



Attendance in Early Elementary Grades

Associations with Student Characteristics, School Readiness, and Third Grade Outcomes

MINI-REPORT

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Background and purpose of analyses

In 2010, ASR published a longitudinal study linking students' school readiness levels at kindergarten entry (as measured by ASR's *Kindergarten Observation Form*¹) to their later academic outcomes (ASR, 2010). Although that study contained some preliminary analyses examining school readiness and attendance in early elementary school grades, it more directly focused on examinations of outcomes relating readiness to performance on third grade English-Language Arts (ELA) and Mathematics California Standards Tests (CSTs).

In February, 2011, ASR began a collaboration with Attendance Works to further “mine” this longitudinal dataset to take a more comprehensive look at the role that attendance may play as a predictor of student success. Specifically, analyses were conducted to investigate the following questions:

- How does attendance in early grades (kindergarten and first grade) relate to third grade performance?
- Does the association between attendance and later outcomes depend on the readiness skills that students possess when they enter kindergarten?

Before addressing these research questions, the sections that follow provide a brief summary of students included in the analyses, an overview of their attendance patterns, and a description of student and family correlates of poor attendance in early elementary grades.

¹ Information about the Kindergarten Observation Form and Applied Survey Research's School Readiness Assessment Model are available upon request: kristi@appliedsurveyresearch.org.

Characteristics of the student sample

The sample described in the sections that follow is drawn from the sample of all kindergarten students who participated in school readiness assessments conducted by Applied Survey Research in Fall 2004 (Santa Clara County only) or Fall 2005 (both Santa Clara and San Mateo counties). From that original study sample, students were included in this set of analyses based on the following:

- Students' kindergarten readiness data had to be **successfully matched to district school records** for their kindergarten through 3rd/4th grade school year; and
- The district **had to have provided attendance data** for one or more years from kindergarten through 3rd/4th grade (not all districts participating in the longitudinal study provided requested attendance data).

Out of the 19 participating school districts, eight districts of varying size provided attendance data. In sum, longitudinal data for 640 students were available for examination. A brief summary of key information about the sample is described on the following page.

As the figure shows, more than one third of the students (37%) attended a school with low Academic Performance Index (API) scores (i.e., schools with a statewide rank of 1, 2, or 3). About half of the students were English Learners, and the largest racial/ethnic group represented was Hispanic/Latino students. About one third of the sample came from families in which income levels were less than \$32,000 per year. Just over two-thirds of the students (68%) had attended a preschool program in the year before entering kindergarten.

Figure 1: School, Student and Family Characteristics of Those with Longitudinal Data

Variables	Number	Percent
Base sample size	640	--
School API for <u>kindergarten</u> year (2004 or 2005)		
Low	239	37%
Middle	181	28%
High	220	34%
Sex (#/% girls)	309	48%
Has special needs	48	8%
Age		
Turned 5 after September 1	144	23%
Turned 5 on or before September 1	492	77%
Is an English Learner		
Yes	323	51%
No	309	49%
Primary language spoken at home		
English	272	54%
Spanish	169	34%
Vietnamese	10	2%
Other	54	11%
Race/ethnicity		
Hispanic/Latino	306	48%
Asian	94	15%
Caucasian	148	23%
Other/DK	92	14%
Family income		
< \$32,000	147	34%
\$32,000 – 81,999/84,999	111	25%
\$82,000/85,000 ⁺ or more	180	41%
Has preschool experience		
Yes	407	68%
No	191	32%

Source: Kindergarten Observation Form and Parent Information Form.

Note: Percentages may not sum to 100 due to rounding. Low API refers to schools with a statewide rank of 1, 2, or 3. Middle API refers to schools with a statewide rank of 4, 5, 6, or 7. High API refers to schools with a statewide rank of 8, 9, or 10.

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

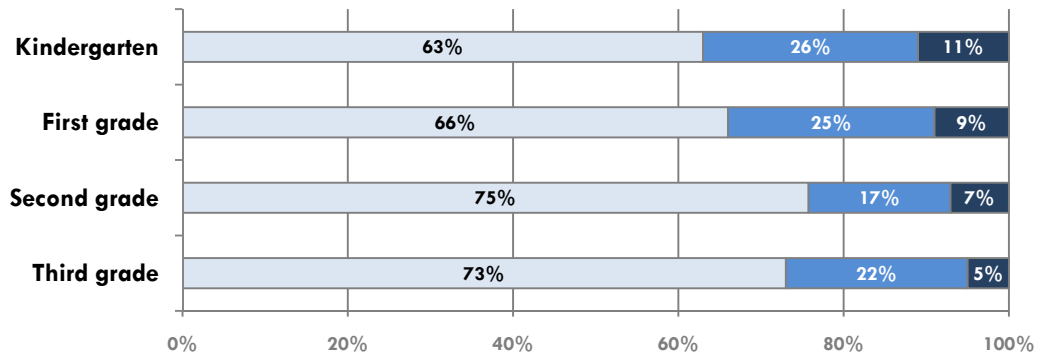
Describing patterns of absences

What were the attendance patterns of the students in the sample? In the figure that follows student attendance is displayed by grade level and according to the percentage of students with satisfactory, at-risk, and chronic absence levels.

As the figure shows, attendance rates tend to improve slightly at children get older. The percentage of students with satisfactory attendance increased over time, and chronic absences decreased by about one-half between kindergarten and third grade.

