Understanding the Persistent Effects of Prior-Year Chronic Absenteeism on Student Achievement at the Start of the Following Year (WORKING TITLE)

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Chronic absenteeism is an area of growing focus in schools across the country. Under the Every Student Succeeds Act (ESSA), states are required to include a valid, reliable, and comparable indicator of school quality or student success in their accountability system, and many states are now placing a greater emphasis on measuring, reporting, and reducing rates of chronic absenteeism to meet these requirements. For example, as of 2017-18, 37 states and the District of Columbia used some indicator of chronic absenteeism as a component of their state report cards or school accountability systems (Kostyo, Cardichon, & Darling Hammond, 2018). While there is no single definition in policy or practice of how many absences are needed for absenteeism to be considered "chronic," the most commonly used and recommended definition is when students miss 10% of school days or more (Balfanz & Byrnes, 2012; Bauer, Liu, Schanzenbach, & Shambaugh, 2018; Ginsburg, Jordan, & Chang, 2014; Kostyo, Cardichon, & Darling Hammond, 2018).

This increased focus on chronic absenteeism is warranted based on the proportion of students across the U.S. who miss school to this degree, and because of the significant negative relationship that has been demonstrated between days of school missed and student achievement. Estimates of the prevalence of chronic absenteeism range from approximately 10% to 16% of all U.S. students (Balfanz & Byrnes, 2012; Chang & Romero, 2008; Ginsburg, Jordan, & Chang, 2014), with 7.3 million students chronically absent during the 2015-16 school year (Bauer et al., 2018). The effects of this persistent absence pattern on student achievement is well-documented, as extensive research has shown that students who are chronically absent from school have significantly lower end-of-year achievement levels when compared to students with no absences or less severe absence rates (Aucejo & Romano, 2016; Chang & Romero, 2008; Gershenson, Jacknowitz, & Brannegan, 2017; Gottfried, 2010; Gottfried, 2014; Gottfried, 2015; Gottfried & Kirksey, 2017; Lamdin, 1996).

Much of the research demonstrating the relationship between chronic absenteeism and student achievement relies on data from end-of-year summative assessments, which are generally administered to students in grades three to eight and high school in the spring of each year. While this research provides insight into the cumulative effects of absences on student achievement at the conclusion of a school year, there is a lack of research evaluating the persistent effects of chronic absenteeism in a previous year on achievement at the start of the following year.

In this study, we build upon the foundation of previous chronic absenteeism research to examine if the effects of prior-year chronic absenteeism are related to significantly lower achievement at the start of the following school year compared to students with no previous absences. This research allows us to evaluate if these effects persist over the summer months, and determine if chronically absent students start the year at a significant academic disadvantage compared to their peers. If so, policies focused on reducing rates of absenteeism should also include targeted academic interventions for chronically absent students, to help these students make up for lost classroom time and “catch up” with students with minimal to no absences. This is a pivotal issue, as research has demonstrated that student absences are greater for students who struggle academically (Kearney, 2016; Nichols, 2003). Thus, if chronically absent students start the following school year well behind their peers academically, then failing to provide additional academic support to help close this achievement gap may result in these students falling further behind and disengaging further from school.

This research also provides an opportunity to examine the evidence in support of defining chronic absenteeism as being absent from school 10% of days or more. Our review of current literature on this topic finds no empirical justification for the establishment of this threshold, and yet it is widely used across the country to define when absenteeism becomes “chronic.” As we examine the persistent effects of prior-year absenteeism on following-year achievement, we can also evaluate if a lower threshold of absences should be used when defining chronic absenteeism. This is important to ensure that interventions and supports meant to change student attendance trajectories are not limited to those students with the most extreme absence patterns. We discuss how local- and state-wide policies around defining chronic absenteeism may be adjusted based on findings from this research.

This article is organized as follows: In the next section, we review current research that describes characteristics of students more likely to be chronically absent, and provide an overview of the relationship between absences and student achievement. We also overview some oft-cited practical strategies used to intervene for those students who meet or exceed accepted local or state definitions of chronic absenteeism. We then describe the sample and data used for this study, and review the analytic approach used to estimate the persistent effects of prior-year absences on student achievement. Finally, we summarize our results and conclude with a discussion of the practical and policy implications for this research.

