

LEVERAGING TEXT-MESSAGING TO IMPROVE KINDERGARTEN ATTENDANCE

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ATTENDANCE

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Poor school attendance in the early grades is predictive of poor subsequent educational outcomes. We report on a pilot intervention aiming to reduce chronic absenteeism in kindergarten. We designed and implemented a two-way, text-based parent-school communication system to encourage daily attendance, provide parents with personalized feedback on their child's attendance, and provide support to mitigate challenges that threatened parents' ability to get their child to school regularly. We piloted this intervention with two kindergarten classrooms (N = 45 students) within one elementary school. This study aimed to address the following research questions: 1) To what extent can the implementation of two-way text message communication between schools and families focused on the importance of school attendance and barriers that families may face getting their child to school regularly reduce rates of chronic absenteeism and improve rates of daily attendance? 2) To what extent do improvements in attendance translate to improvements in downstream outcomes, such as academic achievement? The program was well received, with nearly all families registering for participation and three-quarters of those receiving outreach responding and engaging with school personnel via text. The pilot school's kindergarten chronic absenteeism rate was substantially lower in the intervention year relative to prior trends. Further, in the intervention year, the pilot

school's kindergarten chronic absenteeism rate (13%) was substantially lower than for that of a synthetically constructed comparison school (24%). We discuss implications for sustainability and scaling of an effort such as this.

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PREFACE

This dissertation was not a solo trek, but a journey shared and supported by a number of incredible advisors, colleagues, friends, and family members. It is with great appreciation that I acknowledge their contributions to this challenging and rewarding adventure.

Dr. Lindsay Page, my dissertation and project advisor, was the original inspiration for this innovation and study. Her studies on persistence into college led to this inquiry of whether texting could aid persistence into kindergarten. Dr. Page continually provided encouragement with gentle nudges to ensure this project became a high-quality study. Thank you for enduring the numerous iterations of this work. With respect, I use the pronoun “we” throughout the document to acknowledge your contribution. Without you, the complex statistical analysis would not have been possible. Dr. Heather Bachman and Dr. Sean Kelly, dissertation committee members, challenged me to include the experience of participants in this final document and strengthened my theoretical perspective. Their enthusiasm for the study provided needed reassurance.

I was fortunate to endure this process alongside several wonderful classmates. I would like to thank Dr. Kate Kinsinger, Dr. Lauryn Kohut, Dr. Sarah Wagner, and Dr. Perry Wood for their constant faith and support. They challenged me, taught me, praised me, and provided much needed comic interludes at the most challenging times.

Throughout this journey, my family (both by birth and marriage) has provided me with the motivation and inspiration to press on. They painstakingly listened to my ongoing accounts of this project and the process. Special thanks are warranted by my children, Arabella and Eli, who experienced the greatest sacrifice along the way. While the quantity of our time together suffered, the quality became much more appreciated.

Finally, to my wife and best friend, Erin. You willingly carried the extra burden when my load became too great. I will forever be indebted to you for sticking with me through my worst and most challenging moments. This degree would never have been possible without you. I look forward to making up for lost time.

1.0 INTRODUCTION

Even in the earliest years of schooling, student attendance is predictive of subsequent educational outcomes. Students with high absence in kindergarten perform worse in reading and mathematics as well as on measures of social engagement (Gottfried, 2014). Further, children from traditionally disadvantaged backgrounds, such as those from low-income or minority households, do especially poorly when they were chronically absent in kindergarten (Gee; 2018; Romero & Lee, 2007), where chronic absence is defined as missing more than 10% of the school days in a given year through a combination of excused and unexcused absences. Such early school behaviors are particularly troubling, given that of children who are chronically absent in the early years, only 17% read at grade level in third grade (Bruner, Discher, & Chang, 2011). Further, these students are among those most likely to exhibit the lowest levels of educational achievement at the end of the fifth grade (Ehrlich, Gwynne, Pareja, & Allensworth 2014; Romero & Lee, 2007) and to eventually drop out of school (Balfanz & Byrnes, 2012).

Going a step beyond these descriptive patterns, evidence also points to the causal link between absenteeism and educational outcomes (Gershenson, Jackowitz, & Brannegan, 2017; Goodman, 2014; Gottfried, 2009, 2011, 2014). Gottfried (2014), for example, found that chronic absenteeism leads to reductions in academic achievement as well as educational and social engagement. Collectively, the evidence provided a strong case for focusing on student attendance in the earliest years, both to foster strong habits of daily school attendance from the

beginning of formal schooling and to ensure that students have consistent exposure to foundational content and skills developed in these grades.

Epstein and Sheldon (2002) suggested that efforts to improve early attendance should focus on family and community engagement, as families serve as key decision makers and strongly influence the number of days a child misses school. In addition, the early years of schooling may be a particularly good time to intervene, as parents may be especially receptive to interventions involving supports and expectation setting as they adjust to the new routines associated with their child transitioning to school (Epstein & Sheldon, 2002; Hoover-Dempsey & Sandler, 2005; Hoover-Dempsey et al., 2005).

1.1 THEORETICAL FRAMEWORK

Burr (2015) broadly describes the development of our various roles from a constructivist frame. She states that how we come to become knowledgeable of these roles is created through an ongoing social process. This dynamic interchange throughout the life course shapes our perspectives on a variety of roles and expectations. Burr (2015) explains that key influencers, such as family, help to explain why some siblings share similar viewpoints. However, siblings will also have noted differences in perspective which could be molded through other key influencers or the way in which they internalize interactions. Regardless, Burr (2015) viewed the lens we see the world through as something that is created over time and through experience.

Kohn (1989) connected parent beliefs with parental roles. He believed that parental beliefs were built from personal experience, understanding of child development, and the influence of others. Similarly, Hoover-Dempsey (2005) contends that parental role construction

and their subsequent motivation for involvement in their child's academic course is linked to that parent's experience (what they were raised to believe), efficacy (their belief in their ability to guide learning), and expectations (from peers and broader society). If parenting is constructed as Kohn and Hoover-Dempsey imply, it was the goal of this project to reconstruct it. Could parenting be altered if provided prompted advice, support and encouragement, and opportunities through expanded expectations? This study takes a constructivist perspective believing in the opportunity to redefine parent roles.

This is not the first study to link parental attitudes and student attendance. Robinson, Lee, Dearing, and Rogers (2017) attempted to reshape parental misconceptions about their child's attendance through mailings. The authors sent mail-based communications to parents of at-risk attenders (bottom 60th percentile) emphasizing the utility of regular school attendance and providing accurate reporting of how many days their child missed in relation to their peers. Further, a subsample of the treatment group was provided with additional information urging parents to make use of their social network in ensuring their child attended school.

Robinson et al.'s (2017) approach was based on the expectancy-value model (Atkinson, 1957; Eccles et al., 1983) which posits that people are more motivated to take part in an activity when they recognize its utility in reaching their goals (Eccles & Wigfield, 2002). The findings from Robinson and colleagues appear to support this potential. Students receiving mailings had fewer missed days (6.37 days) compared to the control group (6.9 days). However, when the two treatment groups were analyzed separately (mailings vs. mailings + social support), only the latter group demonstrated a significant reduction in chronic absence (Robinson et al., 2017). This finding provides some evidence that information alone is not enough and that providing connections to human support could be more valuable.

1.2 PURPOSE OF THE STUDY

In this paper, we report on the implementation and impact of a text-message based effort to improve school attendance and reduce chronic absenteeism among kindergarten students. In designing the intervention, we sought to incorporate text-based outreach that distinctly addressed the variation in reasons that young students miss school. To counter misperceptions about the importance of strong school attendance in the early years, text outreach included messaging about the importance of elementary education and strong attendance. The messaging also inquired about logistical and other barriers that families may have been facing and provided links to both services and supports. Different from one-way push notification systems, in this effort, messaging was two-way and introduced a new channel of communication through which families could communicate with the school system, provide feedback regarding their child's school experience, and seek support. Text outreach also included positive messages about opportunities for parent involvement, school events, and other reasons why students would not want to miss school.

