

# **Early Elementary Performance and Attendance in Baltimore City Schools' Pre-Kindergarten and Kindergarten**



March 2012

Faith Connolly and Linda S. Olson

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## **Early Elementary Performance and Attendance in Baltimore City Schools’ Pre-Kindergarten and Kindergarten**

### **Executive Summary**

This study looks at attendance in the early grades of elementary school. In particular, we focus on students enrolled in Pre-Kindergarten (PreK) and Kindergarten (K). We follow these young students over several years to determine their pattern of chronic absence (CA), defined as missing more than one-ninth of days enrolled, and their later attendance and academic outcomes.

We found that students who are CA in both PreK and K often continue to be CA in later years, e.g. one-half of them will be CA the following year. They are also more likely to be retained, with more than a quarter being retained by Grade 3. Interestingly, for students who experience a first episode of CA in K the consequences are also continued low attendance, and lower academic outcomes compared to their peers who attend school more regularly.

If attendance patterns for these students change, the impact of CA can be reduced. This is important because it suggests that it’s *never too late to improve attendance*.

One of the more striking findings was that Head Start students began with, and maintained higher rates of attendance compared with similar students. While they underperformed in reading and math in Grades 1 and 2, by Grade 3, they performed as well as their peers on the state assessments; perhaps their high attendance finally paid off. Further study is needed to explore this pattern.

One area of concern for Baltimore is the consistent underperformance of children who were in home care prior to enrolling in K. We were surprised to find that these students shared similar demographic characteristics with the Head Start students in our study. We discovered that these students may have met the economic qualifications for Head Start in that they qualified for “free” meals in K. A concerted effort needs to be made to determine why they are not attending a pre-school program, and to ensure that all qualified children are enrolled in Head Start or City Schools PreK.

As a result of our analyses we would like to recommend that:

- MSDE report average daily attendance (ADA) and CA rates for students in PreK and K.
- A concerted effort among relevant Baltimore City agencies should aim to maximize enrollment in Head Start and City Schools PreK programs.
- City Schools work with Head Start to develop family education and outreach to emulate the high attendance rates seen among Head Start graduates
- There be monitoring of student attendance as well as of school-wide attendance, examining both ADA and CA as important indicators

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## **Early Elementary Performance and Attendance in Baltimore City Schools’ Pre-Kindergarten and Kindergarten**

*Faith Connolly and Linda S. Olson*

### **Background**

Research has established the positive impact of early childhood education on students’ later academic achievement and on non-academic areas such as later health, depression, obesity, and wages. Investment in quality programs pays off in improved academic achievement and non-cognitive skill development (Heckman, 2011, Ludwig & Miller, 2007; Barnett & Hustedt, 2005; Barnett, 2002; Garces, Thomas, & Currie, 2002).

In numerous recent studies and public discussions a central criterion employed to gauge the success of early childhood education is whether students are reading on grade level at the end of the third grade. In one study, using data from the Early Childhood Longitudinal Study (ECLS-K), Hull (2011) found that students with Pre-Kindergarten (PreK) and half-day Kindergarten (K) performed significantly better on Grade 3 reading skills. This is interesting as it identifies the greater impact of two years of half-day programs, PreK and K, rather than a single year of full-day K. The impact was greatest for Hispanic children, African American children, English Language Learners (ELL), and children from low-income families. While suggesting the importance of investment in early childhood programs, these studies did not look at the attendance of students in these programs or the quality of programs.

### **Impact of Attendance in Early Childhood Programs**

While early education has important implications for student learning, children living in poverty have higher rates of missing school. Too often, families must deal with multiple life challenges, such as unemployment, home instability, food insecurity, health and health care access, and other obstacles. Not only do the children in these families miss more school, but they also have fewer resources available to help them make up for lost instruction. The impact of absence on children in early childhood programs has not been studied extensively. Drawing from an analysis of ECLS-K data, Ready (2010) found a connection between social class, attendance, and cognitive growth in K and first grade. Children from low socioeconomic families with good attendance gained more literacy skills than peers from higher SES backgrounds during K and first grade. These findings reinforce other research (e.g., Downey et al. 2004) showing that formal schooling matters more for disadvantaged than advantaged students.

Chang and Romero (2008) looked explicitly at the impact of chronic absence (missing 10% or more of school days) on later student performance. They found that chronic absence in K is associated with lower academic performance in first grade for all children regardless of gender, race/ethnicity or socioeconomic status. The relationship is especially strong for Hispanic children, who had much lower first grade reading scores if they were chronically absent in K, and for children from poor families who had the lowest levels of educational achievement at the end of fifth grade if they were CA in K.

A complicating factor in examining attendance in Pre-K and K is that the family plays a much larger role than the child—*i.e.*, student attendance patterns are more of a reflection of parental attitudes and behaviors and of family stability than of the student’s own choices. Research has demonstrated the positive effect of school/family partnership efforts in improving attendance at the elementary level (Sheldon & Epstein, 2004; Sheldon, 2007; Entwisle & Hayduk, 1978). School and district policy should prioritize active family engagement strategies that include empowering families to ensure good attendance.

**Early Elementary in Baltimore**

City Schools made it a priority to offer PreK to as many four-year-olds as possible, resulting in a 50-percent expansion of PreK seats, increasing from 3,200 to 4,600 seats in 220 full-day PreK programs throughout the city (Baltimore City Schools, 2011). Full day K was available in all City Schools starting in 2007-08.

Entry Age: For the 2006-2007 school year and thereafter, a child must be five years old by September 1 of the school year to be age eligible to enroll in a public school K or any nonpublic school K in Maryland (MSDE, 2007).

**Chronic Absence in Baltimore**

In recent years, Baltimore has seen some improvements in attendance, but challenges remain. A disturbing finding is that in high school, between one-third and one-half of students are chronically absent, defined as missing more than one-ninth of days enrolled, and the next worst grades are PreK and K with more than 20% of students being CA (Baltimore City, 2010). As seen in Table 1, poor attendance in the early grades, especially chronic absence, is a concern for Baltimore City Schools, with rates increasing from 2006-07 to the present.

Table 1  
Percent of Baltimore City Students Who Were Chronically Absent  
by Grade and School Year for 2006-07 Through 2010-11

<b>Grade</b>	<b>2010-11</b>	<b>2009-10</b>	<b>2008-09</b>	<b>2007-08</b>	<b>2006-07</b>
Pre-K	26.5%	27.4%	19.5%	21.6%	21.7%
Kindergarten	22.9%	22.5%	17.8%	19.4%	20.6%
Grade 1	21.0%	19.5%	15.6%	16.4%	18.7%
Grade 2	17.9%	18.2%	13.6%	14.5%	15.2%
Grade 3	17.6%	16.1%	12.2%	12.8%	14.4%

Source: BERC analysis of City Schools enrolment and attendance data from 2007 through 2011 for students enrolled at least 5 days and who missed more than 1/9 of days on roll.

Having so many children missing so many days early in their academic careers has negative consequences for students, classroom instruction, and schools. The long-term impact is far-reaching, potentially impacting the city's workforce development and broader society, in general.

The purpose of this report is to examine the outcomes of students with low attendance or CA in the early grades. This information can be useful for schools and districts for planning and strategizing around reform efforts. More immediately, our research team is using the findings from this research to develop a research protocol for parent focus groups to determine barriers or challenges families and schools face vis-a-vis attendance and transitions to school, as well as what works.

## **Methodology**

This research is aligned with “Why Reading by the End of Third Grade Matters,” a national initiative of the Annie E Casey Foundation. Specifically we examine attendance in Pre-Kindergarten (PreK) and Kindergarten (K) and its association with students’ later attendance, behavior, and academic achievement.

This study is the first of two on this topic that BERC will produce. A report describing parent and family perceptions of school, attendance, and chronic absence will be published later this year. This first report describes the quantitative data analysis conducted using existing administrative data sources.

## **Research Questions**

The research questions addressed in this study include:

- Q1. Who are the students who are chronically absent in PreK and K?
- Q2. What is the association between attendance and chronic absence in PreK or K and later attendance, suspension or receipt of special education services?
- Q3. What is the association between attendance and chronic absence in PreK or K and later achievement?
- Q4. How do students with different PreK experiences compare on behavior and academic achievement?
- Q5. What is the impact of schools on attendance?

## **Definitions**

The Maryland State Department of Education (MSDE) defines chronic absence (CA) as a student missing more than 20 days if enrolled for a minimum of 90 days. For the purposes of this analysis, we include students enrolled from October 1 of any school year and who were enrolled for at least 5 days. We define CA as missing more than one-ninth (selected as 20 days absent of 180 school days which is one-ninth of days on roll) of their days enrolled. Our analyses examine the effects of attendance using both chronic absence rates and average daily attendance (ADA).

## **Data Sources**

To conduct these analyses, we used de-identified student files from Baltimore City Schools for the 2006-07 through 2010-11 school years. These files contained enrollment information, attendance, suspensions, grade level to indicate promotion or retention, identification of receipt of Free and Reduced Price Meals (FARMS), special education services, or English Language Learner (ELL) support. In addition, we used the 2006-07 Head Start enrollment file to supplement our data on students’ program participation before entering K. Our analysis is only

as accurate as the data entered by schools to indicate absence. We cannot distinguish excused versus unexcused absences, or if students arrive late or leave midday.

*Assessments.* On entry into K, students are assessed using *The Maryland Model for School Readiness* (MMSR), also called the Work Sampling System (WSS), a portfolio-based assessment developed in 1991 by the University of Michigan to determine *readiness* for school. The MMSR captures student skills and behaviors as perceived by teachers for a 66-item checklist, rating students as *proficient, in process, needs development*. Seven domains are reported: Personal and Social Development (focusing on self-identity, the self as a learner, and social development); Language and Literacy (based on the theory that students learn to read and write the way they learn to speak, naturally and slowly); Mathematical Thinking; Scientific Thinking; Social Studies; The Arts; and Physical Development (MSDE, 2010a; Pearson, 2011a).

In Grades 1 and 2 students in City Schools take the *Stanford 10* (SAT10) that measures student progress using a multiple-choice format “to measure student progress toward high academic standards.” We report reading and mathematics results reported as scale scores and as national percentile ranks. Percentile ranks range from 1 to 99 and indicate the percent of students nationally who score at or below an individual students’ score. For example, a student who scores at the 50<sup>th</sup> percentile indicates that that student scored higher than 50 percent of his or her peers nationally using a norming sample of same grade peers (Pearson, 2011b).

In Grade 3 students take the *Maryland School Assessment* (MSA) as part of the No Child Left Behind accountability measures in reading and math. Student performance is reported as scale scores and proficiency ratings of Basic, Proficient and Advanced. Scoring Proficient or Advanced is used to indicate mastery of the grade curriculum. Cut scores were determined using a Bookmark Standard Setting procedure organized by MSDE.

In our prediction models of proficiency levels we used students with MSA and Mod-MSA scores; in models predicting scale scores Mod-MSA scores were not included as they are on a different scale (2-98) than the MSA (240-650). (MSDE, 2007b and 2010c).

## **Methods**

Three cohorts of students were developed for analysis to answer our key questions. Charts describing the number of students remaining in the cohort and their respective grade levels are included in Appendix H.

Cohort 1 provides the longest trajectory of students, as they are followed from their PreK year (2006-07) through Grade 3 (for on-time students in 2010-11). It is defined as the group of students enrolled in City Schools’ PreK program during the 2006-07 school year. This includes 3,364 students of whom 2,582 (77%) were still enrolled in City Schools four years later.

Students who enrolled in K in 2007-08 for the first time compose Cohort 2. This group overlaps with Cohort 1, but by beginning in K it is almost twice as large, including 6,374 K students of whom 5,190 (81%) were still enrolled three years later.

By including students who first entered City Schools in K, we are able to examine how different types of pre-school experiences impact later outcomes.

Cohort 3 captures a more recent group of students, allowing us to determine if there have been changes over the intervening years. It is composed of students who enrolled in PreK in 2008-09 and includes 4,057 students. Of this cohort 3,465 (85%) were still enrolled two years later, most of them in Grade 1 in 2010-11 (on-time students).

Results presented in the Findings section focus primarily on Cohorts 1 and 2. We use Cohort 1 to address questions about how attendance patterns during PreK and K are related to later achievement and behaviors up to Grade 3. Cohort 2 allows us to examine whether students enrolled in City Schools PreK have better attendance and academic performance in the early grades of school compared with students who spent their PreK year in Head Start programs, nonpublic nursery schools, day care programs, or at home. Cohort 3 allows us to answer questions about possible changes over time. Do we see the same trends with this more recent group of students? Analysis for this group extends only to Grade 1 or school year 2010-11.

Attrition. Approximately 85-90% of students remained in City Schools through the end of Grade 1, and around 80% remained three years after K. Students who withdrew and then later re-enrolled in the system are included. All findings will focus on those students who were identified in our cohorts and remained in City Schools. For specific levels of attrition from each cohort, please see Appendices B through D and Appendix H.

## **Regression Models**

Logit Models. Logistic regressions were used to predict the dichotomous measures of CA, suspension, identification for special education services in Grades 1 through 3, retention in grade, and scoring proficient or higher on the MSA.

OLS Models. Ordinary Least Squares models were used to predict continuous measures of average daily attendance (ADA), SAT10 scale scores, MSA scale scores.

Heckman Models. As a check on the impact of missingness in MSA scores, a Heckman correction model was also estimated for Grade 3 MSA scores. The selection equation includes variables such as demographics and missing Grade 1 and 2 SAT10 scores as well as ADA in 2010-11.

Control Variables. For each model we used a similar set of demographic, behavioral and cognitive controls: gender, race/ethnicity, qualifying for FARMS (in K), receiving special education services in K, school-level attendance (ADA or CA) of the school attended in K for grades 1-5 as reported by the MSDE website, and MMSR scores in social/personal and literacy

skills as a baseline measure of socialization skills and prior knowledge, respectively. Where appropriate, we included a control on later attendance after K (e.g., Grade 1 ADA for Grade 1 SAT10 scores, mean of Grades 1 and 2 ADA for Grade 2 SAT10) as a mediating variable to better understand how the impact of early chronic absence is transmitted to later outcomes. This allows us to see how much of the effect of earlier CA is mediated by later attendance patterns and whether there are still lingering effects of early CA beyond what is explained by later attendance.

Multicollinearity. Variance Inflation Factors (“VIF”) were reviewed for all independent variables to ensure there was no problem of multicollinearity in the models.

### **Limitations**

We know outcomes only for students remaining in City Schools. Students who left City Schools and never re-enrolled were more often White, did not qualify for FARMS or special education services.

We can include only those variables that are available. The *nonobservables* such as family cohesiveness and health, financial stress, and community challenges, were not available for our study.

These analyses do not allow us to make causal claims.

## Findings

In this section we provide a response to each of the research questions identified in the Methodology.

### Students Who Are Chronically Absent in PreK and Kindergarten

As seen in Table 2, there are different profiles of students who were CA in PreK or K, neither, or both. Approximately 70% of students were not chronically absent in either PreK or K, and those who missed more than one-ninth of their days on roll were split among one of three categories: CA in both PreK and K, CA in PreK only, or CA in K only. Those who were CA in either PreK or K have a slightly higher rate of participation in FARMS, were less often found to be *ready to enter K* according to their MMSR scores, and were more likely to be identified early for special education services. (For complete descriptive findings see Appendices Tables B2, B3, C2, C3 D2, and D3). Below we discuss only findings that were statistically significant.

Gender and Race/Ethnicity. No findings were discernible.

Service Receipt. Students who were never CA were slightly less likely to receive Free and Reduced Price Meals (FARMS), and were less likely to receive special education services, yet they were more likely to receive English for Speakers of Other Languages (ESOL) services.

Kindergarten Readiness. The MMSR scores for students also varied by their CA experiences in PreK and K. Students who were not CA in either PreK or K had higher social skills and Language/Literacy skills. On average, students who were never CA were more likely to be *Kindergarten Ready* than their peers who were CA in either PreK or K. (See Table B3, C3, and D3.)

Neighborhoods. To understand the residential patterns of students who are chronically absent in PreK and K, we mapped students by their CA in PreK and K (See Figure 1). CA in PreK exists across the district. CA in K, however, is more prevalent in some neighborhoods, and students with high levels of CA in both PreK and K are in smaller pockets or neighborhoods that are in more disadvantaged areas of Baltimore.