Background

Characteristics of Chronically Absent Students

Central to the question of how absenteeism relates to achievement is what factors are associated with or contribute to increased numbers of school absences. This is relevant as it relates to the sample and span of grade ranges used in this study, which is described in the next section. For example, chronic absenteeism tends to be highest in the earlier and later grades (i.e. kindergarten and high school), with attendance improving later in elementary school and then decreasing as students get older (Balfanz & Byrnes, 2012; Bauer et al., 2018). Chronic absenteeism is also cyclical – students who were chronically absent in previous years are more likely to be chronically absent in subsequent years (Bauer et al., 2018; Connolloy & Olsen, 2012).

There are many potential reasons, many of which are interrelated, for why a student may be absent from school, including specific idiosyncratic reasons such as student illness, a lack of transportation or family resources, high student mobility, and many others. More broadly, chronic absenteeism is highly related to student socio-economic status, as students eligible for free and reduced-price lunch are more likely to be chronically absent than higher-income students (Kearney, 2016; Morrisey, Hutchinson, & Winsler, 2014; Ready, 2010; Romero & Lee, 2007). In addition to socio-economic status, research has also shown that ethnicity and eligibility for special education services are also strong predictors of chronic absenteeism (Balfanz & Byrnes, 2012; Ready, 2010).

Absenteeism is also linked to academic ability, with absences occurring more frequently for those students who struggle academically (Kearney, 2016; Nichols, 2003). This last point is particularly relevant to this current study. If chronic absenteeism in a previous school year is related to significantly lower achievement at the start of the following school year, then student absences in this subsequent year may be a function, at least in part, of these students starting school significantly behind academically compared to their peers with high attendance rates.

Effects of Chronic Absenteeism on Student Achievement

Research examining the relationship between student absenteeism and school performance consistently demonstrates that increased absences are related to or result in decreased school performance, and that this pattern is found both within and across school years (Aucejo & Romano, 2016; Chang & Romero, 2008; Gershenson, Jacknowitz, & Brannegan, 2017; Goodman, 2014; Gottfried, 2010; Gottfried, 2014; Gottfried, 2015; Gottfried & Kirksey, 2017; Ready, 2010; Roby, 2004; Romero & Lee, 2007; Morrisey, Hutchison, & Winsler, 2014).

While research has demonstrated that current year attendance is a stronger predictor of current year achievement than attendance in prior years (Connolly and Olsen, 2012; Morrisey, Hutchison, & Winsler, 2014), researchers have established that prior-year chronic absenteeism can be associated with comparatively lower student achievement in subsequent years. In an examination of absenteeism in kindergarten and first-grade achievement, Romero and Lee (2007) found that those students with the highest absenteeism rates in kindergarten subsequently had the lowest achievement levels across multiple subject areas at the conclusion of first grade. Chang and Romero (2008) elaborated on these analyses, and identified that among low socio-economic students, students who were chronically absent in kindergarten also had the lowest achievement levels at the conclusion of fifth grade. These trends are also consistent with within-year results found by Roby (2004), who identified strong correlations across grade levels between mean end-of-year achievement and attendance at the grade-within-school level, and also significant differences in achievement between the students ranked in the top and bottom 10% of attendance at a particular grade level.

While these studies are correlational, additional research has controlled for student, classroom, and school effects to estimate the causal impact of absences on achievement. For example, using panel data from North Carolina, Aucejo and Romano (2016) estimated the relative effects of extending the school calendar compared to decreasing student absences, both of which aim to increase student instructional time. The authors found disparate effects for these two approaches, noting that decreasing absences by ten days resulted in an increase of 5.5% and 2.9% of a standard deviation in mathematics respectively, a much larger effect than simply extended the school calendar by an additional ten days. Gershenson, Jacknowitz, & Brannegan (2017) included absences as a covariate in value-added models, and found that math and reading achievement decreased by 0.02-0.04 standard deviations when absences increased by one standard deviation. Each additional absence was associated with a reduction in math and reading achievement of 0.007 and 0.004 standard deviations respectively.

