

The Impact of One Semester of Future Forward on Reading Achievement and School
Attendance

Curtis J. Jones¹

Marlo Reeves²

Dongmei Li³

Keywords: Randomized Control Trial, Literacy, Tutoring, Family Engagement

¹Curtis J. Jones (jones554@uwm.edu) is the Director of the Office of Socially Responsible Evaluation in Education at the University of Wisconsin in Milwaukee.

²Marlo Reeves is currently a researcher in youth, family, and community development at the American Institutes for Research (AIR) and formerly a Senior Associate at the Office of Socially Responsible Evaluation in Education at the University of Wisconsin in Milwaukee.

³Dongmei Li is a planning and evaluation coordinator for the Austin Independent School District. Previously, she was a Senior Associate at the Office of Socially Responsible Evaluation in Education at the University of Wisconsin in Milwaukee.

Thanks to Kate Bauer-Jones, Angie Brockman, Cris Price, and Alexandria Sedar for their support and feedback.

Funding provided by a Department of Education, Education Innovation and Research grant.

Abstract

Future Forward is an early primary literacy program that pairs one-on-one tutoring with family engagement. As part of an Education Intervention and Research Mid-phase grant, the evaluation of the 2021-22 Future Forward program included 127 students in three schools, with 65 randomly assigned to receive Future Forward in the fall of 2021 and the other 62 randomly assigned to business-as-usual reading instruction. To serve more students in the wake of COVID-19 school disruptions, program participation was changed from one school year to one semester. All but two students received the intended amount of tutoring of at least two sessions per week. Regarding family engagement, 64.5% were contacted at least once per month. School attendance, Star Early Literacy, and DIBELS 8th Edition outcomes were modeled adjusting for the fixed effect of assignment block, student demographics, baseline reading and baseline attendance. Future Forward had statistically significant positive impacts on both Star Early Literacy and DIBELS, with a differential positive impact on students of color. Future Forward did not impact school attendance.

The Impact of One Semester of Future Forward on Reading Achievement and School Attendance

The importance of developing literacy skills at a young age cannot be overstated. The successful development of literacy in elementary school is a strong predictor of future academic success (Rabiner et al., 2016). Further, dropping out of school is predicted with 70% accuracy by the 3rd grade based on reading ability and prior retention (Hernandez, 2012). Outside of the classroom, literacy also predicts long-term economic and health outcomes (Berkman et al., 2011; DeWalt et al., 2004). The racial/ethnic and economic disparities in reading achievement among children are reflected in health outcome disparities among adults (Sudano & Baker, 2006) and children (Mehta et al., 2013). Considering the well-understood effects of developing literacy, it is discouraging that, nationally, only 33% of fourth students are proficient in reading (U.S. Department of Education, 2022). While overall literacy rates are already low, they are even lower for children in low-income families (19%). The challenges we face teaching our students to read have been exasperated by the COVID-19 disruption to education. It is critical that new effective reading interventions and approaches are developed that can reach the increasing numbers of early elementary students behind in their literacy development.

Using one-on-one tutoring provided by a certified teacher has proven effective for programs like Reading Recovery (D'Agostino & Murphy, 2004; D'Agostino & Harmey, 2016). However, the staffing resources needed to use teachers to tutor all students who need literacy support make it difficult to implement in many schools. For districts that consistently face teacher shortages and have large numbers of students who need literacy support, one-on-one tutoring provided by volunteers or paraprofessionals may be a more viable option. While one-on-one tutoring provided by a volunteer may not be as effective as tutoring provided by a certified

teacher, it has proven to be effective (Inns et al., 2018). In fact, seven of the 11 reading tutoring programs with strong evidence of effectiveness included on the Evidence for ESSA website (<https://www.evidenceforessa.org/>) use paraprofessionals or volunteers as tutors. Further, a meta-analysis of 21 studies with randomized evaluation designs found that students tutored by volunteers realized greater oral fluency and writing development compared to controls (Ritter et al., 2009). Even “minimally trained” college students from non-education majors serving as tutors, can have a significant impact on student literacy (Lindo et al., 2017). In her review of effective volunteer or paraprofessional tutoring programs, Wasik (1998) identified several conditions that define successful tutoring programs that do not involve teachers. Effective programs are highly structured, have quality materials, provide strong professional development and supervision to tutors, provide an intensive student experience of at least 90 minutes per week, are well coordinated with classroom instruction, and use ongoing, regular assessments to track student progress. With these conditions in place, a literacy program not using teachers as tutors can still help students. The current study tests the impact of one such program, Future Forward, which could help reduce the societal gap between the literacy development needs of students and the supports available to them.