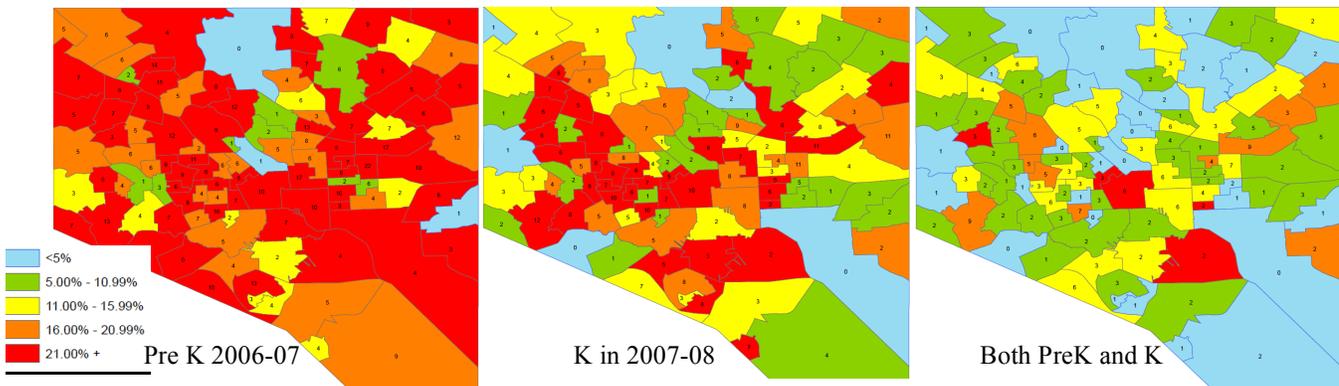


Figure 1. Percent students CA in PreK in 2006-07, K in 2007-08 and both 2006-07 and 2007-08.

**Table 2**  
**Demographics and Service Receipt for Students**  
**Who Enrolled in PreK 2006-07 and Students Who Enrolled in PreK in 2008-09**

<b>Enrolled in PreK 2006-07</b>	<b>Chronic Absence in PreK and K</b>				<b>Full Cohort</b>
	<b>PreK Only</b>	<b>K Only</b>	<b>Pre-K &amp; K</b>	<b>No CA</b>	
<b>Percent of Students</b>	11.9	6.8	9.0	72.3	100.0
<b>Gender</b>					
Male	51.1	54.4	46.1	49.7	49.8
Female	48.9	45.6	53.9	50.3	50.2
<b>Race/Ethnicity</b>					
African American	85.5	93.7	90.0	87.6	88.0
Hispanic	4.7	1.0	2.2	4.7	4.2
White	8.4	5.3	7.7	6.6	6.9
Other	1.4	0.0	0.0	1.1	1.0
<b>Service Receipt in 2006-07</b>					
FARMS	84.0	82.6	83.9	80.2	81.2
Special Education	8.7	10.2	15.9	8.8	9.5
English Language Learner	4.5	0.0	1.9	4.5	3.9
<b>MMSR</b>					
% Missing	6.4	7.3	8.9	4.2	5.1
% Ready: Social/Personal:	53.7	50.8	53.4	64.9	61.7
% Ready: Language/Literacy	51.0	45.5	41.1	59.1	55.7
<b>Enrolled in PreK 2008-09</b>					
<b>Percent of Students</b>	9.3	10.4	9.6	70.7	100.0
<b>Gender</b>					
Male	51.0	54.2	49.7	50.9	51.1
Female	49.0	45.8	50.3	49.1	48.9
<b>Race/Ethnicity</b>					
African American	88.5	90.3	86.9	85.5	86.4
Hispanic	4.7	2.9	2.0	6.1	5.2
White	6.2	5.5	10.0	7.5	7.4
Other	0.6	1.4	1.1	0.9	0.9
<b>Service Receipt in 2008-09</b>					
FARMS	88.8	88.2	85.4	83.9	84.9
Special Education	17.4	12.4	11.7	9.5	10.8
English Language Learner	3.2	2.6	1.1	5.6	4.6
<b>MMSR</b>					
% Missing	5.6	7.1	6.3	5.8	6.0
% Ready: Social/Personal:	63.8	63.2	59.8	67.5	66.0
% Ready: Language/Literacy	54.1	56.7	47.6	61.9	59.3

Source: Baltimore City Schools' enrollment files and MMSR assessment data.

## Attendance and Later Chronic Absence and Academic Behaviors

In this section and forward when we refer to specific Grades 1 through 3, we are referring to the on-time grade that describes the majority of students.

As seen in Figure 2,

- Of students who were CA in PreK in 2006-07, 36.4% were not CA again through 2010-11.
- More than half (58.2%= 36.4+21.8) were CA in 2006-07 only or for one additional year.
- Almost 10% (9.5%) were CA in each of the following four years.
- In contrast, 70.5% of students who entered K in 2007-08 and were CA repeated that behavior over the next 3 years.
- More than one in five (21.6%) continued to be CA in each subsequent year.

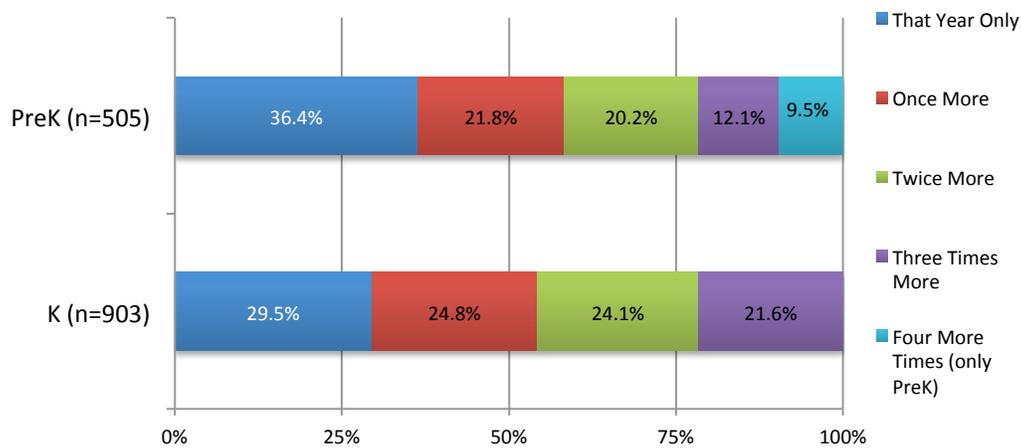


Figure 2. Percent of Baltimore City students entering PreK in 2006-07 and who entered K in 2007-08 who were chronically absent and the number of additional years they were CA through 2010-11.

As seen in Table 3, when examined by pattern of CA in PreK and K, we found that students who were CA in both grades were:

- More often absent in later years. Half (51%) of students who were CA in both PreK and K were chronically absent in 2008-09 (Grade 1 for most) and 45% were CA in 2010-11 (Grade 3 for most). Their ADA rate averaged about 88% in the following three years.
- More often retained in later grades. A quarter (26%) of students who are CA in both PreK and K have been retained by three years later (when third grade is the on-time year) compared with only 9% of students with no chronic absence.

In contrast, students who were never CA were:

- Least likely to be CA in all grades with the maximum rate reaching 9% in third grade.
- Most likely to be in school each day. They maintained an ADA over 95% in each of the following three years.
- Least likely to be retained.

**Table 3**  
**Attendance, Chronic Absence, and Retention Rates for Students Enrolled in PreK in 2006-07 and Those Enrolled in PreK in 2008-09 by Chronic Absence Patterns in PreK and K**

<b>Enrolled in PreK in 2006-07</b>	<b>Chronic Absence in Pre-K and K</b>				<b>Full Cohort</b>
	<b>Pre-K Only</b>	<b>K Only</b>	<b>Pre-K &amp; K</b>	<b>No CA</b>	
<b>Percent Composition</b>	11.9	6.8	9.0	72.3	
<b>Attendance Rate (ADA)</b>					
2006-07 (Pre-K)	81.3	94.2	78.0	96.0	92.5
2007-08 (Kind)	93.7	82.9	80.4	96.1	93.5
2008-09 (most G1)	93.5	89.5	86.6	95.9	94.4
2009-10 (most G2)	92.2	88.7	87.0	95.0	93.5
2010-11 (most G3)	92.2	88.0	88.2	95.0	93.6
<b>ADA G1-G3 (2008-11)</b>	92.7	88.7	87.6	95.3	93.9
<b>Chronic Absence</b>					
2006-07 (Pre-K)	100	0	100	0	20.8
2007-08 (Kind)	0	100	100	0	15.8
2008-09 (most G1)	12.9	35.8	50.8	4.9	12.0
2009-10 (most G2)	21.8	45.1	51.7	8.8	16.6
2010-11 (most G3)	23.3	44.2	45.2	9.1	16.3
<b>Retained in</b>					
K	1.7%	3.6%	3.5%	1.0%	1.5
Grade 1	12.1%	9.3%	14.6%	5.4%	7.2
Any Grade by 2010-11	16.7%	19.2%	25.8%	9.4%	12.3
<b>Students Enrolled in PreK 2008-09</b>					
<b>Percent Composition</b>	9.3	10.4	9.6	70.7	
<b>Attendance Rate (ADA)</b>					
2008-09 (Pre-K)	82.6	94.1	80.1	96.2	93.2
2009-10 (most Kind)	93.3	83.2	80.8	95.7	92.7
2010-11 (most G1)	91.6	87.6	85.5	94.9	93.0
<b>Chronic Absence</b>					
2008-09 (Pre-K)	100	0	100	0	18.9
2009-10 (most Kind)	0	100	100	0	20.0
2010-11 (most G1)	25.8	50.3	59.6	8.1	18.9
<b>Retained in</b>					
K Year 3 (2010-11)	1.8	4.7	2.9	1.0	1.6

Source: Baltimore City Schools' enrollment files.

Students who were CA in either PreK or K experienced different early grade outcomes. Those CA in only PreK had higher attendance, lower CA rates, and lower retention rates than their peers who were CA in K. This suggests that being CA in PreK sometimes is, but sometimes is not, the beginning of a problematic pattern. It is those students CA in both PreK and K, and those students CA for the first time in K, whose patterns prompt the greatest concern. The analyses in the next sections will direct particular attention to these students.

### *Regression Models*

To examine the relationship between CA in the early grades and later elementary school outcomes, we ran regression models controlling for other factors that may influence outcomes. (Full models and regression tables are reported in Appendices E through G).

Models predicting attendance in Grades 1 through 3 show that CA in PreK and K are significant even when we control for attendance in Grades 1 and 2.

We find similar effects in models predicting being off-grade. Students who were CA in PreK and K were 2 to 3 times more likely to be retained before they reached third grade, but these effects are dampened when we controlled on attendance rates in Grades 1 through 3. However, even after controlling on later attendance, CA in PreK and K continue to be significant predictors.

It should be noted that in the models predicting later attendance and retention, CA in PreK only has a smaller negative impact compared with CA in K.

Suspensions are not common for students in these early grades with fewer than 10% for each of the cohorts overall. We found that being CA in PreK or K did not predict suspensions, but poor attendance after K was strongly associated with suspension. In addition, being male, African American, and having a low score on the MMSR Social/Personal measure were statistically significant predictors of suspension.

### **Attendance and Chronic Absence in PreK or K and Later Achievement**

We estimated regression models to predict academic outcomes such as assessment scores and identification for special education services, to determine the role attendance patterns in PreK and K had on students' later achievement. The findings in this section are organized by academic outcomes.

Special Education. While students who were CA in PreK and K were more often identified to receive special education services in later grades, after controlling for attendance in later grades, the impact was no longer statistically significant.

This does not mean that poor attendance in PreK and K is not related to identification for special education, but rather that CA in PreK and K is linked with later poor attendance, and together they are associated with increased identification for special education services. In addition, being male and having lower MMSR K readiness measures, especially in the Social/Personal Development area, are significant.

A schools' rate of CA was statistically significant. Higher school-level rates of CA are associated with a lower likelihood of identification for special education after K. This may be the result of students not being available to be observed by teachers consistently or be identified for Student Support Team (SST) review.

Assessments. Knowing that students who are CA in PreK and K are less likely to have assessment data is a challenge in evaluating assessment outcomes. So these findings should be viewed cautiously. In this section we will review Grade 1 and 2 Stanford 10 (SAT10) scores as well as Grade 3 Maryland School Assessment (MSA) scores. See Appendix A for specifics.

Grade 1 SAT10 Scores. Both being CA and lower average daily attendance were predictive of lower SAT10 scores. When we included attendance in Grade 1 to control for exposure to Grade 1 curriculum, the effect of PreK and K attendance weakened or became no longer significant suggesting that if attendance improved it could minimize the negative impact of being CA in PreK and K.

Grade 2 SAT10 Scores. SAT10 scores in Grade 2 were also lower for students with lower attendance in PreK and K as well as for students who were CA in PreK or K, especially in math. However, the impact of the earlier absences appears to diminish over time. Here again, when models included attendance in Grades 1 and 2, being CA in PreK and K is no longer significant. This suggests that over time, current year attendance becomes a more important predictor of achievement scores, over and above attendance in PreK or K, but current year attendance is predicted by early attendance patterns in PreK and K. So, in Grade 2, being CA in PreK and K still casts a shadow on academic performance.

On a side note, Grade 2 is also where qualifying for FARMS is a stronger predictor of SAT10 scores in reading than CA in PreK and K.

Grade 3 MSA Scores. Chronic absence in PreK and K did not predict whether or not students achieved a “proficient” rating on the Grade 3 MSA. Early CA did predict MSA scale scores, more for math than reading. When a control on attendance in Grades 1 through 3 was added to the models, the effects of early CA almost completely disappeared.

Because there was non-random missingness in the MSA scores, we also estimated a Heckman correction model and found similar results, also showing weak effects of PreK and K CA on MSA scores.

### **Kindergarten Students’ PreK Experiences and Later Behaviors and Academics**

Before starting in a City School K class in 2007-08, students may have been enrolled in a variety of PreK programs. Using City Schools and Head Start enrollment data we could identify which students participated in those two programs. For the remaining students we examined their parents’ responses on the MMSR, K readiness assessment survey. We found that most students had participated in a City School PreK program (44%) or Head Start (13%), with a small group attending both Head Start and City Schools PreK (4%). Other parents reported that their children attended a nonpublic nursery school (11%), day care (5%) or home care (15%). For 8% of the sample nothing could be determined, in most cases because they did not have an MMSR assessment.

Table 4  
Demographics of Students Who Enrolled in City Schools K in 2007-08  
by Their Participation in PreK Programs in 2006-07

	Program Placement in 2006-2007							Full Cohort (6374)
	Nonpub Nursery (10.5%)	Day Care (5.1%)	Home Care (15.3%)	Unknown (7.7%)	Head Start (13.2%)	City PreK/HS (3.9%)	City PreK (44.4%)	
Gender								
Male	49.7	48.3	51.7	51.8	52.4	51.8	49.6	50.5
Female	50.3	51.7	48.3	48.2	47.6	48.2	50.4	49.5
Race/Ethnicity								
African American	75.4	86.7	82.1	80.7	90.6%	94.3	87.3	85.4
Hispanic	4.0	0.6	4.2	5.5	6.1%	1.2	4.4	4.3
White	18.7	11.8	12.0	11.2	2.9%	3.6	7.1	8.9
Other	1.9	0.9	1.7	2.6	0.4%	0.8	1.1	1.3
Service Receipt 2007-08								
FARMS	61.3	64.2	81.9	73.6	86.1	87.6	80.4	78.3
Special Education	6.1	2.8	8.7	7.7	11.6	14.6	9.7	9.1
English Lang. Learner	3.7	0.9	4.2	5.7	5.4	0.4	4.1	4.0

Source: Baltimore City Schools' enrollment files, Head Start enrollment file, and MMSR parent survey.

Who Was Served by Each Program. As seen in Table 4, Head Start students were most likely to qualify for FARMS. This is not surprising as low-income families are the target audience of Head Start. In addition, these students were more likely male, African American or Hispanic, and to receive special education services prior to entering K. In contrast, although students who participated in home care qualify for FARMS at similar rates, they did not participate in Head Start. In addition, by the fourth year (most in Grade 3), home care and Head Start students had similar rates of receiving special education services.