Potentially due to differences in sample size and characteristics, Gottfried (2010) found larger effect sizes associated with the causal impact of attendance on academic performance. Using an instrumental variables approach (distance from school), the author identified that a one standard deviation increase in days of school attended was associated with a 0.28 to 0.45 standard deviation increase in student grade point average (GPA). Further, focusing specifically on kindergarten students using a national dataset, Gottfried (2014) identified that students identified by their teachers as showing strong chronic absenteeism (i.e. absent 20 or more days) achieved at a level -0.17 to -0.20 standard deviations lower than students with 10 or fewer absences in reading and math respectively. Gottfried (2014) also examined the relationship between moderate chronic absenteeism (i.e. absent 11 to 19 days), and while the effect sizes were notably lower than those identified for strong chronic absenteeism, the difference between these students and students with 10 or fewer absences was still statistically significant.

The timing of absences and the subsequent effects on student achievement has also been examined, to determine if absences closer to when testing occurs at the end of the school year are more impactful compared to absences at the beginning of the year (Gottfried & Kirksey, 2017). Focusing on elementary students, the authors found that spring absences were more impactful than fall absences. In math and English/language arts, the cumulative effects of each spring absence on spring achievement was -0.07 and -0.03 standard deviations respectively. Thus, across all of these studies, the clear finding is that as the extent of absenteeism increases, so too does the subsequent negative effect on student achievement, with the strongest effects observed for students who miss the greatest number of days of school.

This research fills a gap in existing literature focused on estimating the impacts of absences on student achievement, by examining to what extent the effects of absences persist into the fall of the subsequent school year. This focus also allows us to determine if chronically absent students in particular start the following year at a significant academic disadvantage compared to students with minimal to no attendance issues, and if those effects are significant and persistent for students with a high number of absences but who do not yet meet the most commonly recognized definition of when absenteeism becomes chronic (10% of days missed).

Recommendations for Reduction of Chronic Absenteeism

Consistent with these previous findings, prior research has demonstrated that one of the most effective ways to improve student achievement is to positively affect student absenteeism rates – the more students are in the classroom, the better their educational outcomes tend to be (Balfanz & Byrnes, 2012; Caldas, 1993; Lamdin, 1996). A number of strategies have been identified to do this, many of which center on early intervention for at-risk students – those students starting to demonstrate problematic attendance patterns. For example, in their recommended three-tier reform system, Attendance Works (n.d.) identified students missing 5-9% of school days as “at risk”, and recommends interventions strategies such as emphasizing the impact of absences on student achievement, monitoring attendance patterns closely, and recognizing positive or improved attendance. As attendance decreases, the organization advocates for personalized outreach, identification of mentors for students, coordinated school and community engagement, and if necessary, legal intervention. Taken together, these strategies are all intended to provide early intervention to students starting to show signs of school disengagement, and provide targeted and more intensive interventions to those students with the most problematic attendance patterns.

Chang & Romero (2008) put forth a number of additional strategies targeted at reducing chronic absenteeism rates. Many of their recommendations center on engaging students’ families, to both educate parents about the importance of attendance and to ensure that children are better prepared for starting school. The authors also advocated for early outreach to families of children with poor attendance, and building stronger collaborations between schools, families, and the broader community. This type of targeted family engagement is consistent with general strategies recommended by Bauer et al. (2018), who also advocated for engaging with parents directly through text messages and mailers, and targeted teacher home visits to engage closely with families and help improve student attendance.

In a review of three state plans, Kostyo, Cardichon, & Darling-Hammond (2018) identified a number of strategies aimed at reducing chronic absenteeism rates. Many of these plans also include early intervention and mentoring/case management, or are focused on specific groups of students deemed most at risk for chronic absenteeism (i.e. high school students, homeless students, students transitioning between schools, low-performing students, etc.). The authors also highlighted plans to recognize and reward schools for student attendance rates maintained at 96% or higher, or having students demonstrate attendance rate improvements of 3% or more.

