systems orientation, and encourage moving beyond the data's face value in decision-making:

- **Create opportunities to ensure that young children have access to enriching learning environments, both in and outside the home.**
Factors such as the setting of a child's early education and the number of books to which they have access predict future success in school. However, not all families have equal access to high-quality preschool or childcare, or the means to create a large personal library. Promoting high-quality childcare that is both affordable and culturally and linguistically relevant to a larger proportion of the population, and investing in public institutions such as local libraries, can create opportunities for parents to provide their children with an enriching environment.
- **Support culturally responsive methods to deepen connections between parents and their children's schools.**
Because much of a child's development happens outside of school hours, children whose parents are engaged in their child's education showed better long-term outcomes in our study. However, language barriers and lack of experience in educational settings may limit some parents from engaging as deeply with their children's schools as they may want. It is therefore critical that educators and school systems make their own environments as accessible to parents as possible, and that other organizations, including F5FC, support parents with services specifically geared towards building their capacity to engage in educational settings.
- **Leverage longitudinal study findings to bolster advocacy efforts around the importance of a child's early years.**
The SRL study highlighted the impact that early childhood experiences have on school readiness and school performance. However, the study *itself* can have an impact on children's outcomes if the findings are used to advocate for continued investment in early childhood by parents, educators, community organizations, and local governments. While the social return on investment in early childhood is well known, Fresno-specific longitudinal data may be even more compelling to local decision-makers.



This final report also includes a suggested framework for utilizing the SRL Study, as well as any past or future studies, in a way that highlights how multiple stakeholders – parents, educators, institutions, and governments – can convert findings into action for a more integrated, systems-oriented approach to serving young children and their families. ✦

Introduction

First 5 Fresno County (F5FC) strives to ensure that all children and their families are healthy, loved, and nurtured. To support this goal, F5FC works with its community and partners to create a seamless system of quality, accessible services that supports the well-being of every child and family. This work is reinforced by a focus on continuous learning and evaluation to ensure the overall fulfillment of F5FC's charge and monitor the extent to which the Commission's actions are benefitting its community.

The School Readiness Longitudinal Study

To identify and document how F5FC-funded services influence children and families over time, F5FC partnered with Harder+Company Community Research (Harder+Company) to conduct a six-year longitudinal study. This School Readiness Longitudinal (SRL) Study launched in Fiscal Year 2013-14 and followed children who received F5FC-funded services from age three or four through the third grade. Using a mixed methods approach, described below, the study examines the association between early childhood experiences and outcomes for children and their families, with a focus on school readiness and academic achievement. More specifically, F5FC identified the following research questions to guide the study:

- What are the outcomes of children and families receiving F5FC-funded services?
- What practices have lasting positive effects on school readiness and school achievement?
- How involved are parents in their children's early learning?
- How do the outcomes of F5FC children and families compare to those of families who did not participate in F5FC services?

Overview of Data Sources

The SRL Study utilized an in-depth Parent Interview along with multiple complementary measures and data sources, some specially designed for this study and some that already existed. These data sources were selected to construct a comprehensive view into the lives of participants, including family characteristics, early learning in the home, pre-kindergarten (pre-k) experiences, kindergarten progress and outcomes, and third grade academic achievement:



The cornerstone of the SRL Study was the annual **Parent Interview** Harder+Company conducted with parents whose families or children received F5FC-funded services. In its first year, the Parent Interview launched by interviewing 509 parents whose children were three to five years old at the time and continued to follow these same families for the duration of the study. With a strong focus on personal outreach and connection, attrition remained below 10 percent each year and data collectors managed to retain the vast majority of families through the sixth year of the study.



Starting in Year 2 of the SRL study, **school districts** attended by study participants provided information to the Harder+Company research team each year, including: attendance; grade retention; parent education; home language; Kindergarten Student Entrance Profile (KSEP) readiness

scores; California English Language Development Test (CELDT) scores; California Assessment of Student Performance and Progress (CAASPP) English Language Arts (ELA) and Math scores (third grade).



A **comparison group** of children who were not in the study cohort was introduced in Year 3, when results were centered on kindergarten readiness. A similar comparison group cohort was assembled in Years 5 and 6 to examine differences in third grade academic achievement between study participants who received F5FC-funded services and their counterparts. Comparison group data were provided by Fresno Unified School District (FUSD) and included a sample of 6,078 kindergarten children in Year 3 and 11,138 third graders in Years 5 and 6.

A more complete description of each of these data sources and other methods used for this report are included in the Appendix. Together, these data offer a window into the early childhood factors that may have the greatest long-term influence on predicting school readiness and provide a detailed description of the types of families that most benefit from F5FC-funded services.

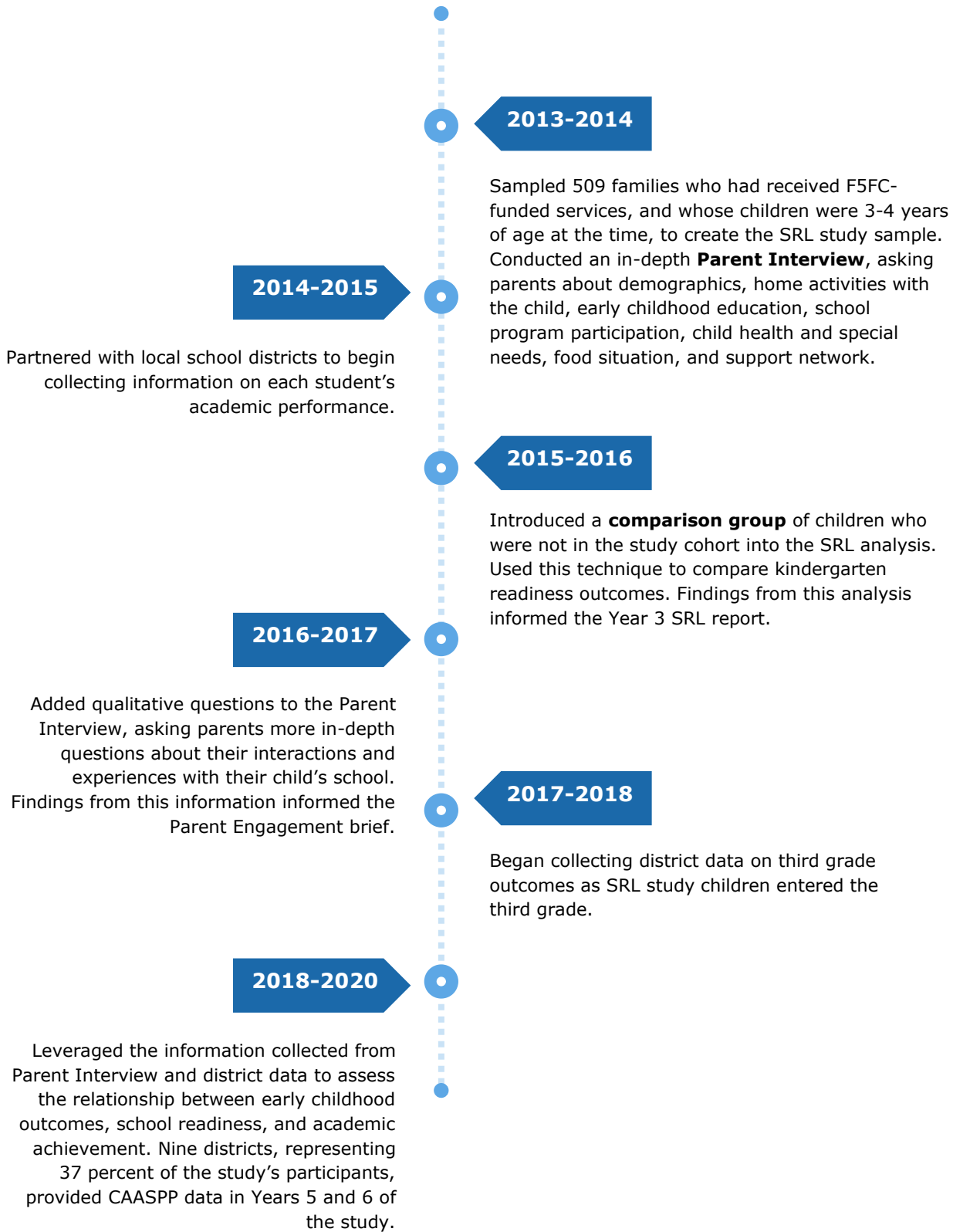
Reporting

Over the six-year course of the SRL study, the Harder+Company team produced various deliverables on an annual basis to document summary findings from our data and spotlight emerging topics of interest to F5FC, its partners, and community stakeholders.

This final SRL report serves as a culmination of our collective learning process with F5FC, comprehensively addressing the key research questions that have guided the study for the past six years, as well as recommendations curated to align with F5FC's new 2020-2025 Strategic Plan. While reporting in earlier years of the study centered on school readiness in the first five years of life, the study has since evolved to include a focus on longer-term academic performance and achievement.


The roadmap on the following page summarizes the cumulative steps taken to create this final report, and the key deliverables each year of the SRL study.

School Readiness Longitudinal Study: Six-Year Roadmap



Given the breadth and depth of data collected over a six-year period, the findings shared in this report are not exhaustive or representative of all the analyses completed by the Harder+Company research team. Rather, these findings were intentionally selected to enable action-oriented discussion and evidence-informed decision making.

Study findings are organized into the following chapters:

- **Portrait of Child and Family Participants.** This chapter highlights notable trends and patterns that emerged across the six years of data collection.
- **Academic Performance in the Third Grade.** This chapter begins to look at the third-grade outcomes of our SRL study children, benchmarking their performance to California and Fresno County, and noting higher standardized test scores when compared to a sample of children from a local school district.
- **Predictors of Academic Success.** In our third chapter, we build on our outcomes analysis by examining the relationship between childhood dynamics, in-home practices, and academic performance among our study children, finding compelling evidence of the impact of early childhood experiences and parent engagement practices.
- **Summary Recommendations.** We conclude the report with a set of overarching recommendations for consideration—based on the findings detailed throughout—as well as a suggested framework for contextualizing these recommendations and making evidence-informed decisions moving forward. 

Portrait of Child and Family Participants

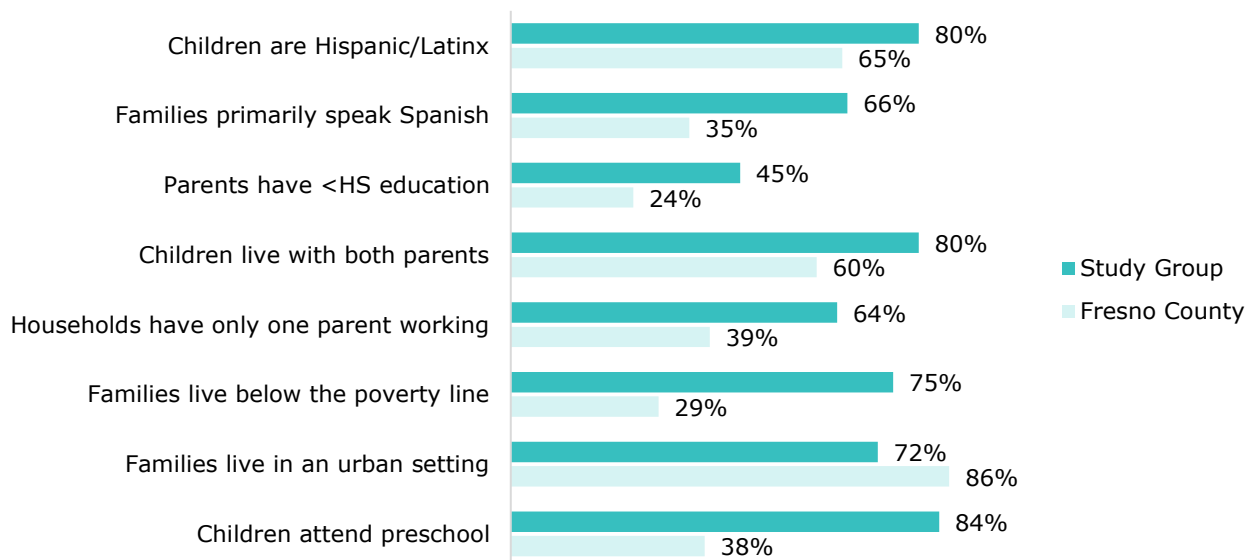
One of the SRL study's greatest strengths lies in the scope and depth of information shared by parent interviewees. By engaging parents for a total of six years, the study collected rich details on family and household dynamics and tracked the development of hundreds of Fresno County children from early childhood to school age.