Future Forward is an early elementary literacy program that combines one-on-one tutoring with family engagement to support student literacy development. In 2017 Education Analytics was awarded an Education Innovation and Research (EIR) Mid-Phase grant to expand and test the impact of Future Forward on students in 14 schools across three states. The planned evaluation included an impact study covering the 2019-20 and 2020-21 school years. Disruptions to schools and Future Forward due to COVID-19 also disrupted the planned evaluation. As schools opened back up Future Forward was given an extension to continue working with

students in three of the 14 schools during the 2021-22 school year. The three schools represented sites with a history of strong implementation of Future Forward. Although with a much-reduced sample, we still conducted a random study of Future Forward's implementation and impact on students during the fall 2021 semester. In this paper we answer the following implementation and impact questions about Future Forward:

- *How much Future Forward did students receive in the fall of 2021?*
- *What was the impact of one semester of Future Forward on regular-school-day attendance?*
- *What was the impact of one semester of Future Forward on reading development?*
- *What student groups differentially benefited from their participation in Future Forward?*

Future Forward Theory of Action

To implement Future Forward, Education Analytics partners with local Boys & Girls Clubs. Clubs employ a local Future Forward team, consisting of an instructional coordinator, tutors, and a family engagement coordinator. Education Analytics provides training, support, and materials to local Clubs implementing Future Forward. Local Clubs tutor students, support families, and work with the school to implement the program and coordinate literacy supports with school teachers. The development of Future Forward was informed by an understanding that more students need literacy support than a school has the capacity to provide. An instructional coordinator oversees a group of four to six paid tutors, with each tutor working with four to six students at a time. Thus, Future Forward can tutor as many as 25 students in a school at the same time.

Future Forward approaches literacy by developing skills while also strengthening systems that can support student literacy development both during and past a student's participation. The

approach of Future Forward is informed by both systems theory (Bronfenbrenner, 1979) and a school-family-community partnership approach (Epstein, 2001). With its school-family-community partnership approach, schools are not solely responsible for developing student literacy. Instead of viewing families and communities as barriers that need to be overcome, they are viewed as having untapped potential for contributing to student literacy development (Nieto, 2012). Through the collaborative work between teachers, Future Forward staff, and families described below, Future Forward develops a learning team that helps motivate students to read, and gain confidence as readers (McGowen et al., 2015), while also promoting greater participation of families in their student's reading development. Research has shown that engaging families in the development of a student's reading can increase student motivation to read (Baker, 2003), which then results in increased development of reading skills (Vaknin-Nusbaum et al. 2017). Through these processes, Future Forward is designed to improve school attendance and reading development (Figure 1).

Tutoring

Students are pulled out of non-core classes during the school day for 30 minutes of one-on-one tutoring, three times per week. Tutoring occurs in a "Future Forward Room", a dedicated print-rich environment. Each 30-minute tutoring session includes several phonics-based activities such as *Word Play* (Wasik & Jacobi-Vessels, 2016) and *Making Words* (Cunningham et al., 1998). Students use graphic organizers to build comprehension skills and write sentences connected to the *Word Play* activity. They may also use *Elkonin boxes*, which involves segmenting words into individual sounds/boxes (Keesey et al., 2014). Each session also includes a short tutor read-aloud. If possible, the same tutor works with a student for the entirety of their participation in Future Forward.

Tutoring is managed by an instructional coordinator, typically a certified teacher, who oversees a group of five to seven tutors in a school. Instructional coordinators participate in a series of all-program trainings at the start of a site's participation in Future Forward. Trainings focus on the implementation of the specific literacy strategies, how to develop a lesson plan, training and supporting tutors, administering and using literacy assessments, such as Star Early Literacy, setting up the Future Forward room, organizing literacy materials, and conducting and documenting observations of tutoring. The instructional coordinator also organizes opportunities to collaborate with school staff, organizing systems of communication with teachers about the progress of students in the program.