We implemented the texting intervention with two kindergarten classrooms (N=45 students) in one elementary school within the Pittsburgh Public Schools (PPS). This pilot school primarily served a low-income population and has a recent history of high rates of kindergarten chronic absenteeism. For the purpose of this study, we used the threshold of missing ten percent of the school year (combined excused and unexcused) as the definition of chronic absence. To gauge the impact of the effort, we compared the kindergarten chronic absenteeism rate in the intervention school to an analogous rate estimated from a synthetically constructed comparison school (e.g., Abadie, Diamond, & Hainmueller, 2010). To preview our findings, the rate of chronic absenteeism among kindergarteners in the intervention school (13.3%) was substantially

lower than for the synthetic comparison (24.4%). Further, the text-based communication effort was well received by both families and school staff. Staff reported being better able to assist parents with tasks and issues including signing up for parent-teacher conferences, seeking feedback on “how sick is too sick” to attend school, and accessing resources to avoid homelessness. The implementation of the program coincided with an improvement in parent ratings of school-parent communication, and the highest praise for the program came from Spanish-speaking families who voiced that the provision of messages in Spanish helped them feel included in and valued by the school.

2.0 LITERATURE REVIEW

2.1 REASONS FOR ABSENTEEISM

The causes of early school absenteeism are multifaceted. Attendance Works (2014) identified three categories of reasons why students are absent in the early years of schooling: myths, barriers, and aversion (see Figure 1.0). Myths are the common misperceptions that parents hold about attendance, including the belief that problematic attendance is limited to unexcused, consecutive days or older grade absenteeism. Findings from the Ad Council (2012) revealed that many parents perceive the elementary years as a time primarily for social development with a focus on academic skills and content coming later in high school. Parents also may misperceive the extent to which their child is actually absent in relation to their peers (Robinson et. Al, 2017; Rogers & Feller, 2016).

Beyond these misperceptions, students also can face legitimate barriers to strong school attendance. These may include poor health, unreliable daily transportation, and unsafe neighborhood pathways to school. Socioeconomic status is a strong correlate of the experience of these barriers (e.g., Chang & Romero, 2008; Connolly & Olson, 2012; Ehrlich et al., 2014; Epstein & Sheldon, 2002; Ready, 2010; Romero & Lee, 2007). Aversion to school also serves as a barrier to strong school attendance. Students and families may hold or develop an aversion to

school based on prior negative experiences with the educational system or early experiences of academic struggle, poor school climate or ineffective discipline.

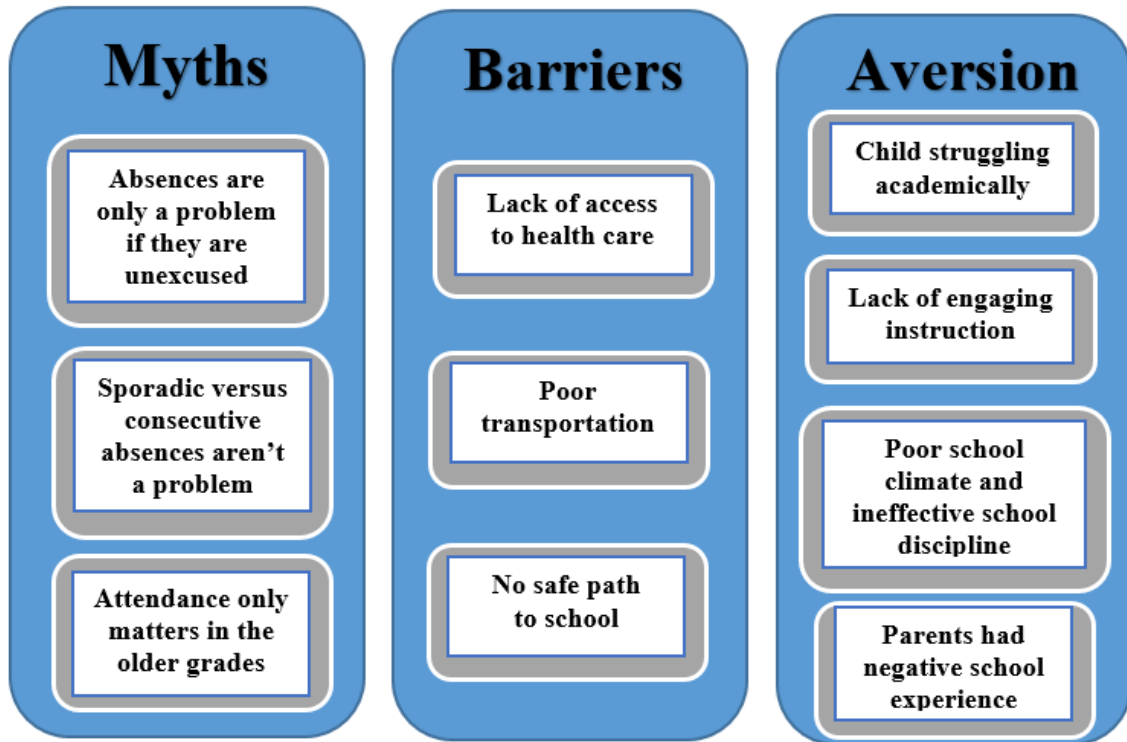


Figure 1. Attendance Works: Why Are Students Chronically Absent?

Several researchers have acknowledged individual- and family-level drivers of absenteeism (Black, Seder, & Kekahio, 2014; Gottfried, 2014). Ehrlich et al. (2014) identified child illness as the leading cause of absence and identified other household factors that relate to high rates of absence, including being raised in a single-parent household, having younger parents, poor parental or household health, inadequate health care coverage, reliance on public transportation, low levels of parental education, and parental unemployment. Within a school, if the chronic absence rate is below 20%, it has been theorized that the reasons could be more heavily linked to

family awareness (e.g., attitudes on the importance school and attendance) and tangible barriers (e.g., consistent transportation). However, when the rate exceeds 20%, more systemic community-and-school-related influences might be at play (Attendance Works, 2014; Bruner, Discher, & Chang, 2011). The authors stressed knowing this distinction allows for interventions that target individual family outreach versus systemic and policy level approaches. High percentages of chronically absent students can be linked to larger issues such as unwelcoming schools, systemic health concerns (particularly asthma), transportation policies (for example, a high share of students required to walk greater distances to school), or high rates of community violence (Chen & Rice, 2016).

2.2 PARENT INVOLVEMENT

When practitioners consider the age at which children enter kindergarten (typically age 5) it is of further importance that they include the child's family as a strong influential factor. Mayer, Kalil, Oreopoulos, and Galeggos (2015) articulate that a fraction (15-18 percent) of a child's life from birth to age 18 is spent in schools while the majority is spent with caregivers. Weis et al., (2011) declare that academic achievement is more strongly connected to the family background than on what happens in schools. Price (2010) found that an intervention to increase mother-reading increased the child's test scores in early grades by 41 percent of a standard deviation (higher than the gains of the often-cited Perry Preschool Project).

Mayer et al. (2015) contend that there is a direct and causal effect between parents spending time with their children and cognitive test scores. The authors go on to articulate that families living in poverty are less engaged in reading to their children, while higher income

families have increased reading leading to the largest gap in reading over the last 20 years. Mayer et al. (2015) found, however, that behavioral tools, goal-setting, and social rewards could increase parent-child reading, especially for a subgroup of parents who were previously less likely to read to their children. Similarly, phone calls and timely information to caregivers about attendance were found to help improve attendance (Helm & Burkett, 1989; Licht, et al., 1991).

2.3 ATTENDANCE INTERVENTIONS

Encouragingly, evidence suggested that interventions can be effective in increasing student attendance (Helm & Burkett, 1989; Kraft & Dougherty, 2013; Licht, Gard, & Guardino, 1991; Roderick, et al., 1997). Some interventions took a comprehensive approach, seeking to address the many different factors that can lead to poor attendance. For example, in New York City, one attendance-focused effort paired high school students with a “Success Mentor,” a staff member or volunteer who met with selected students one-on-one to provide encouragement, detect reasons for absenteeism, and assist with mitigating challenges identified. Students paired with mentors through this program were 15% less likely to be chronically absent (Balfanz & Byrnes, 2012). Further, chronically absent students supported by a Success Mentor gained, on average, nearly two weeks of school. Other interventions were more targeted. Rogers and colleagues (Rogers et al., 2017; Rogers & Feller, 2016), for example, offer experimental evidence that providing parents with low-cost, written feedback via mail about how many days their child had missed school led to a 10% reduction in chronic absence.