Figure 2: School Attendance, by Grade

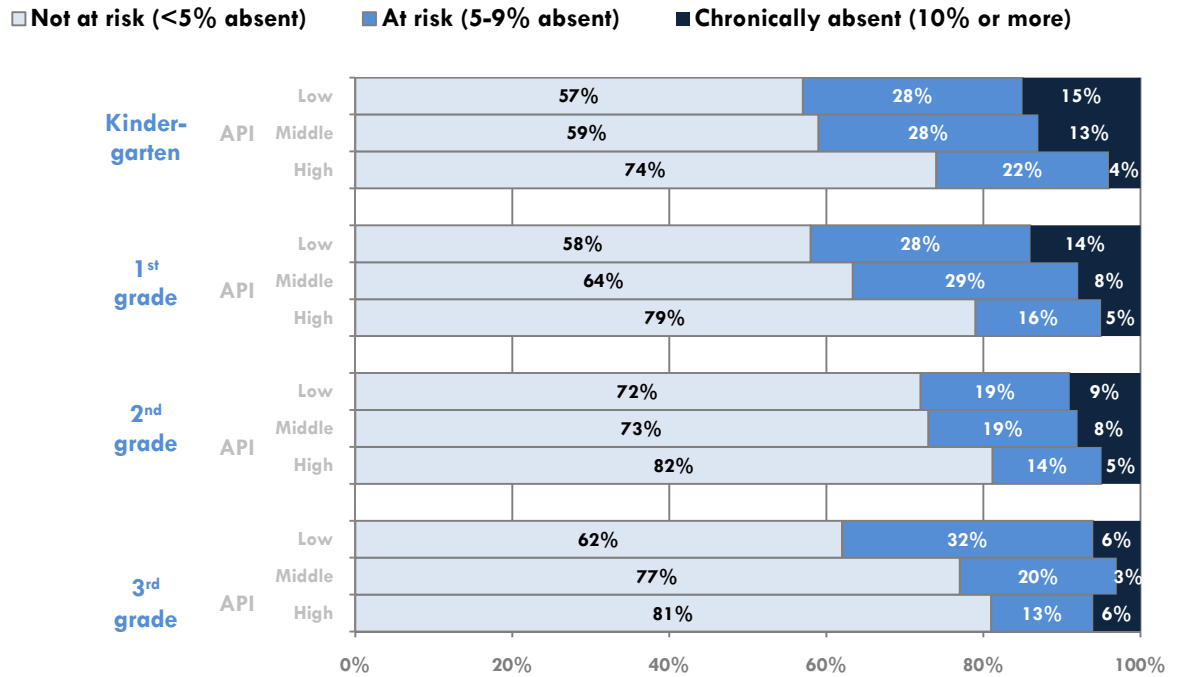
■ Not at risk (absent <5% of days) ■ At risk (absent 5-9% of days) ■ Chronic (absent at least 10% of days)



Sample sizes are as follows: Kindergarten = 628; 1st grade = 578; 2nd grade = 562; 3rd grade = 560.

The figure that follows further divides the sample according to school API level. In general, students from Low (API = 1, 2, 3) and Middle (API = 4, 5, 6, 7) API schools had poorer attendance than students in High API schools. Differences in chronic absence across schools with different API levels tended to diminish by third grade but were still present; in the Low-API schools, less than two thirds of the students had satisfactory attendance in third grade (62%), as compared with 81 percent of students from High-API schools.

Figure 3: School Attendance, by Grade and API Level



Sample sizes are as follows: Kindergarten (Low API = 236; Middle API= 180; High API = 212); 1st grade (Low API = 220; Middle API= 173; High API = 185); 2nd grade (Low API = 217; Middle API= 167; High API = 178); 3rd grade (Low API = 212; Middle API= 167; High API = 181).

What were students' attendance patterns across their earliest school years? To better understand how many students had multiple years of at-risk or chronic attendance, a more detailed analysis divided students according to whether they were not-at-risk, at-risk, or chronically absent across both their kindergarten and first grade years. The cross-tabulation of risk levels in those two years is displayed in Figure 4, and the designation of four "attendance risk groups" is shown in Figure 5. These four groups are used throughout the remainder of this report to describe associations between attendance and later outcomes.

As Figure 4 shows, about half of the students had satisfactory attendance levels in both their kindergarten and first grade years. At the opposite end of the spectrum, about four percent ($n = 22$) were chronically absent in both of these years. About 11 percent had consistently "at-risk" attendance levels in kindergarten and first grade, and six percent demonstrated patterns in which they had moderate attendance risks in which they had been chronically absent in one of those two years and in the at-risk range in the other.

Figure 4: Number (and Percentage) of Students within Each Combination of Kindergarten/First Grade Attendance

		Attendance status in 1 st grade		
		No risk (absent 0-4% of days)	At risk (absent 5-9% of days)	Chronic (absent 10% or more days)
Attendance status in kindergarten	No risk (absent 0-4% of days)	295 (51%)	63 (11%)	12 (2%)
	At risk (absent 5-9% of days)	68 (12%)	61 (11%)	19 (3%)
	Chronic (absent 10% or more days)	19 (3%)	17 (3%)	22 (4%)

