School Readiness and Student Achievement
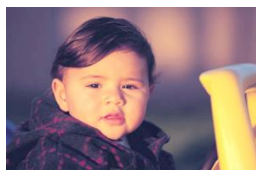
A Longitudinal Analysis of Santa Clara and San Mateo County Students

December, 2010

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Executive Summary

Background

In late 2000, Applied Survey Research (ASR) was commissioned by the Peninsula Community Foundation to develop research materials and a protocol to conduct assessments of students' levels of readiness for school. The project resulted in the creation of a new tool to measure school readiness, called the *Kindergarten Observation Form (KOF)*, which balanced and met two (sometimes competing) needs: (1) the need for a high-quality, valid, and reliable instrument to measure readiness levels; and (2) the need for a tool that was simultaneously "teacher-friendly" and sensitive to the measurement challenges inherent in a typical kindergarten classroom setting.

The KOF was first implemented in 2001, and since that initial assessment, enhancements to the school readiness assessment tools and method have continued. In collaboration with the Santa Clara County Partnership for School Readiness, in 2004 ASR developed a parent survey and teacher survey to enrich the data collected about children entering school, and in 2006, the *Kindergarten Observation Form II* was developed to provide information about the smoothness of children's transitions into kindergarten.

Analyses of the school readiness assessment data collected with the KOF in different regions and years have consistently found evidence of four primary dimensions of readiness (subsequently named the *Basic Building Blocks* of readiness), including the following:

- *Self-Care & Motor Skills* include those skills needed for taking care of one's basic needs or skills showing fine and gross motor coordination;

- *Self-Regulation* skills include basic emotion regulation and self-control skills that are needed to be able to perform well in the classroom;

- *Social Expression* skills include measures related to children's interactions with others, their ability to express themselves in the classroom context, and their engagement with play and learning; and

- *Kindergarten Academics* skills represent the "nuts and bolts" skills that are more academic in nature and tend to be explicitly taught to children at home, in early care settings, and in kindergarten.

The assessment data have helped communities to better understand what skills children possess, what skills children need greater support in developing, how things are changing over time, and what experiences and practices are associated with greater readiness. In particular, analyses examining predictors of higher readiness levels have repeatedly shown that certain children – e.g., older children, girls, children without special needs – tend to enter school more ready to learn. Other significant predictors have pointed to potential opportunities for enhancing children's readiness levels, e.g., preschool experience and provision of information to parents about school readiness and how to develop their children's skills.

A growing body of research at the national level has begun to examine the relationship between children's readiness for school at kindergarten entry and their later school achievement as well. This work has shown that children's social and cognitive readiness for school acts as a

"springboard" for later success in school. Locally, the Santa Clara County Partnership for School Readiness sponsored ASR's first longitudinal study examining longer-term academic outcomes of San Mateo County students who took part in school readiness assessments in 2001- 2003. In this study, ASR found that children who entered kindergarten with strengths across all readiness domains were the most successful on academic tests at third grade, and, in particular, *Kindergarten Academics* skills were most closely associated with later academic success.

The Current Study

Since the completion of ASR's initial longitudinal study, longer-term school outcome data had become available for two additional cohorts of students who participated in school readiness assessments: those who entered kindergarten in fall 2004 (measured in Santa Clara County) and fall 2005 (measured in both Santa Clara and San Mateo counties).

In late 2009, the Santa Clara County Partnership for School Readiness and the Silicon Valley Community Foundation jointly commissioned a second longitudinal study, and plans were initiated to seek cooperation from school districts throughout Santa Clara and San Mateo counties to provide data examining associations between students' school readiness levels at kindergarten entry and their longer-term school outcomes. These new data would also provide an opportunity to re-examine the predictive validity of the KOF – this time with a more geographically, demographically, and socio-economically diverse student sample than was available in the previous longitudinal study.

Key Research Questions

The purpose of this report is to improve our understanding of whether and how the readiness levels of students entering kindergarten in Santa Clara and San Mateo counties may relate to their later school success. More specifically, the following research questions are addressed in the sections that follow:

- What child, family, and school readiness factors were linked to third grade academic outcomes? Were these associations similar for different kinds of students?

- What academic paths were taken by the most and least ready kindergarteners? For students who took a different path than would be suggested by their readiness levels at kindergarten, how were they different from their peers?

- Were the groups of students who were less ready for school at kindergarten able to close the gap by third grade?

- Were school readiness levels associated with other school outcomes, such as reclassification as fluent in English, school attendance, or retention in kindergarten?

- How did the students in the two counties compare to each other?

Securing and Preparing the Data

The potential sample of students for this longitudinal analysis included participants in readiness assessment studies conducted by ASR in fall 2004 and fall 2005. In 2004, readiness assessments were conducted with kindergarten students in Santa Clara County only, and in 2005, readiness assessments were conducted in both Santa Clara and San Mateo counties. In each of these

readiness assessments, a random sample of schools – and a randomly sampled kindergarten classroom within each school – was drawn from all county elementary schools in order to achieve a student sample that was generalizable to the kindergarten population within each county. In addition to the county-wide sample, each readiness assessment also included some targeted oversampling within key regions of interest – generally lower-performing districts where investments had been made to improve readiness-related outcomes among students. ASR sought participation in this longitudinal study from the ten districts in each county with the largest number of students in the readiness samples (county-wide <u>and</u> oversamples) described above. Thus, it is important to keep in mind that the longitudinal data are not generalizable to student populations at the county- or region-level.

With assistance from the both the San Mateo and Santa Clara County Offices of Education, ASR sought permission to receive de-identified student records from the selected districts in each county. All but one district complied with the data requests. Student records across the two datasets (school readiness data kept by ASR and elementary school data kept by districts) were matched according to student initials, date of birth, gender, and school of kindergarten attendance. (In some cases ASR did the matching, whereas some districts requested that they complete the matching themselves). Across the two counties, of the subset of 2,373 school readiness assessment participants in the 19 districts, 1,543 were matched to district records, resulting in a match rate of 65 percent overall.

Figure A: Summary of Data Preparation Steps and Sample Sizes

Readiness data collected on
2,973 students
in Santa Clara County (2004, 2005) and San Mateo County (2005)

Decision to follow up with the 10 districts in each county with the most students in readiness sample =
2,403 possible records for matching
(1,566 in SCC; 837 in SMC)

Received records from 10 of 10 districts in SCC and
9 of 10 districts in SMC =
2,373 possible records for matching
(1,566 in SCC; 807 in SMC)

Matched 1,543 of the 2,373 records =
65% match rate

Students in the Longitudinal Sample

The longitudinal study sample included students who were demographically and socioeconomically similar to the larger sample of students who participated in readiness assessments in Santa Clara and San Mateo counties in 2004 and 2005. One interesting difference between students in the readiness samples who were able to be matched to district records and those who were not was that the matched sample had higher levels of kindergarten readiness than the original samples. Higher mobility (movement out of the original school district), increased grade retention, or some other factor may have led to a lower match rate for students with lower readiness levels.

Did School Readiness Predict Third Grade Test Scores?

The *Kindergarten Academics* and *Self-Regulation* skills that students possessed at the start of kindergarten strongly predicted their performance on English-Language Arts (ELA) and Mathematics California Standards Tests (CSTs) taken 3 ½ years later. Moreover, the interaction of these two types of readiness skills (as indicated by the *Kindergarten Academics* x *Self-Regulation* bar in the following figure) was a significant predictor of later test scores. This means that the impact of these two readiness domains is not simply additive – certain combinations of skills are associated with much stronger performance on third grade tests. Follow-up investigations of this interaction showed that students who had a combination of strong skills in both *Kindergarten Academics* and *Self-Regulation* were particularly likely to perform well on their third grade tests. Family income and ethnicity also were related to performance on third grade tests.

Figure B: Results of Regression Analysis Predicting Third-Grade Standardized Test Scores in English-Language Arts and Math

Source: *Kindergarten Observation Form* and *Parent Information Form* and individual school district data.

Note: Values for each factor listed above represent standardized beta coefficients that were significant at $p < .05$ and, to establish levels of practical significance as well as statistical significance, greater than or equal to .10. For a full listing of all variables entered into the model, see text. The overall regression model for ELA was highly significant, $F = 33.98$, $p < .001$, explaining 35% of the variance in 3rd grade ELA scores ($R^2 = .36$; Adj. $R^2 = .35$). The overall regression model for Math was highly significant, $F = 27.80$, $p < .001$, explaining 30% of the variance in 3rd grade Math scores ($R^2 = .32$; Adj. R^2

It is noteworthy that some variables that were strong predictors of children's readiness at kindergarten entry in previous studies – e.g., gender, special needs status, age and preschool experience – did not have a separate significant association with third grade tests scores. This suggests that, if these variables have an impact on third grade scores, the impact is either indirect (they may affect the readiness of students, which in turn relates to third grade performance), or it is not large enough to be statistically significant.

Comparisons of the predictive power of school readiness levels across different student groups revealed that readiness levels generally were a <u>stronger</u> predictor of third grade performance for Hispanic/Latino students than for other students. The association between kindergarten readiness levels and third grade ELA test performance was similar for English Learners (EL) and Non-EL students. Kindergarten readiness was a slightly better predictor of Math scores for Non-EL students than for EL students.

The Importance of Having Skills in Both *Kindergarten Academics* and *Self-Regulation*

Follow-up analyses looking at students with different combinations of *Kindergarten Academics* and *Self-Regulation* skills show that it is important to be strong in <u>both</u> of these readiness domains in order to increase a student's likelihood of third grade academic success.[1]

As the next two figures show, students who had strong skills in both *Kindergarten Academics* and *Self-Regulation* as they began school were almost three times more likely to be "Proficient" or "Advanced" on their English-Language Arts CSTs than students who had poor skills in these areas, and they were almost twice as likely to be "Proficient" or "Advanced" on their Math CSTs. Conversely, students with low skill levels in both *Kindergarten Academics* and *Self-Regulation* were more than five times as likely to score at the lowest levels on their English and Math CSTs – "Far Below Basic" or "Below Basic" – as students who had strong skills in both of these areas at kindergarten entry.

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[1] For more specific information displaying the nature of the statistical interaction for CST scores used in the regressions (rather than levels displayed in the following figures), see full report text.

Figure C: Percent of Students Scoring at "Proficient" or "Advanced" on Third Grade ELA and Math Tests, by Readiness Patterns
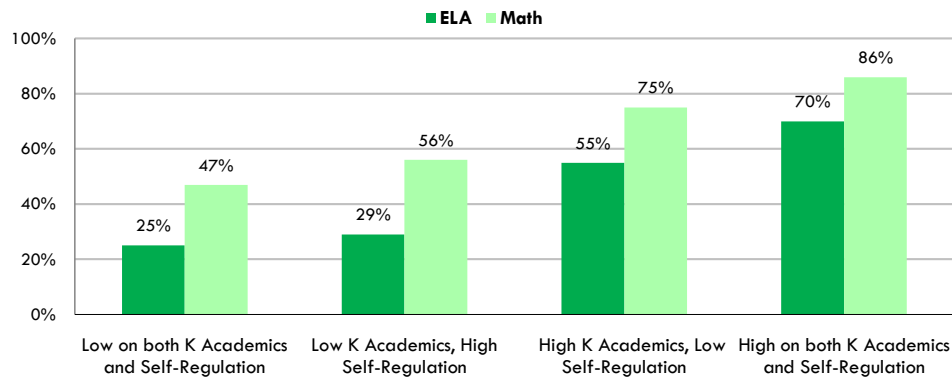
Source: *Kindergarten Observation Form* and individual school district data.

Note: Sample sizes = 367-369, 210-211, 235-236, 514-515, respectively. Students were divided into high and low levels of Kindergarten Academics and Self-Regulation based on whether they were above or below the mean score on each.

Figure D: Percent of Students Scoring at "Far Below Basic" or "Below Basic" on Third Grade ELA and Math Tests, by Readiness Patterns
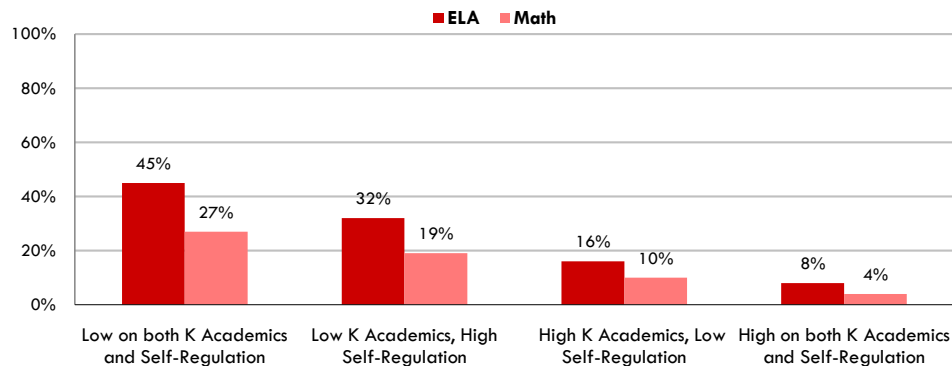
Source: *Kindergarten Observation Form* and individual school district data.

Note: Sample sizes = 367-369, 210-211, 235-236, 514-515, respectively. Students were divided into high and low levels of Kindergarten Academics and Self-Regulation based on whether they were above or below the mean score on each.

Taking a Closer Look at the Academic Paths of the Most and Least Ready Kindergarteners

Ready for School at Kindergarten… But Struggling at Third Grade

According to the regression analysis results, students with strong skills in both *Kindergarten Academics* and *Self-Regulation* were the most likely to be academically successful at third grade. As the following figure shows, of the subset of students with strong skills in *Kindergarten Academics* and *Self-Regulation,* most of these students (68%) were very successful on their third grade tests.

Figure E: Third Grade Outcomes of Kindergarteners Who Were Poised to Succeed When They Began School
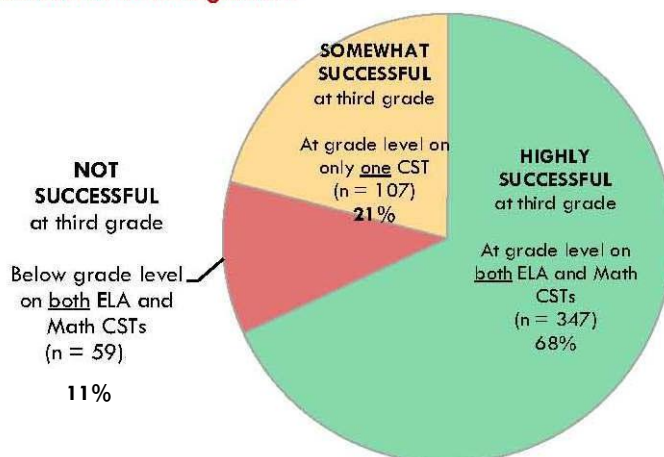
Source: *Kindergarten Observation Form* and individual school district data.

Note: Students were designated as being high on *Kindergarten Academics* and *Self-Regulation* if they scored above the mean score on each readiness domain. An additional three cases were not included in third grade outcome categories because they lacked either ELA or Math CST score data.

However, a small number of the students who were poised to succeed at kindergarten entry were actually struggling at third grade. As the above figure shows, 11 percent of the students who appeared likely to succeed based on their skills at kindergarten were scoring below grade level on both their third grade ELA and Math CSTs. How did these students differ from those who followed a more "expected" academic path, based on their school readiness levels? Comparisons of these students suggested that the fully-ready students who fail to thrive in their early elementary school years were more likely to be:

- Younger than their peers (i.e., a greater percentage turned 5 after September 1 of their kindergarten year);

- English Learners,

- Hispanic/Latino students,

- Students from lower-income families, and

- Students with mothers who had lower education levels.

Looking at their family activities, students who were both poised for success at kindergarten and who were performing at grade level at third grade came from families that were more likely to report daily reading and singing songs and telling stories at kindergarten, as compared with the students who were well-prepared for school but ended up being less academically successful at third grade.

Unprepared at Kindergarten… But Thriving at Third Grade

Another group of students were struggling as they entered kindergarten based on their *Kindergarten Academics* and *Self-Regulation* skills but had "beaten the odds" and were thriving by third grade. As the figure on the following page shows, 28 percent of the students in the sample appeared to be unprepared at kindergarten, based on their readiness levels. Among this group of students, however, some (21% of this subset) had managed to gain ground during their early elementary school years and were achieving at grade level on both ELA and Math CSTs at third grade.

Figure F: Third Grade Outcomes of Kindergarteners Who Were Not Well-Prepared When They Began School

Skills at kindergarten...

Of the 28% of students (n = 371) who were unprepared at kindergarten (students with needs in both *Kindergarten Academics* and *Self-Regulation* skills), where did they end up at third grade?
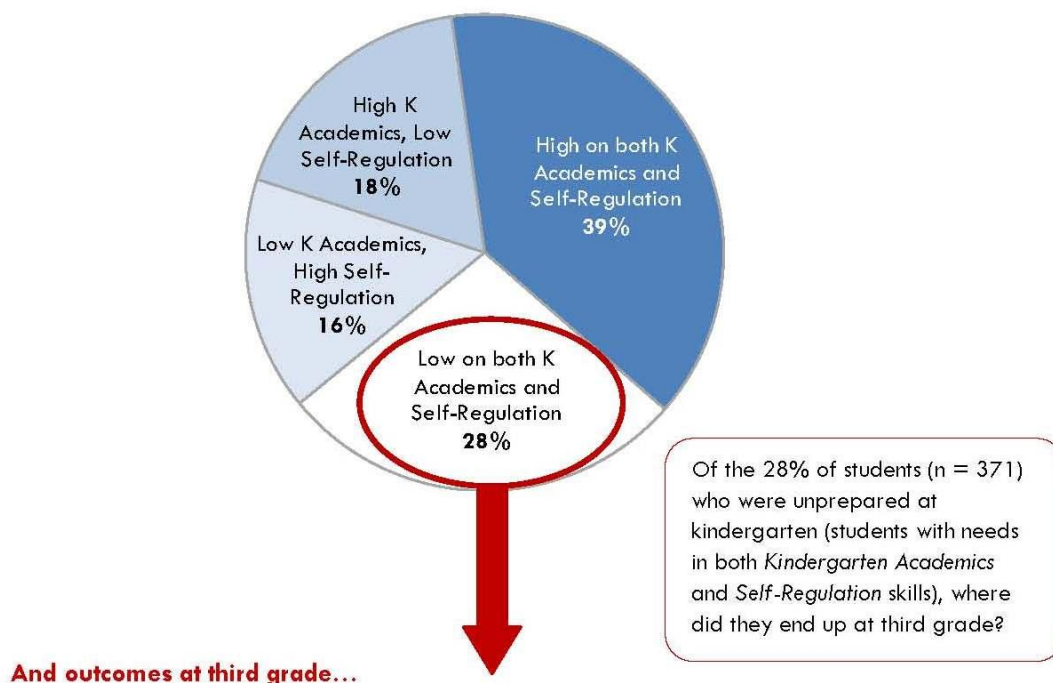
And outcomes at third grade...
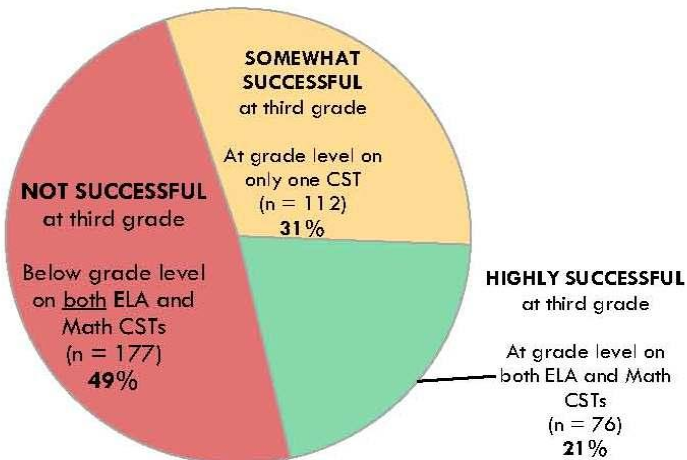
Source: *Kindergarten Observation Form* and individual school district data.

Note: Students were designated as being low on *Kindergarten Academics* and *Self-Regulation* if they scored below the mean score on each readiness domain. An additional six cases were not included in third grade outcome categories because they lacked either ELA or Math CST score data.

Among the students who came into kindergarten relatively unprepared, those who were academically successful and not successful at third grade were again most strongly differentiated by demographic and socioeconomic factors. Asian and Caucasian students were more likely than Hispanic/Latino students to "make up" for low readiness levels and succeed on their third grade tests, as were children from higher-income families and families with higher maternal education levels.

There were fewer young children (turning 5 years old after September 1) among the group that "beat the odds" and achieved academic success than there were in the "Not successful at third grade" or "Somewhat successful at third grade" groups. However, young children were more common in the "Somewhat successful" group than the "Not successful" group.

Surprisingly, trends generally showed that the unprepared kindergarten students who were the most academically successful at third grade were <u>not</u> more likely at kindergarten to have been exposed to many daily activities at home. Perhaps the students who were unprepared at kindergarten and had "beaten the odds" were exposed to especially effective instruction in the years prior to their third grade academic tests.

Were Students Who Were Less Ready for School at Kindergarten Able to Close the Gap by Third Grade?

Several years of readiness assessment data have shown that students from some demographic and socioeconomic backgrounds tend to enter kindergarten with lower readiness levels than their peers. A set of analyses examined how different groups of students progressed between kindergarten and third grade. Were the students who started school with lower readiness levels able to "close the gap" by third grade? Did the gap widen for any groups of students between kindergarten and third grade? These analyses compared the following groups of students:

- Boys and girls;

- Younger and older students;

- Low, middle, and high-income students;

- English Learners and students proficient in English;

- Hispanic/Latino, Asian, and Caucasian students;

- Students with and without preschool experience; and

- Students with different kindergarten *Readiness Portraits*.

Some students who began kindergarten behind their peers in terms of their readiness levels were able to eliminate or shrink the gap by third grade. For example, boys and girls were very similar in their third grade scores (particularly in Math) despite boys being far behind girls when they began school.

The figure that follows reveals that students with different *Readiness Portraits* –that is, with different <u>patterns</u> of readiness strengths and needs at kindergarten entry in the four *Basic Building Blocks* – were much less different from each other at third grade on their English-Language Arts CSTs than they had been at kindergarten entry. However, gaps still persisted at third grade between the most and least ready students. Trends examining students' Math CST scores at third grade were similar to these.