This chapter presents synthesized findings from the SRL study's Parent Interview. Given the breadth of data available, our selection of findings is directly informed by F5FC's areas of top priority, as expressed in both its 2013-2020¹ and 2020-2025² Strategic Plans. These priority areas include challenges and goals related to high quality early care and health care services, parent education and engagement in the home, and family support for navigating Fresno County's early childhood system. Exploring data in these areas provides crucial context to the more complex analyses of school readiness in subsequent chapters of the report.

Family and Child Characteristics

Parent Interview data on the demographic characteristics of study participants shows how unique these families are compared to Fresno County overall. As a direct subset of F5FC families, this demographic breakdown also highlights the kinds of families F5FC has served in years past.

Exhibit 1. Comparing SRL Study Group Characteristics to Fresno County



¹ First 5 Fresno County. (2015) *First 5 Fresno County 2013-2020 Strategic Plan, 2015 Review*. Available at: <http://www.first5fresno.org/wp-content/uploads/2015/07/First-5-Fresno-County-Strategic-Plan-2013-2020-2015-Review-Final-Draft-for-6.17.15.pdf>

² First 5 Fresno County. (2019). *First 5 Fresno County 2020-2025 Strategic Plan*. Available at: <https://www.first5fresno.org/wp-content/uploads/2019/07/First-5-Fresno-County-2020-2025-Strategic-Plan-FINAL.pdf>

The comparisons in Exhibit 1 reveal how parents in the study experience higher levels of poverty, lower levels of education, and primarily speak Spanish at a higher rate compared to the broader Fresno County population.³ Although F5FC aims to serve all families in Fresno County, the SRL sample shows that F5FC serves a high proportion of Hispanic/Latinx families living below the poverty line. It also shows areas F5FC could leverage, such as the high proportion of children who live in two-parent households (80%) and attend preschool (84%). Overall, these findings provide a useful lens through which the rest of the findings in this report should be viewed.

Access to High Quality Childcare and Education

As our research team’s other assessments and data collection efforts in Fresno County have shown, parents face numerous challenges accessing high quality childcare and early education services. Quality childcare is a crucial component of early development, and barriers encountered at a young age can further exacerbate long-term inequities in social, emotional, and intellectual development.⁴ The information collected through Parent Interviews, and detailed in this section, sheds light on which types of childcare options parents rely on, and how access to that care can be a barrier for parent engagement.



Access to childcare may impact parents’ ability to fully participate in school activities.

Findings from the first year of the Parent Interview show that most children attended a formal childcare center (69%), and about a quarter (25%) received care from a relative. This finding shows that the study group parents are utilizing important early childhood education services, but also leaves room to engage the quarter of parents whose children receive care from a relative. Subsequent chapters of this report will discuss this dynamic further, and how the type of childcare a parent chooses can impact how their child performs in school.



69% were enrolled in center-based care



25% received care from a relative



6% received private home care from a non-relative

Childcare continues to impact development later in life, as care arrangements can either enable or impede parents’ ability to participate in school-related activities. Though parents’ responses changed slightly by the child’s grade level, almost half (40%) reported that a lack of childcare was “always” or “sometimes” a barrier to

³ All Fresno County data are from the 2013-2018 American Community Survey, 5-Year Estimates, apart from the following indicators: “Families live in an urban setting” (2010 Decennial Census), and “Child attends preschool” (2010-2014 American Community Survey). County data for “Families primarily speak Spanish” comes from the Census indicator “Population 5 years and older that speaks Spanish at home”. County data for “Children live with both parents” comes from the Census indicator “Husband-wife families with children <18”. County data for “Households have only one parent” comes from the Census indicators “Husband in labor force, wife not in labor force” and “Wife in labor force, husband not in labor force” for “families with children <18”.

⁴ Workman, S., Ulrich, R. (2017). *Quality 101: Identifying the Core Components of a High-Quality Early Childhood Program*. The Center for American Progress. Available at: <https://www.americanprogress.org/issues/early-childhood/reports/2017/02/13/414939/quality-101-identifying-the-core-components-of-a-high-quality-early-childhood-program/>

participating in their child’s school meetings or activities. As discussed in the following section and other chapters of this report, parents play an essential role in their child’s school performance by engaging with their child’s school, and access to childcare can be a major barrier to their participation.

Learning Environments at Home and School

From activities that promote literacy at home, to engaging with their child’s educational community, parent involvement is a crucial component of young children’s academic success. Each year, the study asked parents extensively about the ways they engage with both home- and school-based activities that support their child’s development and academic readiness. This section delves into some of this data and identifies trends in engagement as children grow older.

Throughout the study, parents remained actively involved in reading with their children and encouraging children to read by themselves.

Promoting joint reading, drawing, singing, storytelling, and game playing between parents and children is one of the primary ways that parents can encourage literacy development.^{5,6,7} Results from the Parent Interview show that study families actively engaged in literacy-building activities, such as reading to their child and encouraging their child to read to themselves. In the first five years of the SRL study, approximately 80% of parents engaged in reading with their child at least three times per week. As children in the study advanced in school, the proportion that read to themselves at least three times per week increased to a peak of 75%.

The Parent Interview also asked about reading behaviors and duration. Findings show that the average number of minutes children spent reading to themselves per sitting doubled between the second and sixth year of the study, as children moved from preschool to third grade—from 12 to 25 minutes—and the number of books that children have in their home increased substantially, to a maximum of 60 books.

Parents shared a high level of involvement in children’s academic and emotional development at home, especially in the early years.

Since the beginning of the study, parents consistently reported high levels of engagement at home. In Year 1 when children were between 3 and 4 years of age, parents engaged in numerous activities to promote their child’s development. At this crucial age, 81% played music or sang with their child three times per week or more. More than half of parents engaged in other important activities three times per week or more at this formative age, such as telling stories, playing games and puzzles, and doing arts and crafts with their children.

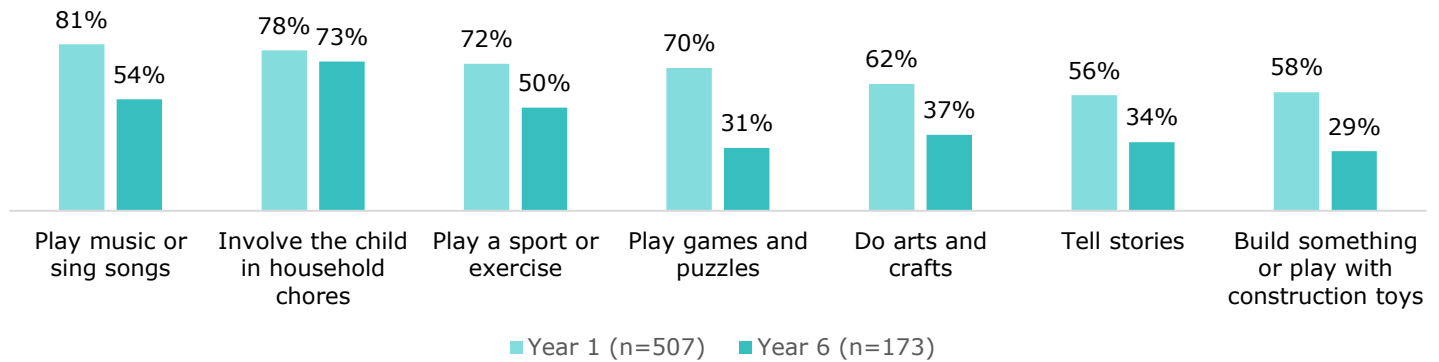


⁵ Mejía de Rodríguez, P. (2018). *5 Early Literacy Practices for Babies*. The Colorado Virtual Library. Available at: <https://www.coloradovirtuallibrary.org/learning/literacy/5-early-literacy-practices-for-babies/>

⁶ Steffani, S., & Selvester, P. M. (2009). The Relationship of Drawing, Writing, Literacy and Math in Kindergarten Children. *Reading Horizons: A Journal of Literacy and Language Arts*, 49 (2). Available at: https://scholarworks.wmich.edu/reading_horizons/vol49/iss2/4

⁷ Miller, Sara & Pennycuff, Lisa. (2008). The Power of Story: Using Storytelling to improve Literacy Learning. *Journal of Cross-Disciplinary Perspectives in Education*. Available at: <https://wmpeople.wm.edu/asset/index/mxtsch/storytelling>

Exhibit 2. Parent Involvement in Activities at Home; Engaged in Activities Three Times per Week or More



Parents report high levels of involvement and confidence in their children’s schools despite difficult language barriers.