Between high-touch, personalized efforts and low-touch, one-directional outreach, technology has a potential role to play in how schools both communicate with families more

effectively about the importance of school attendance and connect families with the support and resources needed to meaningfully reduce the number of school days missed by their child. Outreach via text messaging is particularly promising. Descriptive evidence from the Pew Research Center indicated very high rates of cell phone usage and ownership even among adults from low-income backgrounds and with low educational attainment. For example, in 2017, 92% of adults with a high school diploma or less and 92% of those with incomes below \$30,000 owned a cell phone. Further, cell phone ownership rates for U.S. adults under the age of 50 reached 99% in 2017 (Pew Research Center, 2017). In contrast to these high rates of cell phone ownership (and access to text messaging), rates of internet (and, as a result, email) access were lower among those with lower levels of education and income. For example, while an estimated 69% of those with at most a high school degree have a smartphone, the rate is 54% for those who did not complete high school.

2.4 TEXT MESSAGE COMMUNICATION AS AN INTERVENTION

Text messaging is increasingly used in a variety of policy arenas, and growing evidence reveals text-based communication is a useful tool for improving student outcomes. For example, text-based outreach to provide students with information and connect them to professional counseling support can help to facilitate the on-time transition to and progress through college (Castleman & Page, 2015, 2016, 2017; Page & Gehlbach, 2017). Messaging to parents about their children's educational progress has also shown promise. For example, York, Loeb, and Doss (2018) investigated the impact of text-based outreach to promote pre-literacy activities for pre-school aged children. Doss, Fahle, Loeb, and York (2017) investigated the impact of providing

kindergarten parents with differentiated and personalized literacy guidance via text. Bergman (2015) experimented with personalized outreach to parents about assignments that their school-aged children needed to complete. Mayer, Kalil, Oreopoulos, and Gallegos (2015) utilized text communication to encourage parent-child reading sessions. In all of these interventions, the text-based outreach led to improved outcomes, at a low per-child cost. Kraft and Rogers (2015) focused on the framing of information sent to parents and found that emphasizing what students need to improve rather than where they were excelling led to heightened parental involvement and improved student performance.

Text messaging also is becoming a more routine mode by which school systems communicate with families. For example, the text service REMIND reported that their messaging system is utilized in 70% of public schools in the U.S. (“School communication”, 2017). Yet, educational practitioners may have questions about whether to invest staff and other resources in such strategies.

2.5 RESEARCH QUESTIONS

In this paper, we inform such questions specifically related to early school chronic absenteeism. Specifically, we address the following primary research questions:

Research Question 1: To what extent can the implementation of two-way text message communication between schools and families—focused on the importance of school attendance and barriers that families may face to getting their child to school regularly—reduce rates of chronic absenteeism and improve rates of daily attendance?

Research Question 2: To what extent do improvements in attendance translate to improvements in downstream outcomes, such as academic achievement?

We turn now to detailing our pilot effort to inform these questions.

3.0 METHODOLOGY

Here, we begin by detailing our text-based intervention, *Connect-Text*. We then describe the setting in which we piloted the intervention.

3.1 INTERVENTION CONNECT-TEXT

During the 2015-16 academic year, we designed and implemented *Connect-Text* with the goal of reducing chronic absence, defined as missing 10% or more of school days in an academic year, and increasing daily school attendance among kindergarten students through improved school-to-family text message communication. The program involved a two-way text-messaging system through which the school sent parents pre-programmed, personalized messages approximately once per week. We crafted these messages with several purposes in mind, including increasing parental awareness regarding the importance of strong school attendance, diagnosing barriers to attendance, helping families know about and access available resources, as needs arose, and improving kindergarten attendance.

We designed *Connect-Text* in the mold of the successful *Ready4K!* model which increased early child literacy skills by sending families several different types of messages aligned with the categories of utility, individualization, and support (York, Loeb, & Doss, 2018). Utility messages provided families with important school information and related family/child

opportunities such as out of school time offerings and parent-teacher conferences. Individualization messages provided families with feedback on their child's attendance and motivation on why regular school attendance is critical to their child's educational success. Support messages focused on positive affirmations regarding the importance of the current school year and tips for developmental opportunities to strengthen learning. Examples of each of these types of messages are as follows:

- **Utility message:** Reminder Parent-Teacher Conference Week: No Classes Thursday (10/15-10/16). Message me to reserve a slot with your teacher.
- **Individualization message:** Hi [PARENT NAME], we really missed [CHILD NAME] today. Hope he feels better tomorrow. The field trip to the zoo will be great.
- **Support message:** Reading Rocks! Does your child have a favorite book? Text back and we'll share your fav with your teacher.

Of these three message types, most messages fell into the categories of event/activity sharing (utility) and resource provision (support). Individually targeted messages related to student attendance were sent only when the child became at risk for chronic absenteeism. These messages were always positive in tone, expressing concern and offering assistance.

3.2 SAMPLE

We launched the texting system as a pilot with two kindergarten classrooms (N=45) of one elementary school within the Pittsburgh Public School system. We selected Bridges Elementary (a pseudonym for the intervention school name) based on its recent history of high chronic absenteeism. For example, in the year prior to the pilot, nearly one in five Bridges students was

chronically absent, and this rate was even higher—closer to one-third—among kindergarten students.

Compared to other schools in the district, Bridges exhibited many signs of relatively greater disadvantage (Table 1). In the years prior to the intervention, kindergarten students had higher rates of chronic absence and average daily absence. In the intervention year, nearly three-quarters of the Bridges kindergarten students were black, compared to a rate of about 50% for the district schools overall. The Bridges kindergarteners scored lower on the beginning-of-year DIBELS assessment, were more likely to qualify for subsidized school meals, and were substantially more likely to be classified as ELL. In fact, most elementary schools in Pittsburgh serve very few kindergarten students with ELL status.

Within the Bridges context, the opportunity to participate in text-message dialogue with the school was well received. Nearly all (90%) parents took up the opportunity to participate in the text messaging, and of those participating, nearly three-quarters engaged actively by responding to one or more of the messages received. Unfortunately, we were unable to provide descriptive statistics separately for students and families by participation status.

Table 1. *Chronic Absence Predictor Means, Kindergarten students*

Variables	Bridges K-5 school		Average of other PPS elementary schools
	Real	Synthetic	
Prior absence rates			
Chronic absence rate, 2012 – 13	0.340	0.340	0.260
Chronic absence rate, 2013 – 14	0.328	0.327	0.221
Chronic absence rate, 2014 – 15	0.344	0.344	0.246
Selected descriptive characteristics			
Proportion black	0.733	0.582	0.499
DIBELS composite, beginning of year	23.622	27.396	28.649

Table 1 continued

Free- or reduced-price lunch status	0.689	0.644	0.557
Proportion English language learner	0.200	0.011	0.023

Source: Pittsburgh Public Schools administrative data.

3.3 PROCEDURES

In designing the program, we sought to embed it into the core function of the school while also aiming to make it replicable. When implementing an effort such as this, a key question was whose job it will be to staff the text communication. The answer to this question was not trivial, however, given that school staff members often are stretched thin already. *Connect-Text* employed an AmeriCorps member to test the ability to connect with parents using a low-cost alternative to a new staff position. In addition to working on the texting initiative, the AmeriCorps member regularly spent time in the children’s classrooms, took part in lunch duties, and assisted with daily school dismissal to connect with faculty, staff, parents, and students. These additional responsibilities allowed the AmeriCorps member to forge relationships with school staff as well as the children and families.

Prior to implementation, we conducted two rounds of user testing to gain parent buy-in and tailor messages to Bridges parent preferences (Ahlers-Schmidt et al., 2012). We partnered with an existing parent leadership organization to recruit eight parents to take part in the user testing focus group sessions two weeks prior to the start of the school year. We provided parents with a series of three messages (ordering of messages was randomized) at a time and asked them to place each message on a scale of which message they like “Best to OK to Worst”. Parents ranked 15-18 total messages presented in groupings of three. In December, we conducted a second round of user testing that included four new families participating in the program and a

recruited subgroup of three Spanish-speaking families. Families were recruited for the focus group through an invitation from the text platform, phone calls, and letters in children's backpacks. We learned from user testing that parents favored information-rich, brief messages. This is congruent with Ahlers-Schmidt, et. al. (2010, 2011, 2012) findings that parents preferred messages that were short, simple, and personalized. Individual message ratings were compared to an overall average across all messages. Messages that scored above the average were considered for future use. Messages that fell below the average were revised based on feedback or removed entirely from consideration.