A natural next question is, were these home care children from families eligible for Head Start? Were they unaware of these programs? Did they not meet the financial requirements or were programs not available in their neighborhoods? To determine if the children lived in families that qualified for Head Start we had to use a proxy measure for meeting the income requirement. We used qualifying for “free” meals. Students qualify for free meals if their families make 130% or less of the poverty level. As seen in Figure 3, many of these children live in families that qualify for “free” meals and lived in neighborhoods with Head Start programs in the vicinity. We are continuing to investigate these questions through our focus groups with parents and will report our findings as we confirm them.

Students who enrolled in nonpublic nursery schools and day care were least likely to qualify for FARMS, and had a lower rate of receiving special education services during K and three years later, when most students were in the third grade.

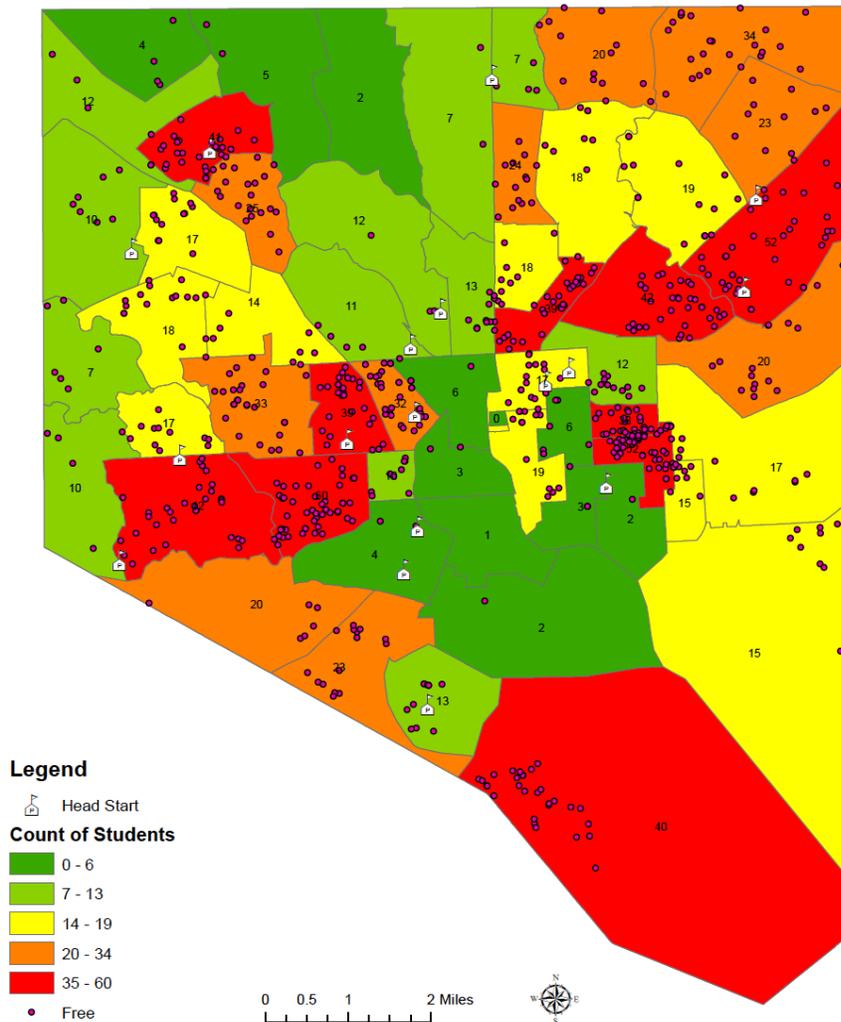


Figure 3. Students who were in home care before enrolling in City Schools Kindergarten who qualified for free meals by neighborhood and proximity to Head Start facility.

Attendance. As seen previously, students who were CA in K were more likely to be CA in every subsequent year, with CA rates ranging from 44% to 48% over grades 1 through 3, compared with rates of 8% to 11% for those not CA in K. (See Appendix B.)

Among students CA in K, slightly less than a third (29.5%) were CA only in K. The majority, the remaining 70.5% went on to be CA at least once more, with 21.6% going on to be CA in each of the subsequent three years. (See Figure 2.)

As seen in Table 5, students who had previously been enrolled in Head Start, independent nursery schools, and day care settings had the highest rate of attendance over the four years, each

with a 4-year ADA over 94% compared to the group overall with an ADA of 93.4%. In addition, their levels of CA were the lowest for each of the four years.

Table 5  
Attendance Rates of Students Who Enrolled in Baltimore City Schools K in 2007-08  
by Their Participation in PreK Programs in 2006-07

	PreK Program in 2006-2007							Full Cohort (6374)
	Nonpub Nursery (10.5%)	Day Care (5.1%)	Home Care (15.3%)	Unknown (7.7%)	Head Start (13.2%)	City PreK & HS (3.9%)	City PreK (44.4%)	
Average Daily Attendance (ADA)								
2007-08	94.2	94.2	90.8	89.9	93.9	93.7	93.5	93.0
2008-09	94.4	94.7	91.6	91.9	94.7	94.9	94.3	93.9
2009-10	94.2	93.9	91.3	91.3	94.0	94.6	93.4	93.2
2010-11	94.1	93.7	91.6	91.5	94.0	94.1	93.6	93.3
Chronic Absence								
2007-08	14.6	13.9	28.5	33.3	15.7	17.0	15.5	18.8
2008-09	12.0	11.8	26.4	26.1	10.5	11.8	11.9	14.8
2009-10	12.7	14.9	27.3	27.9	13.5	11.0	17.1	18.0
2010-11	13.6	13.6	27.4	23.2	13.0	13.5	16.4	17.5
ADA (4 years)	94.2	94.3	91.3	91.2	94.2	94.5	93.8	93.4

Source: Baltimore City Schools' enrollment files, Head Start enrollment file, and MMSR parent survey.

In contrast, students who were in home care had lower attendance rates, 91.3% over the four years, and higher rates of CA with more than a quarter of students CA each year, ranging from 26.4% to 28.5%.

### Regression Models

We again estimated a series of regression models that control on student background variables as described earlier. Here our target variables of interest are chronic absence in K and participation in various types of PreK programs. The findings will be discussed first by CA in K, then by type of PreK program.

Attendance. After controlling on student background, type of PreK experience and school-level CA, we found that students' attendance during K was a strong predictor of later attendance and chronic absence, even when we controlled for later attendance starting in Grade 1.

Chronic absence in Grade 3 is significantly lower for students in Head Start programs and higher for students in home care, compared to students in City Schools PreK. However, these effects disappear when attendance after K is included in the model—the positive effects of Head Start are transmitted through their positive effects on later attendance. The same can be said for the negative effects of home care on students' later attendance.

Academics. Being CA in K led to lower SAT10 scores in reading and math in both Grade 1 and 2. This was true for Grade 1 reading even after controlling for attendance in that year, but again being CA in K led to lower attendance rates in Grades 1 and 2.

Compared to their peers in the City Schools' PreK program, at the end of Grade 1, Head Start students were underperforming on the SAT10 in Grade 1 even though they had better attendance. Since this is a particularly vulnerable population these lower scores are not necessarily a surprise, but seeing their poorer academic performance despite their strong attendance is disheartening. Interestingly, students who enrolled in both City School PreK and Head Start performed comparable to their City Schools PreK peers.

Students in home care performed lower on the SAT10 in both reading and math in Grade 1 and in math in Grade 2 than their peers in City Schools PreK. This was true even after controlling for their Grades 1 and 2 attendance.

Two groups significantly outperformed their peers in the City Schools' PreK. They were:

- Students who were in day care on Grade 1 reading, and
- Students in nonpublic nursery settings, on Grade 2 reading.

Both of these groups were less likely to qualify for FARMS or receive special education services than City Schools' PreK students.

Interestingly, qualifying for FARMS and having higher MMSR ratings explained at least as much of the difference in SAT10 scores than either CA in K or type of PreK program.

Retention. As seen in earlier models, independent of their prior program placement, CA and poor attendance rates in K led to higher retention rates. Students who were in home care prior to enrolling in K were significantly more likely to be retained in later grades compared to their peers. In contrast, students in day care were significantly less likely to be retained. In terms of retention, Head Start students did as well as their peers in City Schools PreK.

Special Education. Head Start students were more often identified to receive special education services after K than any of their peers independent of their attendance.

Suspension. Chronic absence in K was related to suspensions in Grade 3 and cumulative rates of suspension over the three years after K. There are no consistent findings related to PreK placement.

Grade 3 MSA Scores. Again, CA in K was also related to lower MSA scale scores, and most of this is explained through attendance in later grades. Comparison by PreK program found that students attending nonpublic nursery schools and day care outperformed their City Schools PreK peers in reading and students from day care programs also outperformed them in math even after controlling for Grade 3 attendance.

Unlike results for the SAT10, Head Start students performed as well as students who attended regular City Schools PreK. This is really intriguing as they were significantly underperforming in

Grade 2, but “caught up” in G3 on the MSA, or perhaps the assessments are measuring different skills.

### **Impact of Schools on CA and Overall Attendance**

In our models we included a control of the school rate of chronic absence of the school attended in K using data from MSDE based on Grades 1-5. We hypothesized that students attending schools with low attendance rates are more likely to miss school and that higher rates of absenteeism in a school leads to interrupted instruction and a less favorable learning environment.

Influence of School’s Overall Attendance. School-level rates of CA also impact students—students in schools with higher rates of CA are more likely to themselves be CA or have lower attendance, and in addition, they are statistically significantly more likely to have lower academic scores in Grade 1 and to be retained and less likely to receive special education services, suggesting that lower school level attendance has negative consequences on academic outcomes. This deserves more investigation to ensure we understand the actual implication and significance of this preliminary finding.

## Discussion and Recommendations

Low attendance in Pre-Kindergarten (PreK) and Kindergarten (K) is a critical policy issue. Patterns of low attendance established in PreK and K tend to linger in the later grades. Half of the students who were CA, defined as missing more than one-ninth of days enrolled, in both PreK and K will continue to be CA the following year. Students who miss more school have lower scores on standardized tests through Grade 3. Paying attention to a child's average daily attendance as well as rates of CA is an important policy lever for schools to use to improve academic outcomes for students.

School-wide attendance rates also have an impact on student attendance and academic outcomes. This makes intuitive sense when one thinks of the challenges posed for instruction when a classroom has several students who attend school inconsistently. Instruction must be provided for students present every day while also covering material missed by students who are absent. In addition, in schools where absenteeism is more normative, not attending may not be as big a concern as in schools when absenteeism is rare. While this study was not designed to determine the impact of school attendance and CA rates on students, it is an issue that warrants further investigation. We often focus on student attendance issues, but clearly school attendance rates impact school climate and student performance. Attendance may be an important policy lever for principals, where they can make changes that have a large impact on numerous student outcomes.

The encouraging news is that the story can be changed. More than one-half of the students who are CA in PreK manage to get on track and their rates of CA in Grades 1 and 2 are much lower than students who were CA in K. In comparison, students who repeat their CA pattern in K go on to much lower attendance and academic performance. While PreK and K attendance are important, the impact can be minimized in later grades with increased attendance. This is important because it suggests that it's *never too late to improve attendance*.

Our study findings echo those of many others who have emphasized the relationship between poverty and assessment performance. This is seen in two ways. First, we find that Head Start students with excellent attendance underperform compared to their peers on both reading and math in Grades 1 and 2. Second, even controlling for attendance, Grades 1 and 2 reading and math outcomes are explained significantly by childhood poverty indicated by qualifying for FARMS. This speaks to the challenges faced by City Schools where poverty, housing, and unemployment are challenges for families in Baltimore City. It is gratifying to see that by Grade 3, Head Start students are performing as well as the regular City Schools PreK group on the MSA by proficiency levels and scale scores, as well as on their retention rate. Perhaps Head Start students' higher attendance rates start to pay off. It may be that the Head Start program socializes parents and students into a culture of attendance and achievement, which helps these students become more resilient.

In addition, the consistent underperformance of students who were home points to the importance of getting all students, especially students from poor families, into Head Start or other local programs. Many of the home care students in this study may have qualified for Head Start (received *free* meals on entry into K), but were not enrolled. After review by neighborhood, we found that many were located near programs. We do not know if those programs were oversubscribed, or if families were aware that they qualified or if they knew how to enroll their child. This is a policy lever for both the city and school system that needs to be addressed to improve outcomes for children.

Another noteworthy finding is the high attendance rate of Head Start students that was maintained through Grade 3. Head Start alumni had attendance rates higher than all of their peers despite the fact that they are more likely to qualify for FARMS and be identified for special education services. Perhaps this reflects the high level of family involvement and support Head Start programs have with students' families.

A small group of students (4%) were missing MSA scores. On closer inspection it became clear that this group was not random (see Table C6). Specifically, these students had significantly lower levels of attendance. Their ADA rate was 90.4, compared to 94.1 for other third graders. Their rate was remarkably similar to retained students (90.8). They were also more likely to be chronically absent that year, with 33.5% missing more than one-ninth of days, compared to 14.8% for other third graders. Interestingly, they were more likely to be missing their SAT10 scores in Grades 1 and 2 and to receive special education services in third grade. Students were enrolled in schools throughout the district, with the largest number (more than 10) enrolled in a special education center. As recipients of special education services, they might qualify for the mod-MSA or the alternative MSA, but they should be included in the testing program.

We were also interested in looking at students who scored proficient or advanced on the MSA in both reading and math in Grade 3. We found that they too were not a random group, but were statistically significantly more likely than their fellow third graders to be female, not African American, attend a nonpublic nursery school program, and not qualify for FARMS (see Table C6). They had high levels of attendance, 94.6% over Grades 1 through 3, and the lowest levels of CA. They entered K with the highest level of K readiness and were more likely to remain in the same school through grade 3. These students entered City Schools more ready for school than their peers, were from more advantaged backgrounds, and continued to perform well through Grade 3.

We also looked at data on children in foster care during the years 2009-10 and 2010-11 who entered K in 2009-10. However, there were not enough cases in either year (fewer than 50 cases) to sustain a statistical analysis.

We had hoped to investigate the process by which students are selected to receive special education services, but as we analyzed the data we realized the story was much richer and more nuanced than we originally conceived. Our original intention was to examine students who began to receive service, to determine if not being present (CA rate) was a characteristic of these students. Instead we saw students entering and also exiting, making the overall increase in rate of students receiving services across the district more complex and worthy of additional time to

investigate. While in the aggregate, City Schools see an increase in the number of students served as cohorts are promoted and move through school, the underlying story is far more complex.

## **Recommendations**

To address the attendance of students in the early grades, the Maryland State Department of Education (MSDE) needs to report ADA and CA rates for students in PreK and K. The state's accountability measures and their longitudinal data system as well need to include these early attendance rates. With MSDE a recent winner of the *Race to the Top* – Early Learning Challenge, we hope more attention will be paid to these important issues. MSDE currently reports ADA and CA for students in Grades 1 through 5, but attendance and CA for students in PreK and K are equally important and should be reported by the MSDE on its websites.

As a city, Baltimore should monitor enrollment patterns of students in Head Start and City Schools PreK programs. These activities may need to be coordinated with the City Health Department and other organizations working with young families. Because students who are not in a program prior to K struggle more in the early grades, Baltimore should ensure that there is good communication with families concerning the availability of Head Start and PreK programs. Are students not enrolled simply because parents are unaware of the program, the enrollment process, or because they are unaware of the importance of PreK for their child's future success?

Schools should pay careful attention to students arriving in K with no prior PreK program experience. Teachers or principals should have orientation programs that reach out to these families in particular, to ensure a smooth transition for the child and the family. These programs should aim to meet the needs of students and families at their entry into school and provide continuing support and communication. Such an approach can produce strong parent engagement with the school that will avoid later attendance and academic problems. Perhaps some lessons can be learned from the Head Start program, which has a strong record of promoting parental engagement.

As a district, City Schools should assist school staff, especially leadership teams in monitoring both ADA and CA using known best practices and reinstating the Baltimore City Student Attendance Work Group led by the Executive Director of Student Support Services. They should provide principals with successful interventions or policies known to improve attendance of younger students. These would include strategies to involve parents in their children's education and promote good communication between schools and families. There is a positive effect of school/family partnership efforts in improving attendance at the elementary level (e.g., Sheldon & Epstein, 2004; Sheldon, 2007; Entwisle & Hayduk, 1978). City Schools can help equip schools to pursue active family engagement strategies that include empowering families.