Figure G: **Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade ELA, By Readiness Patterns**
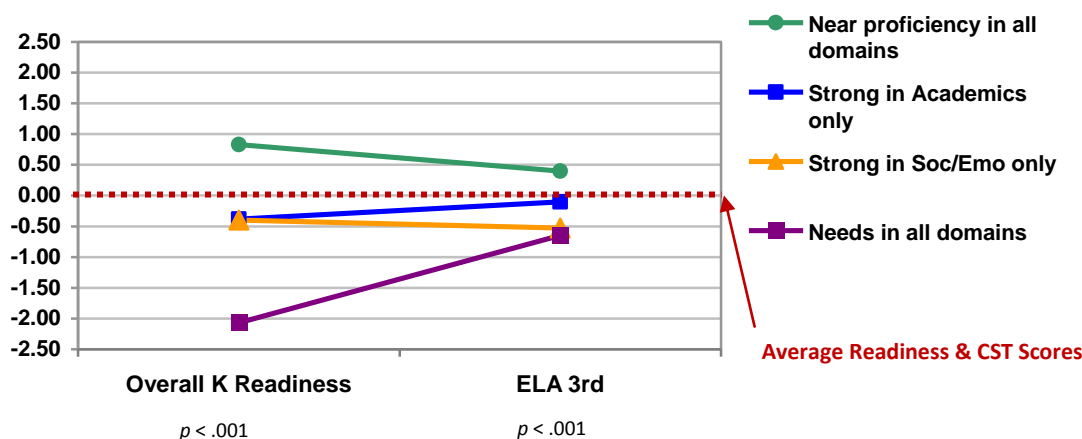
Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on the following sample sizes: 628 "Near proficiency in all," 306 "Strong in Academics," 273 "Strong in Soc/Emo," and 116 "Needs in all." On overall readiness, the "Near Proficiency" group had significantly higher scores than all others; "Strong in Academics" and "Strong in Soc/Emo" were statistically similar, and both had significantly higher scores than the "Needs in all" group. On ELA scores, the "Near Proficiency in all" group had significantly higher scores than all others; "Strong in Academics" had significantly higher scores than the other two groups, and the "Strong in Soc/Emo" and "Needs in all" groups were statistically similar.

Gaps also persisted at third grade between students who had and had not attended preschool. Students who had attended preschool were still performing significantly better than their non-preschooled peers on third grade Math and English-Language Arts CSTs, although the gap between the scores of these two groups had narrowed somewhat between kindergarten and third grade. Similar patterns were observed for younger students (those who turned 5 after September 1 of their kindergarten year), as compared to their older peers.

For some groups of students, initial performance gaps at kindergarten had actually widened further by third grade. High-income students had entered kindergarten with stronger readiness skills than their lower-income peers, and their scores at third grade suggested that the performance gap was increasing with time rather than decreasing.

The most dramatic increase in the performance gap occurred in the ELA scores of Hispanic/Latino students versus other students, however. There were initial differences among Caucasian, Asian, and Hispanic/Latino students at kindergarten entry, but the performance "spread" for Hispanic/Latino versus other students actually increased by about 50% by third grade.

It is important to keep in mind that these are univariate analyses, meaning that they look at one variable at a time, in isolation from other, related variables. Thus these analyses do not provide as complete an explanation of trends as do the regression analyses, which are able to simultaneously account for multiple factors working together (and of course, neither analysis allows for causal conclusions to be drawn). For example, in this sample, race/ethnicity differences are very closely linked to income differences. Hispanic/Latino families were much more likely to be low-income than families from other racial/ethnic groups, so the differences observed across the different racial/ethnic groups also reflect the groups' income differences.

Were School Readiness Levels Associated with Other School Outcomes, Such as Reclassification as Fluent in English, School Attendance, or Retention in Kindergarten?

School readiness levels assessed at kindergarten entry via the KOF were associated with other outcomes besides third grade performance in Math and English-Language Arts CSTs. English Learners with strong readiness skills at kindergarten entry – particularly in *Kindergarten Academics* – performed better on tests measuring their English language skills at all grades from kindergarten through third grade.

Similarly, students who were reclassified at some point between kindergarten and third grade as English-proficient had initial readiness levels that exceeded those of their non-reclassified EL peers on all of the *Basic Building Blocks* of readiness.

Figure H: Average Readiness Scores for English Learners as a Function of Reclassification Status by Third Grade

Source: *Kindergarten Observation Form* and individual school district data.

Note: Scale points are as follows: 1 = Not yet, 2 = Beginning, 3 = In progress, 4 = Proficient. Sample size = 252 reclassified students and 498 non-reclassified students. Reclassified and non-reclassified students differed significantly from each other overall and on all Basic Building Blocks, according to t-tests (all p's < .05).

Analyses were also conducted to investigate whether school readiness was associated with family practices such as ensuring that students attend school and have low absenteeism, which in turn has been shown to relate to students' school performance (Ready, 2010). Results showed that readiness was weakly associated with school attendance rates at kindergarten, but not in later grades. The strongest association between kindergarten attendance and readiness levels was observed for *Kindergarten Academics* skills (r = 0.16).

A small number of students (2% of the students for whom these data were provided) were retained to repeat kindergarten, and their readiness levels at kindergarten entry were compared to those of their classmates who were not retained in kindergarten. Results revealed that the retained students were much further behind their peers on social-emotional and self-care domains of readiness than on the strictly academic types of skills, suggesting that decisions about kindergarten retention have more to do with maturation factors than meeting certain academic performance standards.

Figure I: Average Readiness Scores – Students Who Were and Were Not Retained to Repeat Kindergarten
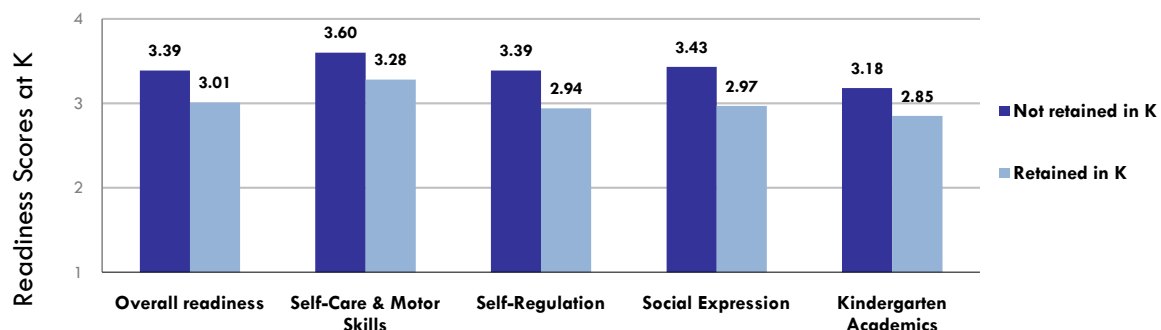
Source: Kindergarten Observation Form and individual school district data.

Note: Scale points are as follows: 1 = Not yet, 2 = Beginning, 3 = In progress, 4 = Proficient. Sample size = 732 students not retained in K and 18 students retained in K. Retained and not retained students differed significantly from each other overall and on all Basic Building Blocks except Kindergarten Academics, according to t-tests at p's < .01. Retained and non retained students differed marginally on Kindergarten Academics (p < .08).

How Did the Students in the Two Counties Compare to Each Other?

Although there were many similarities in the trends observed in Santa Clara and San Mateo counties, some differences emerged as well:

- Data suggested that although sampled students in Santa Clara County started kindergarten less ready than sampled students in San Mateo County, the Santa Clara County students had more than made up for this difference by third grade – performing slightly better than their peers in San Mateo County.

- Regression analyses conducted separately for students in each county suggested that readiness levels explained more of the third grade scores of Santa Clara County students than they did for San Mateo County students, whose scores were in turn explained more by factors related to students' demographic and socioeconomic backgrounds.

- Finally, analyses looking at whether students who started kindergarten with lower school readiness scores were able to close the performance gap by third grade revealed that these gaps were more likely to persist (and sometimes get larger) at third grade for San Mateo County students than for Santa Clara County students.

All of the findings related to cross-county differences should be considered preliminary. Because the samples are not representative at the county level, and because we do not have additional information about school and classroom impacts on learning from kindergarten through third grade, it is difficult to know what could be driving the differences observed between the two counties. It is hoped that presenting information about the differences observed will serve as an initial step to stimulate discussion between districts about what the data mean – and if they may be reflecting successful policies or practices that are improving student achievement levels in the early elementary grades.

Implications and Recommendations

Better Outcomes Ahead for Third Grade Scores?

Combining these longitudinal results with more recent data from readiness assessments conducted in both Santa Clara and San Mateo counties in 2008 (and assuming similar associations between readiness and third grade tests), we would expect more students to be achieving at grade level by the time they take their third grade CSTs in Spring 2012. This is due to trends in which students are entering kindergarten with somewhat stronger skills in *Kindergarten Academics*, although they have generally not shown improvements in their *Self-Regulation* skills.

Acknowledging the Important Role of Early Elementary (K-3) Education

Of course, as we offer predictions about possible trends in student achievement, it is important to keep in mind that elementary school education plays an enormous role in determining how well a child does at third grade – a role that was not able to be explored in this project. The strength of the relationship between school readiness and later academic performance will vary from one region to another, and from one period of time to another, based in part on the quality of the early elementary school environments that receive children as they enter kindergarten – ready (or not) to learn.

Working with Parents and Early Care and Education Providers to Ensure that Learning is Well Under Way Before Kindergarten

The strong associations between school readiness and later school performance underscore the need to help children begin their learning long before they enter kindergarten. These longitudinal data show that what children learn even before they enter kindergarten may impact their third grade scores, which in turn are a strong predictor of even longer-term outcomes such as high school graduation rates (Annie E. Casey Foundation, 2010). Recent work to develop statewide measurement standards that ensure high-quality, developmentally-appropriate ECE experiences are a step in the right direction, as are increasing efforts toward better communication and alignment between ECE and elementary school systems.

Reducing Barriers to Answering Important Questions in Education Research

Across the 19 districts that participated in this project, no two were alike in terms of their data systems or their requirements for sharing data with external research organizations. The complexity of working differently with each of the 19 districts – combined with the significant time and financial resources this process consumed – creates a situation that makes research a very difficult endeavor. This is particularly unfortunate given current concerns about the effectiveness of our education system and the need for high-quality education research to better understand problems such as improving student test scores, closing the widely-observed achievement gap among California's students, and working effectively with the increasing numbers of students who are learning English in an English-based education system. Districts looking to contribute to increasing our understanding of what works (and what doesn't) in education might consider moving toward more cross-district collaboration as they design or update their data systems and protocols.

Introduction

A great deal of local and national research has been dedicated to studying how ready children are for school when they begin kindergarten, documenting the levels of proficiency that children demonstrate across a broad spectrum of school readiness skills, along with the factors that are associated with greater (or lesser) readiness levels. Currently, a variety of school readiness measurement tools and methods are being used in different regions throughout the country, providing information to various stakeholders in both the early education and K-12 system about children's strengths and needs as they enter kindergarten and begin their school careers.

But what is the connection between readiness at kindergarten and longer-term academic outcomes for students? Beyond the sheer measurement of children's school readiness levels, another important facet of this work involves questions about if and why readiness matters at all. It is somewhat taken on faith that being ready for school must translate into greater success in school, but it is important to verify this with data and to understand these associations more precisely – is the benefit associated with being well-prepared to begin school a large or small one? And what types of skills are most strongly related to school success?

A growing body of research has been devoted to answering these questions. A number of studies looking at the relationship between readiness and later achievement have demonstrated that children's social and cognitive readiness for school acts as a "springboard" for later success in school. The five dimensions of readiness defined by the National Education Goals Panel (NEGP)[2] have all been found to contribute to a child's success in school (Kagan, Moore, & Bredekamp, 1995). In particular, children who have competence across these five dimensions are more likely to succeed academically in first grade than are those who are competent in only one or two dimensions (Hair, Halle, Terry-Humen, & Calkins, 2003). A number of other studies have also found linkages between early school readiness and later success in school. For example:

- Mastery of basic numerical concepts prepares children to learn more complex math problems and problem-solving approaches (e.g., Baroody, 2003).

- Number competency skills at kindergarten entry predicted both growth rates between first and third grade math and math performance level in third grade achievement (Jordan, Kaplan, Ramineni, & Locuniak, 2009).

- Children who have difficulty paying attention, following directions, getting along with others, and controlling negative emotions of anger and distress tend to do less well in school (e.g., Raver & Knitzer, 2002; Raver, 2003).

- The ability to control and sustain attention and participate in classroom activities is associated with achievement test scores in the early elementary grades (e.g., Alexander, Entwisle, & Dauber, 1993).

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[2]   The five NEGP dimensions are Physical Well-Being & Motor Development, Social & Emotional Development, Approaches Toward Learning, Communication & Language Usage, and Cognition & General Knowledge.

- Approaches to Learning (ATL) at kindergarten entry, which includes constructs such as persistence, emotion regulation, and attentiveness, was found to predict reading and math performance up through fifth grade (Li-Grining, Votruba-Drzal, & Maldonado-Carreno, & Haas, 2010).

- Students who performed less well on standardized tests in second and third grades also trailed on both cognitive and socioemotional readiness measures early in their kindergarten year (Cannon & Karoly, 2007).

- Both academic and nonacademic school readiness skills at entry to kindergarten were found to be significantly related to eventual reading and mathematics achievement in fifth grade (Le, Kirby, Barney, Setodji, & Gershwin, 2006).

Perhaps one of the most comprehensive examinations of the impact of school readiness comes from a recently-published meta-analysis of six longitudinal, non-experimental data sets exploring the connections between readiness and later achievement. These researchers found that the strongest predictors of later achievement were school-entry math, reading, and attention skills (in that order). To the authors' surprise, however, some measures of socio-emotional behaviors (internalizing and externalizing problems and social/interpersonal skills) were generally insignificant predictors of later academic performance. (Duncan, Claessens, Huston, Pagani, Engel, Sexton, Dowsett, Magnuson, Klebanov, Feinstein, Brooks-Gunn, Duckworth & Japel, 2007). From these studies and others, there is clear indication that school readiness matters. There is somewhat less agreement on exactly which readiness skills matter most.

Local Contributions to School Readiness Research

Development of the ASR School Readiness Assessment Model

In late 2000, Applied Survey Research (ASR) was commissioned by the Peninsula Community Foundation to develop research materials and a protocol to conduct assessments of students' levels of readiness for school. After a comprehensive literature review and with input from a variety of subject matter experts – including community stakeholders, child development and education experts, preschool teachers, and kindergarten teachers – ASR developed a 19-item *Kindergarten Observation Form* (KOF) to measure children's school readiness skills. After pilot testing and refining the instrument, education experts again reviewed the tool and suggested the addition of one more skill representing phonemic awareness (recognition of rhyming words). This resulted in a 20-item tool in which skills were organized according to the five NEGP-designated categories of school readiness.

Since that initial assessment, enhancements to the school readiness assessment tools and method have continued. In collaboration with the Santa Clara County Partnership for School Readiness, in 2004 ASR developed a parent survey and teacher survey to enrich the data collected about children entering school, and in 2006, the *Kindergarten Observation Form II* was developed to provide information about the smoothness of children's transitions into kindergarten. In 2005, ASR conducted a factor analysis on the readiness skills measured in the KOF to better understand the underlying dimensions of school readiness. This analysis suggested that the skills tended to group into four primary dimensions of readiness (subsequently named the *Basic Building Blocks* of readiness), and they include the following:

- *Self-Care & Motor Skills* include those skills needed for taking care of one's basic needs or skills showing fine and gross motor coordination;

- *Self-Regulation* skills include basic emotion regulation and self-control skills that are needed to be able to perform well in the classroom;

- *Social Expression* skills include measures related to children's interactions with others, their ability to express themselves in the classroom context, and their engagement with play and learning; and

- *Kindergarten Academics* skills represent the "nuts and bolts" skills that are more academic in nature and tend to be explicitly taught to children at home, in early care settings, and in kindergarten.

Figure 1:   A List of *Basic Building Blocks* Readiness Skills

Basic Building Blocks	Individual Skills
Self-Care & Motor Skills	- Use of small manipulatives such as crayons, paintbrush, buttons, zippers, etc. - Has general coordination on playground (kicking balls, running, climbing) - Performs basic self-help / self-care tasks (toileting, eating, washing hands)
Self-Regulation	- Works and plays cooperatively with peers (takes turns and shares) - Controls impulses and self-regulates (is not disruptive of others or class) - Stays focused / pays attention during activities - Follows one- to two-step directions - Participates successfully in circle time (listens, focuses, sits still, participates)
Social Expression	- Relates appropriately to adults other than parent / caregiver (converses with, seeks help from) - Appropriately expresses needs and wants verbally in primary language - Expresses curiosity and eagerness for learning (tries new activities, asks questions) - Has expressive abilities (tells about a story or experience in response to a prompt) - Engages in symbolic / imaginative play with self or peers (plays house, fireman)
Kindergarten Academics	- Recognizes the letters of the alphabet (note: may be CAPs, lowercase or combination) - Writes own name (spelling and writing all letters correctly) - Can recognize rhyming words - Engages with books (knows where a book starts, associates print with storyline, pretends to read) - Can count 10 objects correctly ('Please give Maria five crayons, please hand Celia 10') - Recognizes primary colors (Crayola basic 8) - Recognizes primary shapes (circle, triangle, square)

Together, these four readiness dimensions of the KOF – along with the other measurement instruments described – currently comprise ASR's School Readiness Assessment Model (see Figure 2).

Figure 2: Sources of Information to Assess the Readiness of Incoming Kindergarten Students
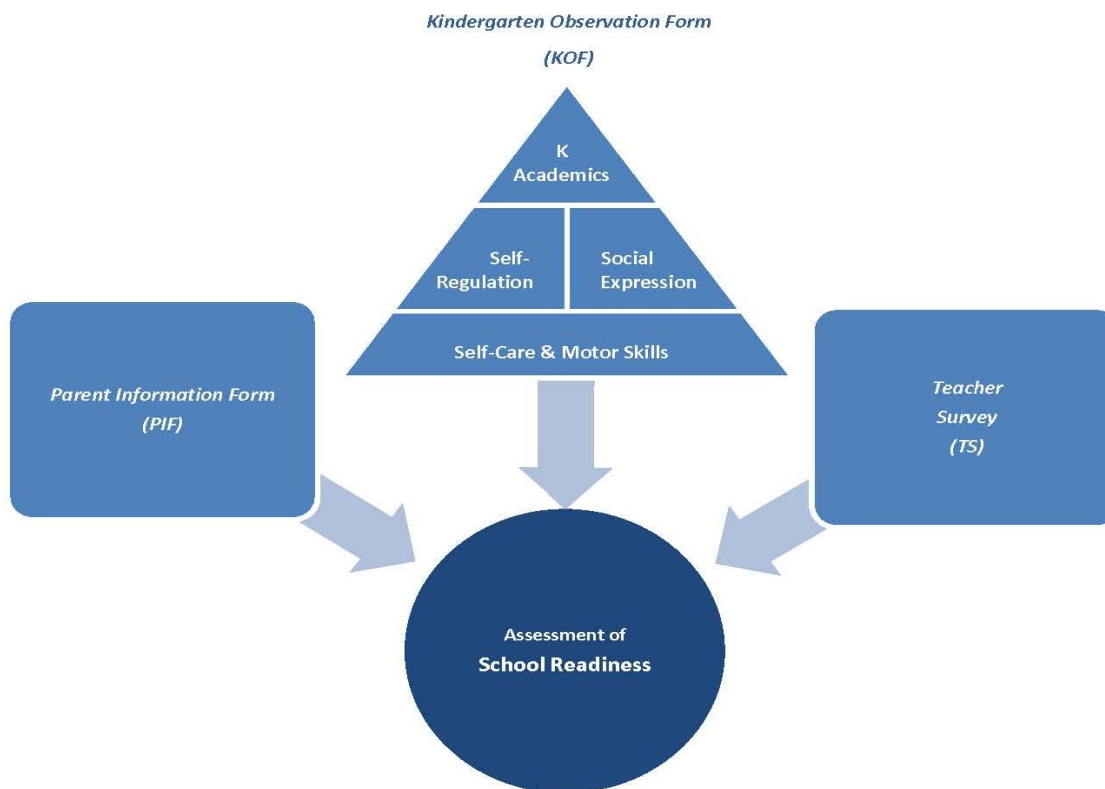
Reliability and Validity of the KOF

In the years since its initial development, the KOF has received growing attention and interest as a high-quality tool that simultaneously recognizes the significant measurement challenges that are inherent in the typical kindergarten classroom setting. As the KOF has become increasingly used in communities beyond San Mateo and Santa Clara counties, the importance of documenting the psychometrics of the tool has increased as well, and a number of different research efforts have provided data on the validity and reliability of the KOF.

In all investigations conducted to date, the KOF has consistently demonstrated strong validity and reliability, including:

- **Strong construct validity:** Correlations with comparable items on *Kindergarten Progress Report* were > .70 on 15 of the original KOF items, with correlations between .46-.67 on the remaining items. Robust correlations have been observed with *Work Sampling System* (overall *r* = .76) and *Brigance K – 1 Screen II* (overall *r* = .57; *Kindergarten Academics r* = .74).

- **Consistently demonstrated known-groups validity**: The KOF consistently discriminates between groups that are known to vary in their readiness levels,

including: older versus younger students, students with and without preschool experience, and students with and without special needs.

- **High levels of internal consistency**: Across KOF administrations, the four readiness factors – *Self-Care & Motor Skills, Self-Regulation, Social Expression,* and *Kindergarten Academics* – have Cronbach's alphas consistently exceeding .80, and are more typically in the range of .85-.93.

- **Indications of moderate-to-strong inter-rater reliability:** Analysis of a recent inter-rater reliability study is in progress – preliminary data suggest moderate-to-strong agreement between paired teacher raters in pre-K settings.

- **Predictive validity:** A key goal of the current project is to provide evidence of the KOF's predictive validity, which has also been documented in an initial longitudinal study linking KOF results to later academic outcomes (described more fully below).

Measurement of School Readiness in Santa Clara and San Mateo Counties

With the development of the KOF, local measurements of children's readiness for school have been sponsored for nearly a decade in San Mateo County and since 2004 in Santa Clara County by, respectively, the Silicon Valley Community Foundation (formerly the Peninsula Community Foundation) and the Santa Clara County Partnership for School Readiness.[3] The data resulting from these efforts have been helpful for tracking the readiness levels of entering kindergarten students over time, especially in the context of changing student demographics in the counties.

The two figures that follow – over four years of readiness assessments in Santa Clara County and over two years in San Mateo County, respectively – show that readiness levels have been stable or increasing over time, with one exception in San Mateo County in which *Self-Regulation* levels seem to be slightly lower among more recent kindergarten students. In Santa Clara County, gains in readiness have been driven largely by lower-income students, with follow-up analyses showing that between 2004 and 2008, low-income children showed greater progress than middle- or high-income children (in varying amounts) in all skills except *Self-Regulation*.