Figure 5: Combined Kindergarten/First Grade Attendance Risk Groups

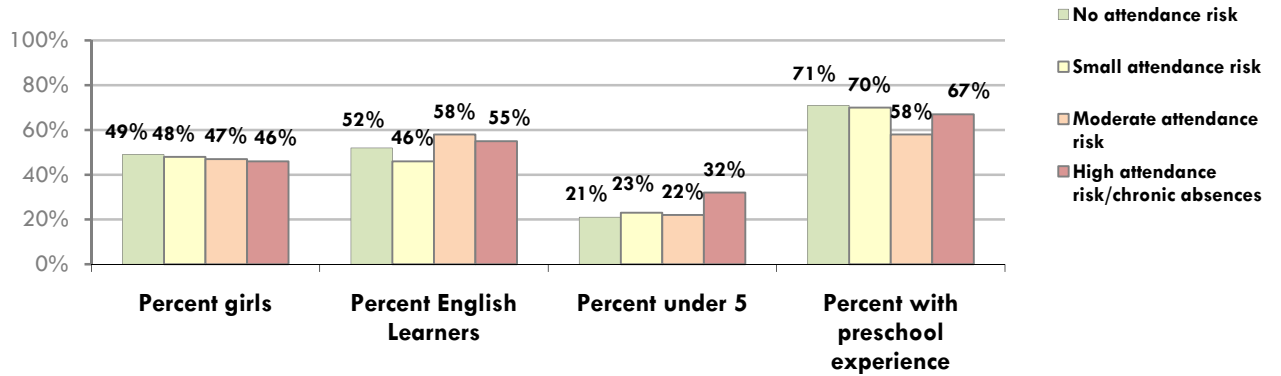
Color code	Group name	Description
	No risk	Both years (K & 1 st) 0-4% of days absent
	Small risk	Both years 5-9% of days absent
	Moderate risk	One year 5-9% of days absent; one year 10% or more days absent
	High risk	Both years with chronic absence (10% or more days absent)

Preliminary analyses comparing students from school of different API levels showed that chronic absence issues tended to occur more often in students who came from lower-performing schools (see Figure 3). The two figures that follow also look at the extent to which other student and family characteristics were associated with higher (or lower) attendance risks, this time using the combined kindergarten-first grade (k/1st) attendance patterns.

As Figures 6 and 7 show, the four attendance risk groups were comprised of somewhat different students, with the sharpest differences occurring in the percentage of students who had very low family incomes (less than \$32,000 per year).²

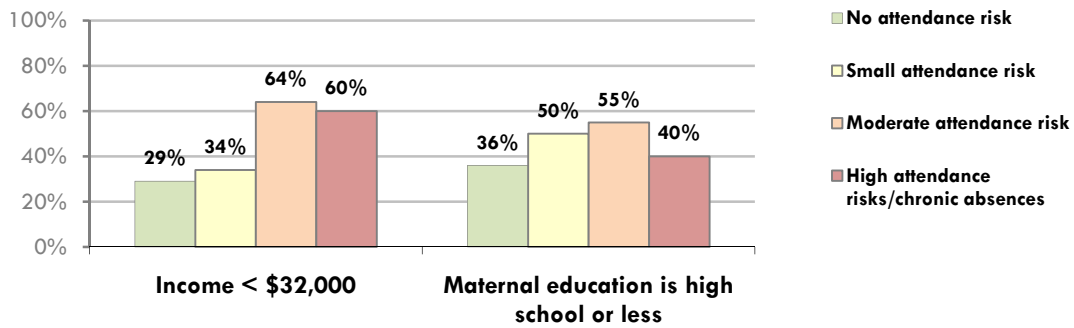
² Due to the small sample sizes observed in the higher-risk attendance groups, there may be some true differences among these groups of students that do not reach the level of statistical significance. Given the small sample size issue, analyses throughout this memo should be considered to be preliminary trends that will need to be replicated with a larger sample of students in future research.

Figure 6: Percentage of Students with Different Background Characteristics, by K/1st Combined Attendance



Some percentages are based on very small sample sizes. Sample sizes are as follows, across the 3 readiness groups: No risk = 286-293; Small risk = 54-61; Moderate risk = 31-36; High risk = 18-22. There were no statistically significant group differences on any variables

Figure 7: Percentage of Students from families with Low Income and Education Levels, by K/1st Combined Attendance



Percentages are based on very small sample sizes. Sample sizes are as follows, across the 3 readiness groups: No risk = 222-231; Small risk = 38-40; Moderate risk = 22; High risk = 10. Groups differed significantly on income according to chi-square tests, $p < .01$, as follows: (no risk = small risk) < moderate risk, and no risk < high risk.

Section Summary: Key Findings

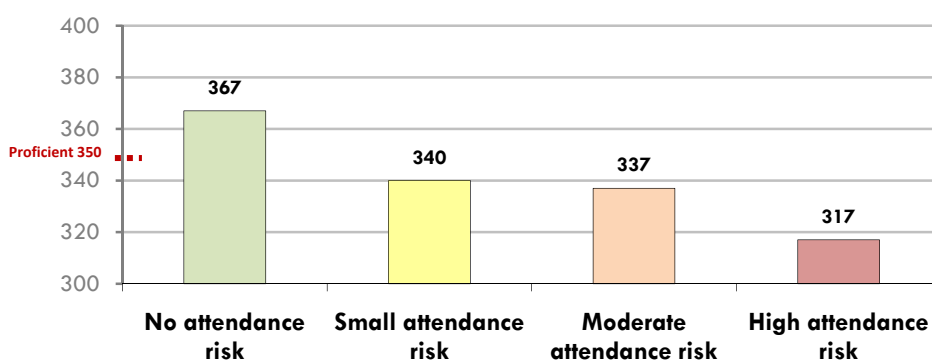
- Students had fewer chronic absences at third grade than in earlier grades.
- Attendance was generally better in High API schools than in Low or Middle API schools.
- Among children with different patterns of attendance across the kindergarten and first grade years, there were no significant differences on major child background variables, but students who had more frequent absences did tend to come from lower-income families.

How does attendance in early grades relate to third grade performance?