In general, many of these interventions are focused on prevention – targeting additional resources at students at-risk of being chronically absent to ensure their level of attendance does not reach that threshold. And, for those students who have met that threshold, providing additional resources to engage the families of these students, and creating greater connections between the school, family, and broader community, are general used to positively affect attendance trends for these students. Of all the interventions identified in the literature, one area of focus that does not feature prominently is providing targeted academic interventions and supports to students in subsequent years to help them catch up academically with their peers. If student achievement is significantly negatively affected by chronic absenteeism, and that deficit persists into the start of the following year, then resources aimed at helping students make up lost instructional time may be one way to ensure that chronic absenteeism also does not persist (or worsen) in later school years.

Data

The data used in this study come from the Santa Ana Unified School District, a large, urban, predominately Hispanic school district in Orange County, California. The dataset used spans the 2015-16 and 2016-17 school years, and includes student-level attendance information (number of days enrolled and number of days absent) and demographic data such as gender, ethnicity, free and reduced price lunch status (FRL), special education status, and English language learner (ELL) status.

The dataset also includes mathematics and reading achievement data from NWEA's MAP Growth assessments. These assessments are computer-adaptive, aligned to a state's curricular standards, and unconstrained by grade. They assess student achievement and growth in four subject areas – mathematics, reading, language usage, and science – and generally take 40 to 60 minutes to complete. This research focuses on mathematics and reading outcomes only, as these are the two subject areas most commonly assessed across the district. The MAP Growth assessments are generally administered three times per year – in the fall, winter, and spring – allowing for multiple observations of student achievement over time, and for student achievement growth to be measured within and across years. NWEA also generates nationally representative achievement and growth norms to provide context in the interpretation of scores (referred to as RIT scores) on these assessments (Thum & Hauser, 2015). The assessments can be administered to students in grades K-12, though given the sparsity of data in this district in the 11^{th} and 12^{th} grade, this research focuses only on students in grades K-10.

In total, the dataset includes testing and demographic information for 41,584 students from the 2015-16 school year, the focal year for this research. Table X provides descriptive information on the overall student sample in 2015-16, and shows that students in this district were predominately Hispanic, ELL, and FRL-eligible. Overall student achievement in the district was below-average, with the median student achieving at the 36^{th} percentile in mathematics and 35^{th} percentile in reading relative to NWEA's national norming sample (Thum & Hauser, 2015). The composition of the sample is relevant to this research given the relationship demonstrated between attendance, poverty, and student achievement, which may have some influence on the magnitude of estimates of the effects of absences on student achievement in subsequent years.

Methods

Measuring Student Attendance

This analysis follows two sets of student cohorts over the course of two years. Students starting in the fall of 2014 are followed through the spring of 2016, likewise students starting in the fall or 2015 are followed through the spring of 2016. All students who have growth scores over the two years of data are included in the analysis. MAP growth scores indicate that students have a fall and spring test score in both years of the data. The analysis also ensures that students with growth scores have attendance data included from the district. Student attendance and MAP test information were merged on a one-to-one basis. Further, this analysis divided students by grade to study the differential impacts at grade-level. For instance, disaggregating at the grade level allows this research to see how absences in the first-grade impact starting achievement at the beginning second-grade, and so on for second graders into third graders. This data provides for information for students starting in Kindergarten through 9th grade. This analytic technique yields more than 5,000 records for analysis with fall and spring test and absence information for each grade-level.

Attendance for included students are counted by fall and spring terms. A cumulative number of days missed is calculated. Students missing 10% of more days are considered chronically absent. Absenteeism data consists of the overall number of absences accrued during the school year because the district does not differentiate between excused or unexcused absences in measures of chronic absenteeism. This study addresses absences in the prior academic year effects on starting achievement in the fall. As such, the cumulative number of absences in the prior year are binned and dummy coded. For this research, students were identified as Chronically Absent (absent 10% or more days), Highly Absent (absent 5%-9.9% of days), Moderately Absent (absent 0.1%-4.9% of days), or No Absences. The No Absence group serves as the reference group for this study.