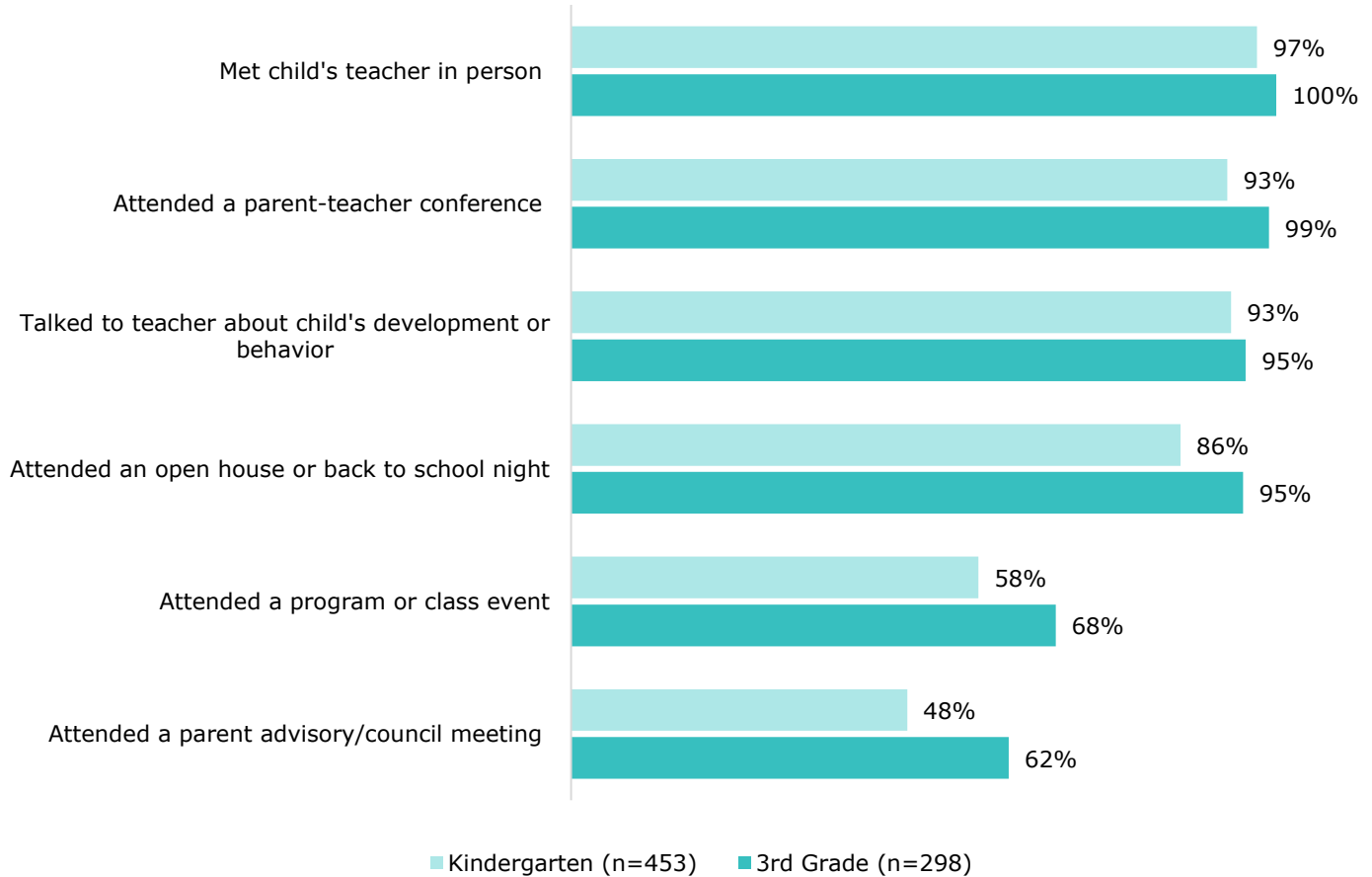
As children grow older and enroll in K-12 schools, parents must adapt to the added responsibilities that come with supporting their child’s in-school learning and development. Findings from the Parent Interview show that study parents feel a strong sense of responsibility for supporting their child’s development and learning, and are confident in their ability to provide their child the resources they need to succeed. From kindergarten to third grade, a minimum of 99% of parents agreed or strongly agreed that it is their responsibility to teach children to value education and success in school. Similarly, a minimum of 97% of parents agreed or strongly agreed that they “know how to help [their] child do well in school.”

Trends also showed that study parents were heavily involved in their child’s school and became more involved over the course of the study. By the third grade, 100% of parents reported having met their child’s teacher in the last year. Between kindergarten and the third grade, the percentage of parents who attended a back-to-school night or open house increased by approximately 10%, and the percentage of parents who had attended a parent council or parent advisory meeting increased by 14%.

While this does not represent all the ways a parent can be involved, the most essential elements of parent involvement—those involving relationship-building with educators and school staff—remained high.

Across all six study years, 99 percent of parents agreed that it is their responsibility to teach their child the value of education.

Exhibit 3. Parent Involvement in School Activities – Kindergarten to Third Grade Comparison



High levels of parent engagement might, in part, be fostered by the trust cultivated between parents and schools. Parents in the study expressed consistently high levels of trust in their children’s schools from kindergarten to third grade. The vast majority of parents (96% and higher, depending on the grade level) agreed or strongly agreed that their child’s school is “welcoming to their family”, and that they trust the staff at their child’s school (95% and higher, depending on the grade level).

Despite high levels of trust with staff, many parents reported that language barriers hindered their full engagement. As their children entered kindergarten, nearly half of parents (46%) reported language being a barrier to their participation in school activities. Although this decreased to 38 percent by the time their children were in the third grade, these findings suggest that many parents and children may be missing out on key opportunities for early school engagement.

Despite high levels of trust, parents report language barriers prevent them from participating in certain school activities.

Access to Child Medical Care and Developmental Services

Many parents in Fresno County—particularly those in low income households—face challenges accessing high quality, culturally appropriate medical care for their

children and families.⁸ For children with developmental and/or behavioral delays, early identification of their needs can transform their ability to develop socially, emotionally, and intellectually.⁹ Across all six years of data collection, the Parent Interview asked parents a number of questions around their children's routine health care and supports for those diagnosed with special needs. These findings help contextualize the challenges study families face and offer insight into their overall experience and success navigating service systems.

Despite receiving consistent, routine medical care, asthma continues to be a major health issue among children of color.

Throughout the study, parents reported that their child was consistently receiving routine medical care; over 95% of parents responded that their child had a checkup or other routine care within the last year. Despite these routine checks, Fresno County continues to have the highest rate of emergency room visits for children under the age of 18 due to asthma of all counties in California.¹⁰ In addition, study group children exhibit even higher rates of asthma than other children in the County — while approximately 33% of children in the study had ever been diagnosed with asthma, only 19% of children across Fresno county have received this diagnosis.

Parent Interview data also reveals substantial disparities in asthma incidence by race/ethnicity. Non-White, non-Asian children in the study had the highest prevalence of asthma diagnoses. Specifically, Hispanic/Latinx children had more than twice the incidence rate of asthma (33%), and Black/African American children had over four times the incidence of asthma (57%) compared to white children (14%). This difference was found to be statistically significant,¹⁰ and is consistent with existing research on the social determinants of children's health.

Parents were not universally aware of their children's developmental screenings, though nearly all children who were diagnosed with a delay received follow-up services.


In addition to the support parents might need addressing their child's asthma, findings from Parent Interview suggest that parents may not receive comprehensive information about—or be aware of—when developmental screenings are being conducted with their children. About one third of parents report being aware of a developmental or behavioral screening having ever been conducted with their child (31-36% over the course of six years). Given the high rates of SRL study children with a medical home and a history of attending center-based childcare—both settings in which a standardized screening is likely to have been administered—it is possible that many of the children whose parents reported *not* being screened, *were* in fact screened without their parent's full awareness. In this sense, findings in this area may highlight a need for greater education and information sharing with parents, rather than increased access to developmental screenings.



⁸ Central Valley Health Policy Institute. (2017). *Community Benefits Needs Assessment in South Fresno*. Available at: <http://www.fresnostate.edu/chhs/cvhipi/documents/Community%20Benefits%20Report%20CVHPI%208-3.pdf>

⁹ Muschkin, Clara G., Helen F. Ladd & Kenneth A. Dodge. (2015). *Impact of North Carolina's Early Childhood Initiatives on Special Education Placements in Third Grade*. CALDER Working Paper No. 121. Available at: <https://caldercenter.org/sites/default/files/WP%20121.pdf>

¹⁰ These findings should be looked at with caution since the proportion of non-Hispanic/Latinx and non-White children in the study group sample is small. These findings were statistically significant at $p < 0.1$.

Although the self-reported rate of screenings is low, data collected from the Parent Interview shows that children diagnosed with a developmental delay received support and essential services. Of the 167 children in the study who were ever diagnosed with a developmental delay, 99% of parents reported that their child received at least one post-diagnosis follow-up action. These actions included referrals to specialists, discussions with doctors or health professionals, meetings with special needs teams, or creating an Individual Family Service Plan (IFSP) or individualized Education Plan (IEP). Additionally, nearly all parents (95%) reported that their children received at least one follow-up service after their diagnosis. These service types include speech therapy, parent support or training, home visits, or various other need-specific services. 

Academic Performance in the Third Grade

One of the learning questions driving the SRL study from its inception is the extent to which early childhood services, such as those funded by F5FC, carry a long-term impact on how a child performs in the classroom. While other research is able to show anecdotal evidence of this, the SRL study observes the relationship between early experiences and later outcomes by comparing the school-based outcomes of a group of children in Fresno County who received First 5-funded services in their early childhood, and those who did not.

To this end, Harder+Company partnered with nine Fresno County school districts to receive academic information on students involved in the SRL study, as well as data on a comparison group of students from Fresno Unified School District (FUSD) who were *not* in the study.

The following chapter looks at this data, specifically, how academic outcomes vary between the groups, as measured by third grade reading and math performance. Because school performance can be a hard concept to measure, our analysis uses the California Assessment of Student Performance and Progress (CAASPP) as a proxy measure—that is, a highly reliable source of data that highlights if a student is meeting the performance standard for their grade level. In the end, the results of this chapter show that SRL study children perform slightly better than a comparison group.

Overview of District Data

Fresno County school districts were key partners in this study, sharing basic demographic information¹¹ and test score results for the children in our study, and de-identified demographic data and test scores for a group of non-study children.¹² In total, the subsequent analysis examines the third grade CAASPP scores for 186 SRL children and 11,138 comparison children from FUSD for school years 2017-18 and 2018-19.

A comparison of each group's demographic characteristics revealed key differences between the study and comparison group. As visualized in Exhibit 4, below, the SRL study children are predominantly Hispanic/Latinx, speak Spanish in the home, and are English language learners. Ten percent of the SRL study children were also enrolled in special education, which aligns with the county average of 10.3%¹³ but is substantially higher than the 3 percent of students designated as special education in the comparison sample.

What is the California Assessment of Student Performance and Progress (CAASPP)?

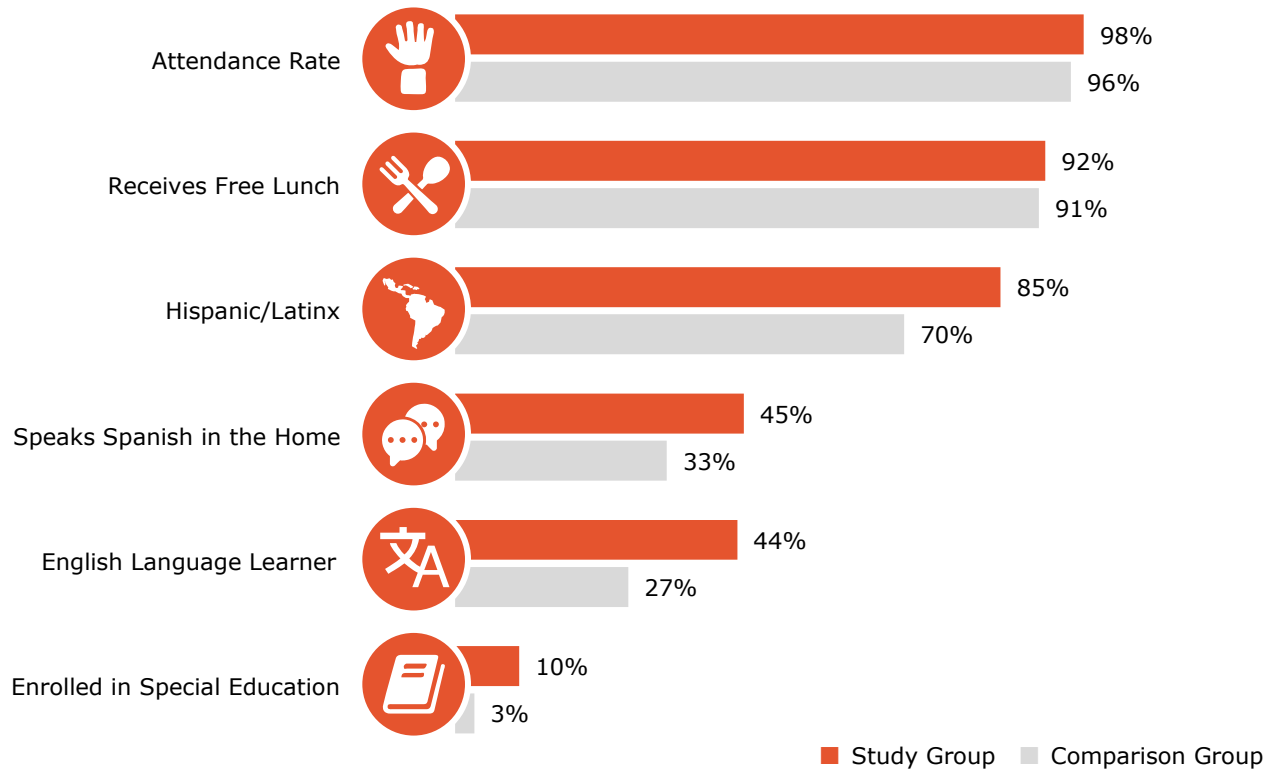
Administered to all public-school students in California in grades 3-8, and 11, the CAASPP is intended to measure how well students are mastering Common Core standards for English Language Arts/Literacy and Math. The CAASPP assesses students' ability

¹¹ Along with the consent form used for the overall SRL study, parents were also asked to give their consent for the release of their child's academic information.