Do students who are chronically absent at kindergarten and/or first grade score more poorly on their third grade English-Language Arts (ELA) and Math tests? What trends are observed for tests that measure progress in English-language development among those learning English? This section presents the results of analyses comparing the third grade test results of students in the four attendance risk groups described in the previous section.

Figure 8 shows students' scores on third grade ELA tests, as a function of their combined attendance in kindergarten and first grade. As the figure shows, students who had good attendance across both grades had the highest third grade scores – statistically significantly higher than any of the other groups. Students who had no attendance risks scored an average of 50 points higher on the ELA tests than students who were chronically absent in their first two years of school.

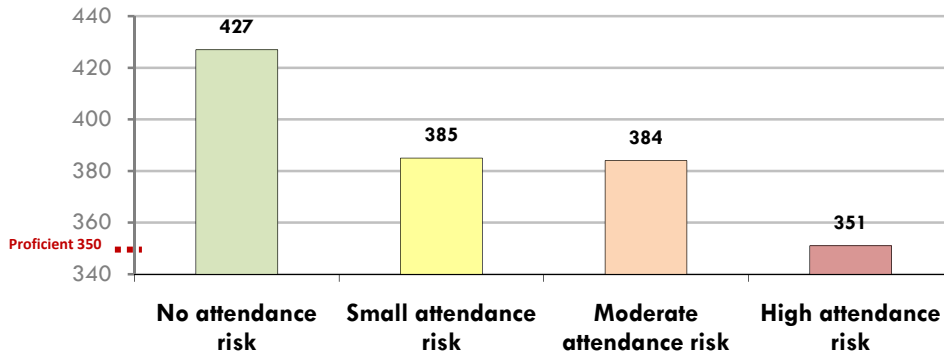
Figure 8: Third Grade ELA Test Scores, by K/1st Combined Attendance



Sample sizes are as follows: No risk = 274; Small risk = 58; Moderate risk = 34; High risk = 18. Overall group differences were statistically significant according to oneway analysis of variance ($p < .001$). Post-hoc tests revealed significant subgroup differences as follows: No risk > (Small risk = Moderate risk = High risk).

The trend was even more pronounced for students' third grade Math CST scores. As Figure 9 shows, there was a 76-point "spread" between students with no attendance risks and students who were chronically absent in both their kindergarten and first grade years.

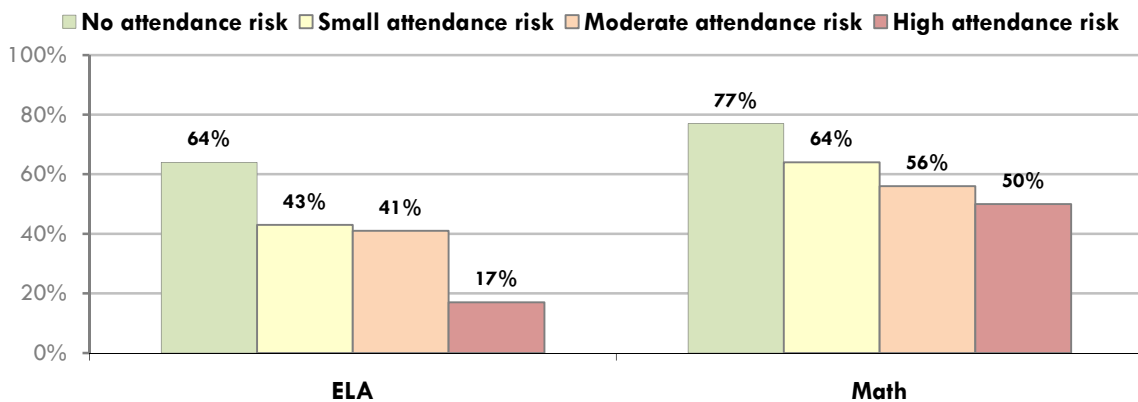
Figure 9: Third Grade Math Test Scores, by K/1st Combined Attendance



Sample sizes are as follows: No risk = 274; Small risk = 58; Moderate risk = 34; High risk = 18. Overall group differences were statistically significant according to oneway analysis of variance ($p < .001$). Post-hoc tests revealed significant subgroup differences as follows: No risk > (Small risk = Moderate risk = High risk).

Figure 10 displays the percentage of students performing at grade level (i.e., with CST scores corresponding to “Proficient” or “Advanced” levels). For both ELA and Math, there is a consistent trend showing that as absences in kindergarten and first grade increase, the likelihood of a student performing at grade level decreases. The difference is particularly dramatic for ELA tests, with 64% of students with strong attendance scoring at grade level on ELA – versus only 17% of students who were chronically absent in their first two years. (The trend is somewhat less pronounced for Math tests because students struggle less with Math tests than ELA tests; more students overall are able to score at or above grade level.)