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3   In addition to Santa Clara and San Mateo counties, readiness assessments have been have been conducted in Lake County (IL), San Francisco County, Santa Cruz County, Alameda County, Marin County, and in all sites in the Los Angeles Unified Preschool network. To date, more than 25,000 students have been assessed using the KOF.

Figure 3:   Santa Clara County: Average Readiness Scores Across Time (20-Item KOF)
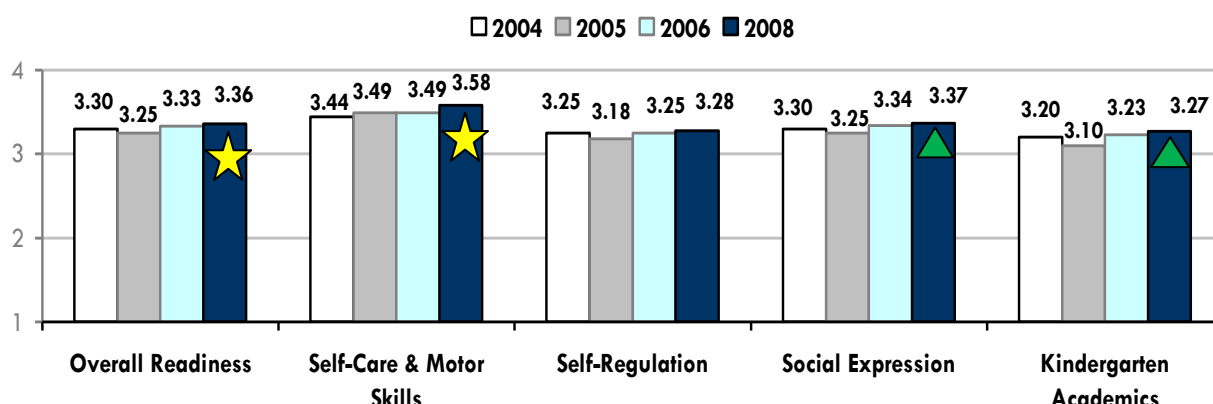
Source: Santa Clara County school readiness assessment data.

Note: Scores are based on a 1-4 scale (1 = not yet, 2 = beginning, 3 = in progress, 4 = proficient). Don't know / Not observed responses are not included. Means are based on the following sample sizes: 682 for 2004 data, 768-796 for 2005 data, 713 for 2006 data, and 703-718 for 2008 data (weighted n's). 2004-2006 data are weighted for EL status; 2008 data are weighted for ethnicity. 2004 scores differed significantly from 2008 scores for *Self-Care & Motor Skills* ($p < .01$)and *Overall Readiness* ($p < .05$), and marginally for *Social Expression* and *Kindergarten Academics* (both p's $< .10$), according to t-tests.

Figure 4:   San Mateo County: Average Readiness Scores Across Time (20-Item KOF)
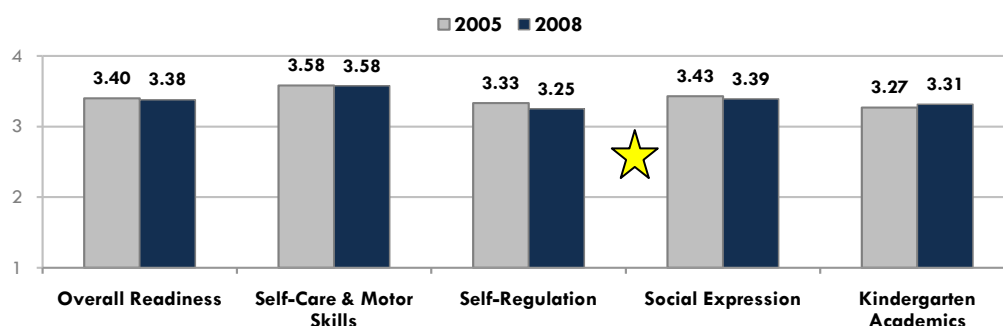
Source: San Mateo County school readiness assessment data.

Note: Means can range from 1 to 4. Scale points are as follows: 1=not yet, 2=just beginning, 3=in progress, 4=proficient. 2005 scores are based on 669-670 county-wide students (weighted n). 2008 scores are based on 646-654 county-wide students (weighted n). Data are weighted for English Learner status.

In addition to providing year-to-year tracking of students' readiness levels across time, the school readiness assessment research has also helped to shed light on the experiences and practices that are associated with enhanced readiness skills. The figure on the following page displays the strongest predictors of readiness for the most recent assessments of school readiness in Santa Clara and San Mateo counties, in 2008.

These results are fairly typical of those observed across different regions and in different assessments years. Some variables are fixed (such as children's gender and special needs status), but others – such as preschool experience and parents having information about school

readiness – represent opportunities for community investments that may enhance children's ability to begin school ready to succeed.

Figure 5:   What Factors Are Related to Enhanced School Readiness?
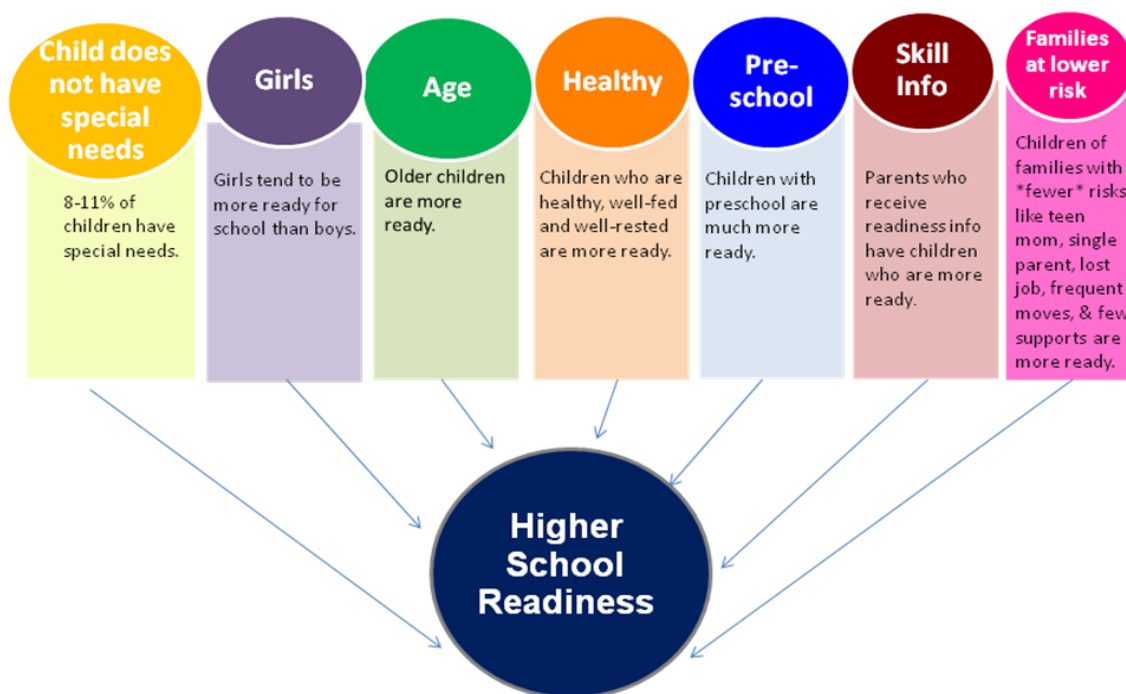
Source: Santa Clara County and San Mateo County school readiness assessment data, fall 2008.

Note: This chart depicts the results of regression analyses to predict school readiness. The factors above "school readiness" were predictors in both Santa Clara and San Mateo counties in 2008. Additional predictors were significant in only one of the counties; these can be found in the respective county reports, available at www.appliedsurveyresearch.org.

In addition to pointing out the "levers" that may lead to enhanced readiness, data from several years of kindergarten teacher surveys collected as part of the readiness assessment have led to a greater understanding of the skill levels that teachers believe children should have as they enter kindergarten. The teacher expectations have provided valuable benchmarks for contextualizing the actual skill levels of entering kindergarten students.

The teacher survey data have also shed light on how teachers prioritize different types of readiness skills. For example, teachers place a high value on having children enter school with strong *Self-Regulation* skills and place less emphasis on the importance of entering school with skills in the "nuts and bolts" *Kindergarten Academics* skills, despite the fact that, as reviewed in the beginning of this section, other (non-local) research has shown that both types of readiness skills may be important for longer-term success.

In an effort to begin local investigations of the potential long-term impact of school readiness, the Santa Clara County Partnership for School Readiness sponsored the first longitudinal study examining longer-term academic outcomes of the San Mateo County students who took part in the school readiness assessments in 2001- 2003. By matching students' initial kindergarten readiness scores to their subsequent standardized testing scores, ASR was able to examine how readiness translates into academic success among local children, examining the association between school readiness data and later third grade achievement test data (ASR, 2008). This

local study of the connections between readiness and later academic performance clearly showed that readiness <u>does</u> matter. In particular, the following findings emerged:

- Children who entered school most ready-to-go were those who were most successful on academic tests at third grade. In fact, gaps that were seen in kindergarten readiness were still present in third grade. Specifically, gaps based on different profiles of readiness, preschool experience, English Learner status, and different ethnicities remained robust in third grade.

- *Kindergarten Academics* skills were most closely associated with later academic success – children who entered school high on *Kindergarten Academics* tended to have the highest third grade test scores, but children who were high in both *Kindergarten Academics* <u>and</u> *Social Expression* were those who did best.

In sum, the data from that study revealed that school readiness (as measured by the KOF) matters for later student success, thus supporting other research on school readiness and providing evidence of the KOF's strong predictive validity. However, because that study was based on a small targeted sample of students from high-need districts and included only students in San Mateo County, it was unclear whether the patterns observed would be repeated with students from more diverse backgrounds, and who lived in places other than the five districts whose data were included in the previous longitudinal study.

The Current Study

Since the completion of the 2008 longitudinal study, longer-term academic performance data has also become available for two new cohorts of students who participated in school readiness assessments: those who entered kindergarten in fall 2004 (Santa Clara County only) and fall 2005 (both Santa Clara and San Mateo counties).

In late 2009, the Santa Clara County Partnership for School Readiness and the Silicon Valley Community Foundation jointly commissioned a second longitudinal study, and plans were initiated to seek cooperation from school districts throughout Santa Clara and San Mateo counties to provide data examining associations between students' school readiness levels at kindergarten entry and their longer-term school outcomes. These new data would also provide an opportunity to re-examine the predictive validity of the KOF – this time with a more geographically, demographically, and socio-economically diverse student sample than was available in the previous longitudinal study.

Key Research Questions

The purpose of this report is to improve our understanding of whether and how the readiness levels of students entering kindergarten in Santa Clara and San Mateo counties relate to their later school success. More specifically, the following research questions are addressed in the sections that follow:

- What child, family, and school readiness factors were linked to third grade academic outcomes? Were these associations similar for different kinds of students?

- What academic paths were taken by the most and least ready kindergarteners? For students who took a different path than would be suggested by their readiness levels at kindergarten, how were they different from their peers?

- Were the groups of students who were less ready for school at kindergarten able to close the gap by third grade?

- Were school readiness levels associated with other school outcomes, such as reclassification as fluent in English, attendance, or retention in kindergarten?

- How did the students in the two counties compare to each other?

Methodology

Section Overview

This section provides a brief summary of how data were compiled and matched to begin looking at whether a link exists between children's readiness for school and any academic, social, or behavioral outcomes in the years through third grade. Specifically, this section describes the following:

- Preparation of the existing school readiness data files;
- Method for choosing and requesting districts to participate in the longitudinal follow-up investigation;
- Processes for matching students' school readiness and district data;
- A summary of match statistics; and
- The analysis approach used for this report.

Preparation of Existing School Readiness Data Files

As described in the introduction, the potential sample of students for this longitudinal analysis included participants in readiness assessment studies conducted by ASR in fall 2004 and fall 2005.[4] In 2004, readiness assessments were conducted with kindergarten students in Santa Clara County only, and in 2005, readiness assessments were conducted in both Santa Clara and San Mateo counties. In each of these readiness assessments, a random sample of schools – and a randomly sampled kindergarten classroom within each school – was drawn from all county elementary schools in order to achieve a student sample that was generalizable to the kindergarten population within each county. In addition to the county-wide sample, each readiness assessment also included some targeted oversampling within key regions of interest – generally lower-performing districts where investments had been made to improve readiness-related outcomes among students.

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[4] For more information about the methods and findings from these studies, reports are available at www.appliedsurveyresearch.org.

In sum, the county-wide samples and oversamples included a total of 1,976 students in Santa Clara County and 997 students in San Mateo County whose records were available for potential matching to longer-term school outcome data.

Figure 6:   Available Data by Year and County

County	2004	2005
Santa Clara County	County-wide representative sample plus oversample (n = 943)	County-wide representative sample plus oversample (n = 1033)
San Mateo County	N/A Not conducted	County-wide representative sample plus oversample (n = 997)

Choosing and Requesting District Participation in the Longitudinal Study

ASR next examined the school readiness data sets to see which districts had the largest representation in the data. Given that school outcome data would need to be requested separately for each school district – and taking into account project timelines and resources – it was decided that the ten districts in each county with the largest number of students in the readiness samples would be approached to provide data on students' academic, social, and behavioral outcomes. Focusing on the top 10 districts in each county did not reduce the available samples significantly; 79% of all students in the 2004 and 2005 Santa Clara assessment samples and 84% of the San Mateo County assessment sample were included among the top 10 districts.

Beginning in January 2010, with assistance from both the San Mateo and Santa Clara County Offices of Education, ASR, PSR and SVCF staff began approaching district staff and seeking permission to receive student records from the selected districts in each county. The following data were requested from each district:[5]

- Child variables for matching records to the readiness data file:
    - Child's first, middle and last initials
    - Child's Birthdate
    - Child's gender
    - Name of school attended (each year K – 3rd/4th)
- Child's current grade (09-10 school year)
- CST scores and levels (ELA and Mathematics, 3rd / 4th grade)
- CELDT scores (each year K – 3rd/4th, as applicable)

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[5]   Number of disciplinary events was also requested, but because these data are collected in very different ways – and because there are few incidents recorded by most districts in school years from kindergarten through third grade – these data were not used.

- Reclassification status of English Learners, as applicable
- Special needs status
- Days attended school (and how many days possible; each year K – 3rd/ 4th)
- Kindergarten retention (Did child repeat his/her kindergarten year?)

Ultimately all ten districts that were approached in Santa Clara County provided student data, and nine out of ten San Mateo County districts provided data. Due to the tremendous strain on many districts' resources and personnel, not all data elements were provided by all districts; however, all districts did provide data on CST and CELDT scores, as well as the necessary data elements for matching student records across the two data sets.

Process for Matching Student Records

Each district's data-sharing agreement and process took a slightly different path. Several districts provided data files to County Office of Education staff, who in turn forwarded the files to ASR for matching to school readiness records. Several districts pulled a comprehensive set of student records for students in the cohorts of interest (students who began kindergarten in 2005 in San Mateo County; students who began kindergarten in either 2004 or 2005 in Santa Clara County), and ASR found matches to school readiness data records. Other districts felt more comfortable doing the record-matching themselves; these districts returned records of matched students only after receiving records for the students in their district who had participated in the readiness assessments – including students' initials, DOB, gender, and year, school, and teacher name of kindergarten attendance.

In all cases, strong protections were taken to protect the privacy and confidentiality of student records, and districts were requested not to provide student names – only initials, date of birth, and gender would be used in the matching process.

Summary of Match Statistics

Of the 2,373 students whose readiness records were available for matching, 1,543 cases (65%) were found in district data. Figure 7 shows the match rates by district and county. [6] As the figure shows, match rates varied considerably from one district to another; more than half of the included districts had a match rate of greater than 70 percent, and only three were below 50 percent.

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[6] Please note that a match between student records not necessarily mean that there was a usable datapoint in the district data. For example, in some cases a match was confirmed in a district data set, but the child moved out of the district before test score data were collected for the student.

Figure 7:   Number of Santa Clara and San Mateo County Children with Matched Readiness and District Data

	District Name	Number of kindergarten students assessed in 2004 or 2005	Number of matches found	Percent of students matched
SANTA CLARA COUNTY DISTRICTS	San José Unified	452	248	55%
	Alum Rock	266	101	38%
	Gilroy	154	125	81%
	Franklin-McKinley	136	63	46%
	Milpitas	115	101	88%
	Santa Clara Unified	112	98	88%
	Cupertino	104	104	100%
	Berryessa	78	49	63%
	Oak Grove	76	42	55%
	Palo Alto	73	66	90%
	SUB-TOTAL Santa Clara County	1,566	997	64%
SAN MATEO COUNTY DISTRICTS	Redwood City	407	255	63%
	San Mateo-Foster City	102	68	67%
	South San Francisco Unified	78	55	71%
	Jefferson	72	70	97%
	Ravenswood City	50	23	46%
	Portola Valley	32	28	88%
	Burlingame	28	20	71%
	La Honda-Pescadero	24	15	63%
	Cabrillo	14	12	86%
	SUB-TOTAL San Mateo County	807	546	68%
	GRAND TOTAL Both counties	2,373	1,543	65%

A summary of the methods and sample sizes involved in the matching of the readiness and school district data follows.

Figure 8:   Summary of Data Preparation Steps and Sample Sizes

Readiness data collected on

2,973 students

in Santa Clara County (2004, 2005) and San Mateo County (2005)

⬇

Decision to follow up with the 10 districts in each county with the most students in readiness sample =

2,403 possible records for matching

(1,566 in SCC; 837 in SMC)

⬇

Received records from 10 of 10 districts in SCC and 9 of 10 districts in SMC =

2,373 possible records for matching

(1,566 in SCC; 807 in SMC)

⬇

Matched 1,543 of the 2,373 records =

65% match rate

Analysis Approach Used in This Report

Throughout this report, data are represented for all students together – including both Santa Clara and San Mateo County students, and students who were in kindergarten in 2004 and in 2005. A subset of analyses was conducted separately for the two counties; some interesting differences that were observed in these analyses are briefly discussed at the end of this report.

In part, the decision to show combined data for the two counties (rather than splitting it and showing results separately for each) is driven by an important caveat of the data: The student sample included in these analyses is not representative of students in these counties (or the region) as a whole. We chose to request longer-term student data from the districts for which we had the

most readiness data. Although we had a good balance of students from different demographic and socioeconomic backgrounds, as mentioned previously, the student oversamples in the 2004 and 2005 readiness studies were focused in higher-need districts, and, consequently, the associations between readiness and school outcomes are more weighted by the experiences of these students than students in other districts. For example, 46% of the matched San Mateo County sample was from Redwood City Elementary District alone, and 25% of the matched Santa Clara County sample was from San Jose Unified School District.

A Snapshot of Students in the Study

Section Overview

Before addressing the key research questions of this longitudinal study, this section that follows provides information about the sample – i.e., the San Mateo and Santa Clara County students who participated in the school readiness assessments whose records were able to be matched to early elementary school outcome data provided by school districts. This description includes basic demographic and family background characteristics, school readiness levels when students entered kindergarten, and students' third and fourth grade test scores.

How Did the Matched Students Compare to the 2004 and 2005 Samples as a Whole?

The figure that follows on the next page shows basic information about the students who are included in the longitudinal study. The left column displays information about the school readiness assessment participants whose data were successfully matched to elementary school records provided by districts. As the figure indicates, more than half of these students (54%) were English Learners. Forty-six percent were from Hispanic/Latino backgrounds, and there were almost equal numbers of Asian and Caucasian students in the sample (20% and 19% of the sample, respectively). About two-thirds of the students (66%) had attended preschool in the year prior to kindergarten. Students were fairly well distributed across the different income levels and school API levels.

The right column of the figure shows comparisons to the original sample of all students who had participated in the school readiness assessments in 2004 and 2005. Across all the variables displayed, the mix of students in the original sample and the matched sample are similar, indicating that there were not any particular subgroups of students in the original school readiness study whose records were more (or less) likely to be matched up with student records provided by districts.

Figure 9:   Student and Family Characteristics – Matched Sample versus All Assessed Students

Variables	Assessed students successfully matched to district records	All students in original readiness studies in 2004 and 2005
Base sample size	1,543	2,973
School API for kindergarten year (2004 or 2005)		
Low	31%	32%
Middle	39%	39%
High	30%	30%
Sex (% girls)	48%	49%
Has special needs	8%	9%
Age		
Turned 5 after September 1	23%	23%
Turned 5 on or before September 1	77%	77%
Is an English Learner		
Yes	54%	52%
No	46%	48%
Primary language spoken at home		
English	54%	55%
Spanish	32%	31%
Vietnamese	4%	4%
Other	11%	10%
Ethnicity		
Hispanic/Latino	46%	47%
Asian	20%	16%
Caucasian	19%	22%
Other/DK	15%	15%
Family income		
< $32,000	37%	38%
$32,000 – 81,999/84,999	30%	28%
$82,000/85,000+ or more	33%	34%
Has preschool experience	66%	64%

Source: *Kindergarten Observation Form* and *Parent Information Form.*

Note: Percentages may not sum to 100 due to rounding. The group "All students in original readiness study" should not be taken as a representative sample of any student populations – it includes both county-wide and regional high-need oversamples from 2004 and 2005 (only 2005 for San Mateo County), and the data are unweighted. It is included here as a referent for examining whether the matched cases were or were not similar to the original group of students assessed.

+ The 2004 *Parent Information Form* used a slightly different income cut than in later years ($82,000 versus $85,000).

What Were the Readiness Levels of the Matched Students?

The figure that follows shows how ready for school the students in the longitudinal sample were when they started kindergarten. The information includes student readiness levels overall and according to the *Basic Building Blocks* of readiness described previously. In addition, students' readiness is presented according to different patterns of strengths and needs, called the *Readiness Portraits*. The *Readiness Portraits* shown in the figure emerged from a statistical procedure called cluster analysis, which sorts students into groups based on common patterns of readiness strengths and needs. The clustering has consistently revealed four basic *Readiness Portraits* that correspond to the following:

- Students proficient or near-proficient across all four readiness domains;

- Students who are strong in their *Kindergarten Academics* but have needs in the dimensions of *Self-Regulation* and *Social Expression* skills;

- Students who have strengths in *Self-Regulation* and *Social Expression*, but who have needs in their *Kindergarten Academics*; and

- Students who have readiness needs across the board.

Once again, for comparison purposes, the readiness levels of all students (matched and unmatched) who participated in the readiness assessments in 2004 and 2005 are included.