Consistent with prior research, chronic absenteeism is higher in kindergarten, and then decreases throughout elementary, before increasing throughout middle and high school (Balfanz & Byrnes, 2012; Romero & Lee, 2007). Attendance patterns also differ by socioeconomic background. Previous research has found absence rates are higher among socioeconomically disadvantaged students (Ready, 2010; Morrisey, Hutchinson, & Winsler, 2014). This research does not review the difference of attendance by race and then ethnicity based on the demographics in the sample, as reviewed in the next section.

Analytic Strategy for Estimating Effects of Absences on Achievement

These data are from a large urban predominately Hispanic, low-income district on the west coast. The data provides student level information including fall and spring test scores and absences for a minimum of two years, for Kindergarten through 9th grade. The primary goal of this research is twofold. The primary aim is to determine whether prior year absences effect starting achievement the following year. A secondary goal is to identify the additive effect of a single absence on starting achievement the following year. The data provides observations for over 62,000 students with prior year test scores and absences information.

Having multiple years of data for these analyses can control for potential endogeneity bias (Aucejo & Romano, 2016). Simply, students may have unobserved characteristics which drive their scores and those scores are going to be correlated with each other over time. In this case our models use student level fixed effects to control for characteristics which are constant over time, as well as include a student's prior score. Gershenson et al (2017) and Gottfried, (2014) highlight that lagged test scores are important to control for the historical influences that are unobserved in the data. Gottfried (2014) points out that "having a lagged outcome on the right-hand side of the model can help to capture influences of noncurrent covariates" (p. 63).

The first equation is modeled to empirically address how prior absences impact students' starting point the following year:

$$\gamma_{ijt} = \beta_0 + \beta_1 Chronic_{i,t-1} + \beta_2 High_{i,t-1} + \beta_3 Moderate_{i,t-1} + \beta_4 \gamma_{i,t-1} \beta_5 Xit + \delta_t + \varepsilon_{ijt}$$

Where γ_{ijt} is the student's, i, Fall RIT at time t in school j. β_1, β_2 andβ_3 are dummy variables for whether or not a student's prior year absences (t-1) classify the student as Chronically absent, Highly Absent, or Moderately absent. Students without any absences are the comparison group, representing the constant in the data. $\beta_4\gamma_{i,t-1}$ is the students prior year fall achievement lagged by one-year. The key variable of interest are the dummy variables for a student's prior absences controlling for both time fixed effects and a student's prior starting score.

$\beta_5 X_{it}$ represents the vector of student level covariates which may or may not vary over time. δ_t represents the time level fixed effects as we follow two different cohorts of students. Including a year fixed effect controls for variations which may occur from year to year differences unobserved in the model. ε_{ijt} represents the error term, which includes all unobserved covariates related to achievement. Each model is run once with all students together and then run by each grade for each subject (math and reading). Running each model by grade provides an additional grade level fixed effect.

The result of the fixed effects model is that all estimates are providing within-school variations of scores, at each grade level where the model is run. Results are robust to the presence of serial correlation present in panel data and to heteroskedasticity as standard errors are clustered at the school level. We do not measure the effect an individual school may have on the overall average starting achievement for each attendance group. The estimates are the average of all students in the group at the district level.

The first model provides a comparison between absentee categories for two cohorts but does not provide additional information on when the number of absences reaches a considerable effect size, set here at .2 of a standard deviation. Using the attendance data provided, the second model measures the impact of a single absence on students' difference between fall to fall achievement.

$$\gamma_{ijt} = \beta_0 + \beta_1 Absences_{i,t-1} + \beta_2 \gamma_{i,t-1} + \beta_3 Xit + \delta_t + \varepsilon_{ijt}$$

γ_{ijt} is the Fall-to-Fall growth in achievement a student experiences between the prior fall test and next fall test. The $\beta_1 Absences_{i,t-1}$ are lagged student absences as a continuous variable. Due to the number of students in the sample we did not distinguish between unexcused and excused absences. The remaining variables remain the same as the previous model. Again, the model is disaggregated by grade and by test measurement (math and reading) to provide estimates at the grade level for students with robust standard errors clustered at the school level.