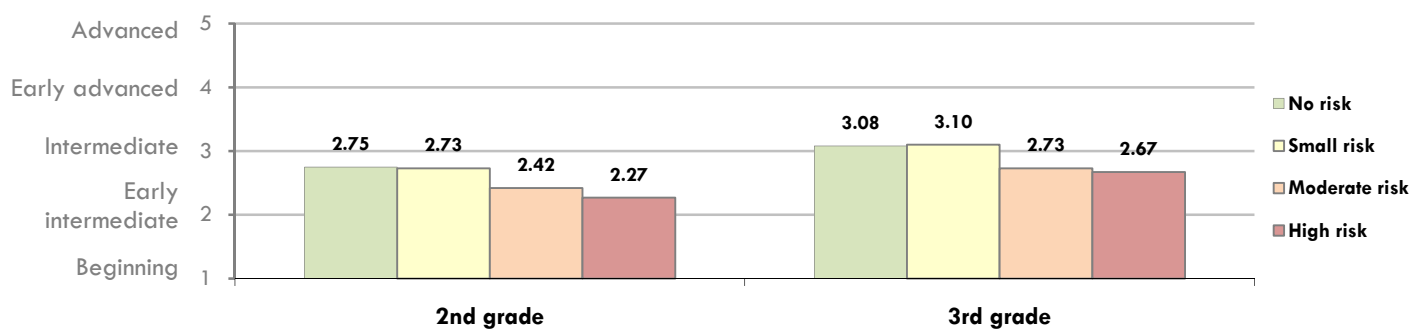
Figure 10: Percentage at Grade Level (Proficient or Advanced) on Third Grade ELA and Math Tests, by K/1st Combined Attendance



Sample sizes are as follows: **ELA**: No risk = 275; Small risk = 58; Moderate risk = 34; High risk = 18. **Math**: No risk = 273; Small risk = 58; Moderate risk = 34; High risk = 18. Overall group differences were statistically significant in **ELA** according to chi-square tests ($p < .001$). Post-hoc tests revealed significant or marginal subgroup differences as follows: No risk > (Small risk = Moderate risk) > High risk. Overall group differences were statistically significant in **Math** according to chi-square tests ($p < .001$). Post-hoc tests revealed significant or marginal subgroup differences as follows: No risk > (Small risk = Moderate risk = High risk).

Do English Learner students who are chronically absent at kindergarten and/or first grade score more poorly on their second and third grade California English Language Development Tests (CELDT)? The figure that follows shows a trend that is similar to the trends observed in the previous figures (although sample sizes for the subset of English Learners are quite small, and thus statistical tests did not reach significance): students with no – or only small – attendance risks scored consistently better than their peers with attendance issues on their second and third grade CELDTs.

Figure 11: Second and Third Grade CELDT Scores among English Learners, by K/1st Combined Attendance



Sample sizes are as follows: No risk = 98-103; Small risk = 21-22; Moderate risk = 15-19; High risk = 9-11. Overall group differences were not statistically significant according to oneway analysis of variance.

Section Summary: Key Findings

- Students with no attendance risks across kindergarten and first grade had significantly higher third grade scores on ELA and Math CSTs than all other students – even those with relatively small attendance issues. Non-significant trends suggested the worst third grade outcomes for students who were chronically absent in both kindergarten and first grade.
- Patterns were similar when third grade data were examined by ELA and Math performance levels (versus scores). Results were particularly strong for ELA levels; on this measure, only 17% (n=3) of students in the high-risk attendance group (chronically absent in both kindergarten and first grade) were performing at grade level. By comparison, 64 percent of students with no attendance issues in kindergarten or first grade were performing at grade level on their third grade CSTs. (This difference was statistically significant.)
- Among students who were English Learners, associations between attendance and scores on their CELDT tests showed similar patterns as those observed for CSTs; however, very small sample sizes limited detection of statistically significant group differences.

Does the association between attendance and later school outcomes depend on the readiness skills that students possess when they enter kindergarten?

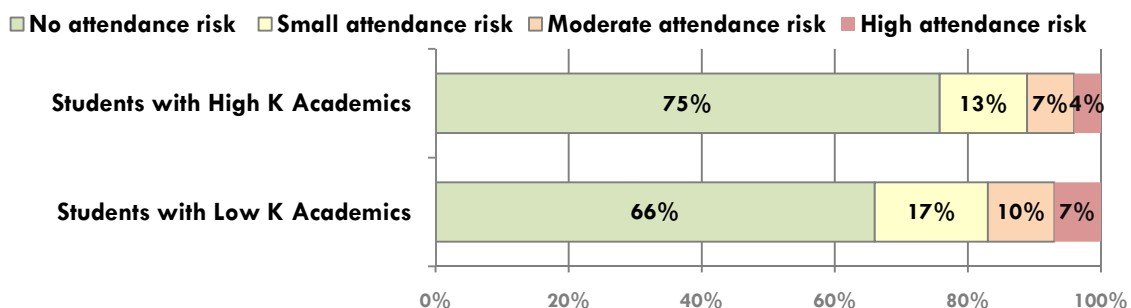
The previous section revealed strong associations between attendance patterns in students' first two years of school and their third grade performance. This section further explores these associations by adding student readiness into the analyses, looking at whether the impact of poor attendance may be different for students with strong readiness skills versus readiness needs at kindergarten entry.

ASR's longitudinal study linking students' school readiness levels to their third grade standardized test scores (i.e., their English-Language Arts [ELA] and Mathematics California Standards Tests [CSTs]) showed that two of the four dimensions of readiness measured by the *Kindergarten Observation Form* were strongly related to third grade performance: students' *Kindergarten Academics* and *Self-Regulation* skills (ASR, 2010).³ More specifically, 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 – they were more than three times as likely to be performing at grade level on both their ELA and Mathematics CSTs. (To maintain as large a sample size as possible for the current analyses, however, we divide our groups into those with high and low readiness levels based on their *Kindergarten Academics* scores alone, as it is this dimension that had the strongest relationship with later school success.)

To determine whether attendance has the same impact on students' third grade performance regardless of their school readiness levels, students in the four attendance risk groups were further divided into two readiness groups, based on whether they were above or below the mean readiness scores on the *Kindergarten Academics* dimension of readiness. For each readiness group, third grade CST scores and levels were compared for children in each of the four attendance risk groups.