**Figure 10: Santa Clara and San Mateo County Kindergarten Readiness Scores and Portraits –
Matched Sample versus All Assessed Students**

Variables	Assessed students successfully matched to district records	All students in original readiness studies in 2004 and 2005
Base sample size	1,543	2,973
Self-Care & Motor Skills	3.50	3.47
Self-Regulation	3.26	3.22
Social Expression	3.29	3.26
Kindergarten Academics	3.15	3.09
Overall Readiness	3.30	3.25

Readiness Portraits
  Near proficient in all domains
  Stronger in academics; needs in social-emotional
  Stronger in social-emotional; needs in academics
  Significant needs in all domains
	46%
	24%
	21%
	10%
		45%
		23%
		21%
		12%

Source: *Kindergarten Observation Form* and *Parent Information Form*.

Note: Percentages may not sum to 100 due to rounding. The group "All students in original readiness study" should not be taken as a representative sample of any student populations – it includes both county-wide and regional high-need oversamples from 2004 and 2005 (only 2005 for San Mateo County), and the data are unweighted. It is included here as a referent for examining whether the matched cases were or were not similar to the original group of students assessed.

Possible Impacts of Grade Retention and/or Family Mobility on the Longitudinal Sample?

There is a small but consistent trend showing that the students who were able to be matched to district records had higher readiness scores than the entire sample of students in the 2004 and 2005 readiness assessments. These patterns could reflect an association between poor school readiness and greater family mobility. It may be that children with lower levels of readiness moved out of the district at higher rates than children with higher levels of readiness. If this were the case, then the more mobile students with lower readiness levels would not have school records in the districts where they began kindergarten, and this would be reflected in a matched sample with higher average readiness levels.

An alternative explanation for this difference in kindergarten readiness for the matched versus original samples assumes an association between school readiness and later school success; i.e., the difference could in part be due to the lowest-scoring students in the original school readiness sample being held back to repeat a grade at some point between kindergarten and third grade. If this had occurred, students would not be in their expected cohort of peers, and thus their data would not have been included in the requested data "pulls" that districts did.

What Were the Third and Fourth Grade CST Scores of the Matched Students?

Finally, the two figures that follow show the average third and fourth grade CST scores of the students in the school readiness assessments who were matched to school district records.

Figure 11: Matched Students' Average CST Scores – Third and Fourth Grade ELA and Math
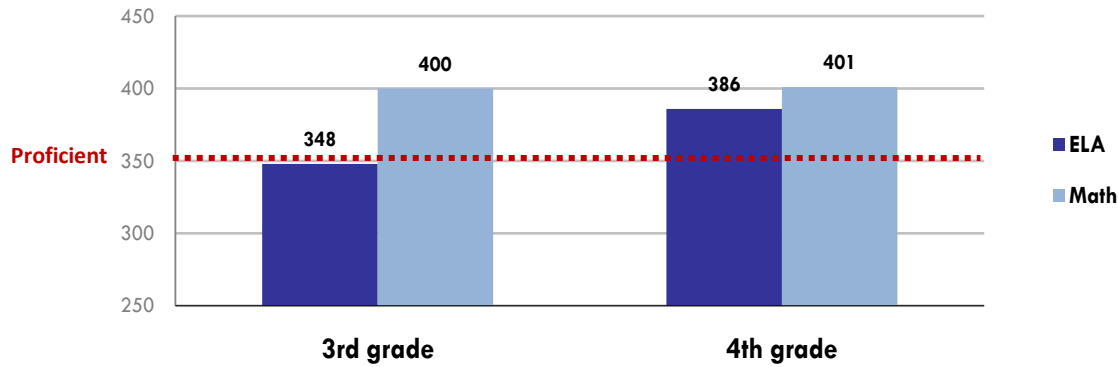
Source: School district data.

Note: Sample sizes = 1333 and 1336 for 3rd grade ELA and 3rd grade Math, respectively and 395-396 for 4th grade ELA and 4th grade Math, respectively. CST scores range from 150 to 600. The minimum score to reach "Proficiency" is 350 for all tests shown above. Cutoff scores for other score levels vary by grade and test type.

Figure 12: Percent of Matched Students at Each CST Level – Third- and Fourth-Grade ELA and Math
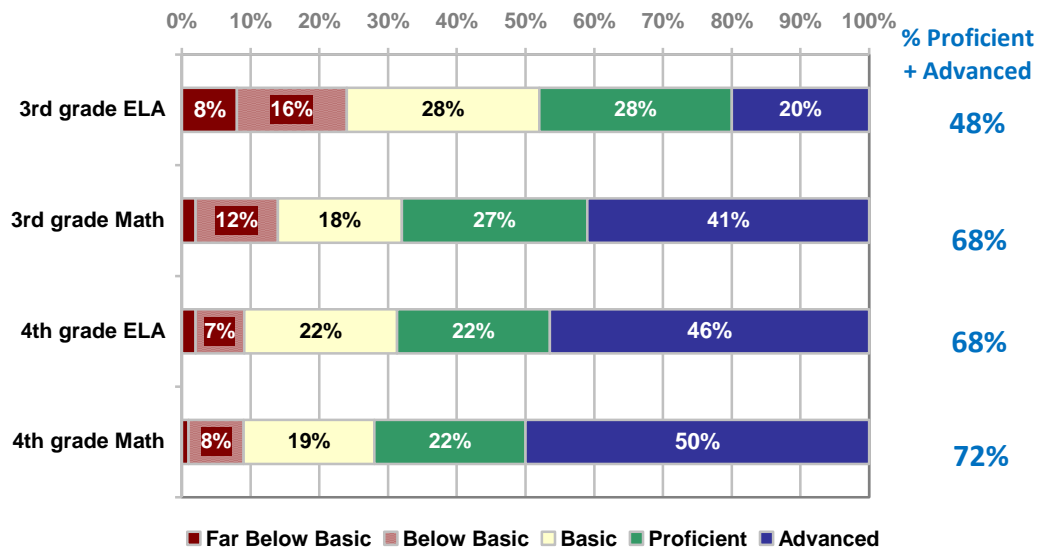
Source: School district data.

Note: Sample sizes = 1334-1335 for 3rd grade and 397-398 for 4th grade. Percentages may not sum to 100 due to rounding. Percentages less than 5% are not labeled.

How do these scores compare to all students county-wide? As the following figure shows, for both third grade ELA and Math CSTs, the scores of this sample were very slightly lower than the scores of the relevant populations of all third graders in these counties. However, test scores for fourth grade ELA and Math for this sample were quite similar to the scores of fourth graders county-wide.[7]

Figure 13: Matched Students' Average CST Scores, Compared with All Students County-Wide

Variables	Longitudinal sample	All Santa Clara County 3rd graders 2008	All Santa Clara County 3rd graders 2009	All San Mateo County 3rd graders 2009
Mean third grade ELA score	348	350	360	357
Mean third grade Math score	400	403	415	406
Mean fourth grade ELA score	386	Not Appl	384	Not Appl
Mean fourth grade Math score	401	Not Appl	402	Not Appl

Source: School district data and California Department of Education.

Note: CST scores range from 150 to 600. The minimum score to reach "Proficiency" is 350 for all tests shown above. Cutoff scores for other score levels vary by grade and test type.

Figure 14 compares the CST levels of the longitudinal sample against those of students county-wide. The figure shows that students in the longitudinal sample were less likely than the county-wide population to be scoring at the "Advanced" level on their third grade ELA and Math CSTs.

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[7] Note that scores for fourth grade were available for only a subset of students, i.e., those from the 2004 Santa Clara County kindergarten sample. Because of this, analyses in this report focus on findings for third grade only.

Figure 14: Matched Students' CST Levels, Compared with All Students County-Wide

Variables	Longitudinal sample	All Santa Clara County 3rd graders 2008	All Santa Clara County 3rd graders 2009	All San Mateo County 3rd graders 2009
Third grade ELA levels				
Far Below Basic	8%	9%	8%	8%
Below Basic	16%	13%	13%	14%
Basic	28%	29%	23%	25%
Proficient	28%	29%	28%	28%
Advanced	20%	21%	28%	26%
Third grade Math levels				
Far Below Basic	2%	3%	2%	2%
Below Basic	12%	11%	10%	10%
Basic	18%	17%	15%	17%
Proficient	27%	25%	23%	25%
Advanced	41%	45%	50%	45%
Fourth grade ELA levels				
Far Below Basic	2%		4%	
Below Basic	7%		8%	
Basic	22%	Not Appl	19%	Not Appl
Proficient	22%		23%	
Advanced	46%		46%	
Fourth grade Math levels				
Far Below Basic	1%		2%	
Below Basic	8%		10%	
Basic	19%	Not Appl	16%	Not Appl
Proficient	22%		22%	
Advanced	50%		50%	

Source: School district data and California Department of Education.

Section Summary

The longitudinal study sample included students who were demographically and socioeconomically similar to the larger sample of students who participated in readiness assessments in Santa Clara and San Mateo counties in 2004 and 2005. One interesting difference between students in the readiness samples who were able to be matched to district records and those who were not was that the matched sample had higher levels of kindergarten readiness than the original samples. Higher mobility (movement out of the original school district), increased grade retention, or some other factor may have led to a lower match rate for students with lower readiness levels.

What Child, Family, and School Readiness Factors Are Linked to Later Academic Performance?

Section Overview

There are many factors that contribute to children's academic success in school.[8] The purpose of this section is to determine the association between children's readiness for school at kindergarten entry and their academic performance more than 3 ½ years later, when they complete their third grade California Standards Tests (CSTs) in English-Language Arts and Mathematics. If readiness skills are important only for kindergarten transition – and if they do not play a role in later academic achievement – readiness scores should not be correlated with students' standardized test scores.

Factors Associated with Third Grade English-Language Arts Test Scores

To better understand how student characteristics and the *Basic Building Blocks* of readiness are associated with later academic performance, ASR conducted a set of regression analyses. Because regression analysis allows us to examine many predictive factors <u>at the same time</u>, we can draw conclusions about which factors are independently associated with academic performance — above and beyond their associations with other factors.

Regression analysis results in a set of what are called "beta coefficients." Beta coefficients are a measure of the strength of association between each factor and standardized test scores, over and above all of the other variables in the model. The magnitude of each beta coefficient signals whether the factor in question is strongly or weakly associated with third grade scores. All coefficients can be compared to one another to determine their relative strengths. A coefficient of .40, for example, is twice as strong as a coefficient of .20.

It is important to keep in mind that regression analyses can provide a glimmer of why children vary, but these are ultimately correlational — not causal — analyses. In other words, it is not possible to state from the data that follow that higher *Kindergarten Academics* scores <u>cause</u> improved academic performance, for example.

It is also important to note that many of the variables that affect academic achievement in the elementary school grades are beyond the scope of this research. We are not able to include any variables in the regression equation that capture the experiences of children in their school years <u>between</u> kindergarten and third grade – for example, there are no measures of teacher effectiveness, curricula used, school climate, or any of a number of other variables that clearly impact student learning and performance. Rather, the predictor variables examined in these regressions include a core set of child and family background variables that may play a role in

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[8]   It should be noted that in this section and throughout this report that the term "school success" is used to designate proficiency on California Standards Tests. We recognize that this is a narrow definition of success and that success can and should include other dimensions of students' school experiences. However, for the purposes of this paper, we limit our definition to focus on the academic test outcomes that are currently prioritized in our education system.

shaping third grade test scores, as well as the variables representing children's readiness for school at kindergarten entry.

The variables used to predict third grade English Language Arts (ELA) and Math CST scores included the following:

- **Child and family background variables**: Gender, special needs status, age, preschool experience, English Learner status, ethnicity, family income, and maternal education level.

- **Children's kindergarten readiness:** Children's skills at kindergarten entry on *Self-Care & Motor Skills*, *Self-Regulation*, *Social Expression*, and *Kindergarten Academics,* as well as two interaction terms: *Kindergarten Academics* x *Self-Regulation* and *Kindergarten Academics* x *Social Expression*. These interaction terms were included in the model to see whether certain combinations of readiness proficiencies are associated with academic success. For example, one might hypothesize that strong *Kindergarten Academics* by itself might not be enough to do well at third grade, and that a combination of strong *Kindergarten Academics* and strong *Self-Regulation* skills is necessary. If this hypothesis were true, the *Kindergarten Academics* x *Self-Regulation* interaction term would emerge as a significant predictor of third grade scores.

Figure 15 shows the results of the regression analysis; depicted are those factors that are significantly related to third grade ELA CST scores, after taking into account all of the other variables. Regression results indicated that this set of predictors explained 35 percent of students' third grade ELA scores (Adj R^2 = .35, p < .001). Figure 15 shows that:

- Of all the variables entered into the regression model, *Kindergarten Academics* levels at kindergarten entry were by far the strongest predictor of third grade ELA test scores – nearly twice as strong as the next biggest predictor. Children who entered kindergarten proficient in the academic basics of kindergarten – recognition of colors and shapes, letter recognition, ability to count 10 objects, writing their own name, and engaging with books – also tended to do better on their ELA standardized tests.

- The next strongest predictor of third grade ELA scores was *Self-Regulation* skills at kindergarten*.* Those students who entered school with skills in staying focused, participating in circle time, and controlling impulses performed better on their third grade ELA tests than their peers who did not enter school with these skills.

- The interaction of these two readiness factors was also a significant predictor, meaning that the impact of *Kindergarten Academics* and *Self-Regulation* on ELA scores is not simply additive. The combination of these two predictors gave some additional insight into how school readiness predicts third grade English test scores. (This finding is discussed in greater depth below.)

- Two other factors emerged as significant predictors of third grade scores as well: higher family income and – in a reflection of the pervasive achievement gap found in California student test score data – not being a child of Hispanic/Latino ethnic background.

It is noteworthy that some variables that were strong predictors of children's readiness at kindergarten entry – e.g., gender, special needs status, age and preschool experience – did not

have a separate significant association with third grade tests scores. This suggests that, if these variables have an impact on third grade scores, the impact is either indirect (they may affect the readiness of students, which in turn relates to third grade performance), or it is not large enough to be statistically significant.

Figure 15:   Results of Regression Analysis Predicting Third-Grade Standardized Test Scores in English-Language Arts

Source: *Kindergarten Observation Form* and *Parent Information Form* and individual school district data.

Note: Values for each factor listed above represent standardized beta coefficients that were significant at p < .05 and, to establish levels of practical significance as well as statistical significance, greater than or equal to .10. For a full listing of all variables entered into the model, see text. The overall regression model was highly significant, F = 33.98, p < .001, explaining 35% of the variance in 3rd grade ELA scores (R^2 = .36; Adj. R^2 = .35).

ASR also conducted a series of separate regression equations for each of several subgroups in the sample, including:

- Students who were and were not English Learners; and

- Students from each of the three most prevalent racial/ethnic groups (Hispanic/Latino, Asian, and Caucasian).

Regression results were similar for English Learners and students who were proficient in English, suggesting that **readiness for school, as measured by the *Kindergarten Observation Form*, was a strong predictor of third grade ELA scores regardless of whether a student was proficient in English or an English Learner.**

However, when looking at regression results among students from different racial/ethnic subgroups, differences did emerge. Specifically, readiness at kindergarten was a stronger predictor of third grade ELA scores for Hispanic/Latino students than it was for Asian or Caucasian students. In fact, readiness scores accounted for twice as much of the variance in the third grade ELA scores of Hispanic/Latino students than third grade scores of Asian or Caucasian students. In other words, although readiness levels were a significant predictor of third grade

scores for <u>all</u> students, readiness appears to have a stronger association with later ELA test performance for Hispanic/Latino students than for Asian or Caucasian students.[9]

The Importance of Having Skills in Both *Kindergarten Academics* and *Self-Regulation*

What does it mean that the interaction between *Kindergarten Academics* and *Self-Regulation* was a significant predictor of third grade English CSTs? In short, it means that certain patterns of readiness on these dimensions are associated with particularly strong performance on third grade tests – and that the impact of these factors is not simply an additive one.

To better understand how students' proficiency in *Kindergarten Academics* and *Self-Regulation* combine to predict third grade academic outcomes, students were first divided into groups according to whether they were above or below the average score on both types of skills. This led to four possible groups, as described in the following figure.

Figure 16:   Percentage of Students Sorting into High and Low *Kindergarten Academics* and *Self-Regulation* Levels

Kindergarten Academics
Cutoff score = 3.17

	Low	High
High	**16%** of students	**39%** of students
Low	**28%** of students	**18%** of students

Self-Regulation
Cutoff score = 3.29
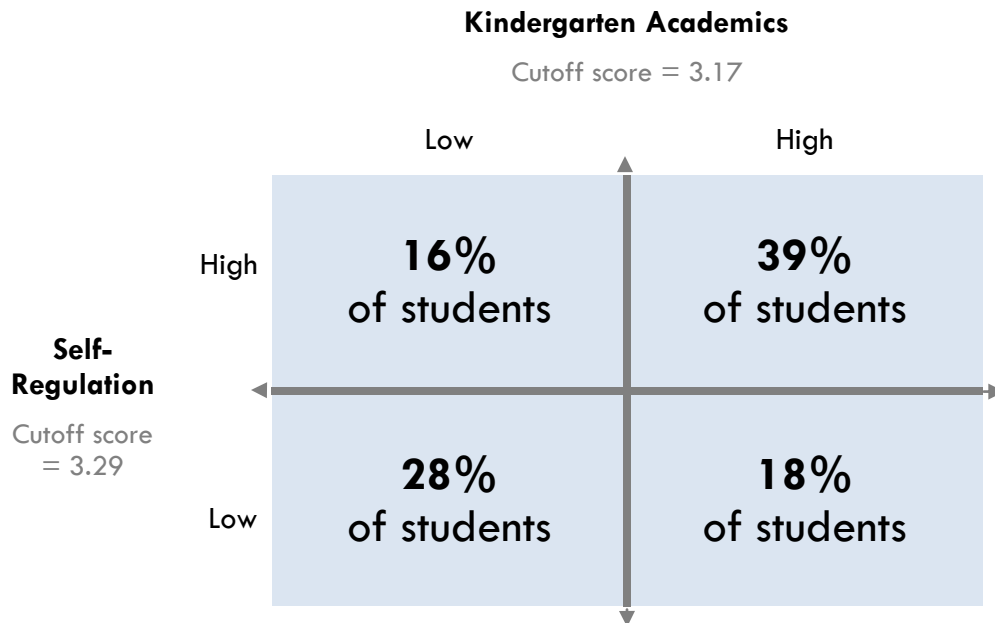
Source: *Kindergarten Observation Form*.

Note: Percentages do not sum to 100 due to rounding. Sample size = 1334. Students were included in these calculations if they: (1) were part of the matched longitudinal sample and (2) had valid scores on an ELA or Math CST. Students were divided into high and low levels of Kindergarten Academics and Self-Regulation based on whether they were above or below the mean score on each. Mean scores are displayed as cutoff scores in the figure.

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[9]   Another noteworthy finding is that variations in control variables such as maternal education and income did very little to help explain the third grade scores of Hispanic/Latino students, but were much more helpful in predicting the scores of Asian and Caucasian students.

The figure that follows on the next page displays the average third grade ELA CST scores for each of those four groups of students in the longitudinal sample. (For reference, the overall average ELA CST score for the longitudinal sample was 348 – just below the cutoff score of 350 that designates proficiency.)

First, students are divided in the figure according to whether their readiness skills in *Kindergarten Academics* were <u>above</u> or <u>below</u> the average score. Students with below-average *Kindergarten Academics* skills are depicted by the green (bottom) line, and students with above-average *Kindergarten Academics* skills are represented by the blue (top) line. The two endpoints of each line reflect students' *Self-Regulation* levels – i.e., whether they were below-average or above-average on *Self-Regulation* skills.

The green line shows that the average third grade CST score for students with below-average *Kindergarten Academics* skills <u>and</u> below-average *Self-Regulation* scores was about 313. The other endpoint of the green line shows that students with below-average *Kindergarten Academics* benefited somewhat when they had good *Self-Regulation* skills – they had an average CST score of 323. In sum, among students who were below-average in *Kindergarten Academics,* those who had strong *Self-Regulation* skills at kindergarten scored about 10 points better than students who did not.

However, the blue line shows that the benefit of having strong *Self-Regulation* skills was much greater for students **if they also had strong skills in *Kindergarten Academics.*** Students with strong skills in *Kindergarten Academics* but below-average scores in *Self-Regulation* had an average ELA score of 358. Students with strong skills in both *Kindergarten Academics* <u>and</u> *Self-Regulation* had an average ELA score of 380. The "boost" that these students received from having strong *Self-Regulation* skills was more than twice as large -- an average of 22 points higher (compared to a boost of 10 points for students who were below-average in *Kindergarten Academics*).

In sum, the figure shows that strong skills in *Self-Regulation* "help" a little when students are below-average in their *Kindergarten Academics*; they help a lot more when students are above-average in their *Kindergarten Academics* skills.

Figure 17: Taking a Closer Look at How *Kindergarten Academics* and *Self-Regulation* Levels Interact to Predict Third Grade ELA Scores
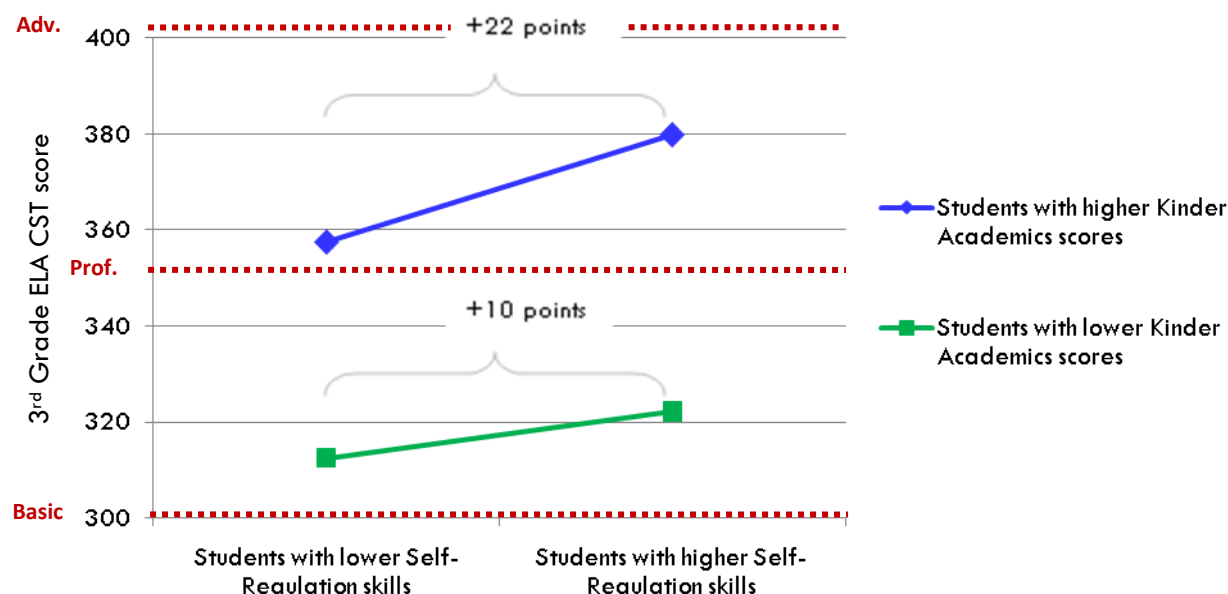
Source: *Kindergarten Observation Form* and individual school district data.