In this age of accountability, principals would be well served to pay attention to the level of CA and ADA at their school. Assessment scores are higher for students who attend school. Patterns of poor attendance are established early but can be changed. By paying attention to PreK and K attendance, school administrators can ensure that children and their families are on the best track

to be successful in school. Close monitoring of students' attendance by classroom teachers and attendance monitors along with monitoring of school-wide attendance by principals and attendance monitors will contribute to increased attendance and performance.

### **Research Next Steps**

BERC would like to investigate and document the connections and relationships that the Head Start program makes with families that nurture a strong attendance commitment long after the child and family are no longer participating in Head Start. Are there Best Practices that can be documented and shared across the city?

Another issue worthy of additional attention is why some eligible students are not participating in Head Start or PreK programs. Has Head Start, City Schools, or the City of Baltimore provided clear messaging to the families of these children that reinforce the importance of PreK to their child's future success? If specific barriers exist and are identified, they can be remedied by the city to ensure all students have access to PreK programming, getting them off to a strong start in school.

Who are the students who "turn around" their poor attendance? What changes allow them to improve their attendance and academic outcomes? Identifying these students and determining what caused the change may help inform practices to improve attendance citywide.

While not surprising, it is disturbing to see the number of students who are CA in PreK and K who are missing assessment data, especially the MSA. The MSA has a wide administration window (about two weeks) in which a child can take or take a make-up of the assessment. It is difficult to miss.

We would like to investigate the flow of these young children into and out of special education services. As aggregated numbers, it appears additional children receive services over time, yet the true flow includes students exiting service at the same time.

A final area that deserves additional attention is measuring the impact or influence a school has on student attendance and therefore student performance. The connection between a school's overall attendance and chronic absence rate and individual students' attendance and performance is a challenging area of study, but one with the potential for a huge payback to the system, school and students.

### **Summary**

We know CA has a negative impact on student performance, and over time Baltimore City has seen wavering levels year-by-year, with consistently higher rates for PreK and K. Whether due to the poor economy or other local challenges, chronic absence continues to be a major concern at every grade level. Resources and attention need to be focused on improving attendance throughout the City Schools, and a good place to start is with our youngest students.

Percent of Baltimore City Students Who Are Chronically Absent  
by Grade and School Year for 2006-07 through 2010-11

<b>Grade</b>	<b>2010-11</b>	<b>2009-10</b>	<b>2008-09</b>	<b>2007-08</b>	<b>2006-07</b>
Pre-K	26.5%	27.4%	19.5%	21.6%	21.7%
Kindergarten	22.9%	22.5%	17.8%	19.4%	20.6%
Grade 1	21.0%	19.5%	15.6%	16.4%	18.7%
Grade 2	17.9%	18.2%	13.6%	14.5%	15.2%
Grade 3	17.6%	16.1%	12.2%	12.8%	14.4%

Source: BERC analysis of the percent of student enrolled for 5 or more days who missed more than 1/9 of their days on roll using City Schools data from 2007 through 2011.

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## Appendix A: Methodological Issues

Missing Data. As with any project, there are instances of missing data. In our case the biggest concern was assessment data. First, we will discuss the level of occurrence then whether the missing data appears to be random or not. Because this is a study of students with poor attendance the issue of missing assessments is significant because it could lead to excluding from our statistical models the very children of interest. For this reason, in Table A1, there is a complete report of missing assessment data for all students. We report on missing MMSR data for all students enrolled in K who did not withdraw before the end of K. Students reported as missing Grade 1 and 2 SAT10 scores are those students who were enrolled in Grade 1 and 2 and did not withdraw that year and had no reported scores.

The *MMSR* is missing for 3% of students in cohort 1, 9% in cohort 2 and 5% in cohort 3. Because it is used as a control variable for student outcomes, students with missing scores are excluded from models. These values range from a high of 13.3% for students who entered K in 2007-08 who were CA in that year to a low of 2.8% of students who entered PreK in 2006-07 and were not CA in either PreK or K.

Table A1  
Percent of Baltimore City Students in PreK K Study  
with Missing Assessment Data by Entering Year Cohort

	Pre-K Only	K Only	Pre-K & K	No CA	Total
<b>Entered PreK 2006-07</b>					
Missing MMSR	4.4	4.2	5.1	2.8	3.3
Missing G1 SAT10 ELA	3.8	12.3	9.1	2.2	3.7
Missing G2 SAT10 ELA	1.9	7.4	10.7	1.9	2.3
Missing G3 MSA ELA	2.5	7.6	10.5	1.8	2.9
<b>Entered K 2007-08</b>					
Missing MMSR		13.3		7.7	8.7
Missing G1 SAT10 ELA		8.8		2.1	3.2
Missing G2 SAT10 ELA		5.7		1.7	2.3
Missing G3 MSA ELA		5.5		1.3	2.0
<b>Entered PreK 2008-09</b>					
Missing MMSR	5.2	5.8	6.3	5.3	5.4
Missing G1 SAT10 ELA	4.3	4.1	6.3	2.7	3.3

Missing Grade 1 SAT10 scores ranged from 12.3% for students who enter PreK in 2006-07 and were CA in K to 2.1% for students who entered K in 2007-08 and were not CA in K. Missing Grade 2 SAT10 scores ranged from 10.7 for students who entered K in 2007-08 and were CA in

PreK and K to a low of 1.7% for students who entered K in 2007-08. Again, those missing SAT10 scores did not differ demographically from the non-missing cases.

Students missing Grade 3 *MSA* scores ranged from 10.5% to 1.3%. This *missingness* is surprising as part of NCLB accountability measures 95% of students must take the assessment and there are multiple opportunities for students to complete make-ups. This high level of *missingness* (>5%) appears more likely for students who were CA in K. The non-random nature of the missing data suggests that we should try to correct for the *missingness* in our models.

**Appendix B: Descriptive Characteristics Cohort 1 (Students Entering Baltimore City School PreK in 2006-2007)**

Table B1  
Descriptive Characteristics of Cohort 1 for Students Entering  
Baltimore City School PreK in 2006-2007 through 2010-11

	Year 1- PreK (2006-07)	Year 2-K (2007-08)	Year 3-G1 (2008-09)	Year 4-G2 (2009-10)	Year 5-G3 (2010-11)
<i>Gender</i>					
Male	49.9	49.8	50.2	50.5	50.5
Female	50.1	50.2	49.8	49.5	49.5
<i>Race/Ethnicity</i>					
African American	87.0	87.9	88.6	88.7	88.5
Hispanic	4.2	4.2	4.2	4.1	4.2
Other	1.1	1.0	0.8	0.8	0.8
White	7.8	6.8	6.4	6.4	6.4
<i>Service Receipt</i>					
FARMS	79.8	81.1	88.0	92.4	91.6
Special Education	9.7	10.1	11.5	13.0	15.4
English Language Learners	3.7	3.8	3.1	2.9	2.6
Mobility: Mean Schools Per Year	1.03	1.10	1.09	1.10	1.08
Retained in Grade (Year Repeated)			1.4	7.6	4.2
Cumulative Retention			1.4	8.9	12.4
PreK	100.0				
K		99.6	1.4	0.1	
Grade 1		0.4	98.2	8.8	0.2
Grade 2			0.4	90.5	12.2
Grade 3				0.6	87.1
Grade 4					0.5
% Any Suspension	0.4	1.0	2.6	3.0	5.0
Total Number of Days Suspended	2.9	4.1	5.6	6.0	6.4
<i>Attendance</i>					
Average Daily Attendance (ADA)	92.3	93.5	94.3	93.5	93.6
Percent Chronic Absence (>1/9)	21.7	15.8	12.2	16.8	16.4
Severe Chronic Absence (>2/9)	5.9	3.1	2.2	2.6	2.6
<b>Number of Students</b>	<b>3364</b>	<b>3029</b>	<b>2837</b>	<b>2696</b>	<b>2582</b>

Table B2  
 Descriptive Characteristics by Chronic Absence Pattern in PreK and K for  
 Students Entering City School PreK in 2006-07 (Cohort 1)

	Chronic Absence in PreK and K			
	PreK Only	K Only	PreK & K	No Chronic Absence
	11.9%	6.8%	9.0%	72.3%
<i>Gender</i>				
Male	51.1	54.4	46.1	49.7
Female	48.9	45.6	53.9	50.3
<i>Race/Ethnicity</i>				
African American	85.5	93.7	90.0	87.6
Hispanic	4.7	1.0	2.2	4.7
Other	1.4	0.0	0.0	1.1
White	8.4	5.3	7.7	6.6
<i>Service Receipt</i>				
FARMS (2006-07)	84.0	82.6	83.9	80.2
FARMS (2007-08)	83.1	84.7	82.8	80.4
FARMS (2008-09)	90.7	92.5	90.8	87.1
FARMS (2009-10)	95.5	96.0	97.5	91.1
FARMS (2010-11)	95.3	95.3	96.8	90.0
Special Education (2006-07)	8.7	10.2	15.9	8.8
Special Education (2007-08)	10.3	13.6	17.3	8.9
Special Education (2008-09)	12.9	17.7	19.6	9.8
Special Education (2009-10)	13.1	21.7	21.8	11.1
Special Education (2010-11)	18.1	23.5	25.0	13.2
Limited English (2006-07)	4.5	0.0	1.9	4.5
<i>Attendance Rate (ADA)</i>				
2006-07 (PreK)	81.3	94.2	78.0	96.0
2007-08 (K)	93.7	82.9	80.4	96.1
2008-09 (most G1)	93.5	89.5	86.6	95.9
2009-10 (most G2)	92.2	88.7	87.0	95.0
2010-11 (most G3)	92.2	88.0	88.2	95.0
ADA – Over All Years	90.6	88.7	84.4	95.6
<i>Chronic Absence Rate</i>				
2006-07 (PreK)	100	0	100	0
2007-08 (K)	0	100	100	0
2008-09 (most G1)	12.9	35.8	50.8	4.9
2009-10 (most G2)	21.8	45.1	51.7	8.8
2010-11 (most G3)	23.3	44.2	45.2	9.1
<b>Number of Students (2007-08)</b>	<b>358</b>	<b>206</b>	<b>271</b>	<b>2,183</b>

**Table B3**  
**Test Scores, Retention and Suspensions by Chronic Absence Pattern in PreK and K for**  
**Students Entering City School PreK in 2006-07 (Cohort 1)**

	Chronic Absence in PreK and K			
	PreK Only	K Only	PreK & K	No Chronic Absence
	11.9%	6.8%	9.0%	72.3%
<i>Achievement Test Scores</i>				
<i>K (2007-08)</i>				
MMSR – Social/Personal: % Ready	53.7%	50.8%	53.4%	64.9%
MMSR – Language/Literacy: %Ready	51.0%	45.5%	41.1%	59.1%
MMSR- Composite: % Ready	57.0%	53.4%	50.4%	68.0%
<i>Grade 1 (2008-09)</i>				
SAT10 Reading Scale Score	550.5	545.9	539.7	563.6
SAT10 Math Scale Score	542.5	541.6	531.8	553.5
Reading SAT10: % ≥ 50 <sup>TH</sup> %tile	46.4%	43.7%	40.6%	58.8%
Math SAT10: % ≥ 50 <sup>TH</sup> %tile	60.3%	57.2%	48.6%	69.8%
<i>Grade 2 (2009-10)</i>				
SAT10 Reading Scale Score	596.3	592.0	594.1	602.9
SAT10 Math Scale Score	586.8	584.4	581.1	596.7
Reading SAT10: % ≥ 50 <sup>TH</sup> %tile	47.9%	47.8%	48.5%	57.7%
Math SAT10: % ≥ 50 <sup>TH</sup> %tile	62.3%	57.7%	52.4%	69.2%
<i>Grade 3 (2010-11)</i>				
MSA Reading Scale Scores	402.9	403.3	404.7	410.0
MSA Math Scale Scores	398.7	401.4	401.1	411.0
MSA Reading: % Prof/Adv. 2011	66.2%	65.4%	72.1%	73.9%
MSA Math: % Prof/Adv. 2011	72.6%	74.0%	73.6%	79.2%
<i>Retention</i>				
Retained in K	1.7	3.6	3.5	1.0
Retained in Grade 1	12.1	9.3	14.6	5.4
Retained, Kind or Grade 1	13.3	13.2	17.9	6.2
Retained in Year 5	4.0	7.0	8.8	3.5
Off-Time Grade by Year 5	16.7	19.2	25.8	9.4
<i>Suspensions</i>				
Any Suspension, PreK (2006-07)	0.3	1.0	0.0	0.4
Any Suspension, Kind (2007-08)	0.8	2.4	0.7	0.9
Any Suspension, G1 (2008-09)	4.2	4.8	2.4	2.2
Any Suspension, G2 (2009-10)	2.2	9.1	2.5	2.7
Any Suspension, G3 (2010-11)	5.7	6.4	5.5	4.7
Any Suspension, Years 3-5	10.9	16.7	9.0	8.0
<b>Number of Students (2007-08)</b>	<b>358</b>	<b>206</b>	<b>271</b>	<b>2,183</b>

**Appendix C: Descriptive Characteristics Cohort 2 (Students Entering City School K in 2007-08)**

Table C1  
 Descriptive Characteristics of Cohort 2 for  
 Students Entering City School K in 2007-08 through 2010-11

	Year 1-K (2007-08)	Year2-G1 (2008-09)	Year 3-G2 (2009-10)	Year 4-G3 (2010-11)
<i>Gender</i>				
Male	50.5	50.4	50.5	50.7
Female	49.5	49.6	49.5	49.3
<i>Race/Ethnicity</i>				
African American	85.4	86.6	87.2	87.2
Hispanic	4.3	4.2	4.0	4.1
Other	1.3	1.2	1.1	1.1
White	8.9	8.1	7.7	7.6
<i>Service Receipt</i>				
FARMS	78.3	85.8	91.0	89.6
Special Education	9.1	11.2	13.0	15.8
English Language Learners	4.1	3.5	3.1	2.8
Mobility: Mean Schools Per Year	1.10	1.11	1.11	1.09
Retained in Grade (Year Repeated)		3.5	8.4	4.5
Cumulative Retention		3.5	11.8	15.8
K	100.0	3.5	0.02	
Grade 1		96.4	11.7	0.2
Grade 2		0.1	88.0	15.6
Grade 3		0.01	0.2	84.0
Grade 4				0.2
% Any Suspension	1.0	2.6	3.4	5.1
Total Number of Days Suspended	3.7	6.0	7.1	6.8
<i>Attendance</i>				
Average Daily Attendance (ADA)	93.0	93.9	93.2	93.3
Percent Chronic Absence (>1/9)	18.8	14.8	18.0	17.5
Severe Chronic Absence (>2/9)	4.0	2.6	3.0	2.8
Number of Students	6,374	5,807	5,427	5,190

Table C2  
 Descriptive Characteristics by Chronic Absence in K for  
 Students Entering City School K in 2007-08 (Cohort 2)

	Chronic Absence in K	
	Yes	No
	18.8%	81.1%
<i>Gender</i>		
Male	50.5	50.5
Female	49.5	49.5
<i>Race/Ethnicity</i>		
African American	86.9	85.1
Hispanic	3.0	4.6
Other	0.9	1.4
White	9.2	8.9
<i>Service Receipt</i>		
FARM Status (2007-08)	82.7	77.3
FARM Status (2008-09)	91.8	84.5
FARM Status (2009-10)	96.8	89.7
FARM Status (2010-11)	96.2	88.2
Special Education (2007-08)	12.2	8.4
Special Education (2008-09)	15.6	10.2
Special Education (2009-10)	17.9	11.9
Special Education (2010-11)	21.0	14.6
Limited English (2007-08)	1.7	4.6
<i>Attendance Rate (ADA)</i>		
2007-08 (K)	81.3	95.7
2008-09 (most G1)	87.4	95.3
2009-10 (most G2)	87.8	94.4
2010-11 (most G3)	88.0	94.4
ADA – Over All Years	86.2	95.0
<i>Chronic Absence Rate</i>		
2007-08 (K)	100.0	0.0
2008-09 (most G1)	47.9	7.5
2009-10 (most G2)	47.6	11.4
2010-11 (most G3)	44.4	11.5
Number of Students (2007-08)	1197	5177

Table C3  
 Test Scores, Retention and Suspensions by Chronic Absence in K for  
 Students Entering City School K in 2007-08 (Cohort 2)