Spanish speaking families especially preferred texts related to their children's progress at school as well as messages that provided information about the things their children were doing at school. Also, they appreciate texts showing that teachers have interest in their children. They expressed a dislike of messages that offered advice or told them what to do, as these messages made them "feel guilty," and they did not think that the guidance was useful for them.

Based on the feedback gathered, we devised a schedule of automated messages and launched the text outreach in September of 2015. The school invited parents to participate in the program via a letter home, face-to-face recruitment at pick-up and drop-off time, and by phone. We sought to personalize the recruitment letter by including a photo of the AmeriCorps member who was staffing the outreach. Consenting parents had the opportunity to receive messages in either English or Spanish, and importantly, the AmeriCorps member was bilingual and able to engage with parents in either language. The initial response to the *Connect-Text* opportunity was quite strong.

We implemented this effort with the technology partner, Signal Vine (for more information, see www.signalvine.com). Outgoing messages to all families were prepared and

scheduled in advance to be delivered on specific days throughout the month. Messages included prompts for families to respond with questions, concerns and additional information they wanted to share with the school. This was in contrast to other existing school-family communication text programs that instead used one-way messaging only. Insights gained from interviewing numerous leaders from other school districts revealed that attendance-focused texting efforts commonly in use generate a generic notification that informs parents that their child has been reported absent for the day. In this intervention, messages encouraged families to respond to the outreach, and the AmeriCorps member monitored incoming text-based communication from families via a web-based portal that allowed her to respond to families' and engage in text-based dialogue. She was then able to call on partnerships with community-based education, social service, and health service providers to refer families to appropriate supports, as needs arose. This holistic, systems-level approach addressed the broader barriers families face beyond child illness (Epstein & Sheldon, 2002; Smythe-Leistico et al., 2012). The most common referrals were to before/after school programs. Commonly, parents reported difficulties matching childcare coverage for their longer work day (8-12 hour shifts) with the shorter duration of the school day (7 hours).

The bulk of the messages sent were individual exchanges between the AmeriCorps member and parents regarding specific questions or concerns. Nevertheless, the burden of this effort was relatively modest, demanding approximately 30 minutes of staff time in a typical week to manage and respond to parent messages. Most messages were questions about school schedules or requests to share information with teachers. Prior to implementation, we established a formal referral process between the school, social service providers, and a community organizing agency to provide support for complex family issues.

3.4 TRACKING ATTENDANCE

During the school year, the AmeriCorps (Jessie) monitored and responded to attendance patterns in 20-day cycles rather than responding to every missed day (with some exceptions). This was due to challenges associated with getting accurate “real time” daily attendance rates by child from the school. Jessie assembled attendance records and created 20-day reports which assessed each child’s attendance record within two categories: “year-to-date” and “last 20 days”. She then coded individual attendance records into one of three categories:

- Good attendance (absent fewer than 5% of days);
- At-risk attendance (absent between 6%-9% of days); and
- Chronically absent (absent more than 10% of days).

Tracking “previous 20 days” allowed us to be responsive to changes in attendance patterns while “year-to-date” helped us to monitor the larger picture. Jessie used these records to reach out to families to celebrate good and improved attendance, raise awareness of declining attendance, and offer more intensive supports to chronically absent students. Over the course of the year, teachers improved their communication with Jessie and notified her when there was a marked change or consecutive days missed.

3.5 CONNECTING FAMILIES TO NEEDED RESOURCES

The ongoing monitoring of attendance allowed for quick and targeted outreach to families. Prior to implementation, we established a formal referral process between the school and social service

providers that provide support for complex family issues. The system ensured a rapid response to families facing a variety of issues.

Consider the experience of one parent, Ashley, who provided permission for her son Devonte's school to communicate with her via text message when she registered him for kindergarten.¹ At the beginning of the school year, Ashley received the following text message:

Dear Ashley: This is Ken and Jessie from Bridges Elementary. This year, we'll be working with Ms. Johnson to do all that we can to help Devonte have a great kindergarten year. Save this number to text us anytime with questions!

Upon receiving this message, Ashley breathed a sigh of relief and quickly texted back:

Thank you so much! It's his first year in school because he didn't go to preschool. I feel lost and have so many questions.

So, began a year-long text conversation between Devonte's school and parents like Ashley through which we aimed to increase regular communication with families, provide guidance and supports to families (as needed), and promote regular school attendance among their kindergarteners. Devonte's attendance was sporadic throughout the school year. The beginning of the year was most problematic as Ashley struggled to establish a new school routine for him and manage the school-related anxiety he experienced that came to light through the following text exchange:

¹ All names of parents, children and the participating school have been changed to protect confidentiality.

Hi Ashley. I noticed Devonte has missed 3 days this week. Is there anything I can do to help?

Ashley's response illustrates her struggle to separate anxiety from physical illness:

He will NOT miss anymore school unless he's deathly sick lol ... Just hard sending him when he's crying curled in a ball and says his stomach hurts. He even went to the bathroom on himself. It was bad! My poor baby ☹

This message triggered more intensive support for both Ashley and Devonte. Jessie worked with school staff to provide a more supportive environment for Devonte to help reduce his anxiety. This included providing positive encouragement and affirmation when Devonte arrived in the morning and "check-ins" throughout the day. In addition, Jessie conducted home visits with Ashley to provide her with reassurance, discuss ways to reduce his anxiety and demonstrate the commitment the school had to ensure her son felt welcomed at school. After this, Devonte's attendance fluctuated between near perfect for months followed by a rash of missed days. Each time, Jessie would respond to the missed days with encouragement and support. In most cases, Ashley simply needed assistance with solving dilemmas that families commonly face. One particular challenge she faced related to arranging transportation for Devonte after nights that she worked late. On these nights, Devonte stayed with his grandmother, and Ashley would pick him up and bring him home in the middle of the night, often waking him during transport. This disruption to Devonte's sleep may have been a contributor to his anxiety. Jessie helped Ashley to

identify a bus stop near Devonte's grandmother's home so that he could sleep uninterrupted and use an alternate route to school on the nights he stayed over. Ashley expressed her deep appreciation for Jessie's support:

Jessie, I can't thank you enough for helping to rework on the bus arrangement. It helps to not wake D in the middle of the night to take him home.

Ashley was not the only parent to benefit from additional communication with and help from Jessie. The experience of Jasmine and her twins, Michael and Shavonne, demonstrate how Jessie's mediating role was able to improve the relationship between the family and the school. Early in the school year, the twins' teacher expressed frustration that both children would miss school when only one was sick. Their teacher requested that Jessie reach out to Jasmine. Her response was indicative of the misguided devaluing of kindergarten that can be prevalent:

Sorry they both missed. I guess I didn't realize how important kindergarten is. It's hard to get one on the bus when the other is sick.

This simple exchange led to a change in behavior. Jasmine worked to ensure that only the child that was sick would miss school. The next time Jasmine met a formidable barrier, she proactively reached out to Jessie for guidance:

Hey Jessie, I need a list of before school programs. I got my job it starts tomorrow 7a to 3p.

Jessie first congratulated Jasmine on her new job and then scrambled to suggest resources. Through ongoing dialogue, a neighbor was recruited to watch the twins and place them on the bus until before school care could be established. Often the timing of requests was not convenient but by responding quickly and reliably, Jessie became a trusted resource as families navigated challenges. We hypothesize that the relative anonymity of the text-based service reduced the stigma of families reaching out for services while still being able to access and benefit from a personal connection.

Of course, not all crises are created equal, as illustrated by Maura and her daughter Brynn facing their worst day, Maura wrote to Jessie:

Please help, Ima get evicted today and we don't have no place to go.

This was Maura's first text message to Jessie, but it signified that Jessie's repeated offers of help whenever needed didn't go lost. Although Jessie did not have the means to fix the problem on her own, the established partners did. Jessie connected with a community agency to find both temporary housing and 10-day bus passes to transport Brynn to school while the school transportation system worked to accommodate the change in address. Not only did Maura and Brynn lose their apartment, most of Brynn's clothes were discarded or lost as they were forced to move immediately. Maura wrote to Jessie:

Hey, so I guess I am going to need two more bus cards to get her to school Monday.