Tutors are from a variety of backgrounds including parents of students in the school, local college students, or former teachers. Tutors receive online training around implementing literacy strategies, lesson planning, and literacy assessments. Most of the training provided to tutors is on-the-job. Tutors are often informally observed by the instructional coordinator and supported while they provide tutoring. Tutors are also formally observed by the instructional coordinator, using a structured observation instrument, at least once monthly and receive feedback following these observations. During a formal observation, instructional coordinators document which instructional strategies were used, how much time each took, how prepared tutors were, and the engagement of students in the lesson.

Family

Engaging families in tutoring programs improves student academic knowledge, skills, and confidence (Bryan, 2005; Little, 2009) and has an even greater benefit for low-income children and children with less-educated parents (Dearing et al., 2006; Lin, 2003). Further, family and community partnership practices can decrease chronic absenteeism (Sheldon &

Epstein, 2004). The process of realizing the great potential of family engagement can be difficult. Future Forward must overcome the historical expectations of parents being superficially engaged in their student's education (Epstein, 2001; Li, 2010). The efforts to do so are intentional and culturally responsive.

Each site has a family engagement coordinator who leads engagement efforts with participating students' families. Family engagement coordinators are often community members and parents of children attending the school. Their work is designed to bridge the divide between school and home by translating literacy concepts, educating families about a variety of literacy activities, and validating the literacy practices already happening in the home. Family engagement coordinators listen and affirm the practices of families and work to build upon them (Nieto, 2012; Gonzalez et al., 2005). Future Forward works to reduce the unequal power relationship between the school, Future Forward, and the family that is assumed by families and teachers at the start of their participation. It creates opportunities for overcoming barriers to family engagement that result from mismatches between school and home regarding language, schedules, and expectations (Lopez & Stoelting, 2010).

Family engagement coordinators receive a variable amount of training, depending on their experience, but all receive training about Future Forward tutoring, how to document communications, using scripts to facilitate effective communications, how to conduct an engaging family event, how to conduct a safe home visit, how to build trust, and cultural differences in communicating with families. Although family engagement can take many forms to meet diverse family needs, there are some structured activities that occur with all Future Forward sites. Sites send home a monthly newsletter that updates families about the program and about future family events. Monthly family events are an opportunity to build connections

between school, home, and the program. Teachers and school administrators often attend to connect with families and talk about the student's progress in school. Family events also include tutors working with families and sharing with them their student's progress in Future Forward and providing families guidance and materials for doing literacy activities at home. In addition to organizing family events, family engagement coordinators send books home to help families build a home library and conduct home visits. Home visits typically focus on further supporting family efforts to promote literacy but can involve problem solving in any number of areas, depending on the needs of the family. Communications that surround family events and home visits are consistent and frequent.

Previous Future Forward Research/Evaluation

In 2011, Future Forward was funded by an Investing in Innovations (i3) grant to develop the program and test its impact in seven Milwaukee schools. Two randomized control trial (RCT) studies found that two years of Future Forward had positive impacts on literacy, reading achievement, and school attendance (Jones, 2018; Jones & Christian, 2021). In a follow-up study, three years after the i3 study ended, Future Forward was found to have a significant sustained impact, equal to approximately one-half year of academic growth on reading achievement (Jones, et al., 2023). Former Future Forward participants were also less likely to be receiving special education services than students assigned to Business-as-Usual (BAU) literacy instruction.

In 2017 Future Forward received an EIR Mid-phase grant to expand to 14 schools across three states. Because the overall impact of Future Forward during the i3 study was realized after just one year of participation (standardized impact on Phonological Awareness Literacy Screener (PALS) of 0.34 after one year compared to 0.23 standard deviations after two years) (Jones &

Christian, 2021) and to make the program more scalable and cost effective, Future Forward participation was changed from two school years to one. The implementation plan and corresponding evaluation involved piloting the program during the 2018-19 school year and then testing its impact on reading development and school attendance with a randomized control trial during the 2019-20 and 2020-21 school years. As with everything else, these plans were severely impacted by the COVID-19 pandemic. These resulting implementation efforts and evaluations had to be adapted to the realities of the education system. Ultimately the 2018-19, 2019-20, and 2020-21 evaluations had to be treated as separate studies. (Table 1).