¹² See the Methods appendix for a complete list of the data and variables shared by the partner school districts.

¹³ California Department of Education. (2018). California Basic Educational Data System & Special Education Division. Data analysis conducted by the Lucille Packard Foundation. Data available at [kidsdata.org](https://www.kidsdata.org), a program of the Lucille Packard Foundation for Children's Health: <https://www.kidsdata.org/topic/95/special-needs-education-enrollment/Bar#fmt=1146&loc=357,2&tf=108&sort=loc>

Exhibit 4. Unweighted Demographics of Study and Comparison Students



To address these demographic differences, our subsequent analysis rebalances the data by statistically weighting key characteristics. These weights address two main issues: any sample differences caused by certain families dropping out of the study for each year of the Parent Interview (attrition weights), and the demographic differences between the study group and comparison group (calibration weights). Unless otherwise noted, all the statistical models and results presented in this and the following chapter are weighed.¹⁴

Student Performance and Progress

Like most standardized tests, the California Assessment of Student Performance and Progress (CAASPP) is a key measure of how well a student is performing in school, and whether they are mastering the concepts they are learning in the classroom. Although standardized tests do not measure educational quality or a student’s intelligence, students, parents, and schools can leverage test results to benchmark student performance and assess which students might need additional support. This section of the report provides an overview of how to interpret CAASPP results and compare results of the SRL study children to those of the comparison group as well as Fresno County and California overall.

The CAASPP is comprised of two subsections — English Language Arts and mathematics. A child’s score on these two sections is combined to create a total composite score of student performance and progress. For third grade students, this score ranges from 2,114 to 2,623. To help parents and students interpret the

¹⁴ More information about our statistical weights can be found in the Methods appendix of this report.

score, there are four levels, indicating if a child has met the standard or needs additional support (Exhibit 5).

Exhibit 5. CAASPP Score Achievement Levels 2018-19¹⁵

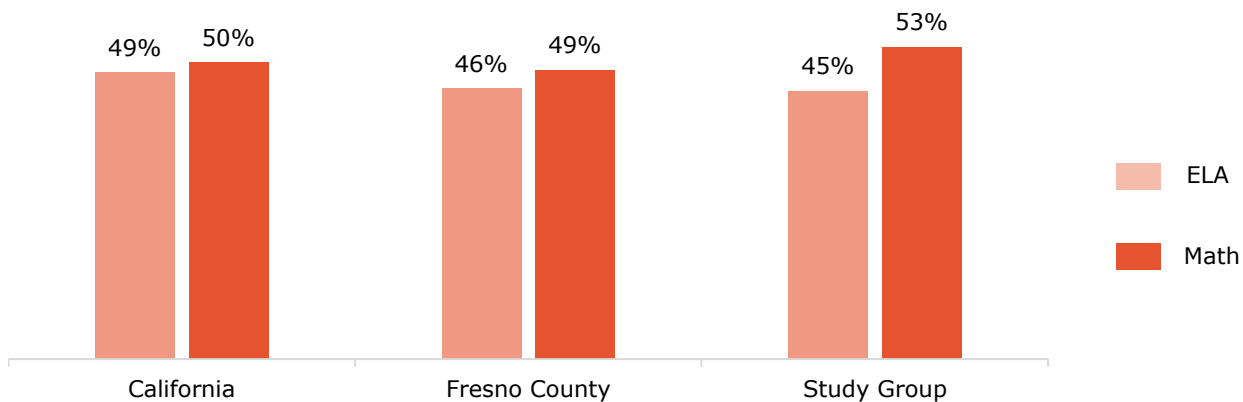
Level 1 Standard Not Met	Level 2 Standard Nearly Met	Level 3 Standard Met	Level 4 Standard Exceeded
<2,381	2,381-2,435	2,436-2,500	>2,500
The student has not met the achievement standard and needs substantial improvement to demonstrate the knowledge and skills for likely success in future coursework.	The student has nearly met the achievement standard and may require further development to demonstrate the knowledge and skills needed for likely success in future coursework.	The student has met the achievement standard and demonstrates the knowledge and skills needed for likely success in future coursework.	The student has exceeded the achievement standard and demonstrates advanced progress toward mastery of the knowledge and skills needed for likely success in future coursework.

For purposes of comparing overall SRL study children CAASPP scores with the comparison group, we have kept this scale as-is (e.g., Exhibit 6, below). However, for our inferential analysis of outcomes—which involves assessments of both practical and statistical significance—we have collapsed these four levels into two: “standard not met” if the student’s score is a Level 1 or 2, and “standard met” if the student’s score is Level 3 or 4. While this is not how CAASPP test scores are typically reported, this collapse into “not met”/“met” was preferred in order to give the analysis results a more qualitative interpretation.¹⁶

Children in the study group have comparable third grade test results to children in the state and county.

Children from our SRL study group showed CAASPP score levels roughly in line with other students from across Fresno County and the state of California, outperforming their peers in meeting the Math standard and meeting the ELA standard somewhat less frequently.

Exhibit 6. Percent Met the CAASPP Standards – State and County Comparison

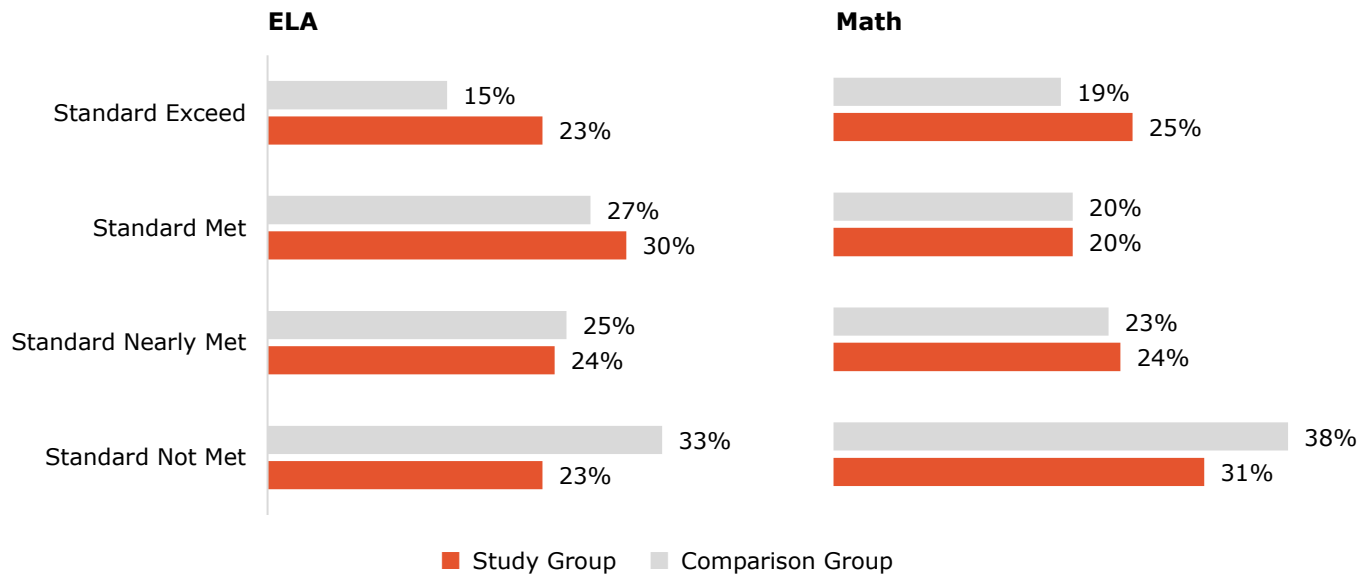


¹⁵ The range of CAASPP scale scores and achievement levels were the same in 2017-18. For more information, visit <http://www.smarterbalanced.org/assessments/scores/>

¹⁶ More information about the statistical model and the limitations of a dichotomous dependent variable can be found in the Methods appendix of this report.

However, comparing the CAASPP test score results of SRL study group children to those of the FUSD comparison group, we observed clear differences in performance. A greater proportion of study children exceeded both the ELA and Math standard.

Exhibit 7. CAASPP Achievement for Study and Comparison Group Children



Study children were more likely to meet the third-grade standards than comparison group children.

Although these frequencies suggest the SRL study group outperforms the local comparison group, only the results of inferential statistical modelling can assess if these differences are statistically significant, and control for other factors that might also influence CAASPP results.¹⁷ For each of these alternate factors, the statistical model calculated an odds ratio—essentially an estimate of that variable’s unique influence on the outcome. Those odds ratios that meet a particular threshold of statistical significance¹⁸ are then considered reliable predictors of differences in test score levels.

The results of this statistical analysis suggest that study group children are more likely to meet both the ELA and Math standards than their non-study counterparts.¹⁹ The exact odds ratios for each variable included in our analysis are detailed below:

¹⁷ Using logistic regression modeling to control for demographic factors, including receiving a free school lunch, English Language Learner status, and enrollment in special education enabled our team to assess the likelihood of meeting the CAASPP standard, and also assess how these control variables may offer their own unique predictive power over outcomes.

¹⁸ The statistical significance assessments give an added degree of certainty that the patterns we observe related to that variable are less likely to be the result of chance, coincidence, or variability in our data.

¹⁹ Note that the odds ratios referenced above do not directly correspond with the frequencies reported in Exhibit 7. The bivariate crosstabs reported in Exhibit 7 show the simple *proportion* of children who met the CAASPP standards by certain categories, while the odds ratios report the *relative chance* a child meets the CAASPP standard after controlling for certain predictive factors.



Children who participated in the SRL study were almost twice as likely (1.6) to pass the ELA standard, and nearly three times more likely (2.5) to meet the Math standard than children in the comparison group.



Children who receive a free lunch at school were less than half as likely to meet the ELA (0.4) and Math standard (0.4) than children who did not receive a free lunch.



English Language Learners (ELLs) were one-third as likely to meet the ELA standard (0.3) and half as likely (0.5) to meet the Math standard than children who were not ELLs.



Children who were enrolled in special education were less than one tenth as likely to meet the ELA standard (<0.1) and the Math standard (<0.1) than children not enrolled in special education.

Although these findings confirm a higher level of academic achievement among children in the study whose families received F5FC-funded services, they also highlight the weight and importance of demographic and socioeconomic factors in predicting the ability to meet CAASPP's language and math standards.