	Chronic Absence in K	
	Yes 18.8%	No 81.1%
<i>Achievement Test Scores</i>		
<i>K (2007-08)</i>		
MMSR – Social/Personal: % Ready	48.8	59.4
MMSR – Language/Literacy: %Ready	33.2	50.8
MMSR- Composite: % Ready	44.3	59.9
<i>Grade 1 (2008-09)</i>		
SAT10 Reading Scale Score	538.8	558.6
SAT10 Math Scale Score	534.7	548.6
Reading SAT10: % $\geq$ 50 <sup>TH</sup> %tile	39.3%	53.9%
Math SAT10: % $\geq$ 50 <sup>TH</sup> %tile	51.6%	65.5%
<i>Grade 2 (2009-10)</i>		
SAT10 Reading Scale Score	590.8	601.2
SAT10 Math Scale Score	581.7	593.0
Reading SAT10: % $\geq$ 50 <sup>TH</sup> %tile	45.8%	55.3%
Math SAT10: % $\geq$ 50 <sup>TH</sup> %tile	55.0%	66.5%
<i>Grade 3 (2010-11)</i>		
MSA Reading Scale Score	402.9	409.0
MSA Math Scale Score	401.4	409.4
MSA Reading: % Prof/Adv.	66.2%	72.7%
MSA Math: % Prof/Adv.	74.5%	76.9%
<i>Retention</i>		
Retained in K	7.8	2.5
Retained in Grade 1	15.8	7.0
Retained in Grade 2	9.2	4.0
Off-Time in 2010-11	28.4	13.0
<i>Suspensions</i>		
Any Suspension, Kind (2007-08)	1.4	0.9
Any Suspension, G1 (2008-09)	2.8	2.5
Any Suspension, G2 (2009-10)	4.2	3.2
Any Suspension, G3 (2010-11)	4.7	5.2
Any Suspension, Years 2 -4	9.7	9.1
Number of Students (2007-08)	1197	5177

Table C4  
 Descriptive Characteristics by Status in 2006-07 for  
 Students Entering City School K in 2007-08 (Cohort 2)

	BCPS Status in 2006-2007						
	BCPS PreK	BCPS PreK & H.S.	Head Start	NonPub Nursery	Day Care	Home Care	Unknown
	44.4%	3.9%	13.2%	10.5%	5.1%	15.3%	7.7%
<i>Gender</i>							
Male	49.6	51.8	52.4	49.7	48.3	51.7	51.8
Female	50.4	28.2	47.6	50.3	51.7	48.3	48.2
<i>Race/Ethnicity</i>							
African American	87.3	94.3	90.6	75.4	86.7	82.1	80.7
Hispanic	4.4	1.2	6.1	4.0	0.6	4.2	5.5
Other	1.1	0.8	0.4	1.9	0.9	1.7	2.6
White	7.1	3.6	2.9	18.7	11.8	12.0	11.2
<i>Service Receipt</i>							
FARM Status (2007-08)	80.4	87.6	86.1	61.3	64.2	81.9	73.6
FARM Status (2008-09)	87.0	95.6	91.7	69.9	71.2	89.1	88.7
FARM Status (2009-10)	92.1	95.4	95.5	77.7	77.7	94.8	93.0
FARM Status (2010-11)	91.0	96.1	93.6	72.6	77.0	93.8	94.0
Special Education (2007-08)	9.7	14.6	11.6	6.1	2.8	8.7	7.7
Special Education (2008-09)	10.9	15.8	13.3	8.9	3.2	11.3	11.7
Special Education (2009-10)	12.5	16.4	15.6	9.7	5.5	13.8	14.3
Special Education (2010-11)	14.5	18.3	18.7	12.4	10.1	17.6	19.0
Limited English (2007-08)	4.1	0.4	5.4	3.7	0.9	4.2	5.7
<i>Attendance Rate (ADA)</i>							
2007-08 (K)	93.5	93.7	93.9	94.2	94.2	90.8	89.9
2008-09 (most G1)	94.3	94.9	94.7	94.4	94.7	91.6	91.9
2009-10 (most G2)	93.4	94.6	94.0	94.2	93.9	91.3	91.3
2010-11 (most G3)	93.6	94.1	94.0	94.1	93.7	91.6	91.5
ADA – Over All Years	93.8	94.5	94.2	94.2	94.3	91.3	91.2
<i>Chronic Absence Rate</i>							
2007-08 (K)	15.5	17.0	15.7	14.6	13.9	28.5	33.3
2008-09 (most G1)	11.9	11.8	10.5	12.0	11.8	26.4	26.1
2009-10 (most G2)	17.1	11.0	13.5	12.7	14.9	27.3	27.9
2010-11 (most G3)	16.4	13.5	13.0	13.6	13.6	27.4	23.2
Number of Students (2007-08)	2828	247	839	670	323	975	492

Table C5  
 Test Scores, Retention and Suspensions by Status in 2006-07 for  
 Students Entering City School K in 2007-08 (Cohort 2)

	BCPS Status in 2006-2007						
	BCPS PreK	BCPS PreK & H.S.	Head Start	NonPub Nursery	Day Care	Home Care	Unknown
	44.4%	3.9%	13.2%	10.5%	5.1%	15.3%	7.7%
<i>Achievement Test Scores</i>							
<i>K (2007-08)</i>							
MMSR – Social/Personal: % Ready	62.1	58.5	51.3	62.0	54.5	48.8	35.5
MMSR – Lang./Literacy: %Ready	55.9	53.8	43.2	52.5	46.3	26.1	9.7
% Ready- MMSR Composite:	64.1	66.9	51.6	62.0	54.7	39.0	25.8
<i>Grade 1 (2008-09)</i>							
SAT10 Reading Scale Score	559.6	555.9	550.0	563.4	566.1	541.5	544.3
SAT10 Math Scale Score	550.3	545.7	542.1	551.1	553.3	535.9	536.0
Reading SAT10: % ≥ 50 <sup>TH</sup> %tile	55.5%	51.4%	47.7%	55.8%	59.4%	39.9%	43.1%
Math SAT10: % ≥ 50 <sup>TH</sup> %tile	66.6%	62.8%	59.6%	67.7%	68.0%	54.8%	52.7%
<i>Grade 2 (2009-10)</i>							
SAT10 Reading Scale Score	601.2	599.4	593.9	609.0	604.8	592.6	594.3
SAT10 Math Scale Score	594.0	593.2	585.7	596.7	595.8	581.9	587.2
Reading SAT10: % ≥ 50 <sup>TH</sup> %tile	55.3%	59.3%	46.9	60.8%	60.4%	46.3%	51.8%
Math SAT10: % ≥ 50 <sup>TH</sup> %tile	66.9%	67.8%	60.6	69.5%	66.3%	55.8%	64.9%
<i>Grade 3 (2010-11)</i>							
MSA Reading Scale Score	408.5	408.6	404.2	416.1	412.6	403.5	403.5
MSA Math Scale Score	408.9	406.1	404.5	416.4	416.9	402.6	401.7
MSA Reading: % Prof/Adv.	72.7%	70.5%	70.0%	78.7%	71.9%	66.9%	65.9%
MSA Math: % Prof/Adv.	78.2%	75.7%	73.1%	82.2%	78.7%	70.8%	71.8%
<i>Retention</i>							
Retained in K	1.4	1.7	4.6	1.8	1.0	5.7	16.4
Retained in Grade 1	7.7	4.7	8.0	6.0	3.5	14.5	13.0
Retained in Grade 2	4.2	6.2	4.6	2.9	1.3	8.8	6.3
Off-Time in 2010-11	12.4	11.1	16.5	10.4	6.6	26.8	31.7
<i>Suspensions</i>							
Any Suspension, Kind (2007-08)	1.0	1.2	1.2	1.9	1.2	0.4	0.2
Any Suspension, G1 (2008-09)	2.5	3.1	2.2	2.9	3.1	2.6	2.7
Any Suspension, G2 (2009-10)	2.8	6.0	4.5	2.3	4.6	3.4	4.1
Any Suspension, G3 (2010-11)	4.9	5.3	5.3	4.7	7.4	5.1	5.3
Any Suspension, Years 2 -4	8.5	13.2	9.5	8.1	9.7	10.0	10.8
Number of Students (2007-08)	2,828	247	839	670	323	975	492

Table C6  
 Student Demographics, Performance, Attendance, Retention and Suspensions for Students  
 Entering Baltimore K in 2007-08 by Retention, MSA Performance on Reading and Math

	MSA Performance in Both Reading and Math				
	Retained	Basic	Proficient/ Advanced	Missing MSA	Total
Student Gender - % Male	58.5%	54.5%	46.1%	52.7%	50.7%
African American	88.8%	92.3%	83.8%	87.4%	87.2%
Free/Reduced Price Lunch, 2007-08	84.3%	85.0%	74.8%	81.9%	79.5%
BCPS PreK	35.9%	45.6%	48.2%	54.9%	45.7%
Head Start	14.5%	15.7%	13.1%	9.9%	13.9%
Head Start & BCPS PreK	2.8%	4.2%	4.2%	4.4%	4.0%
Nursery School	6.8%	8.3%	12.8%	6.6%	10.3%
Day Care	2.0%	4.7%	5.6%	3.3%	4.7%
Home Care	25.7%	15.6%	11.8%	13.7%	15.2%
Unknown Status, 2006-07	12.3%	5.9%	4.3%	7.1%	6.1%
Chronic Absence, 2007-08	32.6%	16.8%	13.7%	29.7%	18.1%
Chronic Absence, 2008-09	27.8%	13.7%	10.1%	24.1%	14.4%
Chronic Absence, 2009-10	29.8%	17.5%	13.2%	29.5%	17.6%
Chronic Absence, 2010-11	27.4%	19.6%	12.1%	33.5%	17.5%
Average Daily Attendance, Years 2-4	90.8%	93.4%	94.6%	90.4%	93.5%
Special Ed Services, 2007-08	11.3%	13.2%	4.9%	33.5%	9.3%
Special Ed Services, 2008-09	17.5%	17.0%	4.9%	34.6%	11.4%
Special Ed Services, 2009-10	24.3%	18.2%	5.3%	36.8%	13.1%
Special Ed Services, 2010-11	30.5%	27.7%	7.3%	35.4%	15.8%
Ever In Special Education, Years 1-4	33.3%	26.3%	9.1%	37.4%	18.8%
Ever Suspended, Years 2-4	12.7%	12.3%	6.1%	7.3%	9.0%
Enrolled In Same School, Years 1-4	40.9%	51.6%	62.9%	41.8%	55.4%
Social/Personal – MMSR % Ready	34.2%	50.0%	69.5%	44.8%	57.8%
Language & Literacy – MMSR % Ready	16.5%	39.1%	62.1%	38.0%	48.0%
Mathematical Thinking 1 – MMSR % Ready	18.8%	43.8%	66.0%	39.9%	51.8%
Retained: Not In Grade 3 in 2010-11	100.0%	0.00%	0.00%	0.00%	15.8%
SAT10 (2008-09)- Mean Scale Score Reading	497.4	536.6	578.5	555.8	555.3
SAT10 (2008-09)- Mean Scale Score Math	502.5	531.1	564.3	545.8	546.2
SAT10 (2009-10) – Mean Scale Score Reading	547.0	573.7	618.6	595.3	593.9
SAT10 (2009-10)- Mean Scale Score Math	541.4	566.5	609.0	586.9	585.6
% Took SAT10 in 2009-10	96.0%	97.8%	98.9%	69.7%	97.2%
Number of Students (N)	820	1495	2693	182	5190

**Appendix D: Descriptive Characteristics Cohort 3 (Students Entering Baltimore City School PreK in 2008-2009)**

Table D1  
Descriptive Characteristics of Cohort 3 for  
Students Entering Baltimore City School PreK in 2008-09 through 2010-11

	Year 1–PreK (2008-09)	Year 2–Kind (2009-10)	Year 3–G1 (2010-11)
<i>Gender</i>			
Male	51.3	51.1	50.9
Female	48.7	48.9	49.1
<i>Race/Ethnicity</i>			
African American	85.5	86.4	86.8
Hispanic	5.2	5.2	5.3
Other	1.2	0.9	0.9
White	8.1	7.4	7.0
<i>Service Receipt</i>			
FARMS	83.3	92.2	91.2
Special Education	10.6	11.6	13.5
English Language Learners	4.5	4.6	4.4
Mobility: Mean Schools per Year	1.05	1.11	1.10
Retained in Grade			1.7
PreK	100.0%	0.1%	
K		99.6%	1.8%
Grade 1		0.2%	97.9%
Grade 2			0.3%
% Any Suspension	0.3	1.2	2.7
Number Days Suspended	2.9	3.0	4.7
<i>Attendance</i>			
Average Daily Attendance (ADA)	93.0	92.7	93.0
Percent Chronic Absence (>1/9)	19.5	20.0	19.0
Severe Chronic Absence (>2/9)	4.1	3.4	2.8
<b>Total Number of Students</b>	<b>4,057</b>	<b>3,664</b>	<b>3,465</b>

Table D2  
 Descriptive Characteristics by Chronic Absence Pattern in PreK and K for  
 Students Entering City School PreK in 2008-09 (Cohort 3)

	Chronic Absence in PreK and K			
	PreK Only	K Only	PreK & K	No Chronic Absence
	9.3%	10.4%	9.6%	70.7%
<i>Gender</i>				
Male	51.0	54.2	49.7	50.9
Female	49.0	45.8	50.3	49.1
<i>Race/Ethnicity</i>				
African American	88.5	90.3	86.9	85.5
Hispanic	4.7	2.9	2.0	6.1
Other	0.6	1.4	1.1	0.9
White	6.2	5.5	10.0	7.5
<i>Service Receipt</i>				
FARMS (2008-09)	88.8	88.2	85.4	83.9
FARMS (2009-10)	94.1	96.3	95.1	91.0
FARMS (2010-11)	93.7	96.8	96.6	89.7
Special Education (2008-09)	17.4	12.4	11.7	9.5
Special Education (2009-10)	18.9	13.9	14.3	9.9
Special Education (2010-11)	19.9	16.1	16.7	11.7
Limited English(2008-09)	3.2	2.6	1.1	5.6
<i>Attendance Rate (ADA)</i>				
2008-09 (PreK)	82.6	94.1	80.1	96.2
2009-10 (most Kind)	93.3	83.2	80.8	95.7
2010-11 (most G1)	91.6	87.6	85.5	94.9
ADA – Over All Years	89.1	88.4	82.2	95.6
<i>Chronic Absence Rate</i>				
2008-09 (PreK)	100	0	100	0
2009-10 (most Kind)	0	100	100	0
2010-11 (most G1)	25.8	50.3	59.6	8.1
<b>Number of Students (2009-10)</b>	<b>339</b>	<b>380</b>	<b>350</b>	<b>2,581</b>

Table D3  
 Test Scores, Retention and Suspensions by Chronic Absence Pattern in PreK and K for  
 Students Entering City School PreK in 2008-09 (Cohort 3)

	Chronic Absence in PreK and K			
	PreK Only	K Only	PreK & K	No Chronic Absence
	9.3%	10.4%	9.6%	70.7%
<i>Achievement Test Scores</i>				
<i>K (2009-10)</i>				
MMSR – Social/Personal: % Ready	63.8	63.2	59.8	67.5
MMSR – Language/Literacy: %Ready	54.1	56.7	47.6	61.9
MMSR- Composite: % Ready	63.4	65.7	58.8	70.7
<i>Grade 1 (2010-11)</i>				
SAT10 Reading Scale Score, Gr 1	551.4	540.9	539.2	563.1
SAT10 Math Scale Score, Gr 1	539.1	535.5	534.7	549.7
SAT10 Reading: % ≥ 50 <sup>TH</sup> %tile	46.7	36.4	39.1	58.0
SAT10 Math: % ≥ 50 <sup>TH</sup> %tile	57.7	50.3	53.0	66.9
Retained in Grade 1/Year 3 (2010-11)	1.8	4.7	2.9	1.0
<i>Suspensions</i>				
Any Suspension, PreK (2008-09)	0.6	0.5	0.6	0.2
Any Suspension, Kind (2009-10)	0.9	2.9	1.1	1.0
Any Suspension , G1(2010-11)	3.8	2.3	4.0	2.5
<b>Number of Students (2009-10)</b>	<b>339</b>	<b>380</b>	<b>350</b>	<b>2,581</b>

## Appendix E: Regression Models for Students Entering PreK 2006-07 (Cohort 1)

Coefficients in *logistic regression models* are *odds ratios* that represent the effect of a unit change in the independent variable (e.g. gender) on the odds of chronic absence (or other dichotomous outcome). For example, an odds ratio of .65 means that a 1 unit increase in X leads to a 35% decrease (1.0 minus .65) in the odds of Y. Conversely, an odds ratio of 1.35 means that a 1 unit change in X leads to a 35% increase in the odds of Y.