Yea, some uniforms for her, maybe sock and underwear. We don't got much.

Later, Jessie arranged bus passes again for Maura and Brynn when they made a welcomed move to a more permanent location. Encouragingly, Brynn maintained perfect attendance during this month of turmoil.

Maura's experiences illustrate the in-the-moment help that families sometimes need. For other families, needs are less acute but challenging nonetheless. So was the case of Manuel and Allegra. Manuel works two jobs to make ends meet. From the beginning of the school year, his daughter Allegra was flourishing in the school's ELL program. However, when this strong student with exemplary attendance missed three days it did not go unnoticed. Allegra's teacher asked Jessie to reach out to Manuel in Spanish. This was indicative of teachers becoming more proactive in their response to absenteeism as the year progressed. For example, offering teachers-initiated outreach through Jessie when they recognized a change in attendance patterns. Manuel responded immediately (translation below) to the offer of assistance:

Our washing machine broke and I've not able to get her clothes clean at the laundromat because I work late. She will be there Monday after I wash her clothes this weekend.

Fortunately, Jessie was able to provide support in response to this need. Working families can be sent into turmoil when cars or household appliances unexpectedly fail. Jessie provided a referral for the family to a local foundation that was able to provide one-time emergency support in response. She also orchestrated translation services for the community family support center

charged with monitoring and dispersing crisis funds. The program provided Manuel with a voucher for a washing machine which was delivered to the family before the weekend. Jessie additionally arranged donated uniforms from the school clothing closet to ensure Allegra didn't have to miss school before the washing machine was installed. Allegra finished the year demonstrating proficiency in her academic subjects while maintaining strong attendance.

3.6 DATA AND ANALYSIS

All data for our investigation came from the Pittsburgh Public Schools administrative records. For each of the 34 elementary school in the district, we observed aggregate measures of the kindergarten average daily absence rate and the kindergarten rate of chronic absenteeism each year for school years 2012-2013 through 2015-2016. The final year in this four-year panel represented our intervention year. In addition to these measures, we selected aggregate information for the 2015-2016 kindergarten students, including student race, English language learner (ELL) status, free- and reduced-price lunch status (FRL), and the beginning-of-year Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2002) composite scores.

We investigated the impact of *Connect-Text* using a case study method in which our goal was to compare the trend in chronic absenteeism at Bridges, the intervention school, to that of a suitably chosen counterpart that did not implement the messaging intervention. Several options were possible for identifying a comparison. One option was to compare trends in Bridges to the average trend across all other PPS schools. This simple comparison (presented in Figure 2) suggested a positive impact of the text messaging intervention, as Bridges experienced a steep

decline in kindergarten chronic absenteeism in the year of implementation, whereas the same was not true for other PPS schools, on average.

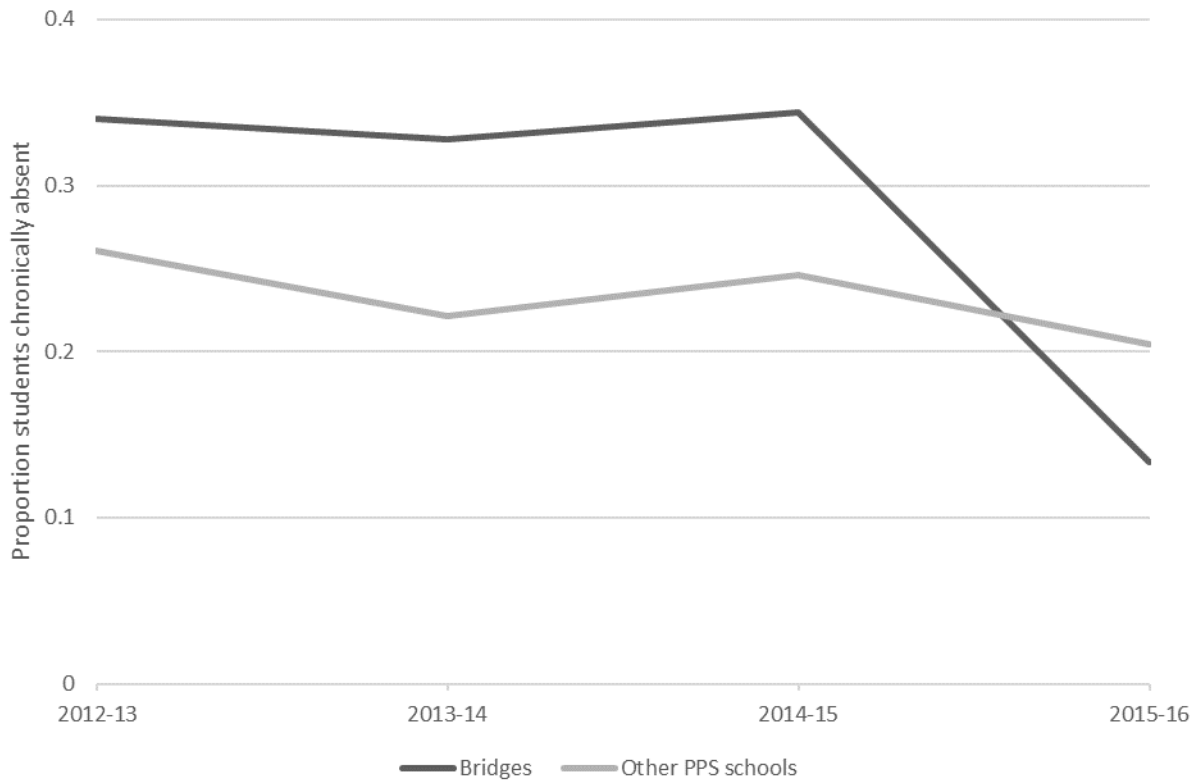


Figure 2. Trends in kindergarten chronic absenteeism for Bridges K-5 and all other PPS elementary schools

Yet, Figure 2 also revealed that prior to the intervention, the prevalence of kindergarten chronic absenteeism in Bridges was substantially higher than in the other district schools overall. Given this lack of similarity in previous patterns, the district as a whole may not be the best point of comparison. A second option was to select a single PPS school that looked most like Bridges in the pre-intervention years. This approach might have lead us to results that were sensitive to our choice of comparison school, however.

Instead, we took a data-driven approach to constructing a suitable comparison, following the work of Abadie et al. (2010). Specifically, we built a single “synthetic” control school that

was a weighted average of other PPS elementary schools. Weights were chosen algorithmically such that the synthetic control school looked maximally like Bridges in terms of a pre-trend in chronic absenteeism and a set of covariates assessed at the beginning of the intervention year. Our primary outcome of interest was the rate of chronic absenteeism among kindergarten students in the 2015-2016 academic year. We utilized the Stata package *synth* for the construction of our synthetic control (Abadie, Diamond, & Hainmueller, 2010). A limitation of our analysis is that we had only three years of data prior to the intervention year.

In Table 1, we also present the average characteristics of our synthetically constructed comparison school. Based on the results in Table 1, we were successful in constructing a weighted composite that is similar to Bridges in terms of pre-intervention trends in chronic absenteeism. Somewhat large differences in kindergarten class racial makeup and ELL status and a modest difference in FRL status remained even after the process of building the synthetic control, but this may be a function of the fact that Bridges was chosen for the intervention because of some of these indicators of disadvantage. To the extent that these characteristics are correlated with the absence measures, the remaining imbalance may lead to downward bias in the differences in outcomes between Bridges and the synthetic control. That is, our results reasonably may be considered lower bound estimates of the impact of the text communication.

To assess the statistical significance of our results, we again followed Abadie and colleagues (2010) and used an exact inference permutation technique whereby we assigned treatment status to each school in our sample and constructed a synthetic control for each school as if it had actually received treatment. We then compared the true treatment impact for the Bridges school to the distribution of impacts that we obtained from this permutation exercise.

We used the placement of Bridges' impact in this distribution to determine the p-value associated with our impact estimate.

Finally, because we find that Spanish-speaking families were particularly receptive to the outreach, we explore intervention year trends in achievement and attendance within Bridges only by Spanish-language status.

4.0 RESULTS

We illustrated trends in chronic absenteeism for Bridges and its synthetic comparison in Figure 3. Here, we observed that the trends prior to the intervention year were essentially equivalent. In fact, our measure of the discrepancy between these pre-trends was quite small, with a root mean squared prediction error (RMSPE) of $2.91e-14$.