In addition, while results from the statistical analysis provide clear evidence of the differences between the academic performance of the SRL study group and the comparison group, this does not definitively link the cause of these differences to early childhood activities. This statistical analysis cannot rule out the impact unobserved variables might have on CAASPP outcomes, such as any additional support study group children might receive, or even participation in this study. To uncover other factors—beyond participation in the SRL study and demographic characteristics—driving differences in school performance, the subsequent chapter pursues additional in-depth analyses using the Parent Interview data collected on SRL study children. ⊕

Findings from the analysis show that SRL study children are almost twice as likely to meet the ELA standard and nearly three times as likely to meet the Math standard.



Predictors of Academic Success

The previous chapter used school district data from a comparison group to assess which factors may relate to long-term school performance in third grade students. However, given the lack of information the study has on the early childhood practices of this comparison group, the comparison analysis can only do so much to identify early childhood drivers of long-term success. To address this, the following chapter takes a deep dive into the Parent Interview responses and CAASPP scores of children who participated in all six years of the SRL study (n=180 or 35% of the original study sample). Using the wealth of information parents shared about their home-based parent-child activities and their child's early childhood experiences, this chapter outlines findings on the third-grade practices and early childhood factors that predict academic success.

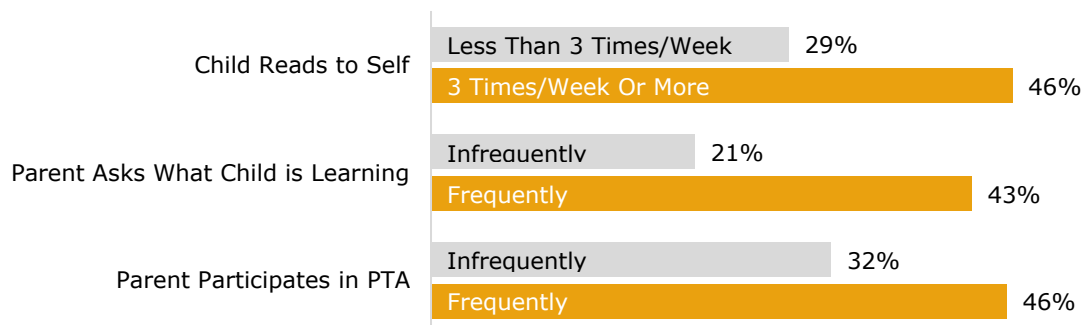
Third Grade Practices

Parents play a crucial role as their children's first teachers, a role which does not end once a child is enrolled in school. As a child becomes older, parents promote their children's interest in school by creating an at-home learning environment and by being engaged in what is happening in the classroom. The following section looks at Parent Interview responses from the year a child was enrolled in the third grade and provides strong evidence to suggest that parent engagement and home literacy promote higher CAASPP scores.

Parent engagement helps improve a child's academic performance.

A frequency comparison of children who met and did not meet the CAASPP ELA standard in the third grade shows that a higher proportion of children who engaged, or whose parents engaged, in beneficial third grade activities met the ELA standard. As Exhibit 8 details, 46% of the children who read to themselves three times per week or more met the CAASPP ELA standard versus only 29% of the children who read to themselves less than 3 times per week. Similarly, 43% of the children whose parents frequently ask what they are learning at school and almost half (46%) of the children whose parents reported participating in the Parent-Teacher Association (PTA) met the ELA standard.

Exhibit 8. Percent of Children Who Met the CAASPP ELA Standard, by Third Grade Practices



Why only one set of scores?

This chapter presents statistically significant results ($p < 0.1$) and focuses on the factors that relate to meeting either the ELA or Math standard. Based on the results of our analysis, the section on third-grade practices only discusses the ELA standard and the section on early childhood practices discusses Math. This simplifies the findings presented in each chart and allows us to cover each standard in greater detail. A discussion of both standards and how they relate to school readiness can be found in the Summary Recommendations chapter of this report.

Although these three third grade practices are associated with a child's test performance, only the results of statistical modelling can isolate the impact these factors have on a child's school performance by controlling for demographic factors that could also influence how a child performs academically.

Using a regression model which controls for various demographic characteristics,²⁰ we found additional evidence to suggest that parent engagement in the third grade increases the *likelihood* a child meets the ELA standard.



Children who read to themselves more than 3 times per week are approximately **2X more likely** to meet the ELA standard than children who read to themselves less



Children whose parents frequently ask what their class is learning are nearly **3X more likely** to meet the ELA standard than children whose parents infrequently ask



Children whose parents participate in PTA are almost **2X more likely** to meet the ELA standard than those whose parents do not

These findings underline the important role parents play in their child's academic success and align with early childhood research on *parent-child practices*, such as parent-child discussion, and *parent-school practices*, such as Parent Teacher Organization involvement. Although both forms of parent involvement impact a child's school performance in different ways, multiple studies have found that engaging in these practices can influence a child's attitudes and behaviors toward school, and thus impact academic achievement. In a 2014 study, sociologist Dr. Ralph McNeal emphasized that, by asking a child about what they learned at school, a parent "conveys the message that 'school is important to me and I want it to be important to you too."²¹

Promoting home literacy increases the likelihood of a child's academic success.

Research has shown that home literacy and reading practices directly influence a child's academic performance by shaping their early language and literacy skills. This continues as a child matures and reading becomes the main way a child learns in the classroom. A 2010 study conducted by the Annie E. Casey Foundation acknowledges that literacy challenges can become a bottleneck for students from the fourth grade onward when most curriculums transition from *learning to read* to *reading to learn*.²²

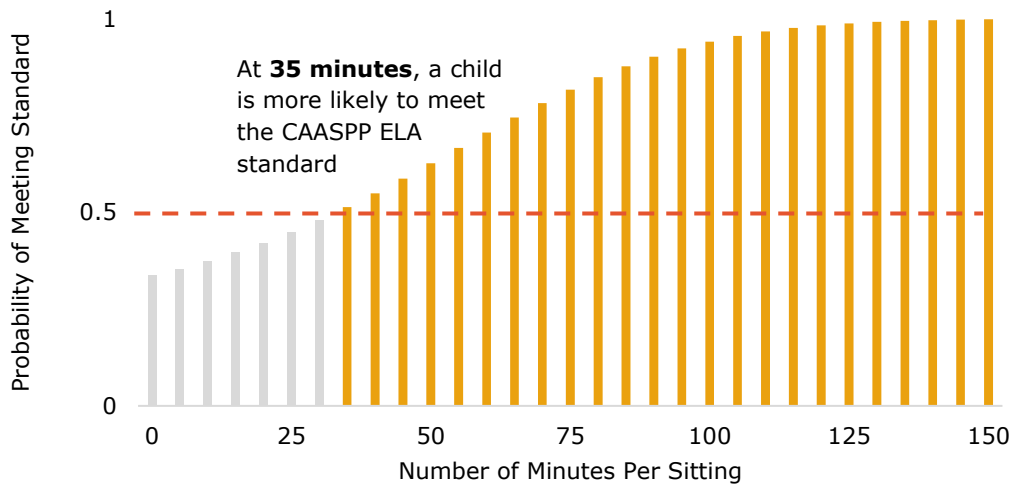
²⁰ Demographic factors included as covariates in our logistic regression model were socio-economic status, English Language Learner (ELL) status, special education designation, and gender.

²¹ Ralph B. McNeal Jr. (2014). Parent Involvement, Academic Achievement and the Role of Student Attitudes and Behaviors as Mediators. *Universal Journal of Educational Research* 2(8), 564 – 576. Available at: <https://files.eric.ed.gov/fulltext/EJ1053945.pdf>

²² The Annie E. Casey Foundation. (2010). *Early Warning! Why Reading by the End of Third Grade Matters: A KIDS COUNT Special Report on the Importance of Reading by 3rd Grade*. Available at:

As detailed in Exhibit 9, the likelihood a child meets the CAASPP ELA standard is higher for children who spend more time reading to themselves per sitting. Using a statistical model, we found evidence that children who read 35 minutes per sitting were 50% more likely to meet the standard. Although promising, data collected from Parent Interview shows that study group children only spend an average of 27 minutes per sitting reading to themselves. This gap shows that more can be done to encourage families and children to spend time reading.

Exhibit 9. Minutes Spent Reading to Self and Likelihood of Meeting the CAASPP ELA Standard



The number of books a child has available in their home also influences their literacy habits, and studies have linked the number of books in the home to school readiness.²³ The SRL study’s own findings support this, presenting strong evidence that more books in the home is associated with a higher likelihood of meeting the ELA standard.

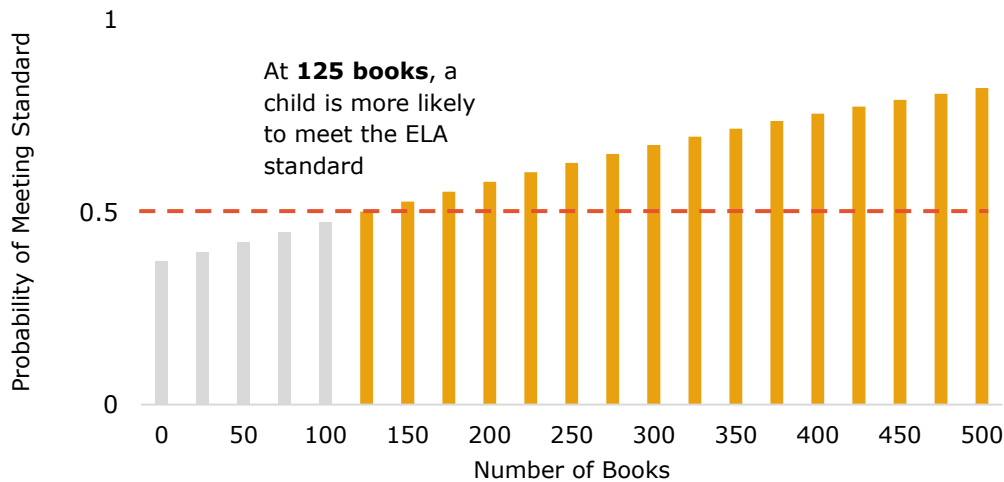
Exhibit 10, below, shows that families with more than 125 children’s books were 50% more likely to meet the standard. Comparing this to the average number of books²⁴ reported by our study group (67 books), these results indicate that there is also an opportunity to support families and promote greater at-home literacy. This point, as well as other recommendations about supporting enriching learning environments, is further discussed in the Recommendations section.