Note: CST scores range from 150 to 600. Cutoffs for Basic, Proficient, and Advanced levels are noted above. Performance levels correspond to the following score ranges: Far Below Basic= 150-258; Below Basic = 259-299; Basic = 300-349; Proficient = 350-401; Advanced = 402-600. The average CST scores for all students together was 348, just below the cutoff for "Proficient." Students were divided into high and low levels of Kindergarten Academics and Self-Regulation based on whether they were above or below the mean score on each. Mean CST scores for the four groups were as follows: Low on both = 313; Low Kinder Academics/High Self-Regulation = 323; High Kinder Academics/Low Self-Regulation = 358; High on both = 380.

How does this translate into third grade proficiency levels? As the following two figures show, students who were low on both their *Self-Regulation* and *Kindergarten Academics* skills at kindergarten were unlikely to be performing at grade level on their English tests at third grade; only one out of four (25%) scored at "Proficient" or "Advanced" levels. Students who had few skills in *Kindergarten Academics* but strong skills in *Self-Regulation* were somewhat more likely to be successful at third grade, with 29 percent scoring at grade level. These two groups were more strongly differentiated at the lowest proficiency levels, however. As Figure 19 shows, nearly half of the students (45%) who were low in both types of skills were classified as "Far Below Basic" or "Below Basic," as compared to about one-third of students (32%) who also had low *Kindergarten Academics* scores, but high levels of *Self-Regulation*.

Having strong *Kindergarten Academics* skills substantially boosted the likelihood that students would be at grade level by third grade. Even without strong *Self-Regulation* skills, 55 percent of students who were ready in their *Kindergarten Academics* were performing well at third grade. Importantly, however, children who were strong in both *Kindergarten Academics* and *Self-Regulation* were even more likely to be successful at third grade, with seventy percent of these students scoring at "Proficient" or "Advanced" levels on their third grade ELA tests. As Figure 19

shows, they also were <u>half</u> as likely as those who were strong only in *Kindergarten Academics* to be performing at the lowest levels on their third grade tests (8% versus 16%, respectively).

Figure 18: Percent of Students Scoring at "Proficient" or "Advanced" on Third Grade ELA Tests, by Readiness Patterns
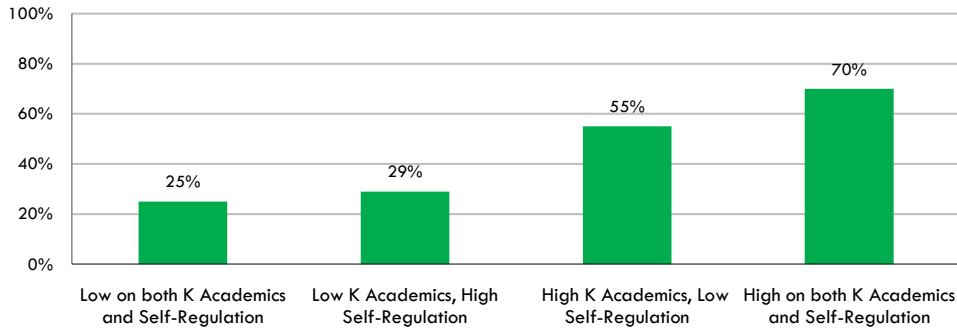
Source: *Kindergarten Observation Form* and individual school district data.

Note: Sample sizes = 367, 211, 235, 515, respectively. Students were divided into high and low levels of Kindergarten Academics and Self-Regulation based on whether they were above or below the mean score on each.

Figure 19: Percent of Students Scoring at "Far Below Basic" or "Below Basic" on Third Grade ELA Tests, by Readiness Patterns
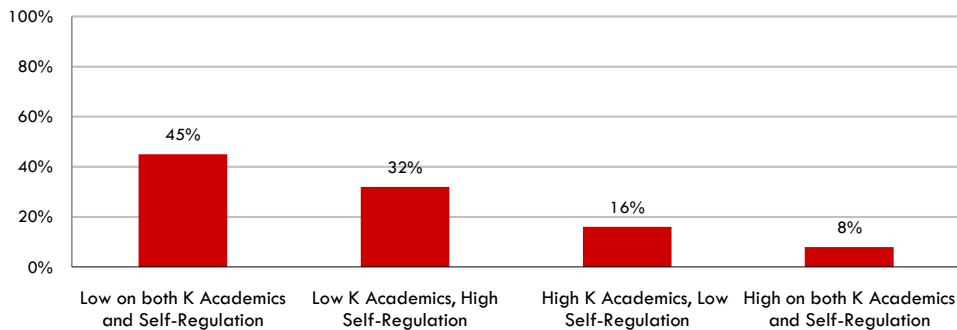
Source: *Kindergarten Observation Form* and individual school district data.

Note: Sample sizes = 367, 211, 235, 515, respectively. Students were divided into high and low levels of Kindergarten Academics and Self-Regulation based on whether they were above or below the mean score on each.

Factors Associated with Third Grade Mathematics Test Scores

Did students' readiness for school at kindergarten show similar associations with their CST Math scores at third grade? The following figure shows that the predictors were quite similar to those observed for ELA scores. Overall, the set of predictors explained slightly less of the Math scores than ELA scores, but the model was still highly significant (Adj R^2 for Math CST = .30, $p < .001$).

As with the ELA scores, *Kindergarten Academics* and *Self-Regulation* scores at kindergarten were the two strongest predictors of third grade Math CST scores. The interaction of the two factors was significant as well, suggesting that their impact on Math scores is more than just an additive effect – certain combinations of skills levels on these two dimensions of readiness are associated with particularly strong performance on Math CSTs. (The nature of this interaction is similar to that of ELA scores and is described on the next page.)

In addition, family income and ethnicity again emerged as significant predictors – although this time the ethnicity variable that emerged in the equation was whether or not the child was Asian, again reflecting the broader statewide trend for Asian students to outperform their peers on Math standardized tests. As with the third grade ELA regression results, some variables that were strong predictors of children's readiness at kindergarten entry – e.g., gender, special needs status, age and preschool experience – did not have a separate association with third grade Math tests scores.

Figure 20:   Results of Regression Analysis Predicting Third-Grade Standardized Test Scores in Math
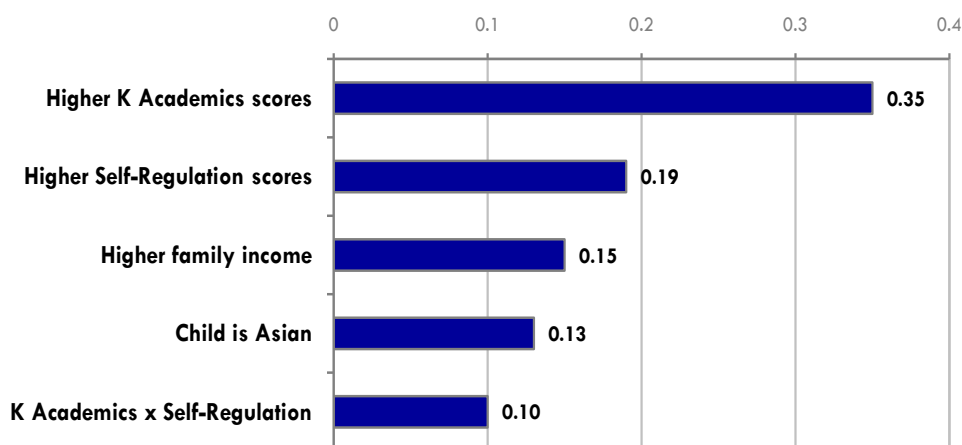
Source: *Kindergarten Observation Form* and *Parent Information Form* and individual school district data.

Note: Values for each factor listed above represent standardized beta coefficients that were significant at p < .05 and, to establish levels of practical significance as well as statistical significance, greater than or equal to .10. For a full listing of all variables entered into the model, see text. The overall regression model was highly significant, F = 27.80, p < .001, explaining 30% of the variance in 3rd grade Math scores (R^2 = .32; Adj. R^2 = .30).

ASR once again conducted a series of separate regression equations comparing results for students who were and were not English Learners and for students from the three largest racial/ethnic subgroups in the sample (Hispanic/Latino, Asian, and White). Kindergarten readiness levels of English Learners were a strong predictor of their third grade Math CST scores, but the relationship between readiness levels and Math CSTs was slightly stronger among students who were proficient in English.

Third grade Math CST regressions computed for students from different racial/ethnic subgroups showed that readiness at kindergarten was a somewhat stronger predictor of third grade scores for Hispanic/Latino students and Asian students than it was for Caucasian students.

The Importance of Having Skills in both *Kindergarten Academics* and *Self-Regulation*

As was the case with ELA scores, knowing students' <u>combined</u> scores at kindergarten in *Kindergarten Academics* and *Self-Regulation* readiness dimensions was more helpful in predicting their third grade Math scores than just knowing their skills in each of these areas individually.

The figure that follows on the next page once again displays the average third grade Math CST scores for four groups of students in the longitudinal sample with different readiness patterns, i.e., whether they were above- or below-average on *Kindergarten Academics* and *Self-Regulation* skills . (For reference, the overall average Math CST score for the longitudinal sample was 400 – in the "Proficient" range.)

Students with below-average *Kindergarten Academics* skills are depicted by the green (bottom) line, and students with above-average *Kindergarten Academics* skills are represented by the blue (top) line. The two endpoints of each line reflect students' *Self-Regulation* levels – i.e., whether they were below-average or above-average on *Self-Regulation* skills.

The green line shows that the average third grade Math CST score for students with below-average *Kindergarten Academics* skills <u>and</u> below-average *Self-Regulation* scores was about 351. The other endpoint of the green line shows that students with below-average *Kindergarten Academics* benefited when they had good *Self-Regulation* skills – they had an average CST score of 366 if they had above-average *Self-Regulation* scores at kindergarten. In sum, among students who were below-average in *Kindergarten Academics,* those who had strong *Self-Regulation* skills at kindergarten scored about 15 points better on their Math test than students who did not.

As with trends for ELA scores, the blue line shows that the benefit of having strong *Self-Regulation* skills was much greater for students **if they also had strong skills in *Kindergarten Academics.*** Students with strong skills in *Kindergarten Academics* but below-average scores in *Self-Regulation* had an average Math CST score of 417. Students with strong skills in both *Kindergarten Academics* <u>and</u> *Self-Regulation* had an average Math score of 443. Thus, strong *Self-Regulation* skills gave students with above-average *Kindergarten Academics* skills a "boost" of 26 points, on average. The boost was smaller – only 15 points – if students were below-average in their *Kindergarten Academics* skills.

Figure 21: **Taking a Closer Look at How *Kindergarten Academics* and *Self-Regulation* Levels Interact to Predict Third Grade Math Scores**
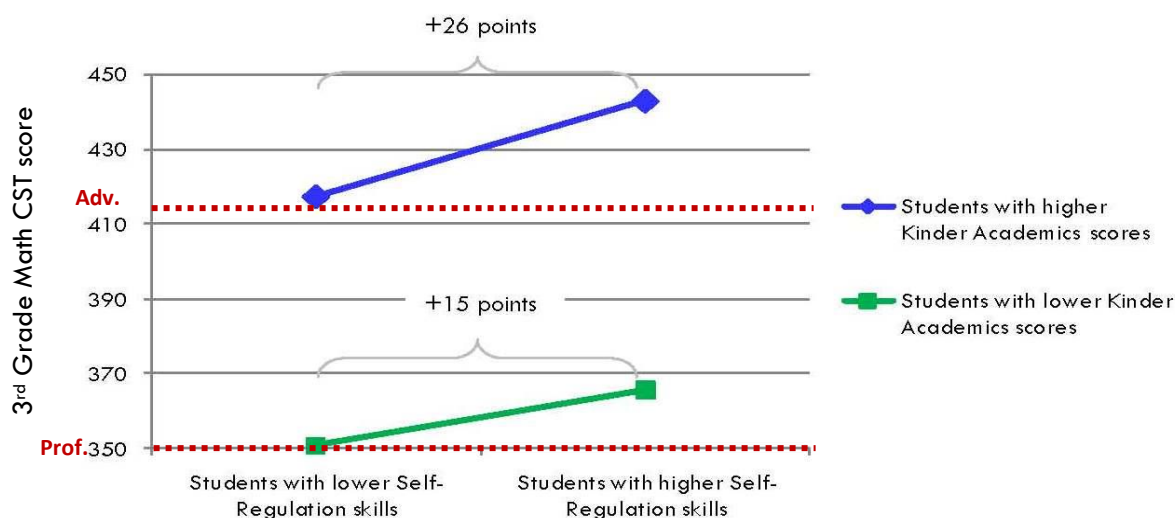
Source: *Kindergarten Observation Form* and individual school district data.

Note: CST scores range from 150 to 600. Cutoffs for Proficient and Advanced levels are noted above. Performance levels correspond to the following score ranges: Far Below Basic= 150-235; Below Basic = 236-299; Basic = 300-349; Proficient = 350-413; Advanced = 414-600. The average CST scores for all students together was 400, in the "Proficient" range. Students were divided into high and low levels of Kindergarten Academics and Self-Regulation based on whether they were above or below the mean score on each. Mean CST scores for the four groups were as follows: Low on both = 351; Low Kinder Academics/High Self-Regulation = 366; High Kinder Academics/Low Self-Regulation = 417; High on both = 443.

The following figures display how these different patterns of readiness were related to third grade Math CST levels. As Figure 22 shows, the pattern is similar to – but even more pronounced than – that observed with English scores. Students with lower *Kindergarten Academics* levels benefit substantially if they have high *Self-Regulation* levels. This "boost" from strong *Self-Regulation* skills is evident as well among students who have strong skills in their *Kindergarten Academics*. Figure 23 shows that almost no students who had strong skills in both readiness domains were scoring at Far Below or Below Basic on their Math CSTs, whereas more than one fourth of students (27%) struggling in both skill domains were scoring at these levels. Students who were doing well in at least one of the two skill areas at kindergarten were somewhat buffered from scoring at the lowest performance levels.

Figure 22: **Percent of Students Scoring at "Proficient" or "Advanced" on Third Grade Math Tests, by Readiness Patterns**
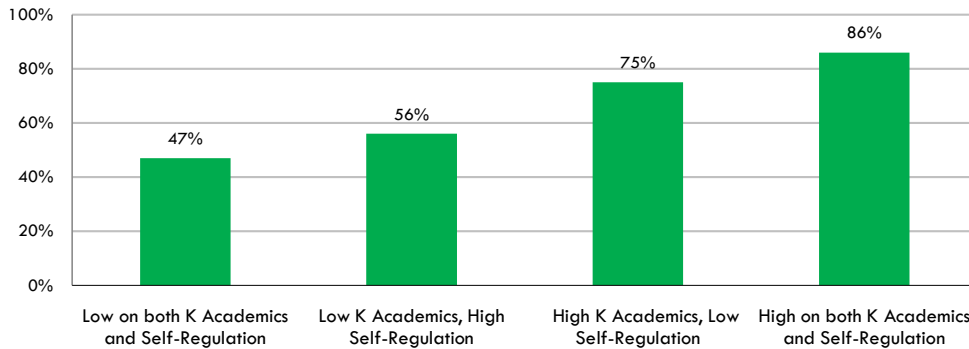
Source: *Kindergarten Observation Form* and individual school district data.

Note: Sample sizes = 369, 210, 236, 514, respectively. Students were divided into high and low levels of Kindergarten Academics and Self-Regulation based on whether they were above or below the mean score on each.

Figure 23: **Percent of Students Scoring at "Far Below Basic" or "Below Basic" on Third Grade Math Tests, by Readiness Patterns**
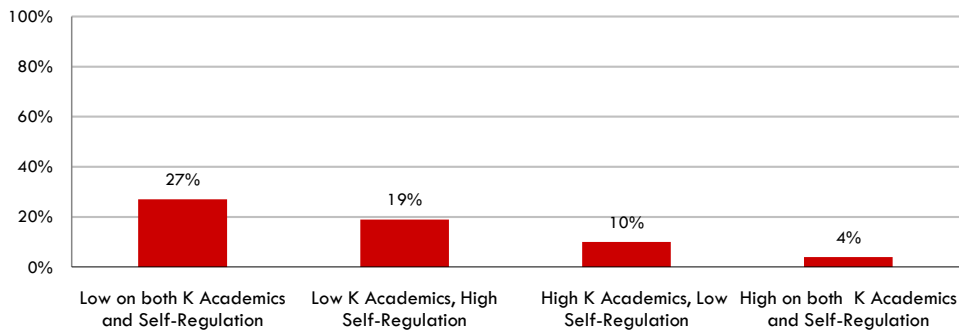
Source: *Kindergarten Observation Form* and individual school district data.

Note: Sample sizes = 369, 210, 236, 514, respectively. Students were divided into high and low levels of Kindergarten Academics and Self-Regulation based on whether they were above or below the mean score on each.

Which Individual Readiness Skills Were Most Strongly Associated with Third Grade Scores?

The regression results show that the children who do best on their third grade English and Math tests tended to start kindergarten already well-prepared with strong skills in *Kindergarten Academics* and *Self-Regulation*. To look at which skills in these *Basic Building Blocks* dimensions had the strongest association with third grade CST scores, correlations between each skill and English and Math CST scores were computed. For both English and Math tests, the skills with the strongest correlations were:

- Recognizes letters of the alphabet;
- Can recognize rhyming words; and
- Can count ten objects.

Fairly weak associations were observed between third grade CST scores and self-help and gross motor skills (e.g. coordination on the playground), as well as on children's engagement in symbolic/imaginative play at kindergarten entry.[10]

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[10] It should be noted that the lack of an association between some of these skills and third grade CST scores does not imply that the skills are not important for other significant academic outcomes not examined here.

Figure 24: Individual Skills Most Strongly Correlated with Third Grade ELA and Math CST Scores

Readiness skills	Correlation with 3rd grade ELA score	Correlation with 3rd grade Math score
Uses small manipulatives	.24	.26
Has general coordination on playground	.12	.16
Performs basic self-help/self-care tasks	.16	.14
Relates appropriately to adults other than parent/primary caregiver	.25	.24
Appropriately expresses needs and wants verbally in primary language	.19	.19
Works and plays cooperatively with peers	.25	.23
Controls impulses and self-regulates	.26	.24
Expresses curiosity and eagerness for learning	.27	.24
Stays focused/pays attention	.30	.29
Follows one-to two-step directions	.28	.28
Participates successfully in circle time	.28	.27
Has expressive abilities	.28	.25
Recognizes letters of the alphabet	**.48**	**.45**
Writes own name	.34	.33
Can recognize rhyming words	**.39**	**.37**
Engages with books	.31	.30
Engages in symbolic/imaginative play	.12	.12
Can count 10 objects	**.37**	**.35**
Recognizes primary colors	.31	.26
Recognizes primary shapes	.35	.31

Source: *Kindergarten Observation Form* and individual school district data.

Note: All correlations were significantly different from 0 at $p < .001$. Sample sizes range from 1256-1328.

Section Summary

The *Kindergarten Academics* and *Self-Regulation* skills that students possessed at the start of kindergarten strongly predicted their performance on English and Math tests taken 3 ½ years later. Moreover, students who had a <u>combination</u> of strong skills in both of those readiness domains performed best on these tests. Family income and ethnicity also were related to performance on third grade tests. Some variables that had previously been found to relate to students' readiness levels – such as age and preschool experience – did <u>not</u> have a separate, significant association with third grade test scores after taking into account other readiness- and non-readiness-related variables.

Students who had strong skills in both *Kindergarten Academics* and *Self-Regulation* as they began school were almost three times more likely to be "Proficient" or "Advanced" on their English-Language Arts CSTs than students who had poor skills in these areas, and they were almost twice as likely to be "Proficient" or "Advanced" on their Math CSTs. Conversely, students with low skill levels in both *Kindergarten Academics* and *Self-Regulation* were more than five times as likely to score at "Far Below Basic" or "Below Basic" on their English and Math CSTs as students who had strong skills in both of these areas at kindergarten entry.

Comparisons of the predictive power of school readiness levels across different student groups revealed that readiness levels generally were a <u>stronger</u> predictor of third grade performance for Hispanic/Latino students than for other students. The association between kindergarten readiness levels and third grade ELA test performance was similar (and large) for English Learners (EL) and Non-EL students. Kindergarten readiness was a slightly better predictor of Math scores for Non-EL students than for EL students.

A missing piece of the third grade academic performance puzzle that was <u>not</u> accounted for in these analyses is the school, classroom, home, and neighborhood influences on students in between kindergarten entry and third grade. Although the measurement and inclusion of these variables was beyond the scope of this research study, more knowledge of the interplay among these factors would likely enhance our understanding of the role that income and ethnicity variables played in predicting third grade achievement in these data. It is interesting that variables like income and maternal education were less helpful in predicting the third grade scores of Hispanic/Latino students than they were for Asian and Caucasian students; this would be a potentially fruitful area for future investigation.

An In-Depth Look at the Third Grade Outcomes of the Most and Least Ready Kindergarteners

Section Overview

The previous section provided strong evidence of the importance of school readiness levels in predicting third grade academic performance – particularly skills in *Kindergarten Academics* and *Self-Regulation*. However, not all students who appeared to be well-prepared for success in school at kindergarten entry were thriving at third grade; conversely, some of the students who appeared to have quite low readiness levels were able to "beat the odds" and perform at grade level on their academic tests by the time they reached third grade.

Who were the students whose skills at kindergarten suggested a different academic "path" than what they actually followed? What distinguishes them from their peers who followed the more typical trajectories based on their kindergarten readiness? This section explores these two groups of students in greater detail – both those who appeared to be poised for success in school and yet were performing poorly in third grade, and those who seemed to be at risk at kindergarten entry due to poor readiness levels but were doing well academically by third grade.

Ready for School at Kindergarten… But Struggling at Third Grade

According to findings from the regression analyses presented in the previous section, the students most likely to be successful at third grade were students who entered kindergarten with a combination of strong skills in both *Kindergarten Academics* and *Self-Regulation* (39% of the longitudinal sample).