Coefficients in *OLS regression models* are *standardized beta coefficients* that indicate how many standard deviations a dependent variable will change per standard deviation increase in the predictor variable. As such they show the relative size of effect each predictor has on the dependent variable.

### Tables E1 – E5: Regression Models Controlling for CA in PreK and K

Table E1	Attendance in Grades 1 through Grade 3 (Year 5)
Table E2	Grades 1 and 2 SAT10 Scale Scores
Table E3	Retention and Special Education
Table E4	Suspension
Table E5	Performance on Grade 3 MSA

### Tables E6 – E10: Regression Models Controlling for ADA in PreK and K

Table E6	Attendance in Grades 1 through Grade 3 (Year 5)
Table E7	Grades 1 and 2 SAT10 Scale Scores
Table E8	Retention and Special Education
Table E9	Suspension
Table E10	Performance on Grade 3 MSA

Table E1

Cohort 1: Students Entering PreK 2006-07 Regression Models Predicting Attendance in Grades 1 through Grade 3 (Year 5)

	Chronic Absence 2008-09 (Grade 1)	Chronic Absence 2010-11 (Grade 3)		ADA 2008-09 (Grade 1)	ADA 2010-11 (Grade 3)		ADA Years 3-5
	Logistic Model (Odds Ratios)	Logistic Model (Odds Ratios)		OLS Regression Model	OLS Regression Model		OLS Regression Model
Gender (Male)	.96	.94	.98	.01	.00	-.01	.00
African American	1.18	.87	.75	-.03+	-.03	-.01	-.04*
FARMS0708	1.14	1.51*	1.54*	-.01	-.05**	-.04**	-.04*
Age0906	1.19	.85	.66+	-.02	-.03	-.00	-.04*
MMSR-Social/Personal	.90	.84	.89	.00	.01	.00	.02
MMSR-Language Literacy	.86	.79	.86	.06**	.05*	.01	.06**
Special Education, 2007-08	1.22	.74	.71	-.03+	.00	.00	.00
School-Level CA 2007-08	1.00	1.01*	1.02**	-.03	-.04*	-.02	-.05**
Chronic Absence, PreK Only <sup>a</sup>	3.09***	2.99***	1.77**	-.13***	-.14***	-.05**	-.17***
Chronic Absence, K Only <sup>a</sup>	11.18***	7.97***	2.42***	-.25***	-.28***	-.10***	-.32***
Chronic Absence, PreK & K <sup>a</sup>	20.52***	7.13***	1.44+	-.42***	-.28***	-.03	-.41***
Student ADA, Years 3,4			.79***			.58***	
<i>Pseudo R<sup>2</sup> (Nagelkerke)/ R<sup>2</sup></i>	.28	.18	.37	.24	.17	.41	.29
	(N = 2694)	(N=2417)		(N = 2694)	(N=2417)		(N = 2383)

\*\*\*  $P \leq .001$  \*\*  $P \leq .01$  \*  $P \leq .05$  +  $P \leq .10$ <sup>a</sup> Baseline category is 'No Chronic Absence in PreK or K'.

Table E2  
Cohort 1: PreK 2006-07 Regression Models Predicting Grades1 and 2 SAT10 Scale Scores

	SAT10-Reading Scale Scores Grade 1		SAT10-Math Scale Scores Grade 1		SAT10-Reading Scale Scores Grade 2		SAT10-Math Scale Scores Grade 2	
	OLS Regression Model		OLS Regression Model		OLS Regression Model		OLS Regression Model	
Gender (Male)	-.11***	-.11***	-.02	-.02	-.09***	-.09***	.03	.03
African American	-.05**	-.04*	-.03	-.02	-.06**	-.06**	-.05*	-.04*
FARMS0708	-.08***	-.09***	-.09***	-.09***	-.09***	-.09***	-.05**	-.05*
Age0906	.09***	.09***	.13***	.13***	.07***	.08***	.09***	.10***
MMSR-Social/Personal	.10***	.11***	.07**	.08***	.06**	.08***	.11***	.10***
MMSR-Language Literacy	.22***	.20***	.20***	.19***	.19***	.16***	.17***	.16***
Special Education, 2007-08	-.02	-.02	-.09***	-.09***	-.09***	-.09***	-.10***	-.10***
School-Level CA 2007-08	-.05**	-.05**	-.04*	-.04*	-.03	-.03	-.03	-.03
Chronic Absence, PreK Only	-.07***	-.04*	-.07***	-.04+	-.03	-.01	-.05**	-.02
Chronic Absence, Kind Only	-.07***	-.03	-.05**	-.00	-.05*	-.01	-.06**	-.00
Chronic Absence, Prek/Kind	-.11***	-.04+	-.11***	-.03	-.04+	.02	-.08***	-.00
Student ADA, Years 3/ 3,4		.16***		.17***		.13***		.17***
<i>Adjusted R<sup>2</sup></i>	.16	.18	.14	.16	.11	.12	.11	.13
	(N =2512)		(N =2502)		(N =2212)		(N =2212)	

\*\*\*  $P \leq .001$       \*\*  $P \leq .01$       \*  $P \leq .05$       +  $P \leq .10$

<sup>a</sup> Baseline category is 'No Chronic Absence in PreK or K'.

Table E3  
 Cohort 1: PreK 2006-07 Regression Models Predicting Retention and Special Education

	Off-Time 2010-11		Enter Special Ed After 2007-08	
	Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)	
Gender (Male)	1.55***	1.58***	1.78***	1.81***
African American	1.05	1.02	1.28	1.25
FARMS0708	1.20	1.17	1.54+	1.51+
Age0906	.40***	.37***	1.15	1.09
MMSR-Social/Personal	.61***		.45***	.45***
MMSR-Language Literacy	.32***		.71+	.74
Special Education, 2007-08	.74	.74	--	--
School-Level CA 2007-08	.98*	.98*	.96***	.96***
Chronic Absence, PreK Only	1.94***	1.64**	1.52+	1.32
Chronic Absence, Kind Only	2.09***	1.36	1.80*	1.24
Chronic Absence, Prek/Kind	3.34***	2.06***	1.75*	1.17
Student ADA, Years 3-5		.94***		.95***
<i>Pseudo R<sup>2</sup> (Nagelkerke)</i>	.17	.19	.09	.10
	(N = 2424)		(N = 2424)	

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

<sup>a</sup> Baseline category is 'No Chronic Absence in PreK or K'.

Table E4  
 Cohort 1: Students Entering PreK 2006-07 Regression Models Predicting Suspension

	Suspended 2008-09 (Grade 1)		Suspended 2008-09 (Grade 2)		Suspended 2008-09 (Grade 3)		Ever Suspended Years 3 - 5	
	Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)	
Gender (Male)	3.81***	3.82***	4.28***	4.32***	2.94***	2.99***	3.41***	3.51***
African American	1.07	1.00	4.33*	4.18*	3.80**	3.61*	2.41**	2.31**
FARMS0708	.79	.77	.83	.80	1.34	1.30	.90	.86
Age0906	.76	.75	1.66	1.64	1.57	1.48	1.37	1.29
MMSR-Social/Personal	.52*	.52*	.57+	.58+	.57*	.56*	.53***	.52***
MMSR-Language Literacy	.86	.89	.62	.65	.71	.76	.83	.89
Special Education, 2007-08	1.55	1.45	1.19	1.14	.76	.77	1.30	1.33
School-Level CA 2007-08	1.00	1.00	1.01	1.00	.99	.98	.99	.99
Chronic Absence, PreK Only <sup>a</sup>	1.75+	1.52	.87	.76	1.13	.94	1.34	1.10
Chronic Absence, Kind Only <sup>a</sup>	1.77	1.27	3.15***	2.24*	.94	.55	1.81*	1.06
Chronic Absence, Prek/Kind <sup>a</sup>	1.04	.49	.85	.46	1.21	.68	1.15	.63
Student ADA, Years 3/ 3-4/ 3-5		.95***		.95**		.93***		.93***
<i>Pseudo R<sup>2</sup> (Nagelkerke)</i>	.08	.10	.13	.14	.08	.10	.11	.13
	(N = 2694)		(N = 2541)		(N = 2424)		(N = 2392)	

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

<sup>a</sup> Baseline category is 'No Chronic Absence in PreK or K'.

Table E5  
 Cohort 1: Students Entering PreK 2006-07 Regression Models Predicting Grade 3 MSA Performance

	Reading MSA Prof/Adv vs. Basic		Math MSA Prof/Adv vs. Basic		Reading MSA Scale Scores		Math MSA Scale Scores	
	Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)		OLS Regression Model		OLS Regression Model	
Gender (Male)	.74**	.74**	1.12	1.12	-.10***	-.10***	-.00	-.00
African American	.65*	.65*	.54**	.54**	-.08***	-.08***	-.11***	-.11***
FARMS0708	.63**	.64**	.59***	.61**	-.11***	-.11***	-.09***	-.08***
Age0906	1.87***	1.91***	2.03***	2.14***	.08***	.08***	.07**	.07***
MMSR-Social/Personal	1.65***	1.66***	1.30+	1.32*	.11***	.11***	.07**	.07**
MMSR-Language Literacy	1.43**	1.40**	2.03***	1.96***	.12***	.12***	.18***	.17***
Special Education, 2007-08	.53***	.53***	.36***	.35***	-.09***	-.09***	-.10***	-.10***
School-Level CA 2007-08	.99	.99	.99	.99	-.01	-.01	-.02	-.02
Chronic Absence, PreK Only <sup>a</sup>	.83	.90	.84	1.01	-.04+	-.02	-.07***	-.04+
Chronic Absence, Kind Only <sup>a</sup>	.75	.91	.91	1.38	-.04+	-.00	-.04*	.01
Chronic Absence, Prek/Kind <sup>a</sup>	1.02	1.26	.95	1.52+	-.02	.02	-.04+	.03
Student ADA, Years 3-5		1.03*		1.07***		.11***		.17***
<i>Pseudo R<sup>2</sup> (Nagelkerke)/ R<sup>2</sup></i>	.09	.09	.11	.13	.10	.11	.10	.12
	(N = 2032)		(N = 2035)		(N = 2008)		(N = 2009)	

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

<sup>a</sup> Baseline category is 'No Chronic Absence in PreK or K'.

Table E6  
 Cohort 1: Students Entering PreK 2006-07 Regression Models Predicting Attendance  
 in 2008-09 (Grades 1) through 2010-11 (Grade 3)

	Chronic Absence 2008-09 (Grade 1)	Chronic Absence 2010-11 (Grade 3)		ADA 2008- 09 (Grade 1)	ADA 2010-11 (Grade 3)		ADA Years 3-5
	Logistic Model (Odds Ratios)	Logistic Model (Odds Ratios)		OLS Regression Model	OLS Regression Model		OLS Regression Model
Gender (Male)							
African American							
FARMS0708							
Age0906							
MMSR-Social/Personal							
MMSR-Language Literacy							
Special Education, 2007-08							
School-Level ADA 2007-08	1.09**	.98	.93*	-.03+	-.00	.01	-.03
Student ADA, PreK	.98***	.99	1.00	.09***	.06**	-.01	.09***
Student ADA, K	.82***	.87***	.96***	.54***	.44***	.11***	.59***
Student ADA, Years 3,4			.80***			.56***	
<i>Pseudo R<sup>2</sup> (Nagelkerke)/ R<sup>2</sup></i>	.34	.22	.36	.35	.23	.41	.43
	(N = 2694)	(N=2417)		(N = 2694)	(N=2417)		(N = 2383)

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

Table E7  
 Cohort 1: Students Entering PreK 2006-07 Regression Models Predicting Grades 1 and 2 SAT10 Scale Scores

	SAT10-Reading Scale Scores Grade 1		SAT10-Math Scale Scores Grade 1		SAT10-Reading Scale Scores Grade 2		SAT10-Math Scale Scores Grade 2	
	OLS Regression Model		OLS Regression Model		OLS Regression Model		OLS Regression Model	
Gender (Male)								
African American								
FARMS0708								
Age0906								
MMSR-Social/Personal								
MMSR-Language Literacy								
Special Education, 2007-08								
School-Level ADA 2007-08	.03	.03+	.01	.02	.02	.03	.02	.03
Student ADA, PreK	.08***	.06**	.07***	.05*	.06**	.04+	.07**	.04+
Student ADA, K	.12***	.05+	.10***	.02	.04+	-.03	.07**	-.03
Student ADA, Years 3/ 3,4		.14***		.16***		.13***		.17***
<i>Adjusted R<sup>2</sup></i>	.17	.18	.14	.16	.11	.12	.11	.13
	(N =2512)		(N =2502)		(N =2212)		(N =2212)	

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

Table E8  
 Cohort 1: Students Entering PreK 2006-07 Regression Models Predicting Retention (Being Off-Grade) and Special Education

	Off-Grade 2010-11		Enter Special Ed After 2007-08	
	Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)	
Gender (Male)				
African American				
FARMS0708				
Age0906				
MMSR-Social/Personal				
MMSR-Language Literacy				
Special Education, 2007-08				
School-Level ADA 2007-08	1.10**	1.10**	1.15**	1.15**
Student ADA, PreK	.98**	.98*	.99+	.99
Student ADA, K	.95***	.97*	.97*	1.00
Student ADA, Years 3-5		.95***		.95**
<i>Pseudo R<sup>2</sup> (Nagelkerke)</i>	.18	.19	.09	.09
	(N = 2424)		(N = 2424)	

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

<sup>a</sup> Baseline category is 'No Chronic Absence in PreK or K'.

Table E9  
 Cohort 1: Students Entering PreK 2006-07 Regression Models Predicting Suspension

	Suspended 2008-09 (Grade 1)		Suspended 2008-09 (Grade 2)		Suspended 2008-09 (Grade 3)		Ever Suspended Years 3 - 5	
	Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)	
Gender (Male)								
African American								
FARMS0708								
Age0906								
MMSR-Social/Personal								
MMSR-Language Literacy								
Special Education, 2007-08								
School-Level ADA 2007-08	.99	.99	.98	.98	1.02	1.02	1.01	1.01
Student ADA, PreK	1.00	1.00	1.03	1.03	.99	.99	1.00	1.00
Student ADA, K	.99	1.04	.97	1.02	1.01	1.06**	.99	1.05**
Student ADA, Years 3/ 3-4/ 3-5		.94***		.93***		.91***		.90***
<i>Pseudo R<sup>2</sup> (Nagelkerke)</i>	.08	.10	.11	.13	.08	.10	.11	.14
	(N = 2694)		(N = 2541)		(N =2424)		(N =2392)	

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

Table E10  
 Cohort 1: Students Entering PreK 2006-07 Regression Models Predicting Grade 3 MSA Performance

	Reading MSA Prof/Adv vs. Basic		Math MSA Prof/Adv vs. Basic		Reading MSA Scale Scores		Math MSA Scale Scores	
	Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)		OLS Regression Model		OLS Regression Model	
Gender (Male)								
African American								
FARMS0708								
Age0906								
MMSR-Social/Personal								
MMSR-Language Literacy								
Special Education, 2007-08								
School-Level ADA 2007-08	1.00	1.00	1.02	1.02	.01	.01	.00	.01
Student ADA, PreK	1.01	1.01	1.01+	1.01	.06*	.05+	.06*	.04
Student ADA, K	1.00	.99	1.01	.97+	.02	-.04	.05+	-.05+
Student ADA, Years 3-5		1.04*		1.07***		.11***		.18***
<i>Pseudo R<sup>2</sup> (Nagelkerke)</i>	.09	.09	.11	.13	.10	.11	.10	.12
	(N = 2023)		(N = 2035)		(N = 2008)		(N = 2009)	

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

## Appendix F: Regression Models for Students Entering K 2007-08 (Cohort 2)

Coefficients in *logistic regression models* are *odds ratios* that represent the effect of a unit change in the independent variable (e.g. gender) on the odds of chronic absence (or other dichotomous outcome). For example, an odds ratio of .65 means that a 1 unit increase in X leads to a 35% decrease (1.0 minus .65) in the odds of Y. Conversely, an odds ratio of 1.35 means that a 1 unit change in X leads to a 35% increase in the odds of Y.

Coefficients in *OLS regression models* are *standardized beta coefficients* that indicate how many standard deviations a dependent variable will change per standard deviation increase in the predictor variable. As such they show the relative size of effect each predictor has on the dependent variable.