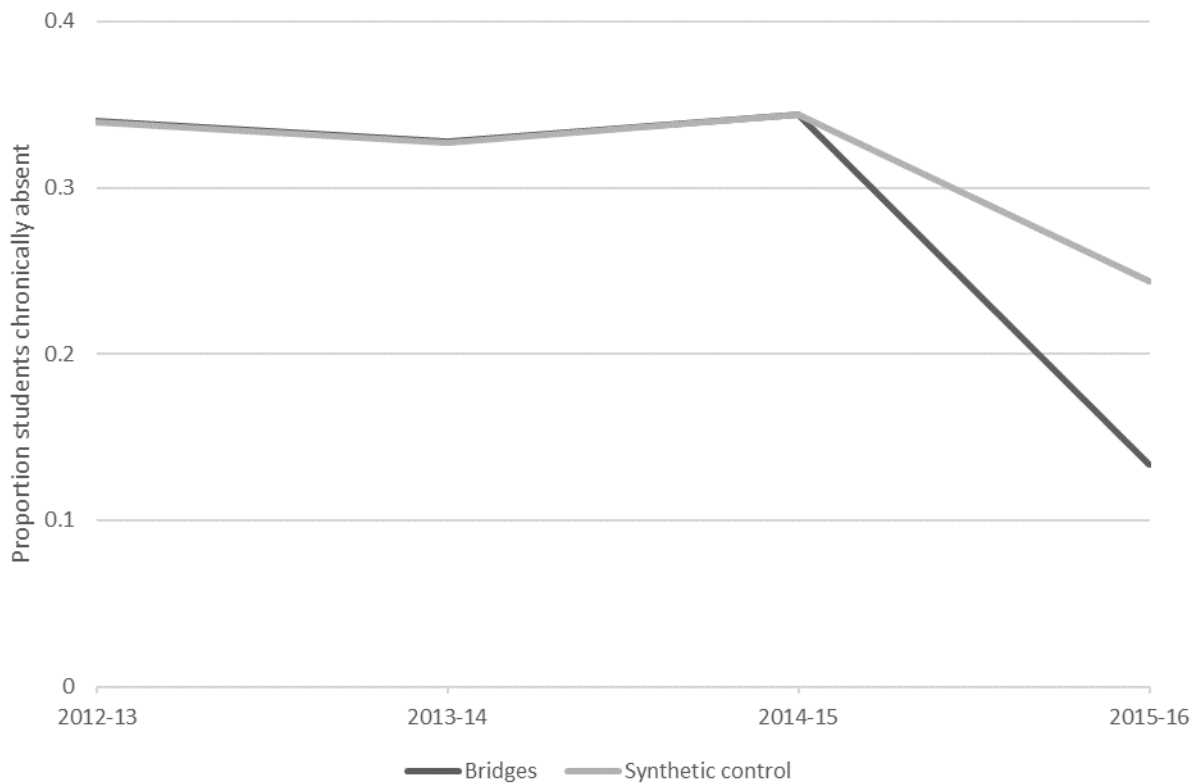
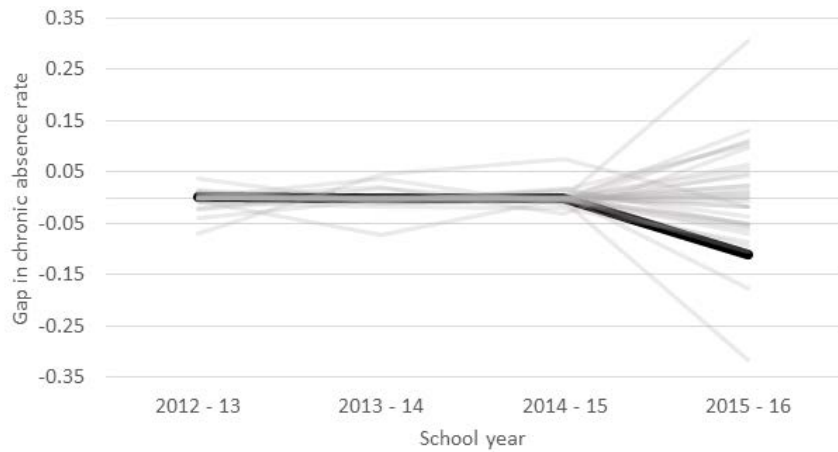


Figure 3. Trends in kindergarten chronic absenteeism for Bridges K-5 and synthetic control school

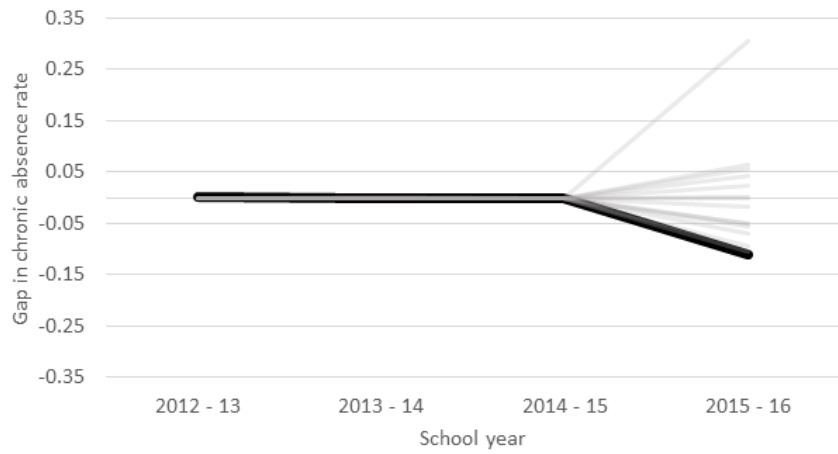
Both Bridges and the synthetic control exhibited declines in chronic absenteeism in the intervention year. The improvement in the synthetic control school may be explained by a co-occurring district-wide “Be There” campaign sponsored by the United Way to raise awareness about school absenteeism. “Be There” was a broad effort that used public awareness, encouragement, and positive reinforcement strategies to improve attendance. The United Way reported attendance rate improvements in 45 of 49 participating schools, namely through attendance challenges and school-level reward systems, although in Figure 2, we do not observe such marked improvements in chronic absenteeism for PPS kindergarteners overall. Compared to the improved rates in the synthetic control school, however, the improvement at Bridges was substantially greater. By the end of the intervention year, 13.3% of Bridges kindergarteners were chronically absent, compared to a rate of 24.4% for the synthetic comparison, a difference of 11.1 percentage points.

We assessed statistical significance by comparing this difference to those obtained by estimating similar “placebo” differences for all other PPS elementary schools. Following Abadie and colleagues (2010), we considered different thresholds of pre-intervention mean squared prediction error (MSPE) for which placebo impacts to include in the comparison distribution generated by permutation. In Figure 4, we present results for all schools (panel A), schools with an MSPE no more than 200 times that of Bridges (panel B), and schools with an MSPE no more than 100 times that of Bridges (panel C). Bridges is highlighted in black, with all other schools in gray. Across these different possibilities, results regarding statistical significance were similar, with p-values falling in the range between 0.10 and 0.05. In short, we concluded that in the year of *Connect-Text* implementation, kindergarten chronic absenteeism was significantly lower in Bridges compared to the rate we would have otherwise expected.