However, there were some students with this readiness profile who were not performing at grade level on their third grade CSTs. As the following figure shows, approximately 68 percent of these students were successful at third grade, as measured by scoring at "Proficient" or "Advanced" levels on both ELA and Math CST tests. Another 21 percent were somewhat successful, scoring at "Proficient" or "Advanced" levels on one test but not the other. The remainder (11%) included a group of students whose performance at third grade was inconsistent with their strong readiness levels coming into school. These students scored at the "Basic" level or below on <u>both</u> their third grade English and Math tests.

Figure 25: Third Grade Outcomes of Kindergarteners Who Were Poised to Succeed When They Began School

Skills at kindergarten...

Low K Academics, High Self-Regulation
16%

High K Academics, Low Self-Regulation
18%

Low on both K Academics and Self-Regulation
28%

High on both K Academics and Self-Regulation
39%
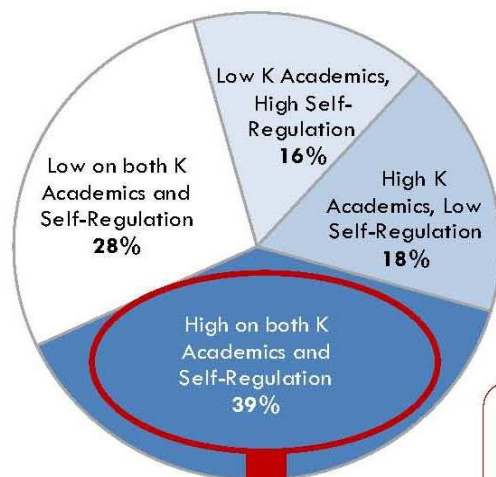
Of the 39% of students (n = 516) who were poised for success at kindergarten (students strong in both *Kindergarten Academics* and *Self-Regulation* skills), where did they end up at third grade?

And outcomes at third grade...

SOMEWHAT SUCCESSFUL at third grade

At grade level on only <u>one</u> CST (n = 107) **21%**

NOT SUCCESSFUL at third grade

Below grade level on <u>both</u> ELA and Math CSTs (n = 59) **11%**

HIGHLY SUCCESSFUL at third grade

At grade level on <u>both</u> ELA and Math CSTs (n = 347) **68%**
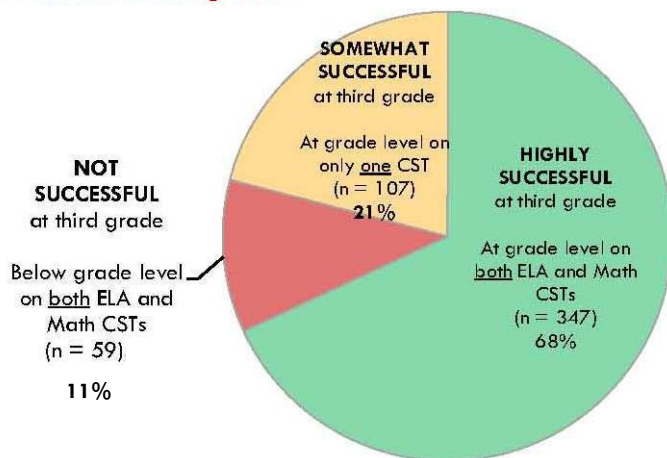
Source: *Kindergarten Observation Form* and individual school district data.

Note: Students were designated as being high on *Kindergarten Academics* and *Self-Regulation* if they scored above the mean score on each readiness domain. An additional three cases were not included in third grade outcome categories because they lacked either ELA or Math CST score data.

Why did some students who were poised to succeed fail to do so? A thorough analysis of this question would need to include an examination of students' experiences during the school years between kindergarten and third grade, which is beyond the scope of this project. However, ASR was able to examine this question using additional data collected during the readiness assessment projects. Specifically, ASR conducted a set of analyses to determine whether these three groups of students differed on two types of variables measured at kindergarten entry,

including: (1) demographic, socioeconomic, or other background factors; and (2) families' engagement in different types of home activities such as reading.

The figure that follows compares the family background characteristics of students who were ready to succeed at kindergarten, as a function of their actual outcomes at third grade. According to these data:

- Younger students who were poised to succeed at kindergarten entry (those born after September 1) were more likely to be among the "Not successful" students who did not achieve proficiency at third grade than they were to be in the "Somewhat" or "Highly" successful groups. Interestingly, there was a greater proportion of young students in the "Highly successful" student group than in the "Somewhat successful" group.

- English Learners who came into kindergarten ready to succeed with strong skills in *Kindergarten Academics* and *Self-Regulation* were disproportionately likely to be among the unsuccessful or somewhat successful students at third grade. Although they made up about half of the "Unsuccessful" and "Somewhat successful" student groups, they only made up one-third of the "Highly successful" group (p <.001).

- Hispanic/Latino students who entered kindergarten with strong skills also appeared to be significantly more likely to "lose ground" during the years between kindergarten and third grade than Asian or Caucasian students. Asian and Caucasian students who started with strong readiness skills made up 26 percent and 35 percent, respectively, of the "Highly successful" group of students at third grade, as compared to only 10 percent and 15 percent of the "Not successful at third grade" group. The opposite was true for Hispanic/Latino students – they made up more than half of the "Not successful" group, but only 21 percent of the "Highly successful" group (p < .001).

- The variability in findings for different racial/ethnic groups is likely explained in large part by differences in other factors as well. For example, students who came into kindergarten well-prepared to succeed in school were more likely to actually do so if they came from high income families (p < .001) and from families where the mother was highly educated (p < .001).

- Although there was some variation in the preschool experience among the groups of students who were ready to succeed but had different third grade outcomes, this did not reach statistical significance. This suggests that the impact of preschool experience is primarily expressed as variations in students' readiness skills at kindergarten, but not as a separate influence on later school performance.

Figure 26: Demographic and Family Backgrounds of Students Who Were Poised to Succeed at Kindergarten, as a Function of Third Grade Outcomes

Variables	Students poised for success at kindergarten and …			All students in longitudinal sample (for comparison)
	Not successful at third grade	Somewhat successful at third grade	Highly successful at third grade	
Sex (% girls)	58%	52%	57%	48%
Has special needs	2%	8%	4%	8%
Turns 5 after September 1 of K year*	**25%**	**8%**	**16%**	23%
Is an English Learner*	**53%**	**50%**	**33%**	54%
Ethnicity*				
Hispanic/Latino	54%	49%	21%	46%
Asian	10%	17%	26%	20%
Caucasian	15%	18%	35%	19%
Other/DK	21%	16%	18%	15%
Family income*				
< $32,000	33%	42%	16%	37%
$32,000 – 81/84,999	48%	29%	27%	30%
$82/85,000⁺ or more	20%	29%	40%	33%
Maternal education level*				
High school or less	45%	39%	23%	41%
Some college	38%	24%	19%	19%
BA/BS or adv degree	18%	38%	58%	40%
Has preschool experience	67%	76%	76%	66%

Source: *Kindergarten Observation Form* and *Parent Information Form*.

Note: Percentages are based on 40-59 "Not successful" students, 72-107 "Somewhat successful" students, and 278-347 "Highly successful" students. Percentages within cells may not sum to 100 due to rounding. The three groups differed significantly overall on the items shown in bold text, according to chi-square tests (*** = $p < .001$).

The figure that follows displays various family activities among students who were poised for success as they started school (based on their strong kindergarten readiness scores), according to whether they were not successful, somewhat successful or highly successful at third grade. The figure shows a general trend in which students who were successful at third grade came from families that were more likely to be engaging in daily activities with their child – even among this subset of students who were very well-prepared for school as they began kindergarten. This difference was statistically significant for two behaviors: daily reading and telling stories or singing songs.

It is important to note that these were family activities measured at kindergarten entry, 3 ½ years before third grade tests were administered. The associations observed here with third grade outcomes suggest that the family practices reported at kindergarten probably continued as children progressed through their early elementary school years.[11]

Figure 27:   Percent of Families Engaging in Various Daily Activities, as a Function of Third Grade Outcomes
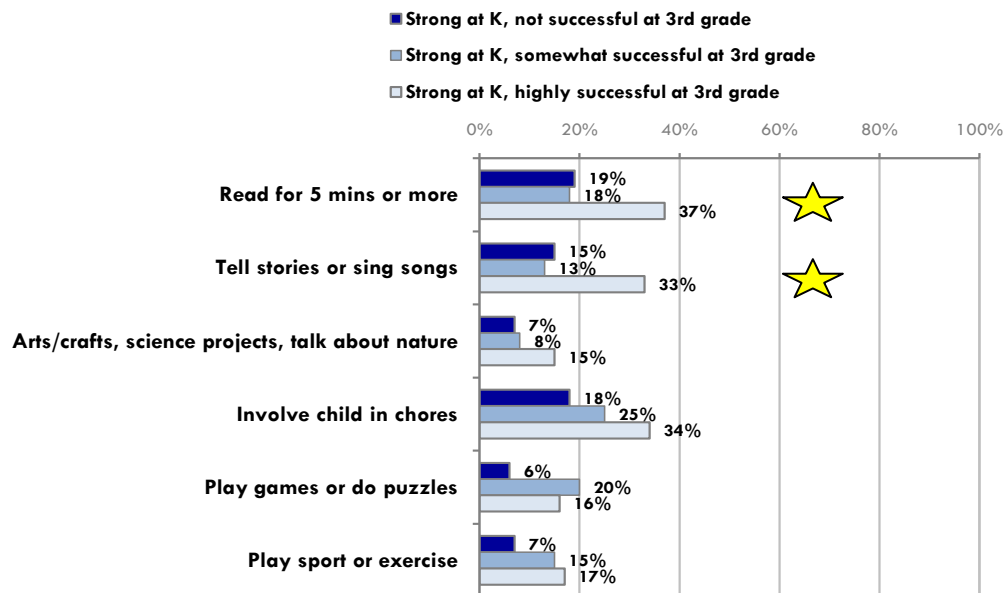
Source: *Parent Information Form.*

Note: Families were considered to be engaging in activities daily if they indicated that they did the activity 7 or more times per week. Percentages are based on 31-43 "Not successful" students, 52-80 "Somewhat successful" students, and 204-302 "Highly successful" students. Percentages within cells may not sum to 100 due to rounding. The three groups differed significantly overall on the items with a star next to them, according to chi-square tests (*p* < .01).

Unprepared at Kindergarten… But Thriving at Third Grade

Results of analyses looking at the readiness factors that best predict third grade academic outcomes suggest that the students who were most at risk for poor third grade outcomes were those who had low readiness levels at kindergarten entry on both their *Kindergarten Academics* and *Self-Regulation* skills. These students were more than five times as likely to be at "Far Below Basic" or "Below Basic" on their third grade CSTs, as compared with students who had strong skills in these areas.

Not all of these students were struggling at third grade, however. As the following figure shows, about one in five of these students (21%) actually "beat the odds" suggested by their

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[11]   Hours of sleep per night and whether a child watched more than 2 hours of day daily were also examined, but they had no association with third grade outcomes.

kindergarten readiness levels and were thriving at third grade, scoring at "Proficient" or "Advanced" levels on both their ELA and Math CSTs. Another 31 percent of these students scored at "Proficient" or "Advanced" levels on one test but not the other. The remaining students (49%) scored below grade level on both tests.

Figure 28:   Third Grade Outcomes of Kindergarteners Who Were Not Well-Prepared When They Began School
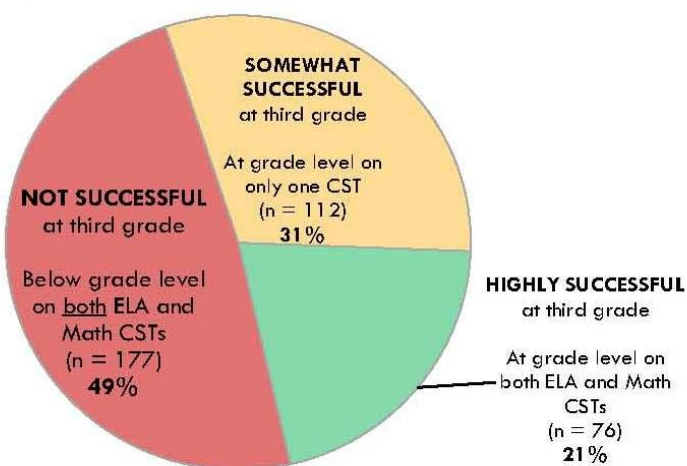
Source: *Kindergarten Observation Form* and individual school district data.

Note: Students were designated as being low on *Kindergarten Academics* and *Self-Regulation* if they scored below the mean score on each readiness domain. An additional six cases were not included in third grade outcome categories because they lacked either ELA or Math CST score data.

Once again, ASR more closely examined this group of students who entered kindergarten lacking the set of skills that were most strongly related to later school success, looking at whether

students who were able to beat the odds and succeed by third grade differed from students whose third grade outcomes followed a path that would be more expected based on their readiness challenges as they entered kindergarten.

The figure that follows compares the demographic and socioeconomic characteristics of students who were unprepared at kindergarten, as a function of their actual outcomes at third grade. The data show that:

- There were fewer young children (turning 5 years old after September 1) among the group that "beat the odds" than there were in the "Not successful at third grade" or "Somewhat successful at third grade" groups. However, young children were more common in the "Somewhat successful" group than the "Not successful" group.

- Asian and Caucasian students were more likely than Hispanic/Latino students to "beat the odds" and become successful at third grade if they were not ready for school at kindergarten ($p < .001$). Asian students who started with poor readiness skills made up only 7 percent of the "Not successful at third grade" group of students, as compared to 29 percent of the "Highly successful at third grade" group. Caucasian students made up only 4 percent of the "Not successful" group, but 12 percent of the "Highly successful" group. Hispanic/Latino students who were not ready for school at kindergarten were much less likely to have been successful at third grade. They made up 76 percent of the "Not successful" group, but only 47 percent of the "Highly successful" group.

- There were also different patterns based on students' family income. Students from higher-income families who were not ready for school at kindergarten (i.e., above $82/$85,000 per year) were more likely than students from lower-income families to have beat the odds and scored at grade level by third grade ($p < .05$).

- There were also trends – although not as strong and not always consistent – for higher maternal education levels to be associated with students being unprepared at kindergarten entry but successful at third grade ($p < .10$).

- Preschool experience did not vary among these students – again, this suggests that the impact of preschool experience is expressed as variations in students' readiness skills at kindergarten, but not as an ongoing impact on later school performance.

Figure 29: Demographic and Family Backgrounds of Students Who Were Unprepared at Kindergarten, as a Function of Third Grade Outcomes

Variables	Students unprepared at kindergarten and …			All students in longitudinal sample (for comparison)
	Not successful at third grade	Somewhat successful at third grade	Highly successful at third grade	
Sex (% girls)	41%	37%	34%	48%
Has special needs	7%	12%	8%	8%
Turns 5 after September 1 of K year*	**32%**	**44%**	**25%**	23%
Is an English Learner	70%	69%	68%	54%
Ethnicity*				
Hispanic/Latino	76%	65%	47%	46%
Asian	7%	19%	29%	20%
Caucasian	4%	9%	12%	19%
Other/DK	13%	7%	12%	15%
Family income*				
< $32,000	65%	52%	54%	37%
$32,000 – 81/84,999	30%	32%	23%	30%
$82/85,000+ or more	5%	17%	23%	33%
Maternal education level+				
High school or less	61%	59%	67%	41%
Some college	27%	24%	15%	19%
BA/BS or adv degree	12%	17%	18%	40%
Has preschool experience	54%	55%	53%	66%

Source: *Kindergarten Observation Form* and *Parent Information Form*.

Note: Percentages are based on 117-177 "Not successful" students, 66-112 "Somewhat successful" students, and 55-76 "Highly successful" students. Percentages within cells may not sum to 100 due to rounding. The three groups differed significantly overall on the items shown in bold text, according to chi-square tests (*** = $p < .001$; ** = $p < .01$; * = $p < .05$; + = $p < .10$).

The following figure shows the various family activities among students who were unprepared at kindergarten (based on their low readiness levels), according to whether they were not successful, somewhat successful, or highly successful at third grade.[12] Unlike the trends presented previously for the students who were poised for success, these trends did not follow the pattern that would be expected based on third grade outcomes. Instead, the figure shows

[12] As noted in the previous section, it is important to keep in mind that these family activities were reported as children were entering kindergarten, so they do not necessarily represent the family practices that were going on after that, i.e., during the early elementary school years.

an interesting trend in which students who were <u>somewhat</u> successful at third grade came from the families that were the most engaged, although this difference was not statistically significant for the most part (except for daily involvement of the child in chores, which was significant at *p* < .01).

Figure 30: Percent of Families Engaging in Various Daily Activities, as a Function of Third Grade Outcomes

Source: *Parent Information Form*.

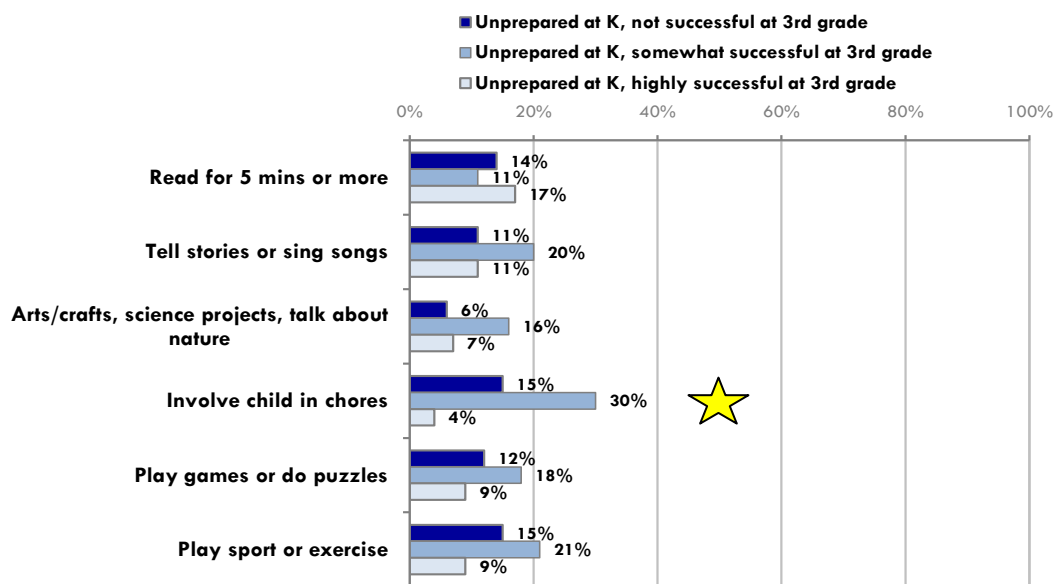Note: Families were considered to be engaging in activities daily if they indicated that they did the activity 7 or more times per week. Percentages are based on 82-125 "Not successful" students, 51-80 "Somewhat successful" students, and 43-64 "Highly successful" students. Percentages within cells may not sum to 100 due to rounding. The three groups differed significantly overall on the items with a star next to them, according to chi-square tests (*p* < .01).

Section Summary

This section took a closer look at the actual third grade outcomes of two groups of students whose readiness levels at kindergarten suggested a particular performance trajectory in their early elementary school years.

According to the regression analysis results, students who had strong skills in both *Kindergarten Academics* and *Self-Regulation* were the most likely to be successful at third grade. However, a small number of these students who were poised to succeed at kindergarten entry were actually struggling at third grade and not performing at grade level on their English-Language Arts and Math CSTs. How did these students differ from those who followed the "expected" path, based on their school readiness levels? Comparisons of these students suggested that the fully-ready students who fail to thrive in their early elementary school years were more likely to be English Learners, Hispanic/Latino students, lower-income, and have a mother with lower education levels. Students who were both poised for success at kindergarten <u>and</u> who were performing at

grade level at third grade came from families who were more likely to report daily reading and singing songs and telling stories at kindergarten, as compared with the students who were well-prepared for school but ended up being less academically successful at third grade.

Another group of students were struggling as they entered kindergarten based on their readiness levels but had "beaten the odds" and were thriving by third grade. These students were again most strongly differentiated by demographic and socioeconomic factors. Asian and Caucasian students were more likely than Hispanic/Latino students to make up for low readiness levels and succeed at third grade, as were children from higher-income families and families with higher maternal education levels. Surprisingly, trends generally showed that the unprepared students who were the most academically successful at third grade were not more likely at kindergarten to have been exposed to many daily activities at home.

Comparing Progress from Kindergarten to Third Grade among Different Student Groups: Which Students "Closed the Gap"?

Section Overview

The previous two sections of this report examined third grade academic outcomes and how they relate to readiness levels by first looking at how multiple factors work together to predict third grade academic outcomes (the multivariate approach used in regression analyses), and then by looking at different combinations of readiness levels and third grade outcomes to determine what variables correlate with students taking the expected or unexpected academic path through third grade, based on their readiness levels at kindergarten. That analysis used a univariate approach, looking separately at individual factors that were associated with different academic trajectories. In both of these analyses, data showed that readiness levels at kindergarten – specifically *Kindergarten Academics* and *Self-Regulation* skills – and certain demographic and socioeconomic factors played a role in understanding how students perform academically at third grade.

This section once again takes a univariate approach to understanding the trajectories of different groups of students to see how they progress from kindergarten to third grade. Specifically, this section examines how different demographic and socioeconomic groups of students progressed between kindergarten and third grade. In most cases, among these groups of students, there were readiness gaps at kindergarten entry. These analyses look at whether, relative to their more prepared peers, the students who started school with lower readiness levels were able to "close the gap" by third grade.

To assess the relative sizes of gaps between groups of students at kindergarten versus third grade, scores on both tests were converted into a *z*-score format that allows them to be compared to each other, even though they were initially measured using completely different scales. Creating these *z*-scores puts all the data (readiness and CST scores) on a single, comparable scale. This comparability is necessary for examining the size of the gaps between different groups of students, to determine whether that gap is increasing, decreasing, or staying the same.

In transforming each set of scores into z-scores, the average becomes 0. Positive scores represent scores that are above the average, whereas negative scores represent scores that are below the average. Please note that in the figures that follow, the key information of interest is **the size of the gap** between the two groups being compared at the two different timepoints – and not the change in z-scores within a particular group. For example, in Figure 31, the z-score for girls' third grade ELA score is lower than their z-score for their readiness score. This does not mean that girls were doing worse at third grade; rather it means that they were not outperforming boys by as large a margin at third grade as they were at kindergarten entry.

The z-scores for students' readiness score and third grade CST scores are displayed in the figures throughout this section, with comparisons for the following groups of students:

- Boys and girls;
- Younger and older students;
- Low, middle, and high-income students;
- English Learners and students proficient in English;
- Hispanic/Latino, Asian, and Caucasian students;
- Students with and without preschool experience; and
- Students with different kindergarten *Readiness Portraits*.