### Tables F1 – F5: Regression Models Controlling for CA in K and Type of PreK Experience

Table F1	Attendance in Grades 1 through Grade 3 (Year 4)
Table F2	Grades 1 and 2 SAT10 Scale Scores
Table F3	Retention and Special Education
Table F4	Suspension
Table F5	Performance on Grade 3 MSA

### Tables F6 – F10: Regression Models Controlling for ADA in K and Type of PreK Experience

Table F6	Attendance in Grades 1 through Grade 3 (Year 4)
Table F7	Grades 1 and 2 SAT10 Scale Scores
Table F8	Retention and Special Education
Table F9	Suspension
Table F10	Performance on Grade 3 MSA

Table F1

Cohort 2: Students Entering K 2007-08 Regression Models Predicting Attendance in 2008-09 (Grade 1) through 2010-11 (Grade 3)

	Chronic Absence 2008-09 (Grade 1)	Chronic Absence 2010-11 (Grade 3)		ADA 2008-09 (Grade 1)	ADA 2010-11 (Grade 3)		ADA Years 2-4
	Logistic Model (Odds Ratios)	Logistic Model (Odds Ratios)		OLS Regression Model	OLS Regression Model		OLS Regression Model
Gender (Male)	1.09	1.08	1.04	-.01	-.02	-.01	-.02+
African American	1.37*	1.25+	1.15	-.03*	-.03*	-.01	-.04***
FARMS0708	1.33*	1.48***	1.38*	-.03*	-.07***	-.05***	-.06***
Age0907	1.28+	1.27+	1.13	-.03**	-.04**	-.02	-.04***
MMSR-Social/Personal	.94	.76**	.76*	.01	.05***	.04**	.03*
MMSR-Language Literacy	.75**	.93	1.09	.06***	.02	.01	.05***
Special Education, 2007-08	1.12	.83	.75+	-.02+	.00	.01	-.01
School-Level CA 2007-08	1.00	1.01*	1.01+	-.04**	-.03+	-.00	-.04**
Chronic Absence in K	10.71***	5.50***	1.74***	-.45***	-.35***	-.09***	-.47***
Head Start <sup>a</sup>	.82	.73*	.85	.02	.03+	.01	.03*
Head Start & Pre-K <sup>a</sup>	.80	.68+	.90	.03*	.03*	.00	.04***
Home Care <sup>a</sup>	2.02***	1.36**	1.08	-.09***	-.05***	.00	-.09***
Nursery or School-Like <sup>a</sup>	1.20	.87	.86	-.01	.01	.01	.01
Day Care <sup>a</sup>	1.08	.83	.91	.01	-.00	-.01	.01
Student ADA, Years 2,3			.81***			.55***	
Pseudo R <sup>2</sup> (Nagelkerke)/ R <sup>2</sup>	.28	.17	.34	.25	.16	.38	.28
	(N = 5292)	(N = 4715)		(N = 5292)	(N = 4715)		(N = 4647)

\*\*\* P ≤ .001    \*\* P ≤ .01    \* P ≤ .05    + P ≤ .10

<sup>a</sup> Baseline category is 'BCPS Pre-K'.

Table F2  
 Cohort 2: Students Entering K 2007-08 Regression Models Predicting Grades 1 and 2 SAT10 Scale Scores

	SAT10-Reading Scale Scores Grade 1		SAT10-Math Scale Scores Grade 1		SAT10-Reading Scale Scores Grade 2		SAT10-Math Scale Scores Grade 2	
	OLS Regression Model		OLS Regression Model		OLS Regression Model		OLS Regression Model	
Gender (Male)	-.10***	-.10***	-.02	-.02	-.08***	-.08***	.02	.02
African American	-.09***	-.09***	-.07***	-.06***	-.12***	-.12***	-.09***	-.09***
FARMS0708	-.09***	-.09***	-.09***	-.09***	-.10***	-.10***	-.07***	-.07***
Age0907	.03*	.04**	.09***	.09***	.01	.01	.06***	.06***
MMSR-Social/Personal	.11***	.11***	.09***	.10***	.09***	.09***	.11***	.11***
MMSR-Language Literacy	.23***	.22***	.20***	.19***	.19***	.19***	.18***	.17***
Special Education, 2007-08	-.03+	-.03+	-.08***	-.08***	-.07***	-.07***	-.09***	-.09***
School-Level CA 2007-08	-.02+	-.02	-.03*	-.03*	-.05***	-.05***	-.02	-.02
Chronic Absence in K	-.09***	-.03*	-.07***	.00	-.04***	.00	-.05***	.01
Head Start <sup>a</sup>	-.03*	-.03*	-.03*	-.03*	-.03+	-.03+	-.03*	-.04*
Head Start & Pre-K <sup>a</sup>	.00	-.00	-.00	-.01	.01	.01	.01	.01
Home Care <sup>a</sup>	-.07***	-.06***	-.07***	-.06***	-.02	-.02	-.05***	-.04*
Nursery or School-Like <sup>a</sup>	-.01	-.00	-.02+	-.02	.03+	.03+	-.01	-.01
Day Care <sup>a</sup>	.03*	.03*	.02	.02	.02	.02	.02	.02
Student ADA, Years 2/2,3		.13***		.15***		.09***		.14***
<i>Adjusted R<sup>2</sup></i>	.17	.19	.14	.16	.14	.15	.12	.13
	(N =4882)		(N =4868)		(N =4238)		(N =4231)	

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

<sup>a</sup> Baseline category is 'BCPS Pre-K'.

Table F3  
 Cohort 2: Students Entering K 2007-08 Regression Models Predicting Retention and Special Education Through 2010-11

	Off-Grade 2010-11		Enter Special Ed After 2007-08	
	Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)	
Gender (Male)	1.39***	1.37***	1.90***	1.89***
African American	1.20	1.16	1.38+	1.34
FARMS0708	1.21	1.16	1.24	1.21
Age0907	.52***	.48***	1.14	1.10
MMSR-Social/Personal	.66***	.68***	.53***	.54***
MMSR-Language Literacy	.26***	.26***	.60***	.62***
Special Education, 2007-08	.81	.79+	--	--
School-Level CA 2007-08	.98***	.98***	.96***	.96***
Chronic Absence in K	2.14***	1.42**	1.26+	.95
Head Start <sup>a</sup>	1.07	1.12	1.33+	1.35*
Head Start & Pre-K <sup>a</sup>	.86	.93	.99	1.04
Home Care <sup>a</sup>	1.73***	1.63***	1.21	1.14
Nursery or School-Like <sup>a</sup>	.77	.77	1.16	1.16
Day Care <sup>a</sup>	.41***	.41***	1.22	1.22
Student ADA, Years 2-4		.94***		.96***
<i>Pseudo R<sup>2</sup> (Nagelkerke)</i>	.19	.20	.08	.09
	(N = 4738)		(N = 4738)	

\*\*\*  $P \leq .001$       \*\*  $P \leq .01$       \*  $P \leq .05$       +  $P \leq .10$

<sup>a</sup> Baseline category is 'BCPS Pre-K'.

Table F4  
 Cohort 2: Students Entering K 2007-08 Regression Models Predicting Suspension Through 2010-11

	Suspended 2008-09 (Grade 1)		Suspended 2008-09 (Grade 2)		Suspended 2008-09 (Grade 3)		Ever Suspended Years 2 - 4	
	Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)	
Gender (Male)	5.44***	5.47***	4.99***	4.97***	3.71***	3.69***	4.25***	4.29***
African American	1.07	1.01	3.48**	3.37**	3.70***	3.49***	2.72***	2.58***
FARMS0708	1.23	1.22	1.08	1.10	1.51*	1.42+	1.26	1.19
Age0907	1.11	1.06	1.01	.98	1.18	1.08	1.15	1.06
MMSR-Social/Personal	.50***	.50***	.51***	.51***	.56***	.57***	.52***	.53***
MMSR-Language Literacy	.93	.98	.77	.80	.72+	.78	.87	.92
Special Education, 2007-08	1.01	.94	1.17	1.12	.80	.79	1.03	1.02
School-Level CA 2007-08	1.00	1.00	1.01	1.01	1.00	.99	1.00	1.00
Chronic Absence, K	1.08	.63+	1.32	.97	.70+	.36***	1.01	.58***
Head Start <sup>a</sup>	.77	.80	1.52+	1.57*	.85	.87	.98	1.02
Head Start & Pre-K <sup>a</sup>	1.14	1.28	1.77+	1.93*	1.02	1.17	1.30	1.46
Home Care <sup>a</sup>	.89	.80	1.09	1.02	.89	.78	1.05	.94
Nursery or School-Like <sup>a</sup>	1.29	1.24	1.00	1.00	1.07	1.05	.98	.97
Day Care <sup>a</sup>	1.37	1.38	1.81+	1.77+	1.54	1.51	1.23	1.22
Student ADA, Years 2-4		.95***		.96***		.92***		.93***
<i>Pseudo R<sup>2</sup> (Nagelkerke)/ R<sup>2</sup></i>	.09	.11	.12	.12	.10	.13	.12	.14
	(N = 5292)		(N = 4950)		(N = 4739)		(N = 4650)	

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

<sup>a</sup> Baseline category is 'BCPS Pre-K'.

Table F5  
 Cohort 2: Students Entering K 2007-08 Regression Models Predicting 2010-11 Grade 3 MSA Performance

	Reading MSA Prof/Adv vs. Basic		Math MSA Prof/Adv vs. Basic		Reading MSA Scale Scores		Math MSA Scale Scores	
	Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)		OLS Regression Model		OLS Regression Model	
Gender (Male)	.73***	.74***	1.06	1.07	-.10***	-.10***	-.01	-.00
African American	.50***	.51***	.48***	.49***	-.13***	-.13***	-.15***	-.14***
FARMS0708	.67***	.69***	.60***	.62***	-.13***	-.12***	-.12***	-.11***
Age0907	1.07	1.09	1.16	1.21	.01	.02	.02	.03+
MMSR-Social/Personal	1.48***	1.48***	1.58***	1.59***	.09***	.09***	.09***	.09***
MMSR-Language Literacy	1.67***	1.65***	1.80***	1.76***	.15***	.14***	.16***	.15***
Special Education, 2007-08	.54***	.54***	.44***	.43***	-.07***	-.07***	-.09***	-.09***
School-Level CA 2007-08	1.00	1.00	1.00	1.00	-.02	-.01	-.01	-.00
Chronic Absence, K	.84+	.99	1.08	1.47**	-.03*	.01	-.04*	.03+
Head Start <sup>a</sup>	1.06	1.05	.91	.90	-.01	-.01	-.00	-.01
Head Start & Pre-K <sup>a</sup>	.97	.94	.92	.88	.02	.01	.00	-.00
Home Care <sup>a</sup>	.92	.94	.79*	.84	-.02	-.01	-.02	-.01
Nursery or School-Like <sup>a</sup>	1.24	1.23	1.09	1.10	.04*	.04*	.02	.02
Day Care <sup>a</sup>	.98	.98	1.04	1.05	.03+	.03+	.05**	.05**
Student ADA, Years 2-4		1.03**		1.05***		.09***		.15***
<i>Pseudo R<sup>2</sup> (Nagelkerke)/ R<sup>2</sup></i>	.10	.10	.11	.12	.12	.13	.12	.14
	(N = 3886)		(N = 3889)		(N = 3838)		(N = 3840)	

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

<sup>a</sup> Baseline category is 'BCPS Pre-K'.

Table F6

Cohort 2: Students Entering K 2007-08 Regression Models Predicting Attendance in 2008-09 (Grades 1) through 2010-11 (Grade 3)

	Chronic Absence 2008-09 (Grade 1)	Chronic Absence 2010-11 (Grade 3)		ADA 2008-09 (Grade 1)	ADA 2010-11 (Grade 3)		ADA Years 2-4
	Logistic Model (Odds Ratios)	Logistic Model (Odds Ratios)		OLS Regression Model	OLS Regression Model		OLS Regression Model
Gender (Male)							
African American							
FARMS0708							
Age0907							
MMSR-Social/Personal							
MMSR-Language Literacy							
Special Education, 2007-08							
School-Level ADA, 2007-08	1.04+	.99	.97	-.02	-.01	.00	-.01
Student ADA in K	.82***	.87***	.95***	.59***	.45***	.13***	.61***
Head Start <sup>a</sup>	.97	.81	.87	.01	.02	.01	.01
Head Start & Pre-K <sup>a</sup>	1.03	.80	.95	.01	.01	.00	.02*
Home Care <sup>a</sup>	1.92***	1.26*	1.07	-.06***	-.03*	.00	-.06***
Nursery or School-Like <sup>a</sup>	1.39*	.93	.88	-.02*	.01	.01	-.01
Day Care <sup>a</sup>	1.20	.88	.92	-.00	-.01	-.01	-.00
Student ADA, Years 2,3			.82***			.52***	
<i>Pseudo R<sup>2</sup> (Nagelkerke)/ R<sup>2</sup></i>	.35	.21	.35	.37	.22	.38	.41
	(N = 5292)	(N = 4715)		(N = 5292)	(N = 4715)		(N = 4647)

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

<sup>a</sup> Baseline category is 'BCPS Pre-K'.

Table F7  
 Cohort 2: Students Entering K 2007-08 Regression Models Predicting Grades 1 and 2 SAT10 Scale Scores

	SAT10-Reading Scale Scores Grade 1		SAT10-Math Scale Scores Grade 1		SAT10-Reading Scale Scores Grade 2		SAT10-Math Scale Scores Grade 2	
	OLS Regression Model		OLS Regression Model		OLS Regression Model		OLS Regression Model	
Gender (Male)								
African American								
FARMS0708								
Age0907								
MMSR-Social/Personal								
MMSR-Language Literacy								
Special Education, 2007-08								
School-Level ADA, 2007-08	.01	.01	.01	.01	.04**	.04**	.02	.02
Student ADA in K	.13***	.07***	.11***	.04*	.05***	-.00	.08***	-.00
Head Start <sup>a</sup>	-.03*	-.03*	-.03*	-.03*	-.03+	-.03+	-.04*	-.03*
Head Start & Pre-K <sup>a</sup>	-.00	-.00	-.01	-.01	.01	.01	.01	.01
Home Care <sup>a</sup>	-.06***	-.05***	-.07***	-.06***	-.02	-.02	-.05**	-.04*
Nursery or School-Like <sup>a</sup>	-.01	-.00	-.02+	-.02	.03+	.03+	-.01	-.01
Day Care <sup>a</sup>	.03*	.03*	.02	.02	.02	.02	.01	.02
Student ADA, Years 2/2,3		.10***		.13***		.09***		.13***
<i>Adjusted R<sup>2</sup></i>	.18	.19	.14	.16	.14	.15	.12	.13
	(N =4882)		(N =4868)		(N =4238)		(N =4231)	

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

<sup>a</sup> Baseline category is 'BCPS Pre-K'.

Table F8  
 Cohort 2: Students Entering K 2007-08 Regression Models Predicting Retention and Special Education Through 2010-11

	Off-Grade 2010-11		Enter Special Ed After 2007-08	
	Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)	
Gender (Male)				
African American				
FARMS0708				
Age0907				
MMSR-Social/Personal				
MMSR-Language Literacy				
Special Education, 2007-08				
School-Level ADA, 2007-08	1.10***	1.10***	1.15***	1.14***
Student ADA in K	.94***	.97***	.98**	1.00
Head Start <sup>a</sup>	1.12	1.14	1.36*	1.37*
Head Start & Pre-K <sup>a</sup>	.93	.96	1.01	1.03
Home Care <sup>a</sup>	1.67***	1.60***	1.17	1.13
Nursery or School-Like <sup>a</sup>	.78	.77	1.18	1.17
Day Care <sup>a</sup>	.41***	.41***	1.22	1.22
Student ADA, Years 2-4		.95***		.97***
<i>Pseudo R<sup>2</sup> (Nagelkerke)</i>	.20	.21	.08	.09
	(N = 4738)		(N = 4738)	

\*\*\*  $P \leq .001$       \*\*  $P \leq .01$       \*  $P \leq .05$       +  $P \leq .10$

<sup>a</sup> Baseline category is 'BCPS Pre-K'.