The following figure shows that the students with strong readiness were also somewhat more likely to have better attendance, although this was not a statistically significant difference.

Figure 12: Percentage of Students in Each Attendance Risk Group, by Readiness Levels



Sample sizes are as follows: Low Kindergarten Academics = 157. High Kindergarten Academics = 256. Percentages may not sum to 100 due to rounding. The attendance levels of the two readiness groups were not significantly different, according to chi-square tests.

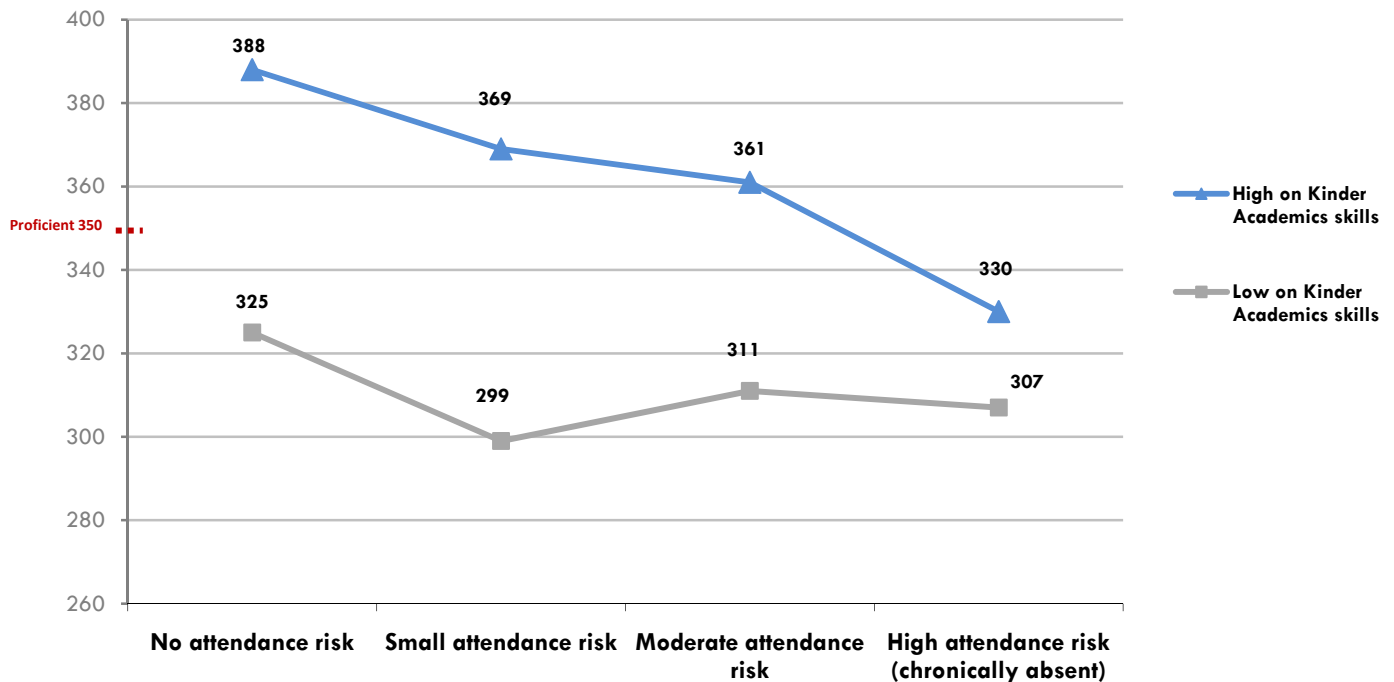
³ In these studies and others that use the KOF to measure readiness, readiness levels have consistently been shown to be predicted by a number of demographic, socioeconomic, and readiness-promoting experiences, including: being older, being a girl, not having special needs, children's basic well-being, maternal education and income levels, parents having received information about children's readiness levels prior to starting kindergarten, and having preschool experience.

Is the association between attendance and 3rd grade test outcomes similar for students who come into the school very well-prepared versus less well-prepared? As the following figure shows, these data suggest that attendance has a much stronger impact on students who enter school with strong readiness skills; among students with strong readiness levels, there is a general linear decline in scores from those with strong attendance to those with very chronic absenteeism – and a difference in scores of more than 50 points. However, for students who came into kindergarten with low readiness levels, the trend does not show as clear an association between attendance and third grade ELA scores.

The trends among these students suggest that students who come into school with a strong set of skills may lose any benefits of that preparedness if they are chronically absent in their first two years of school. The gap in third grade scores between those with high readiness levels and those with low readiness levels shrinks as attendance risk increases – to the point where, if a child is chronically absent in his or her first two years, it may not matter if s/he entered school strongly prepared to succeed.