<https://www.aecf.org/resources/early-warning-why-reading-by-the-end-of-third-grade-matters/>

²³ The Urban Institute. (2014). *More Books at Home Linked to Higher Reading Scores*. Available at: <http://www.urbanchildinstitute.org/articles/updates/more-books-at-home-linked-to-higher-reading-scores>

²⁴ This Parent Interview question included library books and any books their child might share with siblings to the total count of books in the home

Exhibit 10. Number of Books in the Home and Likelihood of Meeting the CAASPP ELA standard



Early Childhood Practices

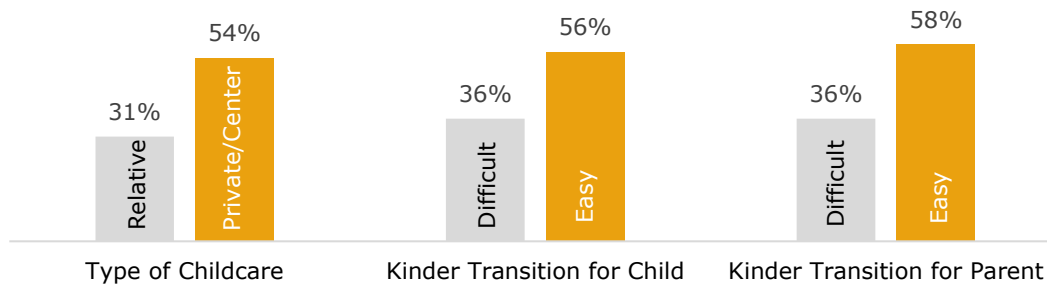
First 5 Fresno County’s work centers around the first five years of life because these early years play a crucial role in ensuring children have a strong foundation to reach their full potential. To align with F5FC’s work in early childhood development and honor the SRL study’s intention of linking early childhood experiences to longer-term outcomes, this section explores the relationship between the early childhood experiences of SRL study children, as detailed in Year 1 of the Parent Interview, their kindergarten readiness assessments,²⁵ and their long-term academic performance.

Childcare setting and kindergarten readiness both influence a child’s academic performance later in life.

As with third grade at-home experiences, we found strong evidence that early childhood experiences have a long-lasting impact on the academic performance of SRL study children. Exhibit 11 illustrates how a higher proportion of children with positive early childhood experiences met the CAASPP Math standard.

²⁵ Although there are various kindergarten readiness tools currently used statewide, the Kindergarten Student Entrance Profile (KSEP) was the primary instrument used in Fresno County and by our partner school districts during Year 3 of the SRL study, when most of the children were in kindergarten. The KSEP is a 13-item screening tool designed to assess a child’s school readiness through observational ratings of six social-emotional and seven school-ready knowledge items. More information about the KSEP can be accessed at the Fresno County Superintendent of Schools website: <https://www.fcoe.org/ksep>

Exhibit 11. Percent of Study Group Children Who Met the CAASPP Math Standard, by Early Childhood Experiences



Specifically, 54% of the children who received either private or center-based childcare met the CAASPP Math standard, compared to only one in three of the children who received care from a relative. Additionally, as a part of Parent Interview, parents were asked how difficult the transition to kindergarten was for them and their child: we see that over half (56% and 58%) with easy transitions met the CAASPP Math standard.

As was previously explained in the third-grade practices chapter, a crosstab comparison of two variables cannot control for other factors that might also impact the outcome of interest (in this case, performance on the CAASPP). To account for other factors, our analysis used a statistical model to further assess the relationship between the above early childhood experiences and CAASPP outcomes. Controlling for demographic characteristics, the regression model found strong evidence that early childhood practices were associated with a child’s long-term academic performance.



Children who attend either private or center-based care are **4X more likely** to meet the math standard than children who receive care from a relative



Children who had an easy kinder transition are nearly **3X more likely** to meet the math standard than children who had a difficult transition



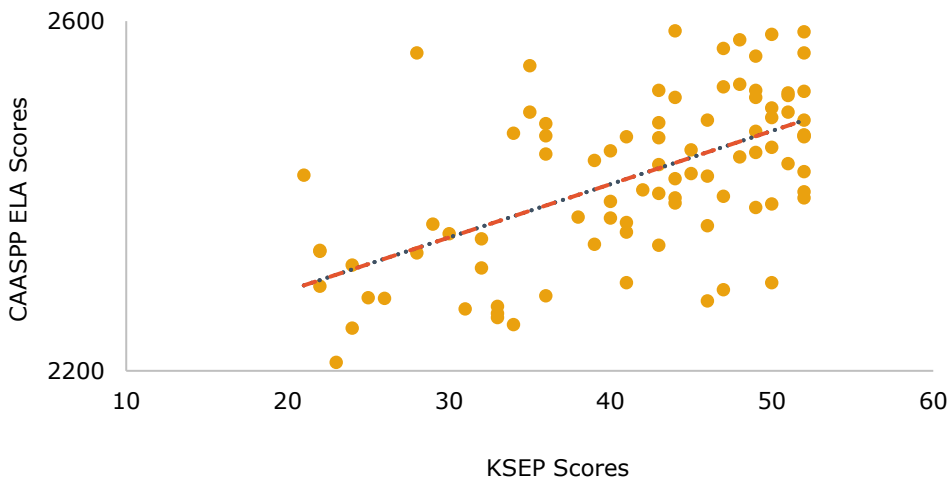
Children whose *parents* reported having an easy kinder transition are almost **3X more likely** to meet the math standard than children whose parents reported a difficult transition

A child’s readiness to enter cap continues to impact their academic performance for years to come.

The above analysis already indicates that early childhood experiences are correlated with a child’s school readiness and academic performance. To further emphasize the important role early childhood plays in setting children up for success, our analysis of early childhood predictors also delved into the relationship between kindergarten readiness and standardized test performance in the third grade.

Exhibit 12 looks at the relationship between a child’s score on their Kindergarten Student Entrance Profile (KSEP) and their overall CAASPP score, which is derived from their performance on the ELA and Math sections. The overall incline of the line in this exhibit shows a strong positive relationship between these two assessments – high KSEP scores in kindergarten correlate to high CAASPP scores in the third grade. More concretely, children who were “ready to go” in kindergarten also appear to “exceed the standard” for the CAASPP.

Exhibit 12. Relationship between KSEP and CAASPP performance



Statistical analysis quantified the relationship between these two assessments, and found that children whose KSEP results were categorized as “quarterly monitor” or “ready to go” were over 7 times more likely to meet the CAASPP ELA standard and over 4 times more likely to meet the CAASPP Math standard.²⁶

²⁶ KSEP results are reported under one of four categories – “immediate follow up” for children who are not yet emerging on a majority of school readiness items; “monthly monitor” for children rated mostly emerging and almost mastered; “quarterly monitor” for children mastering fewer than 8 school readiness items; and “ready to go” for children mastering 8 or more school readiness items.

Children are:

7X more likely to pass the ELA standard if they master the KSEP school readiness items



4X more likely to meet the math standard if they master the KSEP school readiness items



The KSEP asks teachers to assess a child’s kindergarten readiness using 13 socio-emotional and school-ready knowledge items. To determine which of these 13 items relate to a child’s long-run academic success, we concluded analysis by taking a deep dive into all KSEP items. This revealed that a child’s mastery of various KSEP items directly correlates to their likelihood of meeting the CAASPP ELA and Math standards. This was especially true for all six of the socio-emotional items. The table below summarizes these findings for the results that met the threshold of statistical significance.

Exhibit 13. Relationships between KSEP Items and CAASPP Performance

Socio-Emotional Item Mastered	Findings	
	ELA Standard	Math Standard
Is enthusiastic and curious about school	29X more likely to meet	7X more likely to meet
Persists with tasks after experiencing difficulty	15X more likely to meet	8X more likely to meet
Maintains attention to tasks	15X more likely to meet	8X more likely to meet
Exhibits impulse control and self-regulation	13X more likely to meet	10X more likely to meet
Seeks adult help when appropriate	5X more likely to meet	-
Engages in cooperative play activities with peers	4X more likely to meet	-

School Readiness Item Mastered	Findings	
	ELA Standard	Math Standard
Demonstrates expressive verbal abilities	12X more likely to meet	4X more likely to meet
Writes own name	7X more likely to meet	-
Names upper case alphabet letters	5X more likely to meet	5X more likely to meet
Understands that numbers represent quantity	4X more likely to meet	-

The findings in this chapter provide compelling evidence for the importance of early childhood education and how it can shape a child's academic success later in life.

This evidence aligns with the findings of other education studies in the field showing that academic success is not so much influenced by what a child learns in their current grade, but by what they learned in years prior. These challenges can be difficult to surmount, as evidenced by a Yale University study that found that three quarters of students who are poor readers in the third grade remained poor readers in high school.²⁷ Other studies have even shown that a child's academic performance stabilizes and is unlikely to change after early elementary school.²⁸ Early childhood investment, therefore, can play a profound role in setting up students for success.

The following chapter continues to discuss the implications of these findings and puts forth recommendations for early childhood funders like F5FC. #



²⁷ U.S. Department of Education. (1999). *Start Early, Finish Strong: How to Help Every Child Become a Reader*. Available at: <https://www2.ed.gov/pubs/startearly/index.html>

²⁸ Pedersen E, Faucher TA, Eaton WW. (1978). A new perspective on the effects of first-grade teachers on children's subsequent adult status. *Harvard Educational Review*, 48(1), 1-31. Available at: <https://doi.org/10.17763/haer.48.1.t6612555444420vg>

Summary

Recommendations

Below, we put forward three broad recommendations based on the findings from the SRL to suggest actionable steps F5FC can take to make use of these findings over its 2020-2025 strategic plan cycle. These recommendations are framed with the following considerations in mind:

- How do the current findings build on previous research, including previous SRL study findings, other evaluations of F5FC's work, and the academic literature?
- Given that this study primarily involved quantitative data and interviews with parents, what other considerations that cannot be quantified or accounted for by the study – for example, local or historical context, systemic barriers, etc. – help frame the findings, and how can we connect these findings to conditions beyond the home environment and to the local and county conditions?
- In keeping with F5FC's shift to a systems focus – moving beyond individual behaviors to community and county-level factors – how can F5FC use these research findings to effect change beyond individual behaviors and the provision of direct services?

I. Create opportunities to ensure that young children have access to enriching learning environments, both in and outside the home.

Our analysis found that children who attended private or center-based early care were more likely to meet the third grade CAASP Math standards than children cared for by relatives. However, the application of this finding requires F5FC to consider other important factors. For example, Fresno County's *Preconception to Age 5 Blueprint for Funding and Advocacy*²⁹ noted two challenges to private or center-based care: *access* and *trust*.

Access to high quality childcare and education was the most frequently cited challenge facing Fresno County families. *All* parents that participated in *Blueprint* focus groups cited this issue as a key concern. While our findings in the current study may suggest that more parents should enroll their children in private or center-based care, factors such as location, cost, and hours of operation may make this impractical for many parents.

Even in situations where access may not be an issue, use of private or center-based care may be undesirable to many parents. *Half* of the parents who participated in *Blueprint* focus groups said they mistrusted non-relative caregivers. Many parents prefer to place their children in the care of relatives for cultural or safety reasons, and households that are multi-generational or multi-family may already provide a trusting, culturally relevant, and cost-free environment for children.



²⁹ First 5 Fresno County. (2019). *Preconception to Age 5 Blueprint for Funding and Advocacy*. Available at: <https://www.first5fresno.org/wp-content/uploads/2019/03/Final-Findings-Report-Blueprint-Comm-Engagement-Updated.pdf>

To address these issues, F5FC should embrace the concept of creating an enriching community or environment for children, whether they are cared for in the home or outside of it, or by professional childcare workers or their family members. Such an environment should provide parents with multiple, high-quality options for childcare *regardless of setting*.

Ideally, private or center-based care providers should be vetted, qualified, and well-paid; they should be available even in low-income and rural communities; and families should be able to place their children in their care regardless of their ability to pay. As a trusted voice in the community, F5FC may be an appropriate stakeholder to provide clear and accurate information about private or center-based care to parents to clarify any potential misconceptions or address misgivings, or to maintain a list of vetted childcare centers that meet parents' logistical and cultural needs. For families that choose to place their children in the care of relatives, their communities should have spaces and events available to the public that can provide a similar level of enrichment as private or center-based care providers do.