Table F9  
 Cohort 2: Students Entering K 2007-08 Regression Models Predicting Suspension

	Suspended 2008-09 (Grade 1)		Suspended 2008-09 (Grade 2)		Suspended 2008-09 (Grade 3)		Ever Suspended Years 2 - 4	
	Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)	
Gender (Male)								
African American								
FARMS0708								
Age0907								
MMSR-Social/Personal								
MMSR-Language Literacy								
Special Education, 2007-08								
School-Level ADA, 2007-08	.97	.97	.97	.97	1.01	1.00	1.00	1.00
Student ADA in K	.99	1.04*	.99	1.02	1.00	1.06***	.99	1.04***
Head Start <sup>a</sup>	.78	.80	1.50+	1.54+	.86	.86	.99	1.01
Head Start & Pre-K <sup>a</sup>	1.14	1.21	1.82+	1.93*	1.00	1.07	1.31	1.39
Home Care <sup>a</sup>	.88	.82	1.10	1.04	.87	.78	1.04	.95
Nursery or School-Like <sup>a</sup>	1.31	1.24	.99	.99	1.07	1.04	.99	.95
Day Care <sup>a</sup>	1.38	1.39	1.81+	1.73	1.54	1.50	1.24	1.21
Student ADA, Years 2-4		.94***		.95***		.91***		.92***
<i>Pseudo R<sup>2</sup> (Nagelkerke)/ R<sup>2</sup></i>	.09	.11	.11	.13	.10	.12	.12	.14
	(N = 5292)		(N = 4950)		(N = 4739)		(N = 4650)	

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

<sup>a</sup> Baseline category is 'BCPS Pre-K'.

Table F10  
 Cohort 2: Students Entering K 2007-08 Regression Models Predicting Grade 3 MSA Performance

	Reading MSA Prof/Adv vs. Basic		Math MSA Prof/Adv vs. Basic		Reading MSA Scale Scores		Math MSA Scale Scores	
	Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)		OLS Regression Model		OLS Regression Model	
Gender (Male)								
African American								
FARMS0708								
Age0907								
MMSR-Social/Personal								
MMSR-Language Literacy								
Special Education, 2007-08								
School-Level ADA, 2007-08	.96+	.96+	.96+	.96+	.01	.01	-.01	-.01
Student ADA in K	1.02*	1.00	1.01	.99	.05***	.00	.06***	-.02
Head Start <sup>a</sup>	1.05	1.06	.91	.91	-.01	-.01	-.00	-.00
Head Start & Pre-K <sup>a</sup>	.93	.92	.89	.87	.02	.01	.00	-.00
Home Care <sup>a</sup>	.92	.94	.81+	.84	-.01	-.01	-.02	-.01
Nursery or School-Like <sup>a</sup>	1.25+	1.25+	1.11	1.12	.04*	.04*	.02	.02
Day Care <sup>a</sup>	.98	.99	1.05	1.07	.03+	.03+	.05**	.05***
Student ADA, Years 2-4		1.03**		1.05***		.09***		.15***
<i>Pseudo R<sup>2</sup> (Nagelkerke)/ R<sup>2</sup></i>	.10	.10	.11	.12	.12	.13	.12	.14
	(N = 3886)		(N = 3889)		(N = 3838)		(N = 3840)	

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

<sup>a</sup> Baseline category is 'BCPS Pre-K'.

## Appendix G: Regression Models for Students Entering Pre-K 2008-09 (Cohort 3)

Coefficients in *logistic regression models* are *odds ratios* that represent the effect of a unit change in the independent variable (e.g. gender) on the odds of chronic absence (or other dichotomous outcome). For example, an odds ratio of .65 means that a 1 unit increase in X leads to a 35% decrease (1.0 minus .65) in the odds of Y. Conversely, an odds ratio of 1.35 means that a 1 unit change in X leads to a 35% increase in the odds of Y.

Coefficients in *OLS regression models* are *standardized beta coefficients* that indicate how many standard deviations a dependent variable will change per standard deviation increase in the predictor variable. As such they show the relative size of effect each predictor has on the dependent variable.

Tables G1 – G2: Regression Models for CA in PreK and K; ADA in PreK and K

Table G1	Attendance in Grade 1 (Year 3)
Table G2	Grade 1 SAT10 Scale Scores

Table G1  
 Cohort 3 - Students Entering Pre-K 2008-09 Regression Models Predicting Attendance in 2010-11 (Grades 1 )

	CA 2010-11 (Grade 1)	ADA 2010-11 (Grade 1)	ADA 2010-11 (Grade 1)	Suspended 2010-11 (Grade 1)		Suspended 2010-11 (Grade 1)	
	Logistic Model (Odds Ratios)	OLS Regression Model	OLS Regression Model	Logistic Model (Odds Ratios)		Logistic Model (Odds Ratios)	
Gender (Male)	.996	-.00	-.01	4.33***	4.37***	4.29***	4.34***
African American	2.04***	-.08***	-.08***	6.57**	5.50*	6.46**	5.44*
FARMS0910	1.79*	-.03*	-.02	2.09	1.92	2.04	1.92
Age0908	1.12	-.03	-.03*	1.09	1.07	1.09	1.06
MMSR-Social/Personal	.84	.04*	.03+	.59+	.61+	.60+	.62+
MMSR-Language Literacy	.98	.02	.01	.74	.75	.75	.75
Special Education, 2009-10	1.41*	-.04**	-.03*	1.08	1.08	1.05	.99
School-Level CA 2009-10	1.02**	-.07***		1.02	1.01		
School-Level ADA 2009-10			.03+			.94	.94
Chronic Absence, Pre-K Only <sup>a</sup>	3.61***	-.14***		1.64	1.36		
Chronic Absence, Kind Only <sup>a</sup>	11.06***	-.34***		.81	.42+		
Chronic Absence, Pre-K & Kind <sup>a</sup>	15.86***	-.42***		1.42	.60		
Student ADA, Pre-K			.12***			.98	.99
Student ADA, K			.54***			1.00	1.05*
Student ADA, Year 3					.93***		.93***
<i>Pseudo R<sup>2</sup> (Nagelkerke)/ R<sup>2</sup></i>	.30	.29	.39	.10	.13	.10	.13
	(N = 3157)	(N = 3157)	(N = 3157)	(N = 3157)		(N = 3157)	

\*\*\*  $P \leq .001$     \*\*  $P \leq .01$     \*  $P \leq .05$     +  $P \leq .10$

<sup>a</sup> Baseline category is 'No Chronic Absence in Pre-K or K'.

Table G2  
 Cohort 3: Students Entering Pre-K 2008-09 Regression Models Predicting 2010-11 SAT10 (Grade 1) Scale Scores

	SAT10-Reading Scale Scores Grade 1		SAT10-Math Scale Scores Grade 1		SAT10-Reading Scale Scores Grade 1		SAT10-Math Scale Scores Grade 1	
	OLS Regression Model		OLS Regression Model		OLS Regression Model		OLS Regression Model	
Gender (Male)	-.07***	-.07***	-.01	-.02	-.07***	-.07***	-.02	-.02
African American	-.12***	-.11***	-.12***	-.10***	-.12***	-.11***	-.12***	-.10***
FARMS0910	-.08***	-.07***	-.06***	-.05**	-.08***	-.07***	-.05**	-.05**
Age0908	.06***	.07***	.08***	.08***	.06***	.07***	.08***	.08***
MMSR-Social/Personal	.07***	.07***	.06**	.06**	.07**	.08***	.06**	.06**
MMSR-Language Literacy	.25***	.25***	.23***	.23***	.25***	.16***	.23***	.23***
Special Education, 2009-10	-.02	-.02	-.09***	-.09***	-.02	-.02	-.09***	-.08***
Chronic Absence, Pre-K Only <sup>a</sup>	-.05**	-.02	-.05**	-.03				
Chronic Absence, K Only <sup>a</sup>	-.12***	-.07***	-.09***	-.03+				
Chronic Absence, Pre-K & K	-.11***	-.05**	-.08***	-.01				
ADA, Pre-K					.02	.01	.03+	.02
ADA, K					.16***	.09***	.11***	.02
School-Level CA 2009-10	-.09***	-.08***	-.09***	-.08***				
School-Level ADA 2009-10					.10***	.09***	.09***	.09***
ADA, Year 3		.15***		.16***		.13***		.15***
<i>Adjusted R<sup>2</sup></i>	.17	.19	.15	.16	.18	.19	.15	.17
	(N =2949)		(N =2950)		(N =2949)		(N =2950)	

\*\*\*  $P \leq .001$       \*\*  $P \leq .01$       \*  $P \leq .05$       +  $P \leq .10$

<sup>a</sup> Baseline category is 'No Chronic Absence in Pre-K or K'

## Appendix H: Charts of Student Enrollment Over Time

### Chart H1 - Students Entering PreK in 2006-2007

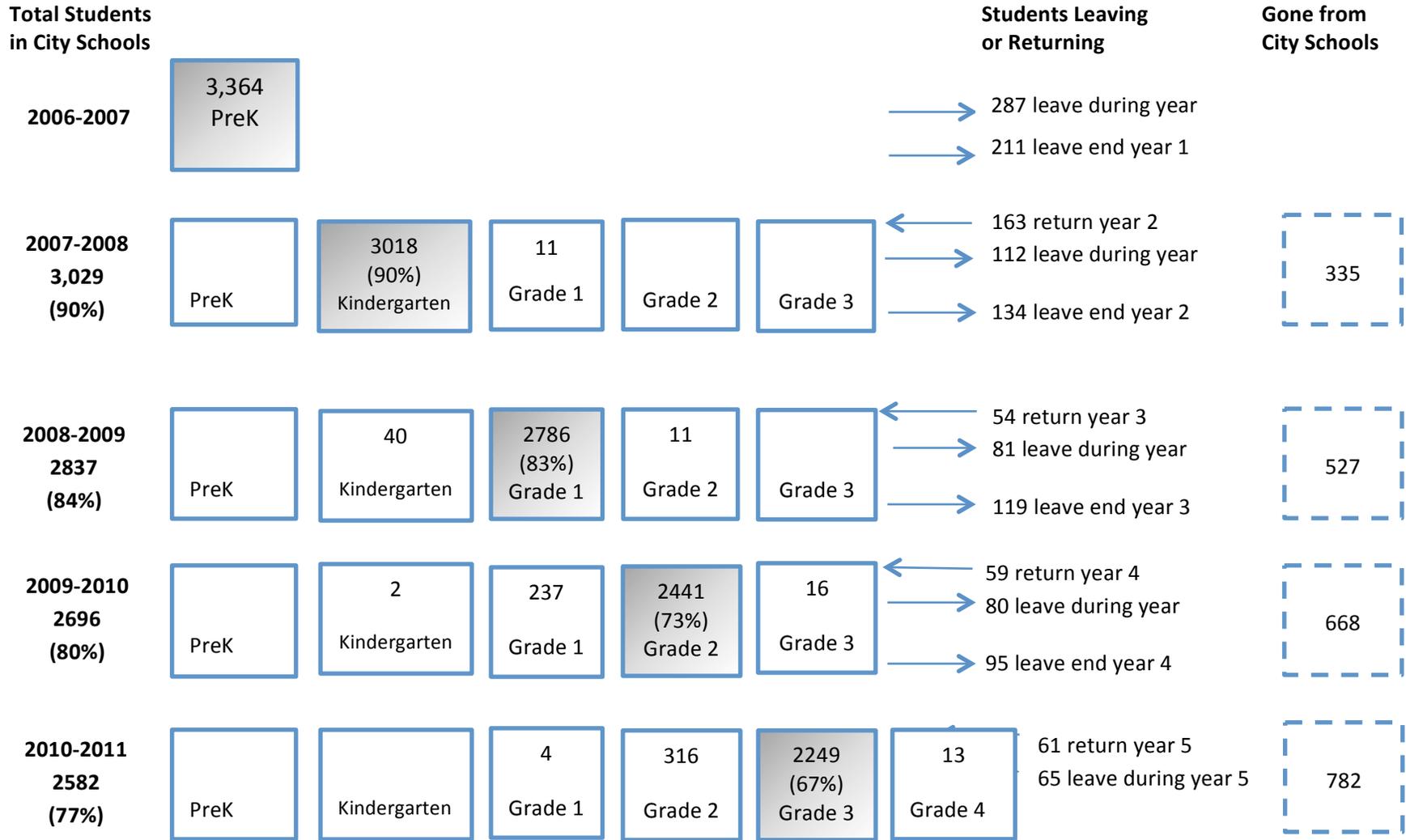
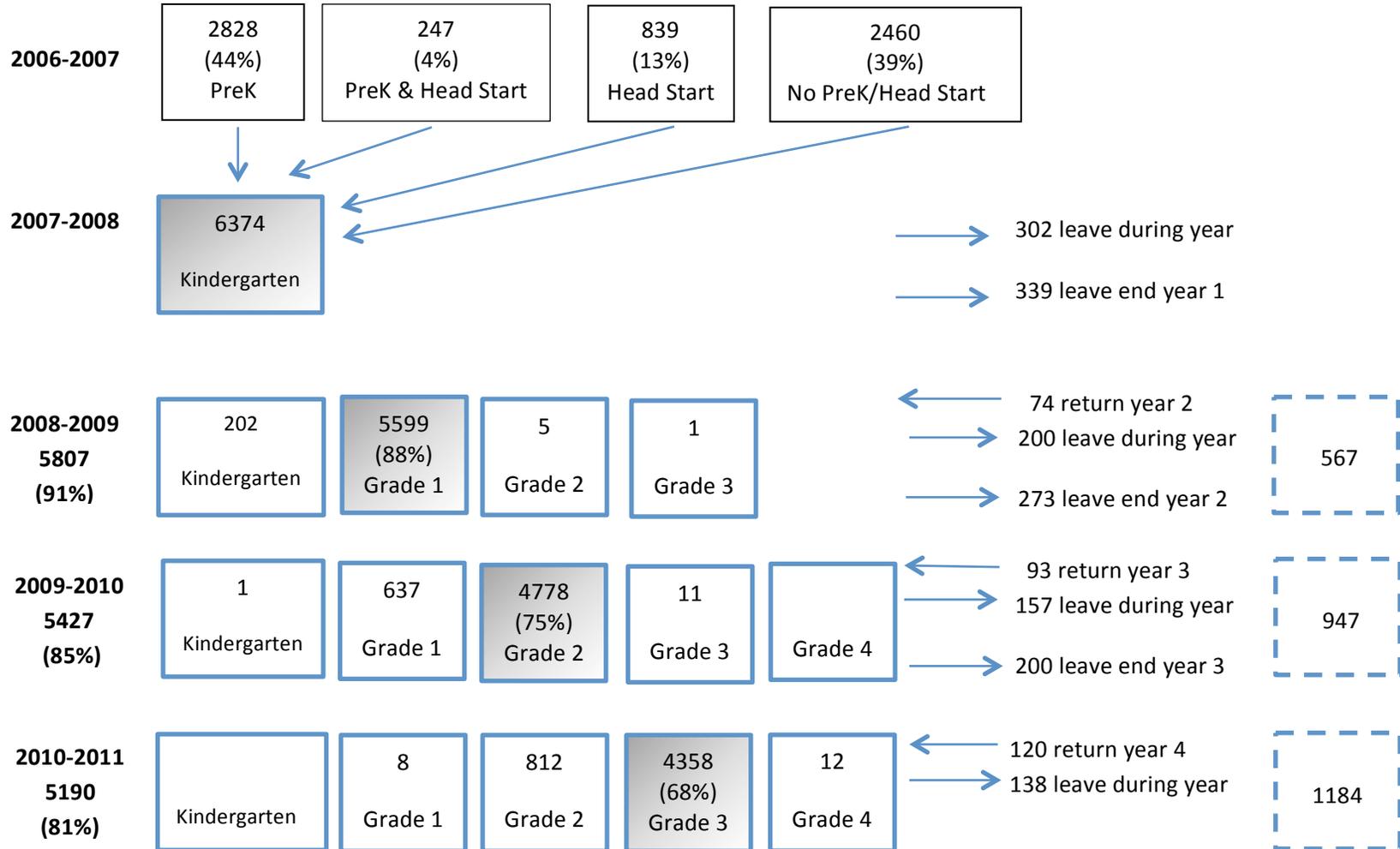


Chart H2 - Students Entering Kindergarten in 2007-2008

Total Students  
in City Schools

Students Leaving  
or Returning

Gone from  
City Schools



**Chart H3 - Students Entering PreK in 2008-2009**

**Total Students  
in City Schools**

**Students Leaving  
or Returning**

**Gone from  
City Schools**