Boys and Girls

One of the most robust findings in previous school readiness studies is that girls enter school with significantly higher readiness levels than boys. As the set of two figures that follow show, the gap shrinks significantly by third grade in English-Language Arts, although girls' scores are still significantly higher than those of boys. For Math scores, however, boys' and girls' scores are not distinguishable by third grade.

Figure 31: Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade ELA, By Gender
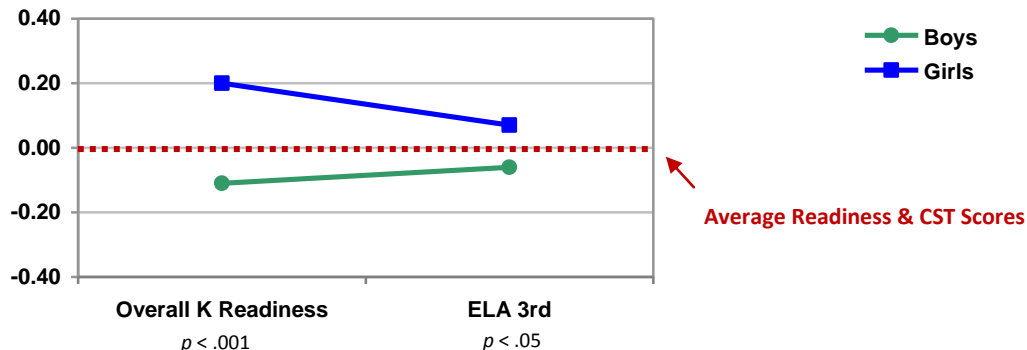
Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on 684 boys and 643 girls. The differences between boys and girls are significant for overall readiness and ELA scores, according to t-tests.

Figure 32: Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade Math, By Gender

Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on 687 boys and 643 girls. The difference between boys and girls is significant for overall readiness but not for Math scores, according to t-tests.

Younger and Older Students

Another consistent finding in school readiness studies is that older children enter school more ready than younger children. A recent California bill has initiated a change to kindergarten entry cutoff dates; the cutoff dates will gradually move from December 2nd to September 1 over the next several years. How might this change impact children by the time they reach third grade?

As the figures below show, the gap between the younger and older students decreased by third grade in both English-Language Arts and Math scores, but the students who turned 5 between September 2 and December 2 were still performing less well than their older peers at third grade. This underscores the need for strong articulation and alignment across pre-k to third grade and the importance of ensuring that teachers across all grades implement effective practices that help younger students "catch up" to their older peers by third grade, even if they start school somewhat behind.

Figure 33: Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade ELA, By Age

Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on 299 younger children and 1024 older children. The differences between younger and older children are significant for overall readiness and ELA scores, according to t-tests.
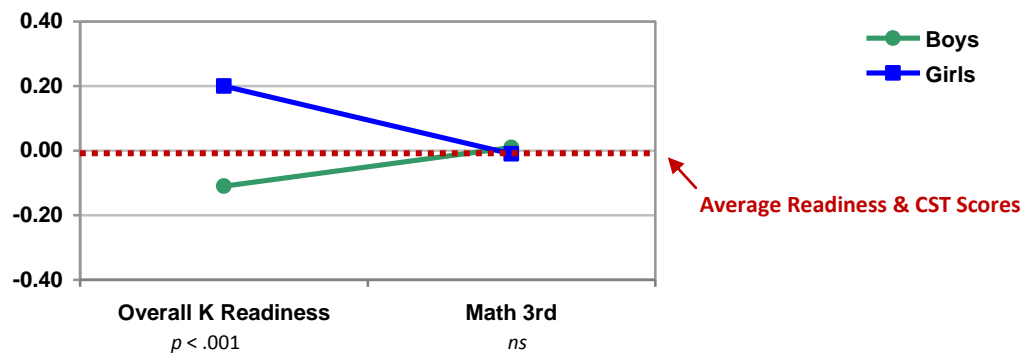
Figure 34: Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade Math, By Age

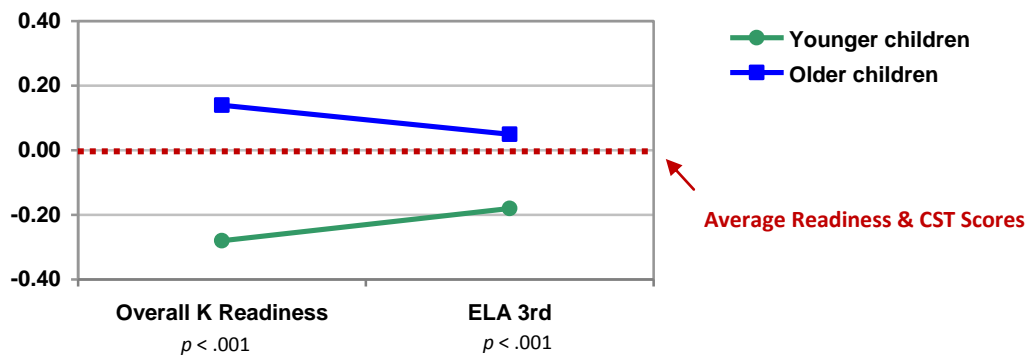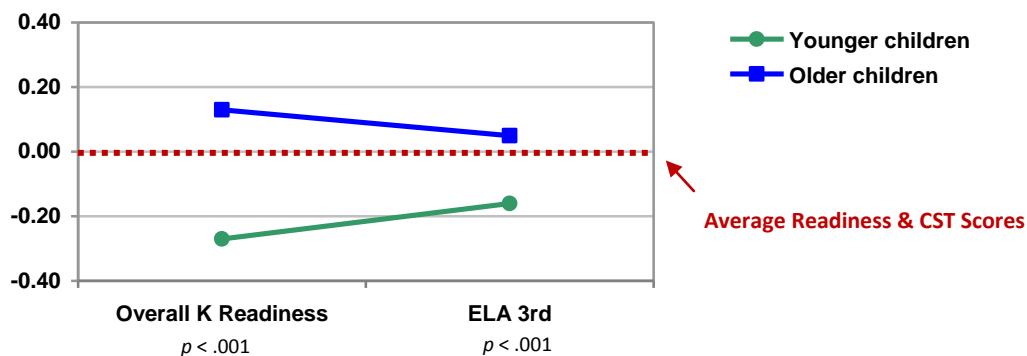Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on 298 younger children and 1028 older children. The differences between younger and older children are significant for overall readiness and ELA scores, according to t-tests.

Low, Middle and High Income Students

For comparing students from different income levels, the income variable was divided into three groups. The low-income group included students' whose family income was less than $32,000 per year. The middle-income group earned $32,000 - $84,999 per year ($81,999 in the 2004 assessment sample). The high-income group included students whose families earned $85,000 ($82,000 in 2004) or more per year.

As the figures show, income strongly differentiated the students – both at kindergarten and at third grade, and on both English and Math performance. At both timepoints, the three income groups were significantly different from each other, and it appears as if the advantage for the high income group may be widening over time. This may reflect tendencies for higher-income students to attend better-resourced schools that typically have greater success in getting their students into the highest performance levels on standardized tests.

Figure 35:   Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade ELA, By Income Level

Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on 339 low-income, 269 middle income, and 310 high-income students. The differences among all three income groups are significant for overall readiness and ELA scores, according to oneway ANOVAs and post hoc tests.

Figure 36:   Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade Math, By Income Level

Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on 339 low-income, 272 middle income, and 311 high-income students. The differences among all three income groups are significant for overall readiness and Math scores, according to oneway ANOVAs and post hoc tests.

English Learners and Students Proficient in English

Comparing students who were identified as English Learners at kindergarten entry (some of whom were later reclassified to English-proficient) to students who were not English Learners in kindergarten, data show two different trends for ELA and Math. The gap between EL and non-EL students increased between kindergarten entry and third grade for ELA tests. For Math, the gap decreased slightly. (As the next set of figures will show, this is likely due to the strong performance of Asian EL students on third grade Math CSTs.)

Figure 37:   Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade ELA, By EL Status
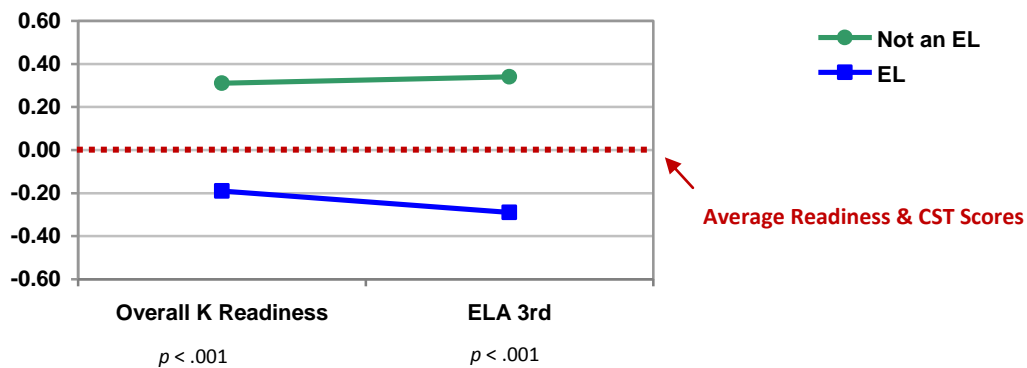
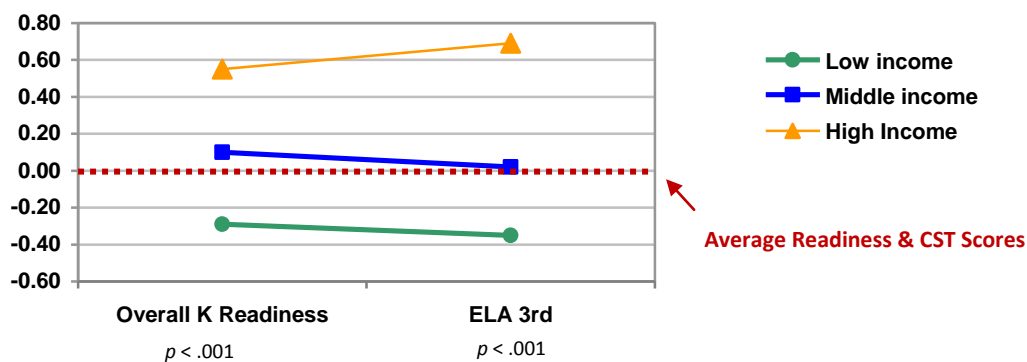Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on 601 non-EL students and 710 EL students. The differences between Non-EL and EL students are significant for overall readiness and ELA scores, according to t-tests.
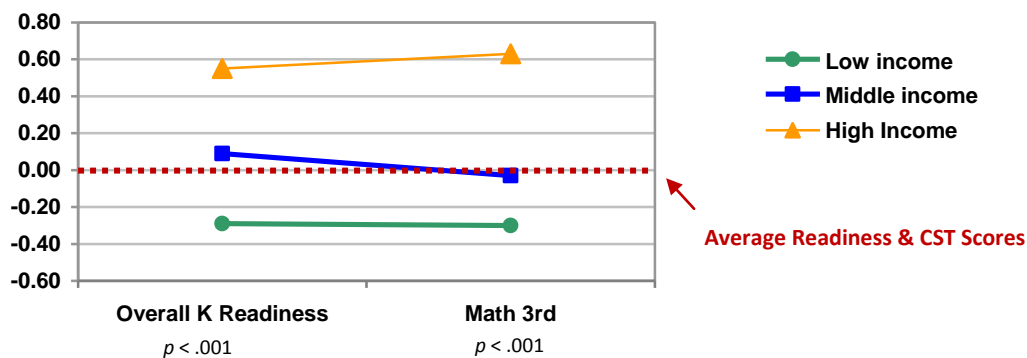
Figure 38:   Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade Math, By EL Status

Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on 605 non-EL students and 709 EL students. The differences between Non-EL and EL students are significant for overall readiness and Math scores, according to t-tests.

Student Race/Ethnicity

The two figures that follow reflect the widely-observed achievement gap in test scores of students in California. Although a readiness gap in these groups already existed at kindergarten, the gap between Hispanic/Latino students and other students had grown by third grade for both ELA and Math scores.[13]

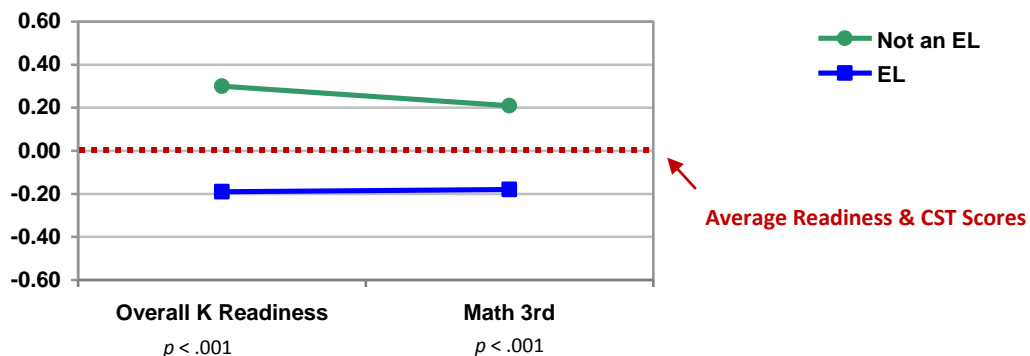**Figure 39:   Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade ELA, By Ethnicity**

Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on 620 Hispanic/Latino, 256 Asian, and 249 Caucasian students. On overall readiness and ELA scores, Caucasian students had significantly higher scores than Asian students, and both Caucasian and Asian students had significantly higher scores than Hispanic/Latino students.

Figure 40:   Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade Math, By Ethnicity
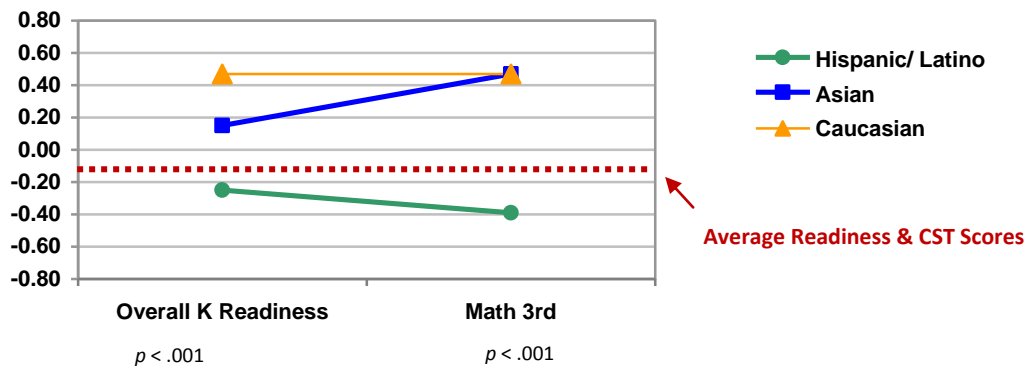
Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on 619 Hispanic/Latino, 257 Asian, and 253 Caucasian students. On overall readiness, Caucasian students had significantly higher scores than Asian students, and both Caucasian and Asian students had significantly higher scores than Hispanic/Latino students. On Math scores, Caucasian and Asian students had statistically similar scores, and both Caucasian and Asian students had significantly higher scores than Hispanic/Latino students.

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[13]   It is important to note that in this non-representative longitudinal sample, there were disproportionate numbers of Asian students from low-income backgrounds and disproportionate numbers of Caucasian students from high-income backgrounds. Thus the lines in these graphs for the Asian and Caucasian students reflect <u>both</u> ethnic differences and income differences simultaneously. (Hispanic/Latino students were largely from lower-income families in this sample and in the population as well.)

Students With and Without Preschool Experience

Another robust finding from the school readiness research is that children who have attended preschool begin kindergarten more prepared for school. Although children without preschool made up some of this gap by third grade, the advantage persisted in both third grade ELA and Math scores.

Figure 41: Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade ELA, By Preschool Experience

Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on 823 students with preschool experience and 429 students without preschool experience. The differences between preschooled and non-preschooled students are significant for overall readiness and ELA scores, according to t-tests.

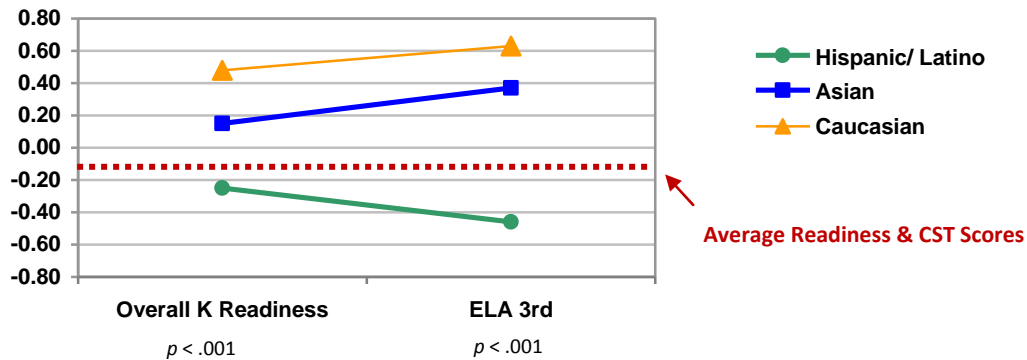**Figure 42: Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade Math, By Preschool Experience**
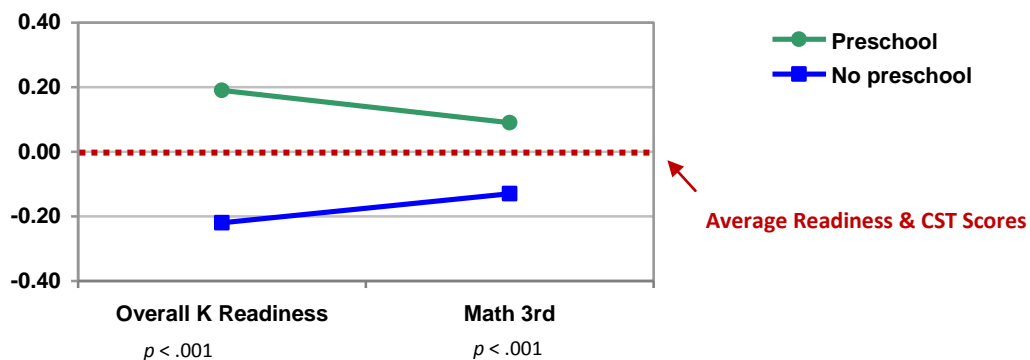
Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on 827 students with preschool experience and 428 students without preschool experience. The differences between preschooled and non-preschooled students are significant for overall readiness and ELA scores, according to t-tests.

Students with Different Kindergarten *Readiness Portraits*

In ASR's readiness assessments, children had been sorted via an analytic technique called cluster analysis into four groups (called *Readiness Portraits*) based on their <u>patterns</u> of readiness, i.e., their combinations of strengths and needs in the four *Basic Building Blocks* of readiness. The figures below show the trajectory of the students in each portrait. The figures show that the spread among the groups had decreased quite a bit by third grade – but this is part due to the cluster analysis procedure itself, which statistically maximizes the differences among the groups into which it sorts students.

Figure 43: Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade ELA, By Readiness Patterns
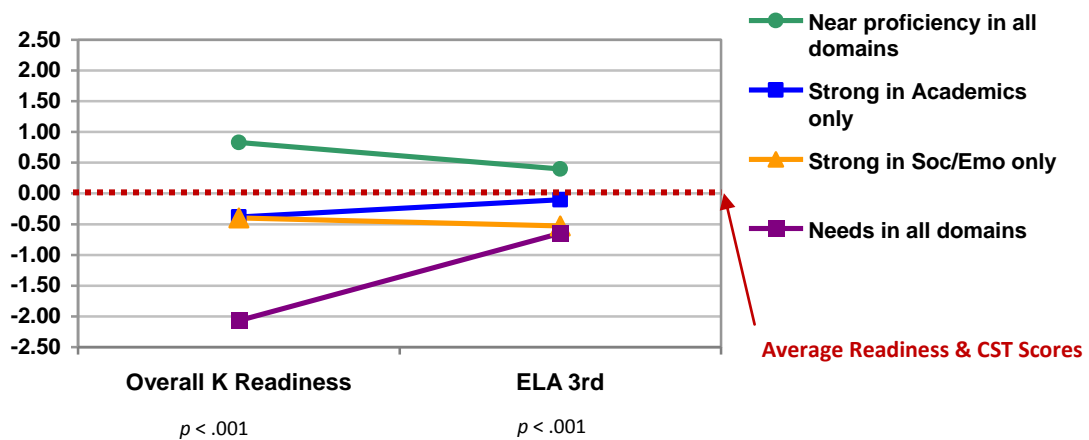
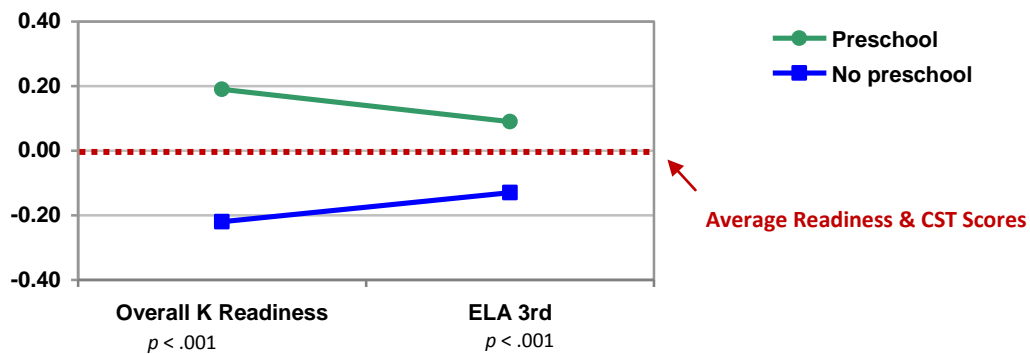Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on 628 "Near proficiency in all," 306 "Strong in Academics," 273 "Strong in Soc/Emo," and 116 "Needs in all." On overall readiness, the "Near Proficiency" group had significantly higher scores than all others; "Strong in Academics" and "Strong in Soc/Emo" were statistically similar, and both had significantly higher scores than the "Needs in all" group. On ELA scores, the "Near Proficiency in all" group had significantly higher scores than all others; "Strong in Academics" had significantly higher scores than the other two groups, and the "Strong in Soc/Emo" and "Needs in all" groups were statistically similar.