Access to enriching opportunities in the community – such as age-appropriate cultural, musical, or educational events; access to open spaces for play; etc. - can also off-set limitations parents may face in their home environment. For example, our study found that as the number of children's books in the home grows, the probability of a child meeting third grade CAASP ELA standards improves dramatically. Community institutions, such as public libraries, can potentially support parents in achieving this goal.

Ensuring Fresno County is an enriching environment for all children will be a complex, long-term undertaking, and require cooperation among parents, childcare providers, community organizations, and county agencies. F5FC is ideally situated to lead or coordinate this effort, especially given its transition to a more intentional focus on systems change.

II. Support culturally responsive methods to deepen connections between parents and their children's schools.

We found that parent engagement in their children's education is important in driving future educational and developmental outcomes. For example, children whose parents frequently ask what their children are learning in school, or whose parents participate in a Parent-Teacher Association (PTA), are more likely to meet the third grade CAASP ELA standard.

Once again, these findings should spark contextual action. Parents should indeed be encouraged to stay informed on their children's education, which requires communicating about it with both their children and their children's teachers. However, the success of this communication is largely predicated on parents' linguistic, educational, and social capital.

In our study, 66% of families primarily spoke Spanish, 45% of parents had less than a high school education, and 75% had household incomes that place them below the federally established poverty level. While valuing education is independent of all these factors, language, educational, and socioeconomic barriers may contribute to a knowledge gap that hinders parents from fully engaging with educators, or from being conversant in discussing school activities with their children. For instance, monolingual Spanish speakers in jobs that do not allow the flexibility to take time off for meetings may find it especially challenging to join a PTA whose proceedings happen exclusively in English. As a result, they may have less insight and influence on their children's education.

Educators and school systems are, therefore, critical in supporting parents to bridge the educational knowledge gap by addressing barriers to participation, such as holding meetings after business hours, providing simultaneous interpretation for Spanish speakers (or speakers of languages other than English), and equipping parents with the tools to converse with their children about the topics they are learning. This does not address root causes in disparities of language, educational attainment, and income, but may help to partially mitigate these factors.

F5FC can contribute to parents' access and ability to engaged in their children's education by taking an integrated approach that promotes parents' skill development while also reducing barriers at the school district level. For example, F5FC could provide technical assistance to local Family Resource Centers to incorporate an educational engagement component into their existing services, while also convening Fresno County school districts to develop culturally and linguistically appropriate PTA or parent-teacher conferencing practices. Regardless of the specific initiatives, the overall goal should be to undo both individual and systemic barriers to engagement.

III. Leverage longitudinal study findings to bolster advocacy efforts around the importance of a child's early years.

Many of our findings on outcomes in year 6 of the study are consistent with findings from year 3 of the study (see *School Readiness Longitudinal Study: Kindergarten Findings*). Indeed, data from the current study aligns with previous research that has shown that the first five years of life — prior to children entering school — are critical in predicting school performance later in life. While this does not discount the importance of learning and development during a child's early school years, it does underscore the need to *maximize children's learning and development before they enter kindergarten*.

Our findings show that maintaining an enriching learning environment in the home and at school throughout grades 1-3 leads to better outcomes in meeting third grade CAASP ELA and Math standards. Nevertheless, by kindergarten, most children were already set on a trajectory that largely determined their third-grade outcomes.

This insight has implications for parents, program providers, F5FC, and decision-makers.

Many parents may think of their children's learning trajectory as beginning with formal schooling in kindergarten, which is typically the domain of professional educators, and may not realize the influence family members and caregivers can have on key developmental milestones since birth. Parents may, therefore, benefit from learning opportunities and resources from the various professionals they interact with during their children's early years — direct service providers, healthcare providers, social workers, county agencies — that can equip them with clear guidance on providing an enriching home environment. But such supports require coordination among various stakeholders, and broad investments in early childhood, areas in which F5FC can play a key role.

At the systems level, F5FC is uniquely positioned to advocate for greater investment in early childhood education, on par with investments in K-12, higher education, and workforce development programs. While investment in these later life stages is critical, investing in the earliest stages of life has an outsized effect on both human and fiscal outcomes. For example, the Heckman curve, a visualization of the return on investment at various life stages, demonstrates that the highest

rate of economic returns comes from the earliest investments in children.³⁰ F5FC and community advocates can use the evidence generated from the SRL study in communications with decision-makers at the county and state level.

Considerations

Throughout the course of the SRL study's 6-year span, F5FC, its partners, and Fresno County residents have generated a large volume of data on early childhood conditions and outcomes, resulting in numerous reports and briefs. As the holder of this information, F5FC can serve to translate findings into clear and actionable guidance, and to identify which data is most relevant to various stakeholders.

Over the next five years, as outlined in the *2020-2025 Strategic Plan*,³¹ F5FC is shifting its efforts to a focus on systems. This will require addressing stakeholders beyond children and families, including childcare providers, community organizations, F5FC itself, and other county agencies. It requires thinking about conditions for early learning and development not only at the household level, but also at the community and county level, which is now a core element of F5FC's vision.

In the three preceding recommendations, we have modeled an approach we recommend F5FC adopt in future work: to clearly highlight how the same data can be applied by multiple stakeholders, and to identify which stakeholders bear primary responsibility or agency to effect change. For example, F5FC can ask itself the following questions when interpreting research findings:

1. What methods did the study use, and what can the findings from those methods tell us? Where should we seek additional **context to make better sense of the findings**?
 - a. For quantitative data (e.g. counts of children and families served, surveys where responses are reported on a scale, etc.), are there qualitative considerations (cultural preferences, systemic barriers, etc.) that may influence how findings are operationalized?

For example, the study found that the number of books in a child's home is related to school outcomes; however, the quality of those books, and whether they are developmentally appropriate, is likely to be important, too.
 - b. For qualitative data, how prevalent is the phenomenon shown in the findings, and what level of response is warranted?

For example, we cite previous findings that many parents mistrust private or center-based childcare, and substantiate this sentiment by noting that half of the study participants expressed this sentiment.
2. Based on the research, what **concrete behaviors** can parents and families adopt to better support their children's early learning and development?

³⁰ The Heckman Equation. (2017). *The Heckman Curve*. Available at: <https://heckmanequation.org/resource/the-heckman-curve/>

³¹ First 5 Fresno County. (2019). *First 5 Fresno County 2020-2025 Strategic Plan*. Available at: <https://www.first5fresno.org/wp-content/uploads/2019/07/First-5-Fresno-County-2020-2025-Strategic-Plan-FINAL.pdf>

- a. What barriers prevent them from doing so, or make adoption of such changes unappealing – i.e., access, cultural relevance, existing assets they possess that provide other advantages, etc.
 - b. How can other stakeholders help promote parents’ and families’ ability to adopt behaviors that promote positive child development?
3. How can the research **inform best practices** for professional childcare providers?
- a. Do professional childcare providers have the resources and training they need to provide the type of high-quality care the research shows is needed?
 - b. Do existing childcare providers deliver care in a way that is accessible and culturally relevant to the populations they serve, based on parents’ and families’ expressed needs through the research?
 - c. How do these learnings translate into at-home settings by non-professional childcare providers (i.e., friends and relatives)?
4. What **gaps or needs does the research reveal** that would suggest areas where community organizations and non-profits can support parents and families?
- a. What resources must be mobilized — by F5FC, other county agencies, foundations, etc. — for community organizations and non-profits to operate effectively?
 - b. What barriers — operational, programmatic, regulatory — must be addressed for community organizations and non-profits to fulfill their missions?
5. How can F5FC or other county agencies use research findings to **advocate for budgetary or policy changes** to promote early childhood education?
- a. What decision-makers have the standing or authority to make such changes?
 - b. What types of data or evidence appeal these decision-makers, and how can F5FC use its existing knowledge base in service of educating decision-makers on the importance of initiatives that promote early childhood development?

F5FC has been steadfast in using evaluation to build an evidence base for how its core investments lead to positive change, show promise, or need to be reconsidered. The SRL study is the capstone to nearly a decade of learning and reflection, and positions F5FC well to enter the 2020-2025 Strategic Plan cycle with the knowledge to take concrete steps toward improving outcomes for the County’s children and families. 📌

Appendix: Methods

The First 5 Fresno County (F5FC) School Readiness Longitudinal (SRL) study used various data sources to assess the relationship between a child's early childhood experiences and their academic outcomes in school. These sources included an annual interview conducted with parents whose families received F5FC-funded services (Parent Interview), as well as standardized test data collected from local school districts. This appendix details how these data sources were collected, analyzed, and used to inform the findings in this report, as well as the study's limitations.

Data Sources

Parent Interview

The Parent Interview was an annual survey conducted over the phone with 509 parents whose families received F5FC-funded services between Fiscal Year 2010-11 and 2013-14. The survey instrument was developed in collaboration with F5FC staff and pulls from various national and statewide surveys, including the Head Start FACES study,³² the Early Childhood Longitudinal Survey Birth and Kindergarten cohorts (ECLS-B and ECLS-K),³³ the National Longitudinal Surveys of Children and Youth (NLSCY),³⁴ and the California Health Interview Survey (CHIS).³⁵ Like these other surveys and studies, the Parent Interview included an extensive series of questions asking parents about their child's home environment, health, and school experiences, as well as demographic information about the child and parents. To align with the development of the study children, the protocol was updated each year to ask age-relevant questions.

To facilitate survey administration and to minimize respondent attrition, Harder+Company took various steps to address respondents' needs and ensure they remained engaged across study years. These steps included:

- **Administer the survey in English or Spanish.** The Parent Interview protocol was developed in English and translated into Spanish by translators familiar with the variety of Spanish dialects spoken in Mexico and Central America. This helped to ensure a high level of survey comprehension and that study parents who identify as dual-language or native Spanish speakers felt comfortable responding to questions.
- **Train bilingual and bicultural data collectors.** To administer the survey to study parents over the phone, Harder+Company used bilingual and bicultural interviewers. Each year, the interviewers participated in a

³² Head Start Family and Child Experiences Survey (FACES). U.S. Department of Health & Human Services, Administration for Children & Families, Office of Planning, Research & Evaluation. Available at: <http://www.acf.hhs.gov/programs/opre/research/project/head-start-family-and-child-experiences-survey-faces>

³³ Early Childhood Longitudinal Survey Birth and Kindergarten cohorts (ECLS-B and ECLS-K). U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. Available at: <https://nces.ed.gov/ecls/birth.asp>

³⁴ National Longitudinal Survey of Children and Youth (NLSCY). Statistics Canada and Human Resources and Skills Development Canada. Available at <http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=4450&lang=en&db=imdb&adm=8&dis=2>

³⁵ California Health Interview Survey (CHIS). Los Angeles, CA: UCLA Center for Health Policy Research. Available at <http://healthpolicy.ucla.edu/chis/design/Pages/questionnairesEnglish.aspx>

Parent Interview Topics

The following list details some of the topics covered by the Parent Interview across the SRL study's six-year history:

- Child, mother, and father demographic characteristics (e.g. ethnicity, labor force participation, educational attainment, income)
- Home educational activities (e.g. reading practices, screen time, internet access, parent-child activities, summer activities)
- Early childhood education (e.g. type of daycare, preschool, pre-kindergarten, or Head Start experiences)
- K-12 education experiences (e.g. parents' experiences and perceptions of their child's school, parent involvement, homework practices, extracurriculars)
- Health (e.g. last doctor or dentist visit, insurance coverage, eye tests and immunizations)
- Special needs (if applicable) (e.g. diagnosis and services used)

half day training, designed to teach the ethics of gathering confidential data, techniques for addressing participants' questions and/or comments, and a review and practice of the survey.