Limitations

Caution should also be taken in the generalizability of the results. This study utilizes data from one large urban district. The district consists of predominately low-income and Hispanic students. The propensity for the population to be weighted to low-income students and students of color is significant because absence rates are higher among socioeconomically disadvantaged students (Ready, 2010; Morrisey, Hutchinson, & Winsler, 2014). This means low-income students are exposed to the potentially harmful effects of absences more often. Absences among this population may cause greater harm to students who reside in socioeconomically disadvantaged households because such households may be less able to compensate for lost instructional time than their more advantaged counterparts (Chang & Romero, 2008).

It may be that this study is estimating the impacts of chronic absenteeism among a largely homogenous district consisting of underserved student populations. Due to the population studied results may produce upward bias estimates. As such, the study should be taken as the upper bound estimate of previous year absenteeism's effect on the following fall's achievement.

Results

Our results show that the effects of chronic absenteeism are significant and persistent in mathematics across grades. Table X. highlights achievement differences and effect sizes of those differences for students in prior year attendance bins. We find that students who were chronically absent in the prior year start the following year 0.2 to 0.45 SDs lower than students with no absences in the prior year, with the effect varying depending on student grade-level. The effects in reading are much smaller, and non-significant in the majority of grade levels.

The results also indicate that students who exhibit a high number of absences, but are not chronically absent, also experience significant and persistent effects of absences. We find that students who experience high rates of absences also start the fall between .15 and .22 SDs lower than their non-absent peers. The effects of prior absences on fall achievement is experienced at every grade used in the analysis. The results for highly absent students are similar to those of chronic absent students in reading, showing few effects.

For students who are highly and chronically absent these models were repeated using a different comparison group. Adjusting the comparison group so that students with four or fewer absences are referenced produce similar results across all models. Table X. highlights the effect of prior absenteeism binned by the number of days absent, with a different comparison group.

Chronically absent students show start between .2 and .37 SDs behind their peers with four or fewer absences. Among highly absent students' starting achievement lags behind these same peers by .1 and .17 SDs.

We also find preliminary evidence in this research that suggests that the most commonly used definition of chronic absenteeism – students who are absent from school 10% of days or more (Kostyo, Cardichon, Darling-Hammond, 2018) – is likely too conservative of a definition. Our results indicate that students across grades who were Highly Absent also start the following school year significantly behind their peers who had no absences in the prior year.

Results for models measuring the effect of a single day absent on starting achievement further highlight the number of days cumulative absences begin to have a significant impact. We find the impact of a single absence has a greater effect on starting achievement in mathematics. There are no grades where a .2 SD effect size is reached after 18 days in mathematics. In some grades a .2 SD effect size is reached at 12 to 14 days. Table X. shows the number of days absent it would take for the impact to be .2 SDs on starting achievement the following fall. The results highlight that even one absence has a significant effect on achievement, but that effect is amplified the more absences a student has and significantly impacts starting achievement prior to a student being labeled as chronically absent.

Discussion

There are two primary policy implications for this research. First, policies directed at improving attendance rates should also include a central focus of providing additional academic resources and supports to those students who were chronically absent in a previous year. Second, policies targeted only at students who were absent for 10% or more of days overlook a large subset of students whose achievement is significantly and negatively affected as a result of their absences. Policymakers should consider redefining definitions of when absences become "chronic" to focus on providing additional interventions or supports before students are absent 10% of days or more.

Students who are miss 5% or more of the prior academic year start the following school year at significant academic disadvantages compared to students with minimal to no absences in the prior year. Additional academic support is essential to ensure that chronically absent students do not continue to fall further behind their peers in subsequent years. Academic support can take on several forms, but what is clear is that teachers should know their students' prior absences at the start of the year. In schools that only test in the spring of every year, knowledge of absences could be essential to helping educators disrupt attendance patterns early in the year. Waiting for achievement tests or for the students to show evidence of becoming chronically absent a second year may be too late. Prior attendance can be considered a warning sign for teachers, providing information that is useful in engaging students early on to disrupt attendance patterns.

Future research, specifically relevant to the cumulative effect of attendance, will focus on how the change in attendance patterns in the second year of data impacts achievement in the third year. If teachers interrupt attendance patterns, descriptive evidence shows that students grow at higher paces than if their attendance had remained similar in the second year. Additional research could also provide evidence that increasing attendance may increase student engagement on assessments, which in turn may also boost achievement.