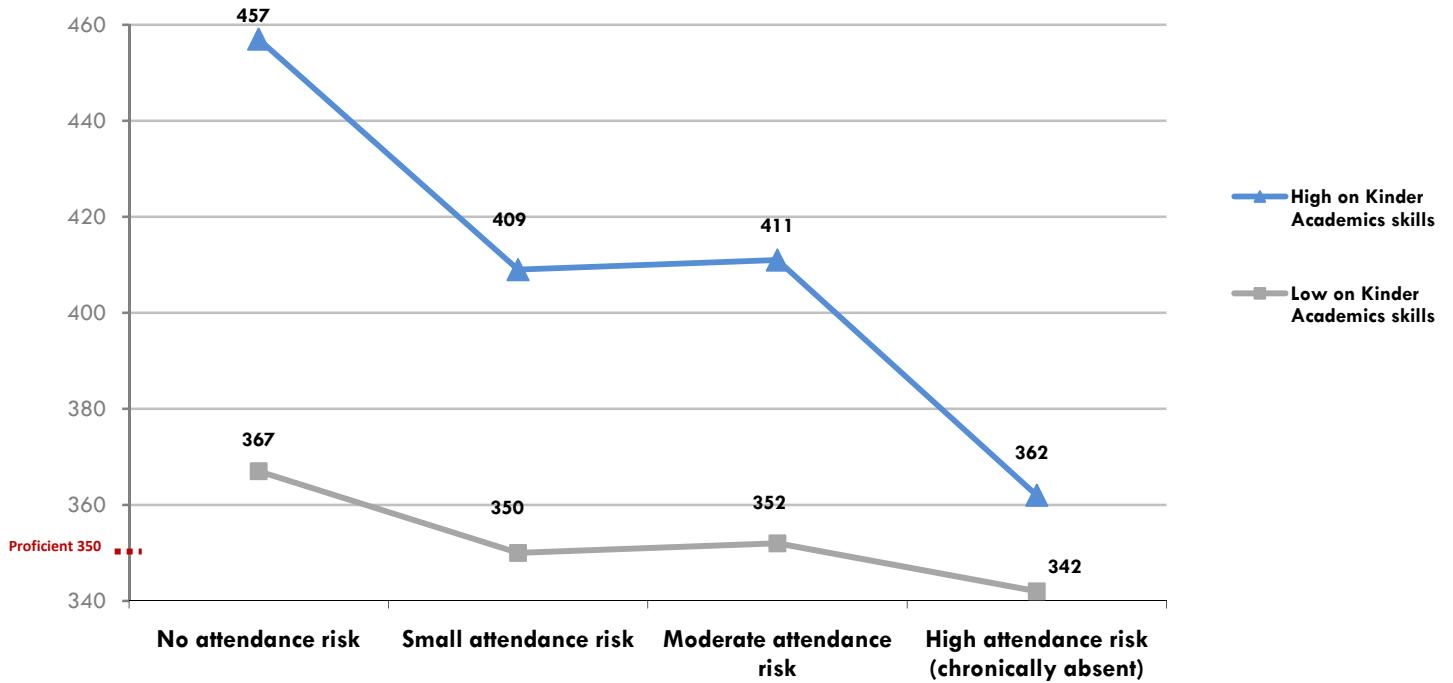
Findings for third grade Math scores are even more pronounced, as Figure 14 on the following page shows.

Figure 13: Third Grade ELA Test Scores, by K/1st Combined Attendance and Readiness Levels



Sample sizes are as follows: High Kindergarten Academics: No risk = 182; Small risk = 34; Moderate risk = 18; High risk = 8. Low Kindergarten Academics: No risk = 92; Small risk = 24; Moderate risk = 15; High risk = 10. **High Kindergarten Academics:** Overall means are significantly different according to oneway ANOVA, $p < .01$. Post-hoc tests showed significant group differences as follows: No risk > all other groups; Small risk = moderate risk; Small risk > high risk; moderate risk = high risk. **Low Kindergarten Academics:** Overall means are not significantly different according to oneway ANOVA.

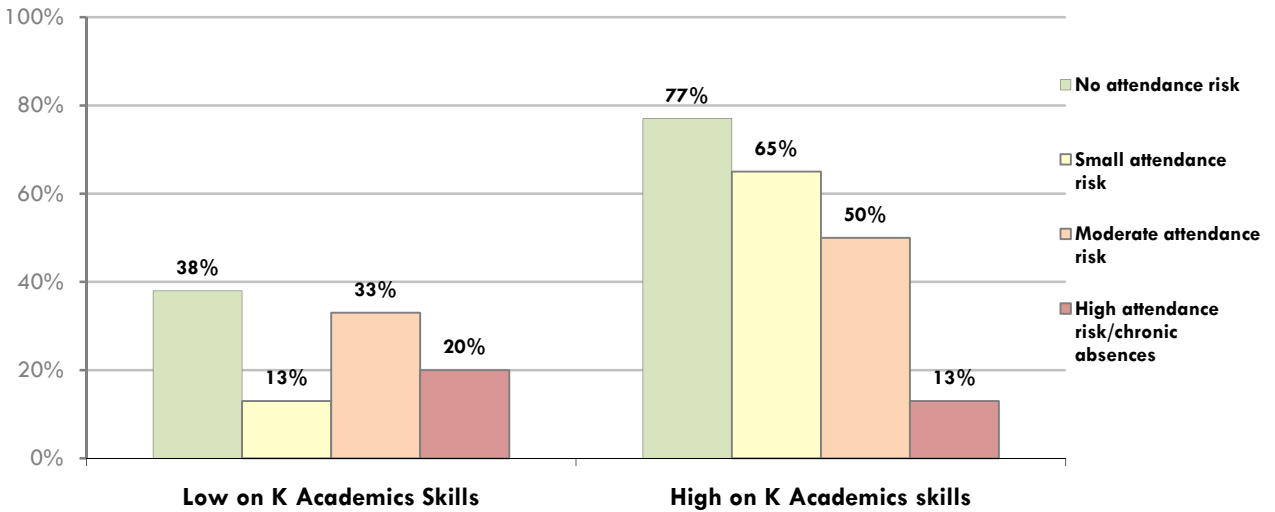
Figure 14: Third Grade Math Test Scores, by K/1st Combined Attendance and Readiness Levels



Sample sizes are as follows: High Kindergarten Academics: No risk = 182; Small risk = 34; Moderate risk = 18; High risk = 8. Low Kindergarten Academics: No risk = 92; Small risk = 24; Moderate risk = 15; High risk = 10. **High Kindergarten Academics:** Overall means are significantly different according to oneway ANOVA, $p < .001$. Post-hoc tests showed significant group differences as follows: No risk > (Small risk = moderate risk = high risk). **Low Kindergarten Academics:** Overall means are not significantly different according to oneway ANOVA.