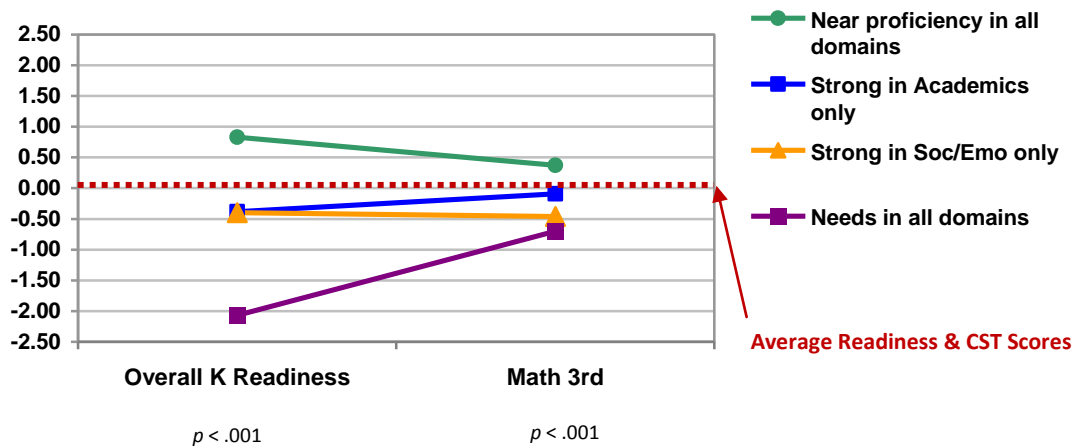**Figure 44:** **Size of the Readiness and Test Score Gaps at Kindergarten and Third Grade Math, By Readiness Patterns**

Source: *Kindergarten Observation Form* and individual school district data.

Note: This chart is based on 629 "Near proficiency in all," 309 "Strong in Academics," 273 "Strong in Soc/Emo," and 115 "Needs in all." On overall readiness, the "Near Proficiency" group had significantly higher scores than all others; "Strong in Academics" and "Strong in Soc/Emo" were statistically similar, and both had significantly higher scores than the "Needs in all" group. On Math scores, all groups were statistically different from each other.

Section Summary

This section investigated how different groups of students progressed between kindergarten entry and third grade. Specifically, a set of analyses examined the extent to which groups of children who started school somewhat behind their peers on measures of school readiness were able to close the gap by third grade, as evidenced by their performance on their ELA and Math CSTs. These analyses are not causal in nature; they are merely descriptions of observed differences in key student subgroups.

Some students who began kindergarten behind their peers in terms of their readiness levels were able to eliminate or shrink the gap by third grade. For example, boys and girls were very similar in their third grade scores (particularly in Math) despite boys being far behind girls when they began school.

Students with different *Readiness Portraits* –that is, with different <u>patterns</u> of readiness strengths and needs in the four *Basic Building Blocks* – were much less different from each other at third grade than they had been at kindergarten entry. However, gaps still persisted at third grade between the most and least ready students.

Gaps also persisted at third grade between students who had and had not attended preschool. Students who had attended preschool were still performing significantly better than their non-preschooled peers on third grade Math and English-Language Arts CSTs, although the gap between their scores had narrowed somewhat between kindergarten and third grade. Similar patterns were observed for younger students (those who turned 5 after September 1 of their kindergarten year), as compared to their older peers.

For some groups of students, initial performance gaps at kindergarten had actually widened further by third grade. High-income students had entered kindergarten with stronger readiness skills than their peers, and their performance at third grade suggested that the performance gap was increasing with time rather than decreasing. The most dramatic increase in the performance gap occurred in the ELA scores of Hispanic/Latino students versus other students, however. There were initial differences among Caucasian, Asian, and Hispanic/Latino students at kindergarten entry, but the performance "spread" for Hispanic/Latino versus other students actually increased by about 50 percent by third grade.

School Readiness and Other Outcomes

Section Overview

Academic performance is one of several outcomes that may be predicted by school readiness levels, but there are others as well. In this section, analyses explore the following questions:

- Are the readiness levels of English Learners at kindergarten entry associated with how well they do on their California English Language Development Test (CELDT) at kindergarten through third grade?

- Are the English Learner students who are more ready for school more likely to be reclassified as fluent English proficient?

- Is readiness for school at kindergarten entry associated with students' school attendance in kindergarten through third grade?

- Is kindergarten readiness related to whether children are held back to repeat kindergarten?

Associations between Readiness and English Language Proficiency

The CELDT is a test administered by California to new students whose home language is not English and to returning students who are currently classified as English Learners. The CELDT tests English language proficiency in four domains: listening, speaking, reading and writing. Students who take the test receive an overall score and a score for each domain. Five performance levels are used to describe students' English proficiency: Beginning, Early Intermediate, Intermediate, Early Advanced, and Advanced.

Using data received from districts, ASR investigated whether English Learner students who were more ready for kindergarten also performed better on the CELDT. Results were examined for CELDT tests at kindergarten, first, second, and third grade and are displayed in the figure that follows.

The figure shows a highly stable pattern across four years of student CELDT results: students who were more ready for kindergarten were also performing consistently better on their tests of English language development.

Figure 45: Average Readiness Scores by CELDT Levels in Kindergarten Through Third Grade
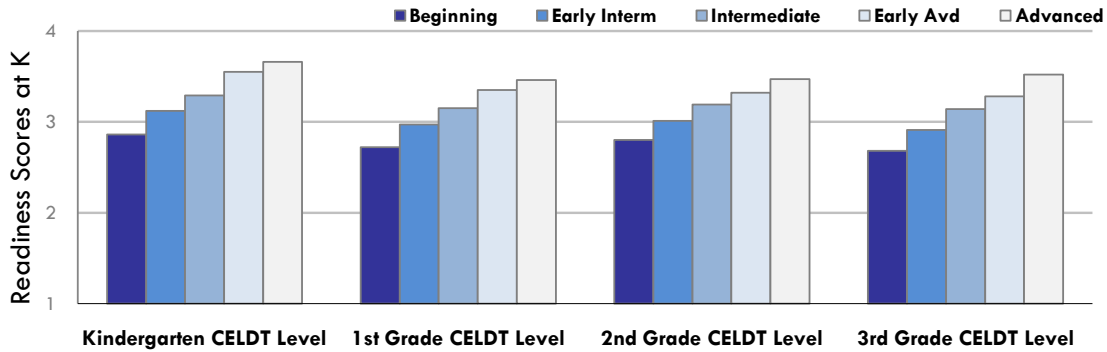
Source: *Kindergarten Observation Form* and individual school district data.

Note: Scale points are as follows: 1 = Not yet, 2 = Beginning, 3 = In progress, 4 = Proficient. Within each CELDT year, students' readiness levels differed according to CELDT level, according to oneway analyses of variance. Follow-up tests showed that each level was significantly different from every other one, with the following exception: students in the Early Advanced and Advanced levels in K, 1st, and 2nd grades had statistically similar readiness levels.

The figure that follows shows the correlations between CELDT levels and readiness, overall and for each *Basic Building Block*. *Kindergarten Academics* had the strongest association with CELDT scores at every grade level. *Social Expression* appeared to be associated with CELDT scores initially, but its association weakened over time, whereas *Self-Regulation* continued to be moderately associated with performance on the CELDT through third grade.

Figure 46: Correlations Between Readiness Scores and CELDT Levels

CELDT Year	CELDT correlation with:				
	Overall Readiness	Self-Care & Motor Skills	Self-Regulation	Social Expression	Kindergarten Academics
Kindergarten	.41	.25	.27	.33	.42
1st grade	.34	.17	.26	.26	.35
2nd grade	.31	.17	.24	.12	.40
3rd grade	.36	.17	.29	.17	.43

Source: *Kindergarten Observation Form* and individual school district data.

Note: All correlations are significant at $p < .001$. Sample sizes are as follows: 431 for kindergarten (due to missing data from one large district), 503 for 1st grade (due to missing data from one large district), 547 for 2nd grade, and 515 for 3rd grade.

Readiness levels were also associated with whether or not English Learner students were reclassified as Fluent English Proficient between kindergarten and third grade. As the following figure shows, compared to their non-reclassified peers, English Learners who were reclassified as fluent in English between kindergarten and third grade had significantly higher readiness scores at kindergarten entry on each of the four *Basic Building Blocks.*

Figure 47: **Average Readiness Scores for English Learners as a Function of Reclassification Status By Third Grade**

Source: *Kindergarten Observation Form* and individual school district data.

Note: Scale points are as follows: 1 = Not yet, 2 = Beginning, 3 = In progress, 4 = Proficient. Sample size = 252 reclassified students and 498 non-reclassified students. Reclassified and non-reclassified students differed significantly from each other overall and on all Basic Building Blocks, according to t-tests (all p's < .05).

Attendance

Is readiness for school at kindergarten entry associated with students' school attendance in kindergarten through third grade? Analyses were conducted to investigate whether readiness was associated with family practices such as ensuring that students attend school and have low absenteeism, which in turn has been shown to relate to student performance (Ready, 2010).

As the correlation matrix below shows, there is a small correlation – at kindergarten only – between children's readiness for school when they started kindergarten and how many days they attended school that year. After kindergarten, however, these associations mostly disappear, except for a very small positive relation between student's *Kindergarten Academics* scores and their first grade attendance.

Figure 48: **Correlations Between Readiness Scores and Days Attended School at Each Grade**

	Correlation with:				
School Year	Overall Readiness	Self-Care & Motor Skills	Self-Regulation	Social Expression	Kindergarten Academics
Kindergarten attendance	**.16**	**.15**	**.11**	**.09**	**.16**
1st grade attendance	.07	.07	.02	.04	.08+
2nd grade attendance	<.01	.03	.01	.01	-.01
3rd grade attendance	.02	-.02	.03	-.02	.04

Source: *Kindergarten Observation Form* and individual school district data.

Note: Correlations in bold are significant at p < .05. The + designates a marginally significant correlation (p = .06). Sample sizes are small because most districts did not provide attendance data: N = 626 for kindergarten, 576 for 1st grade, 560 for 2nd grade, and 558 for 3rd grade.

Retention in Kindergarten

Very few students in the matched sample were identified as having repeated kindergarten – only 18 students (or 2% of the 752 whose retention status was provided by districts) were held back to repeat kindergarten. As the figure that follows shows, these students had been significantly less ready for school when they began kindergarten.

However, unlike findings for other school outcomes, the biggest gaps between retained and non-retained students were not in their <u>academic</u> preparedness; instead, the biggest differences occurred in basic self-care and social-emotional readiness domains; *Self-Regulation* and *Social Expression* skill gaps were the largest, followed by *Self-Care & Motor Skills.* The students who were held back to repeat kindergarten were only marginally lower in their academic preparedness than their peers who were not held back in kindergarten.

Figure 49:   Average Readiness Scores – Students Who Were and Were Not Retained to Repeat Kindergarten

Source: *Kindergarten Observation Form* and individual school district data.

Note: Scale points are as follows: 1 = Not yet, 2 = Beginning, 3 = In progress, 4 = Proficient. Sample size = 732 students not retained in K and 18 students retained in K. Retained and not retained students differed significantly from each other overall and on all Basic Building Blocks except Kindergarten Academics, according to t-tests at p's < .01. Retained and non retained students differed marginally on Kindergarten Academics (p < .08).

Section Summary

School readiness levels assessed at kindergarten entry via the KOF were associated with other outcomes besides third grade performance in math and English. English Learners with strong readiness skills at kindergarten entry – particularly in *Kindergarten Academics* – performed better on tests measuring their English language skills at all grades from kindergarten through third grade. Similarly, students who were eventually reclassified as English-proficient had initial readiness levels that exceeded those of their non-reclassified EL peers on all of the *Basic Building Blocks* of readiness.

School readiness was weakly associated with school attendance rates, but only at kindergarten.

A small number of students were retained to repeat kindergarten, and their readiness levels at kindergarten entry were compared to those of their classmates who were not retained in

kindergarten. Results revealed that the retained students were much further behind their peers on social-emotional and self-care domains of readiness than on the strictly academic types of skills, suggesting that decisions about kindergarten retention have more to do with maturation factors than meeting certain academic performance standards.

How Did Students in Santa Clara and San Mateo Counties Compare?

A subset of analyses was conducted looking at associations between readiness levels and academic outcomes separately for students in San Mateo and Santa Clara counties. However, some caution should be used in interpreting these data; as noted in the Methodology section of this report, these students are not representative of the entire population of students in each county, and so any differences that emerge cannot be assumed to be reflecting truths about all students or all schools or all districts county-wide.

Another difficulty that arises in showing differences between the two counties is that – even if we assume that the results reflect meaningful differences in the experiences of students across the two counties – it is difficult to offer explanations or follow-up analyses to explain <u>why</u> the differences may be occurring. It was beyond the scope of this particular study to collect and integrate additional data capturing the experiences of the matched sample of students during the years between kindergarten and third grade, although this is certainly an enormous contributor to students' success at third grade (and beyond).

It is also important to keep in mind that, in general, **the findings across the two counties were quite similar**. In both counties, readiness levels were strongly related to third grade CST scores, and *Kindergarten Academics* was by far the strongest of all the possible child/family background and readiness factors used to predict test scores.

With these caveats in mind, a description of some key differences observed between the two counties is provided, for purposes of stimulating thought and discussion about the stories these data might be telling.

Higher Readiness Levels in San Mateo County, but Lower Third Grade Test Scores

Past readers of the 2005 school readiness assessment report for San Mateo and Santa Clara counties may recall that there were two key differences observed between entering kindergarteners in the two counties: first, that rates of preschool attendance were significantly higher in San Mateo County than in Santa Clara County; and, second (consistent with higher preschool attendance rates), that readiness levels of San Mateo County kindergarten students were consistently higher than those of Santa Clara County kindergarteners, by a (statistically significant) margin across all of the *Basic Building Blocks*, with differences between the two counties ranging from 0.09 to 0.18 points.

However, looking at the county-level CST scores for this cohort of students (who took their third grade CSTs in 2009), there was a very small but consistent trend for Santa Clara County students to be performing slightly better than San Mateo students on their third grade tests in Math and English-Language Arts. In sum, then, although Santa Clara County students started kindergarten with lower skill levels than San Mateo County students, their third grade tests were on average a little bit higher.

There are, of course, a number of different ways to interpret this data. It may be that some schools in Santa Clara County have been very successful in taking children who are less school-ready than desired and substantially accelerating their learning up through the third grade. Certainly there have been significant investments in some larger districts that are intended to improve student outcomes. For example, for several years, Applied Materials has sponsored the organization Partners in Innovation to work in schools in San Jose Unified School District.

Demographic and Socioeconomic Factors Play a Larger Role in Third Grade Academic Outcomes in San Mateo County than in Santa Clara County

Given the findings noted above, it is not surprising that regression analyses looking at the factors associated with third grade test scores differed somewhat across the two counties. The set of factors representing children's readiness at kindergarten entry was a highly significant predictor of third grade scores in both counties, but readiness levels explained <u>more</u> of the variance in Santa Clara County students' scores than San Mateo County students' scores.

The regression results in the two counties differed in another way as well. Specifically, the block of factors that included demographic and socioeconomic factors – ethnicity, EL status, income, maternal education, etc – explained more variance in third grade scores of San Mateo County students than Santa Clara County students.

In all, more of the variance in San Mateo students' third grade scores was explained by the full set of predictors (readiness and background factors together) than in Santa Clara County students. This means that there is less <u>unexplained</u> variance in third grade scores in San Mateo County than in Santa Clara County – including the school and classroom influences occurring between the kindergarten and third grade that should be helping to boost children's test scores.

Different Academic Trajectories for Students in the Two Counties

County differences can also be seen from the perspective of the "closing the gap" analyses presented earlier in this report. Recall that these analyses tracked the extent to which students who had lower readiness levels than their peers at kindergarten entry were able to make up the difference by third grade and close the performance gap. For some groups, the initial gap at kindergarten had increased by third grade.

Investigations of these trends for students within each county showed that in two comparisons, gaps had widened from kindergarten to third grade in San Mateo County, while remaining stable or decreasing in Santa Clara County. For example, San Mateo County students from different income levels started out with observable differences in their readiness levels, and this performance gap had widened by third grade. Gaps based on income levels were fairly constant between kindergarten and third grade for students in Santa Clara County. Similarly, the gap between English Learners and students proficient in English had widened by a sizeable amount for ELA scores in San Mateo (and slightly for Math scores), but in Santa Clara County the gap stayed stable for ELA scores and shrank considerably for Math scores.

Summary

In sum, although there were many similarities in the trends observed in Santa Clara and San Mateo counties, some differences emerged as well. Data suggested that although sampled students in Santa Clara County started kindergarten less ready than sampled students in San Mateo County, the Santa Clara County students had more than made up for this difference by third grade – performing slightly better than their peers in San Mateo County. Regression results suggest that readiness levels explain more of the third grade scores of Santa Clara County students than San Mateo County students, whose scores were explained more by factors related to demographic and socioeconomic factors. Finally, analyses looking at whether students who started kindergarten with lower school readiness scores were able to close the performance gap by third grade revealed that these gaps were more likely to persist (and sometimes get larger) at third grade for San Mateo County students than Santa Clara County students.

All of the findings related to cross-county differences should be considered preliminary. Without additional information about the school and classroom impacts on learning between kindergarten and third grade, it is difficult to know what could be driving the differences observed between the samples in the two counties. Students might have faced (and responded to) different school and classroom influences in the different regions, but there may be other explanations for these findings as well. It is hoped that presenting information about the differences observed will serve as an initial step to stimulate discussion between districts about what the data mean – and if they may be reflecting successful policies or practices that are improving student achievement levels in the early elementary grades.

Implications and Recommendations

Better Outcomes Ahead for Third Grade Scores?

Data from readiness assessments conducted in both Santa Clara and San Mateo counties in 2008 indicate that students are entering kindergarten with somewhat stronger skills in *Kindergarten Academics*, but they have generally not shown improvements in their *Self-Regulation* skills. Assuming that there are similar associations between readiness levels at kindergarten and later academic performance for these students, this would suggest a trend in which more of these students will be achieving at grade level by the time they take their third grade CSTs in Spring 2012.

Acknowledging the Important Role of Early Elementary (K – 3) Education

As we offer predictions about possible trends in student achievement, it is important to keep in mind that elementary school education plays an enormous role in determining how well a child does at third grade – a role that was not able to be explored in this project. The strength of the relationship between school readiness and later academic performance will vary from one region to another, and from one period of time to another, based in part on the quality of the early elementary school environments that receive children as they enter kindergarten – ready (or not) to learn. Some of the likely school-level factors that would impact the associations between readiness and later success include

- The quality of the curricula and teachers in a school;

- Efforts to engage parents in the school community and in enrichment activities with their child at home;

- The degree of intervention and extra assistance that is offered to the most at-risk students;

- The existence of policies to assist English Learners in succeeding in an English-language based educational system; and

- The ability of schools to ensure that children with special needs are identified early and receive assistance to facilitate their learning.

Working with Parents and Early Care and Education Providers to Ensure that Learning is Well Under Way Before Kindergarten

The strong associations between school readiness and later school performance underscore the need to help children begin their learning long before they enter kindergarten. These longitudinal data show that what children learn even before kindergarten may impact their third grade scores, which in turn are a strong predictor of even longer-term outcomes such as high school graduation rates (Annie E. Casey Foundation, 2010). Efforts should be made to encourage pre-k and elementary school systems to communicate with each other and to develop consistent expectations and values for educating students. Increasing the connections between preschools (and child care of all types) and elementary schools will help to ensure that children begin acquiring essential skills as early as possible.

Coupled with this, these data highlight the need to ensure that policies are in place to help parents choose high-quality, developmentally-appropriate pre-k learning experiences for their children and to assist ECE providers as they work to build the school readiness skills of the children in their care. To this end, recent work in California has begun to develop a statewide preschool quality rating system, which is intended to give guidance to providers and parents alike by creating common quality measures that will be used for early learning and care programs statewide.

Reducing Barriers to Answering Important Questions in Education Research

Across the 19 districts that participated in this project, no two were alike in terms of their data systems or their requirements for sharing data with external research organizations. The complexity of working differently with each of the 19 districts – combined with the significant time and financial resources this process consumed – creates a situation that makes research a very difficult endeavor.

This is particularly unfortunate given current concerns about the effectiveness of our education system. Good education research is especially important as we attempt to tackle problems such as improving student test scores, closing the widely-observed achievement gap among California's students, and how to work effectively with the increasing numbers of students who are learning English in an English-based education system. Districts looking to contribute to increasing our understanding of what works (and what doesn't) in education might consider moving toward more cross-district collaboration as they design or update their data systems and protocols. This would allow for greater efficiency in conducting research that yields meaningful insights into how to ensure that all students can achieve their full academic potential.

About the Researcher

ASR is a nonprofit social research firm dedicated to helping people build better communities by creating meaningful evaluative and assessment data, facilitating information-based planning, and developing custom strategies. Incorporated in 1981, the firm has over thirty years of experience working with public and private agencies, health and human service organizations, city and county offices, school districts, institutions of higher learning, and charitable foundations. Through community assessments, program evaluations, and related studies, ASR provides the information that communities need for effective strategic planning and community interventions.

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About the Santa Clara County Partnership for School Readiness

The Santa Clara County Partnership for School Readiness is a collaborative of public, private and non-profit organizations that started meeting in 2001 because the David and Lucile Packard Foundation and the Health Trust saw a need to build strategic linkages between the organizations that support programs for early childhood. The members made a commitment to develop a shared understanding of the results of the local investments in early childhood, and to foster collaboration among the Partners in order to improve the collective results. In 2003, the group formalized an Agreement to Cooperate, and established a fiscal sponsor. Currently, Silicon Valley Community Foundation acts as the fiscal sponsor.

Current members of the Partnership include:

> Applied Materials, Bella Vista Foundation, Bring Me a Book Foundation, City of Milpitas, FIRST 5 Santa Clara County, Gilroy Unified School District, Grail Family Services, Go Kids, Heising-Simons Foundation, Junior League of San Jose, Kids in Common, KTEH, Local Early Education Planning Council of Santa Clara County, Mujer a Mujer, Morgan Family Foundation, David and Lucile Packard Foundation, Reading Partners, San Jose City Library, Santa Clara County Office of Education, Silicon Valley Community Foundation, Silicon Valley Education Foundation, Silicon Valley Leadership Group, Sobrato Family Foundation, and United Way Silicon Valley.

For more information about the Santa Clara County Partnership for School Readiness, contact Loretta Burns at burnslh@gmail.com or visit www.sccpsr.org.

About the Silicon Valley Community Foundation

Silicon Valley Community Foundation is a catalyst and leader for innovative solutions to our region's most challenging problems. Serving all of San Mateo and Santa Clara counties, the community foundation has $1.7 billion in assets under management and 1,500 philanthropic funds. The community foundation provides grants through donor advised and corporate funds in addition to its own endowment funds. The community foundation serves as a regional center for philanthropy, providing donors simple and effective ways to give locally and around the world. Find out more at www.siliconvalleycf.org.

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