- **Keep the survey duration to under 45 minutes.** The study instrument was updated every year to include more age-relevant questions to better understand a child's environment and development at the time of the interview. This was done in conjunction with a thorough review of the instrument as a whole, which also identified questions to remove to limit overall survey length to 45 minutes.
- **Coordinate survey administration around parents' schedules.** Interviewers used a tracking database to document each time they outreached to parents. The database included updated contact information given by parents each year they completed the interview, and additional contact information for relatives and friends as another means of tracking participants who were hard to reach. Once in contact with parents, interviewers worked with them to identify the best time and date to complete the interview. Parents were also given the option to cut the interview short at any point and continue the survey at a later date. Outreach typically began in the fall each year (October or November) and ended by February of the following year. This helped give parents ample time to schedule and complete the interview.
- **Provide parents with a financial incentive, increased each year.** The original sample of 509 parent participants was taken from F5FC's internal client tracking database, along with their contact information, information about their child, and services they or their child might have received. During the first interview, parents were asked for their consent to participate in the study, informed that they would be compensated with a \$40 gift card for their time, and that the gift card amount would increase by \$5 each year they participated. This gave parents an incentive to continue with the study for all six years.

A total of 377 families were interviewed as a part of the Year 5 Parent Interview, 74% of the original study sample. Of the 377, 173 families were also interviewed in Year 6 of the study to increase the total number of interviews conducted with parents with children enrolled in third grade. By the final year of the study, a total of 298 parents with third graders completed the Parent Interview.

District Data

Harder+Company partnered with nine Fresno County school districts to collect information on the academic performance of third graders enrolled in the SRL study either in School Year 2017-18 (Year 5 of SRL) or School Year 2018-19 (Year 6 of SRL). These districts include Alvina Elementary, Central Unified, Coalinga-Huron Unified, Firebaugh-Las Deltas Unified, Fowler Unified, Fresno Unified (FUSD), Kings Canyon Joint Unified, Mendota Unified, and Selma Unified.

Of the study children who attended a partner district school, we received district information for a total of 188 students, including performance on both the English Language Arts (ELA) and Math sections of their California Assessment of Student Performance and Progress (CAASPP) test.³⁶ In addition to the CAASPP test scores, the study also requested the following variables from school districts:

³⁶ Two of the 188 students took the California Alternate Assessment (CAA). After weighing, and so were not included in the 180 students used for the Study Group Analysis.

- Parent Education
- Student Attended Preschool
- Student Group(s) (as reported for the California Dashboard)
- Eligible for Free Lunch (Y/N)
- Eligible for Reduced-Price Lunch (Y/N)
- Special Education (Y/N)
- Days Enrolled
- Days Unexcused Absences
- Days Attended
- Number of Suspensions
- Math Retention (Y/N)
- ELA Retention (Y/N)
- End of Year Retention (Y/N)
- ELPAC Date, Overall Score, and Level
- CELDT Date, Scale Score, and Level
- California Alternate Assessment (CAA) Test
 - Test Date
 - ELA Scale Score
 - ELA Level
 - ELA-Reading level: Literary
 - ELA-Reading: Informational (level)
 - ELA-Reading level: Vocabulary (level)
 - ELA-Reading level: Foundation (level)
 - ELA-Writing (level)
 - MATH Scale Score
 - MATH Level
 - MATH-Operations and Algebraic Thinking
 - MATH-Number and Operations in Base Ten (level)
 - MATH-Number and Operations-Fractions (level)
 - MATH-Measurement and Data (level)
 - MATH-Geometry (level)
- Progress Report, (Year's Final)
- Grade Point Average (if applicable)

FUSD shared the same data points for a group of comparison students not involved in the SRL study, in addition to information on the comparison groups' home language, ethnicity, and parent educational attainment to help with statistical weighing.

Exhibit 14. District Comparison Data

	Year 5 (2017-18)	Year 6 (2018-19)
Total Number of Students	5,496	5,878
Number of third graders with Reported CAASPP ELA Scores	5,379	5,759
Number of third graders with Reported CAASPP Math Scores	5,382	5,764

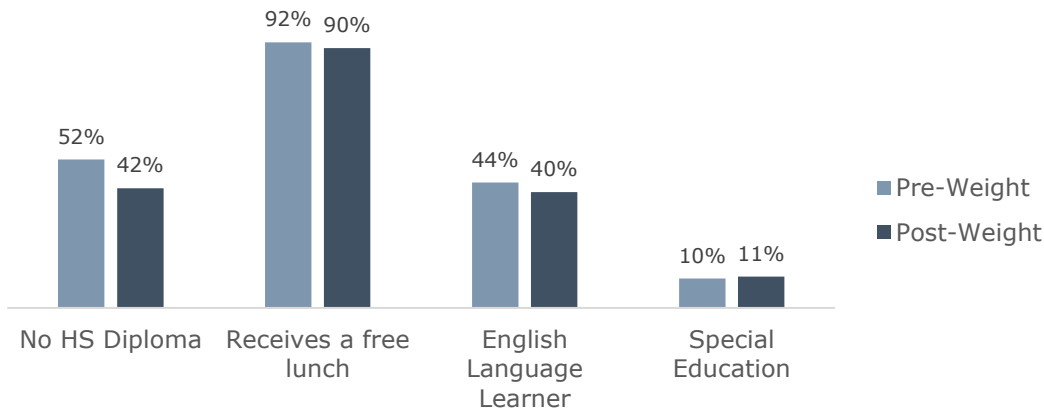
Data Analysis

Statistical Weights

The Harder+Company research team created two statistical weights to facilitate reliable and generalizable analyses: an attrition weight to correct for the changes in our sample caused by small decreases in response rate year over year, and a calibration weight to account for the differences between our study group sample and the comparison group sample we received from FUSD.

For the attrition weight, the research team created a logistic regression model to test which demographic characteristics correlate with the probability of remaining in our study sample through Year 6. These demographic characteristics were taken from the information reported during Year 1 of the Parent Interview and were chosen because of their potential correlation to academic outcomes. These included parents’ educational attainment level, parent labor force participation status, household poverty status, and child ethnicity. The results of this regression indicated that parent educational attainment was negatively correlated with participation in the SRL study, i.e., parents with less than a high school education were more likely to participate in the study through Year 6 than parents who graduated high school or attended college. These statistically significant results³⁷ gave us sufficient evidence to indicate that our final sample needed correction to better match the original study sample. Exhibit 15 below shows how the parent educational attainment-based attrition weight impacted our study sample and corrected the proportions of a handful of demographic characteristics.

Exhibit 15. Study Group Sample Proportions, Pre- and Post-Attrition Weight



We followed a similar process to create statistical weights for the comparison sample we received from FUSD. These calibration weights were used to ensure that the comparison group more closely matched the demographic composition of our study sample, so that the results of the comparison group analysis align with the kinds of families and children F5FC typically serves.

Unlike the study sample, we received data on a small number of demographic characteristics for our comparison sample. Although this was done intentionally to ensure the confidentiality of the children included in the comparison group, this limited the number of demographic characteristics we could use to create a calibration weight. Of the variables available and related to the outcome of interest

³⁷ Statistically significant (p<0.1)

(CAASPP performance), we chose child ethnicity to create a calibration weight and balance the two groups accordingly. This helped increase the weight given to Hispanic/Latinx children in the comparison sample, and the weight of related demographic characteristics, such as English Language Learner status.³⁸

Statistical Models

With study weights in place, the research team also sought to create statistical models that balanced methodological rigor with practical considerations. Following the research design designated at the onset of the study, the research team created multivariate logistic regression models to assess the correlation between study participation and third grade outcomes. Using participation in the study as the binary explanatory variable and meeting either the CAASPP ELA or Math standard as the two binary response variables, our team was able to quantify the independent relationship between these factors and present answers to the study's research questions.

In addition to these variables, the models controlled for factors that were potentially associated with study participation and the outcomes of interest. In the model that compares study group and comparison group outcomes, these control variables included receiving a free school lunch, English Language Learner status, and special education status. In the model that looks at third grade and early childhood predictors, control variables included living below the poverty line, English Language Learner status, gender, and enrollment in special education. Both sets of control variables were explicitly selected based on our understanding of the drivers of academic success and the availability of data. Our research team also tested a range of additional control variables but settled on the final selection to avoid issues with collinearity and overfitting of the model.

The variables included in the third grade and early childhood predictors model were selected through an iterative process based on practical and statistical significance. This included regressing third grade outcomes on all relevant Parent Interview variables related to third grade and early childhood experiences. Only the results that met our significance threshold of a p-values less than 0.1 (90% confidence interval) were considered correlated to third grade outcomes and included in the report.

Limitations

From its onset, the SRL Study was designed as a multi-year, mixed methods study to better inform F5FC's early childhood practices. Although the study abides by several rigorous research design practices, such as the use of well-known and validated measures from prior studies for the Parent Interview and statistical weighing to account for attrition and sampling bias, the final results and recommendations were intended for F5FC and contextualized to Fresno County.

The following limitations should be considered when reviewing the implications and recommendations outlined in this report:

- **Sampling limitations.** As previously noted, the study's original sample of 509 families was extracted from F5FC's client tracking database. This convenience sampling approach limits the generalizability of the study's findings to a greater population and only represents a fraction of the children F5FC served in 2013-14. Additionally, despite extensive tracking and increasing financial incentives, a small percentage of parents were not

³⁸ See Chapter 3 for a breakdown of comparison group and study group demographics.

reachable each year, averaging to a seven percent attrition rate. Our statistical weighing approach helped to ensure that our final sample of 180 families matched the demographic characteristics present at the beginning of the study, but did not correct for any demographic differences between the study sample and the kinds of families F5FC currently serves at the time of this report's publication.

- **Missing data and observations.** Harder+Company worked with data collection interviewers to guarantee all interview questions were answered and entered into a centralized dataset. However, we did not have the same level of quality control over the data we received from partners, which often varied in quality and completeness by district. The research team worked to reduce the chance of loss by creating data entry templates for districts to use, and by outreaching to districts about errors or data inconsistencies. Missing data and observations can limit the ability to conduct statistical analyses and can undermine the amount of variation in a statistical model. Wherever possible, we opted to using variables with complete data to avoid such issues.
- **Survey limitations.** Interview-based surveys carry a number of strengths, including potential for customization and adaptation, and ease of administration, but the data they produce face various limitations. For example, surveys rely on respondents to self-report their behaviors, practices, or opinions. Although the Parent Interview interviewers used IRB-approved consent scripts to assure respondents that there were no "right or wrong" responses, respondents might have been influenced by a social desirability to provide better or more socially acceptable responses and portray themselves in a better light. Surveys also rely on a participant's memory, often asking them to reflect on something that occurred in the past. Poor memory can thus alter a respondent's answers, as can selective recall bias where a respondent only remembers more favorable or more memorable events.
- **Logistical regression model and a dichotomous dependent variable.** As was previously explained, the research team chose to build both our comparison and study group analyses around a dichotomous dependent variable: whether or not students met the CAASPP standard. Although sometimes criticized for its non-linear results, we chose a multivariate regression model with binary dependent variables to facilitate the interpretation of the model's findings by a wide audience of readers. Our research team also explored the possibility of conducting analysis on the CAASPP scale score and CAASPP levels but found that the results of these models were more difficult to interpret for a general audience, and more challenging to derive actionable recommendations from. +

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