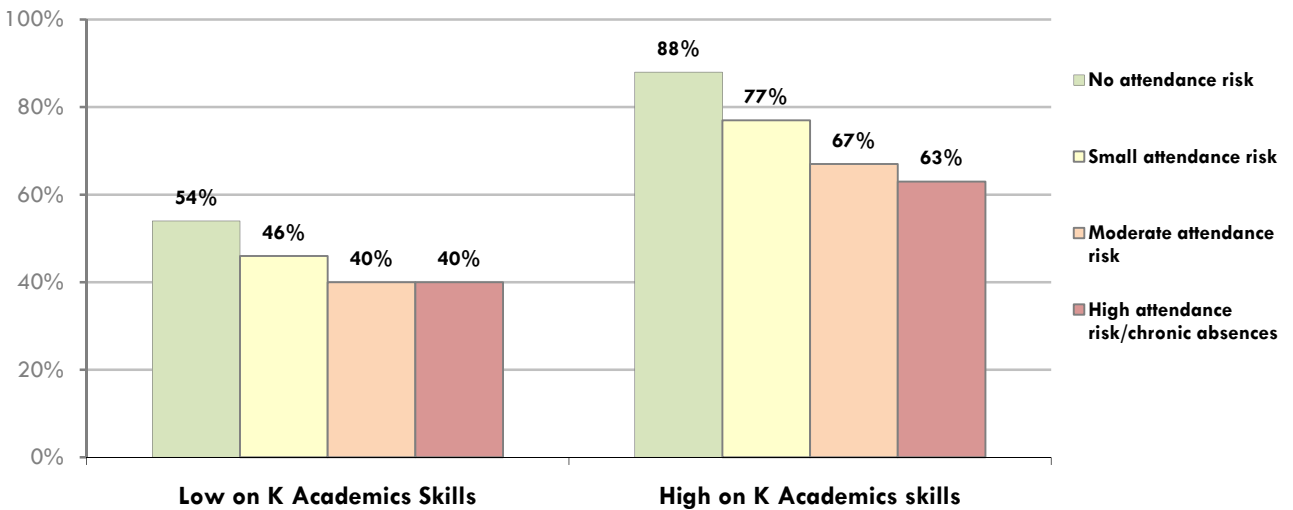
Figures 15 and 16 display the percentage of students who scored at grade level on their ELA and Math CSTs, respectively, as a function of readiness levels and attendance patterns. Once again, the patterns suggest that attendance matters more for students with strong readiness levels than for students who enter school with great readiness needs.

Figure 15: Percentage Performing at Grade Level (Proficient or Advanced) on Third Grade ELA Tests, by K/1st Combined Attendance and Readiness Levels



Sample sizes are as follows: Low Kindergarten Academics: No risk = 92; Small risk = 24; Moderate risk = 15; High risk = 10. High Kindergarten Academics: No risk = 183; Small risk = 34; Moderate risk = 18; High risk = 8. Chi-square tests were not conducted due to small expected cell counts.

Figure 16: Percentage Performing at Grade Level (Proficient or Advanced) on Third Grade Math Tests, by K/1st Combined Attendance and Readiness Levels



Sample sizes are as follows: Low Kindergarten Academics: No risk = 92; Small risk = 24; Moderate risk = 15; High risk = 10. High Kindergarten Academics: No risk = 181; Small risk = 34; Moderate risk = 18; High risk = 8. Chi-square tests were not conducted due to small expected cell counts.

Section Summary: Key Findings

- Chronic absence at kindergarten and first grade may erase many of the benefits of entering kindergarten with strong readiness skills. Among students who entered school with strong skills in *Kindergarten Academics*, 77 percent of those with good attendance in their first two years of school were performing at grade level on their third grade ELA CSTs, as compared to only 13 percent of students who were chronically absent in the first two years. Patterns were similar – but less extreme – for Math CSTs
- Chronic absence may have an impact on students who enter school with readiness needs as well, although the current data suggest that this impact is likely much smaller than the impact on children who have strong readiness levels at kindergarten entry.

Conclusions and next steps

The analyses presented in this report suggest that attendance may have a significant impact on school success, even in students' earliest school days. Moreover, chronic absence in kindergarten and first grade may serve to nearly eliminate the benefits of entering kindergarten with a strong set of skills that typically are associated with success at third grade.

These analyses should, however, be considered as an exploratory investigation; they are based on only a small number of students who had high attendance risks. ASR hopes to soon replicate these findings with larger samples of students (and students from other Bay Area regions), using additional cohorts of students who took part in readiness assessments several years ago. As part of these analyses, ASR will also further explore the role of other demographic and background factors of the students in the sample, as the different attendance risk groups were comprised of somewhat different students. This will allow for a more precise understanding of the role that attendance plays in attenuating the relationship between readiness at kindergarten entry and later school success.

Finally, these data underscore the need to bridge the gap between those working on attendance issues and those working to promote school readiness. There is a large community of service providers, researchers, and policy-makers working on school readiness issues who could benefit from learning about these findings. It is important that these data are shared with this community to raise their awareness of chronic absence issues in early elementary school as a potential threat to their efforts to enhance children's school readiness.