Interventions around attendance should also occur earlier. Students, especially in lower grade mathematics begin to see a .2 standard deviation impact in achievement on fall tests after missing only 12 -17 days. This means students are experiencing the results of missing instruction time far earlier than current projections may catch. Future research should study the appropriate time to begin interventions to prevent attendance. What is clear is that students tend to repeat attendance patterns every year. In other words, students who are chronically absent in one year, remain chronically absent the next year. Both the cumulative nature of attendances, and the tendency for students to repeat similar number of attendances the following year makes interrupting potentially troubling attendance habits even more important.

Stemming the number of absences in the following years by working with the students and students' support systems could help reduce the degree to which students fall behind in subsequent years. Based on this research, it is suggested that policies aim to interrupt attendances happening in the current year prior to when students are deemed as chronic, or on pace to be chronically absent. It is also suggested that policies aim to provide teachers with additional information on students' prior attendance. This additional information could be used to engage students who were chronically or highly absent in the previous year, early on in the current year. The process of engaging students who have already shown to have a propensity for multiple absences could help catch students up, provide additional supports, or address other impediments to attending school.

It is important to note that this research is not indicating that prior-year absences cause lower achievement. The research indicates that prior year absences are a good indicator of students who will start the year further behind than their peers. This research demonstrates that students journey through education are connected beyond the school year or school room walls. The effect of attendance does not end with the academic year but continues into future years. Researchers, practitioners, and policy makers should treat education as a continuous journey.

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Tables & Figures

Table X. Descriptive Statistics, 2015-16

Variables	Mean (SD)
Attendance	
Avg. Attendance Rate	0.976 (0.03)
% Chronically Absent	0.029 (0.17)
Student Demographics	
% Female	0.494 (0.50)
% Hispanic	0.960 (0.20)
% Free-Reduced Price Lunch	0.841 (0.37)
% English Language Learner	0.823 (0.38)
% Special Education	0.103 (0.30)
Student Achievement	
Avg. Math Scale (RIT) Score (Spr. '16)	204.31 (28.23)
Avg. Reading Scale (RIT) Score (Spr. '16)	200.70 (22.47)
	Median
Median Ach. Percentile - Math (Spr. '16)	36th
Median Ach. Percentile - Reading (Spr. '16)	35th

Table X. Average Attendance Rates and Number of Days Absent by Absence Category, 2015-16

Absence Category	Absence Category Range	Absence Category Range - Days Missed (180 School Days)	N of Students	Avg. Attendance Rate	Avg. N of Absences
Chronic Absence	10%+	18+	1,203	85.3%	24.1
High Absence	5.0-9.9%	9 to 17	4,644	93.5%	11.4
Moderate Absence	0.1-4.9%	1 to 8	25,655	98.0%	3.5
No Absence	0%	0	10,082	100.0%	0.0
Total			41,584	97.6%	4.1

Table X. Percent of Students by Absence Category by Grade, 2015-16

		2015-16 Absences			
Grade	N of Students	Chronic Absence	High Absence	Moderate Absence	No Absence
K	3,333	4.6%	17.5%	61.2%	16.7%
1st	3,671	2.7%	13.0%	62.0%	22.3%
2nd	3,999	2.2%	11.6%	63.0%	23.2%
3rd	4,005	1.7%	9.6%	63.5%	25.2%
4th	4,171	1.8%	9.5%	64.1%	24.6%
5th	4,113	1.8%	9.0%	63.4%	25.9%
6th	3,800	1.9%	9.2%	61.0%	27.9%
7th	3,667	2.9%	9.3%	60.6%	27.2%
8th	3,692	3.4%	11.4%	61.7%	23.4%
9th	3,637	4.1%	11.2%	58.8%	26.0%
10th	3,496	5.5%	12.8%	58.3%	23.4%
Total	41,584	2.9%	11.2%	61.7%	24.2%