(a) Bridges (in black) and all other PPS elementary schools (in gray)



(b) Bridges and all PPS schools with MSPE < 200 times higher than Bridges



(c) Bridges and all PPS schools with MSPE < 100 times higher than Bridges

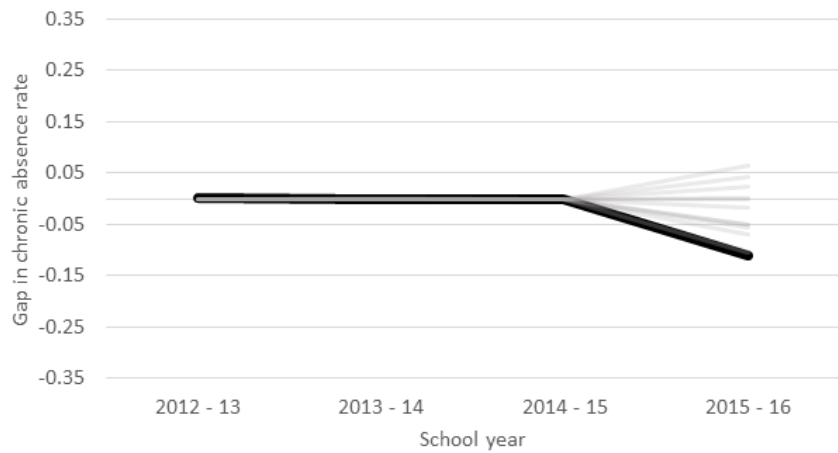


Figure 4. Gap in chronic absenteeism between each school and synthetic control

In Figure 5, we repeated this analysis but examined differences in average absence rate. Here, we observed that the average Bridges kindergartener missed 5.9% of school days, compared to a synthetic control rate of 7.6%. Scaling by a 180-day school year, this was equivalent to the typical Bridges students attending approximately three more days of school per year than would be expected based on the synthetic control rate. This difference, however, was not statistically significant.

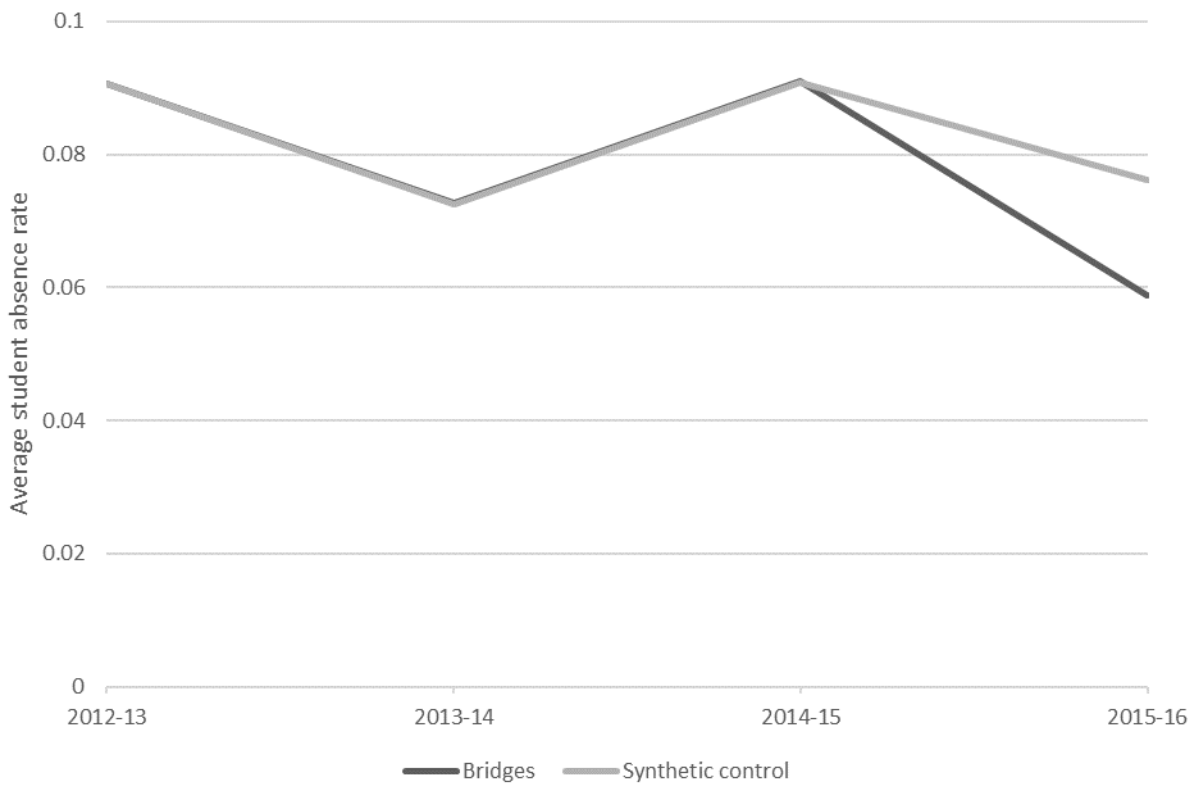


Figure 5. Trends in kindergarten average absence rate for Bridges K-5 and synthetic control school

In an exploratory analysis, we used the site weights obtained in our analysis of chronic absenteeism to compare end-of-year DIBELS scores for Bridges and its synthetic comparison. We found essentially no difference in DIBELS performance, suggesting that the improvements that we observed in attendance do not translate to improvements in achievement, at least in the

short-run. Given the average improvement in attendance of three days that we estimated, a key question was what magnitude of impact on test score performance would be reasonable to expect. Using data from the ECLS-K, Gershenson et al. (2017) estimated a significant, causal relationship between student achievement and attendance such that each additional absence reduced test performance by 0.002 SD, on average, for children in kindergarten and first grade. Using this benchmark, we might have expected a difference in achievement under .01 SD, certainly too small to detect given the limitations of our sample.

Finally, as noted above, Spanish-speaking families were particularly appreciative of the opportunity to text message with a school staff member in Spanish. Related to this, we explored evidence that the intervention may have been particularly beneficial for children from Spanish-speaking families. In this exploration, we considered only kindergarteners within Bridges, comparing Hispanic children and their non-Hispanic counterparts. When we compared trends in absenteeism and chronic absenteeism, we observed improvements in the intervention year that were qualitatively larger for Hispanic students than non-Hispanic students. In addition, when we compared DIBELS scores for Hispanic and non-Hispanic children in Bridges, from the beginning of the school year, Hispanic children scored about 0.30 SD below their non-Hispanic counterparts. By the end of the year, the performance of Hispanic and non-Hispanic children was essentially the same. PPS does not serve a large share of Hispanic children. When we compared the trend in the achievement gap between Hispanic and non-Hispanic children and limited our examination to those schools where at least 5% of the kindergarten class were of Hispanic origin, we observed a narrowing of the gap in achievement over the course of the school year, but a gap still remained for Hispanic children in these other schools by the end of the kindergarten year. We emphasize that this was highly exploratory, as sample sizes were

quite small once we disaggregate by ethnicity. For example, in our intervention year, Bridges served a total of 45 kindergarteners. As a result, the differences that we found were not estimated precisely enough to be statistically significant. Still, it stands to reason that the intervention may have had particular impacts for children of Spanish-speaking families if the ability to communicate with the school in Spanish was itself an innovation of the intervention.

5.0 CONCLUSIONS AND RECOMMENDATIONS

In 2015, when the Every Student Succeeds Act (ESSA) was signed into law to replace No Child Left Behind (NCLB) it came with changes to the way school performance would be measured (Hough, Penner & Witte, 2016). These changes included increasing a state's rights to tailor their education policies but at the same time required expanded data collection (Schanzenbach, Bauer, & Mumford, 2016). Schanzenbach and colleagues suggest that states should consider making chronic absence their self-selected indicator, given the research linking this measure to academic outcomes. Indeed, a decade of research indicating chronic absence as a meaningful marker of attendance gave rise to a host of interventions to reduce chronic absence. These interventions have targeted attendance in different ways. For example, programs have used mentors to increase student connections to school and career planning in the upper grades (Balfanz & Byrnes, 2012). These programs aimed to reduce the anonymity students feel in large buildings while offering the support and guidance of a trusted advisor. Other programs have turned to awareness as a means to increase attendance. Interventions that raised attention to absenteeism were successful in reducing the number of days missed (Chang, Russell-Tucker, & Sullivan, 2016; Chen & Rice, 2016; Epstein & Sheldon, 2002; Rogers et al., 2017).

Efforts to reduce early chronic absence have, to date, tended to focus on more comprehensive and systemic issues. Generally, younger children are not seen to be purposely truant. Instead, their absence is viewed as the result of school, family, and community factors.

Early prevention programs have tended to center on transportation, health, and community issues that hinder high rates of attendance (Chang, Russell-Tucker, & Sullivan, 2016; Chen & Rice, 2016). In the intervention on which we report here, Connect-Text focuses on parents as a valuable source of support and resource for their children. The goal is to reinforce the importance of kindergarten as a foundation for early school success and the notion that each day of schooling will drive later school success.