Table X. Coefficients and Effect Sizes by Absence Category

	Mathematics			Reading		
Grade (2015-16)	Chronic Absence	High Absence	Moderate Absence	Chronic Absence	High Absence	Moderate Absence
K	**-3.75*** **	**-2.19*** **	**-1.30** **	-3.10	-0.58	-0.75
	-0.31	-0.18	-0.11			
1st	**-5.31*** **	**-2.28*** **	**-1.41*** **	-0.97	**-3.86* **	-0.78
	-0.45	-0.19	-0.12		-0.27	
2nd	**-3.42*** **	**-1.83*** **	**-1.06*** **	-2.41	-1.27	**-1.00* **
	-0.36	-0.19	-0.11			-0.07
3rd	**-1.91* **	**-1.35*** **	**-0.53* **	-0.84	-0.45	-0.37
	-0.22	-0.16	-0.06			
4th	-1.32	**-1.35*** **	**-0.77*** **	-1.54	**-0.99* **	-0.36
		-0.15	-0.09		-0.10	
5th	**-2.64** **	**-1.14*** **	**-0.96*** **	-0.94	**-1.25* **	**-0.67* **
	-0.30	-0.13	-0.11		-0.12	-0.06
6th	**-2.62** **	**-2.06*** **	**-0.95*** **	-0.65	**-1.55* **	-0.51
	-0.25	-0.20	-0.09		-0.13	
7th	**-2.04* **	**-2.31** **	**-1.54*** **	-2.04	**-1.36** **	**-0.99*** **
	-0.20	-0.22	-0.15		-0.11	-0.08
8th	**-3.66* **	**-2.42*** **	**-1.52*** **	-1.94	**-2.47*** **	**-1.26*** **
	-0.33	-0.22	-0.14		-0.22	-0.11
9th	**-3.34*** **	**-2.17*** **	**-0.96*** **	**-3.38** **	**-2.13*** **	**-1.03**
	-0.33	-0.21	-0.09	-0.30	-0.19	-0.09

Impact on RIT of a Single Absence in the prior year

	Math			Reading		
Grade	RIT	Effect	Days Absent to .2 effect	RIT	Effect	Days Absent to .2 effect
1	-.14***	0.012	17	-0.09		
2	-.14**	0.012	16	-0.12		
3	-.16***	0.017	12	-.1*	0.007	27
4	-.12***	0.014	14	-0.03		
5	-.1***	0.011	18	-.09***	0.01	21
6	-.1***	0.011	18	-.08*	0.008	26
7	-.15***	0.014	14	-.11**	0.009	22
8	-.12**	0.011	18	-.08**	0.007	28
9	-.15**	0.013	15	-.13**	0.011	18
10	-.14**	0.014	14	-.14***	0.013	15

	Mathematics			Reading		
Grade (2015-16)	18+	11 to 17	5 to 10	18+	11 to 17	5 to 10
K	**-3.18*** **	**-1.59** **	**-1.29*** **	-2.51	0.6	-0.06
	0.26	0.13	0.11			
1st	**-4.35*** **	**-1.67*** **	**-1.17*** **	-0.41	-1.96	-0.33
	0.37	0.14	0.1			
2nd	**-2.93*** **	**-1.52*** **	**-1.31*** **	-1.89	-0.83	-1
	0.3	0.16	0.14			
3rd	**-1.60* **	**-1.39** **	**-1.03*** **	-0.51	0.07	-0.17
	0.19	0.16	0.12			
4th	-0.98	**-1.00* **	**-0.82** **	-1.48	**-1.41* **	**-.52* **
		0.11	0.09		0.14	0.05
5th	**-2.06* **	-0.33	**-.65* **	-0.52	-1.19	**-0.35* **
	0.23		0.07			0.03
6th	**-2.11* **	**-1.92*** **	**-.85** **	-0.49	**-2.25** **	**-0.83* **
	0.2	0.19	0.08		0.19	0.07
7th	-1.21	**-1.32* **	**-.97*** **	-1.33	-.81	-0.54
		0.13	0.09			
8th	**-2.60* **	**-1.88** **	**-.78** **	-1.17	**-1.85** **	-.95
	0.23	0.17	0.07		0.16	
9th	**-2.77*** **	**-1.72* **	-.78	**-2.83* **	**-2.00** **	**-.79* **
	0.27	0.17		0.25	0.18	0.07