Although previous programs have attempted to foster this awareness through face-to-face interactions or phone calls (Chang, Russell-Tucker, & Sullivan, 2016), Connect-Text utilizes text messaging which Bridges parents self-report as their preferred method of communication. The messaging focused on providing information about key school components while engaging parents in two-way dialogue to address specific barriers to children attending school each day. The program provided swift outreach to assist the families of students whose attendance revealed signs of risk. Indeed, given the formal referral process established among the school, social service providers and community organizations prior to the start of the intervention, the project's AmeriCorps member was able to respond quickly to needs such as transportation, temporary housing, and even a washing machine for one family. This particular family was provided a voucher towards a free washing machine when it was discovered that their child was missing school as a result of not having clean clothes. The AmeriCorps member was able to connect another family that had been evicted with immediate shelter (meaning no time living on the street) and van service to school from a community agency (meaning no missed days of school even though it took the district's transportation department 10 days to process the child's change in address). Text-messaging as a less intrusive communication strategy resonated with families. We hypothesize that the anonymity of the text-based service reduced the stigma of reaching out

and provided a “psychologically safe” mode (Wanless, 2016) for families to present potentially sensitive challenges and seek guidance and support.

We return to the constructivist theoretical framework to consider how parental attitudes may have been shaped (or re-shaped) by this project. It was stated that a parent’s prior experiences, efficacy, and perceived expectations influences their level of engagement (Hoover-Dempsey & Sandler, 2005; Hoover-Dempsey et al., 2005). This project was most targeted in increasing the expectation for parent engagement. Parents were given repeated and ongoing invitations to participate in their child’s learning at home and at school. The program acknowledged and praised the home-based experiences which can often go invisible to school staff. Providing recognition of parental efforts may have also improved some parents’ belief in their ability to foster student learning. Further, efficacy can be developed when support and resources are available to help navigate difficult circumstances. Increasing the likelihood of small gains can build confidence and teach decision making strategies for handling future challenges.

In considering an intervention such as this, the cost is inevitably a key component. The primary expenses in our implementation included the licensing the Signal Vine platform and the salary for the AmeriCorps staff member. The AmeriCorps member devoted approximately one-quarter of her time to the Bridges kindergarten students and families. Therefore, we estimate implementation costs of approximately \$9000, or \$200 per kindergarten student in this pilot (supervisory and support staff were not included in this cost equation). Staff cost could be reduced substantially if the intervention were conducted with existing personnel (e.g., teachers or school social workers). Because the technology could have been used to reach more students,

we would anticipate a much lower per-student cost in scaling up to reach more students and families.

While there may be ways to reduce the overall cost, there are a few aspects that we consider key components of the program. The first key component is that the messaging system is two-way and highlights the multi-dimensionality capability. It was important to build an expectation for parental responses by explicitly asking parents to text back messages early in the program. A second essential element was celebrating successes as much as highlighting opportunities for growth. Parents appreciated messages that acknowledged improved attendance and their presence at school functions. In general, a consistent positive and supportive tone helped to forge relationships with families.

Additional key components are related to the other relationships essential to supporting families. The third critical feature identified was the network of resources needed to ensure that timely assistance was provided to families, as needed. The AmeriCorps developed relationships with community-based service agencies early in the school year to be proactive in recruiting partners for when the need might arise. Finally, the fourth key element is working in harmony with the school. This element is important for non-school agencies implementing interventions on behalf of education institutions. Communicating with faculty, assisting with school responsibilities (e.g., lunch and bus duties), and sharing credit helped to development a positive partnership with school personnel. As a result, the AmeriCorps received event information, attendance data, and classroom reports in a timely manner.

Although we do not expect that messaging alone can solve the problem of chronic absenteeism entirely, our results suggest that increased positive communication between families and schools can help. Qualitatively, school staff reported that the text-based communication

facilitated their ability to assist parents with tasks and issues ranging from signing up for parent-teacher conferences, to discussing when a child should stay home due to sickness, and accessing resources to avoid homelessness. Quantitatively, our results from comparing the intervention school to a synthetically constructed comparison suggest the potential of text-based communication to encourage attendance and surface real barriers families face.

Of course, we underscore that our study reports on a pilot-level intervention, implemented within one school and with close oversight from our project team. Many efforts to scale promising interventions yield results that are often disappointing, especially in the case of social interventions that rely heavily on human inputs, as the quality of human input can be highly variable (Davis, Guryan, Hallberg, & Ludwig, 2017). Indeed, in addition to heavy involvement from our team, our observation is that the AmeriCorps member who staffed the pilot intervention was excellent at her work and over time became quite well-liked by the school's kindergarten community, teachers and families alike. Nevertheless, the intervention itself is relatively straightforward and reliant on a ubiquitous form of communication. Taken together, these promising results are worthy of further investigation to understand whether such an effort can be used successfully to improve school-family communication and reduce chronic absenteeism at scale.

APPENDIX A

CONSENT FORM



Communication Consent Form

IN PREPARATION FOR THE 2015-16 ACADEMIC YEAR, the Pittsburgh Arsenal PreK-5 School is piloting a new system of family-school communication with the families of kindergarten students. We are launching a text messaging system that we plan to use to keep you up-to-date on important school information and to communicate with you regularly about how your child is doing. Most importantly, we hope that this will provide you with an easy way to communicate and to let us know what we can do to better support you and your child. To sign up for this messaging, please provide us with your cell phone number. If you have an unlimited text message plan, you will receive these messages at no additional cost. Otherwise, standard text-messaging rates do apply.

If you have any questions regarding this new texting system, please feel free to contact Principal Rea at 412-529-7307.

Please return this bottom portion to Pittsburgh Arsenal PreK-5



Get Ready Arsenal Communication Consent Form

I consent to receive text messages from Arsenal PreK-5 regarding important information about the school and my child. I understand that costs may apply, if I do not have an unlimited text messaging plan, and that I have the option to end participation in the text messaging effort at any time.

Parent/Guardian Name (please print)

Cell phone (number you can best be reached)

Parent/Guardian Signature

Alternate phone

Kindergarten Student Name (please print)

Figure 6. Consent Form

APPENDIX B

IRB APPROVAL



University of Pittsburgh
Institutional Review Board

3500 Fifth Avenue
Pittsburgh, PA 15213
(412) 383-1480
(412) 383-1508 (fax)
<http://www.irb.citt.edu>

Memorandum

To: Kenneth Smythe-Leistico
From: IRB Office
Date: 11/27/2017
IRB#: [PRO17100091](#)
Subject: Leveraging Text-Messaging to Improve Kindergarten Attendance

The above-referenced project has been reviewed by the Institutional Review Board. Based on the information provided, this project meets all the necessary criteria for an exemption, and is hereby designated as "exempt" under section

45 CFR 46.101(b)(4)

Please note the following information:

- Investigators should consult with the IRB whenever questions arise about whether planned changes to an exempt study might alter the exempt status. Use the **"Send Comments to IRB Staff"** link displayed on study workspace to request a review to ensure it continues to meet the exempt category.
- It is important to close your study when finished by using the **"Study Completed"** link displayed on the study workspace.
- Exempt studies will be archived after 3 years unless you choose to extend the study. If your study is archived, you can continue conducting research activities as the IRB has made the determination that your project met one of the required exempt categories. The only caveat is that no changes can be made to the application. If a change is needed, you will need to submit a NEW Exempt application.

Please be advised that your research study may be audited periodically by the University of Pittsburgh Research Conduct and Compliance Office.

Figure 7. IRB Approval

APPENDIX C

DEFINITION OF KEY TERMS

Attendance Works: leading national organization (based out of California) reviewing strategies, research, and polices related to chronic absence

Average Daily Attendance: the percent of students present on any given day. If the 95 out of 100 students are present on average the school's Average Daily Attendance (ADA) would be 95%

Chronic Absence: as defined by Attendance Works (see above), "chronic absence" is the benchmark of missing 10 percent or more of the school year through a combination of excused and unexcused absences

Connect-Text: a two-way text-messaging system (between worker and parent) predicated on the theory that fostering early school-parent communication nurtures a stronger relationship in which the relevance of school and attendance can be addressed

Kindergarten Transition: the time period or process of shifting from the preschool or home setting to elementary school to begin kindergarten.

Parent Engagement: defined as parents and school staff working collectively to support and improve the learning, development, and health of children

Signal Vine: a two-way, text messaging platform (based out of Washington DC) that provides opportunities for engagement through technology.

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