In 2018-2019, the grant started as expected, with Boys & Girls Clubs hiring and training staff, organizing their program, and working with students and families in all 14 schools (Jones et al., 2023). The evaluation tested the impact of the pilot through a regression discontinuity study, showing encouraging, but not statistically significant, results. The 2019-20 program had to be stopped midyear when schools shut down due to COVID-19, which meant the evaluation was only able to measure the impact of a partial Future Forward program on school attendance (Jones & Li, 2023). The results of the partial program were positive, with a statistically significant positive overall impact, and differential positive impacts on Black students, students who started the program with low attendance, and Black students who started the program with low attendance (Table 1). In 2020-21, Future Forward was not able to work in-person with students since schools mostly remained closed to outside programs and individuals. To continue supporting students and families during the pandemic, Future Forward changed to virtual tutoring and family engagement. This decision meant that Future Forward's EIR grant would end without a true assessment of its implementation and impact. Even considering the modified program, a random study of its impact on the reading achievement of 133 students across nine

schools was still implemented (Jones et al., 2023). Although, overall, Future Forward did not have a significant impact on reading achievement, it may have had a differential positive impact on Black students ($\beta = 0.34, p = 0.095$) and Black male students ($\beta = 0.54, p = 0.052$).

Ultimately, EIR did allow Future Forward to carry over unspent funds to offer an additional year of programming in a limited number of schools during the 2021-22 school year.

****Insert Table 1 About here****

Current Study

Setting

The 2021-22 Future Forward study was limited to three of the 14 schools originally included in the EIR-funded study. These included one Wisconsin and two Alabama schools (Table 2). Future Forward partnered with two local Boys & Girls Clubs to implement Future Forward in these schools. The two Alabama schools are located in an urban community. Both schools are relatively high performing, with 51% and 57% reading proficiency, and do not receive Title I funding. They do not provide students with Tier II intervention services. Both schools mostly served White students and families before a 2015 consent order of United States District Court for the Northern District of Alabama, Northeastern Division changed their attendance areas to include students living in a segregated Black community. Staff at both schools shared that they have struggled to support these new students. The Wisconsin school is in a small town/rural community. The school is lower performing, with 32% reading proficiency and receives Title I funding. It serves mostly White (73%), low-income (67%) students. Students do receive Tier II interventions as part of its Response to Intervention process.

****Insert Table 2 About here****

Research Design

We used a RCT design, with students assigned to conditions within regular-school-day classroom blocks, to assess the impact of one semester of Future Forward on school attendance and reading achievement. Students were randomly assigned to either Future Forward or BAU reading instruction within classrooms in the fall. Students assigned to Future Forward received the same reading instruction from the school as students assigned to BAU. Students who received BAU reading instruction in the fall would be offered the opportunity to receive Future Forward during the spring semester. The delayed intervention design provided the opportunity to measure the impact of Future Forward, while still providing literacy supports to all students and families who consented to be in the study.

Measures

School attendance was calculated twice, covering the school year prior to the start of the program and then covering the time when students were participating. Attendance rates were computed by dividing the total attended days by the total days of school from before Future Forward started and dividing the total attended days by the total days of schools during the time Future Forward was active. Attendance rates during the program were checked for skewness and found to be within acceptable levels (-1.2).

Student *motivation to read* was measured by surveys of classroom teachers. Teachers were asked to report at the start and end of the program how often each student showed an interest in reading books, *frequently*, *occasionally*, or *never/rarely*.

Star Early Literacy is a short, online, adaptive assessment, administered to all students by Future Forward staff in the fall and at the end of participation in January. Former teachers serving as Future Forward staff organized the assessments. Star Early Literacy measures several aspects of reading development including Phonological Awareness, Phonemic Awareness,

Fluency, and Reading Comprehension. The results across these areas are combined for a composite score that has high internal reliability (0.95) and concurrent validity with other reading assessments (Renaissance Learning, 2021). Star Early Literacy composite scale scores were standardized separately within grade levels for each administration.

Local Reading/Literacy Assessments included the PALS in Wisconsin and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) 8th Edition in Alabama. Wisconsin schools administer the PALS in the fall and spring. Alabama schools administer the DIBELS in the fall, winter, and spring. Thus, DIBELS scores can serve as a covariate and impact variable for the current study, while the PALS can only serve as a covariate. Both the PALS and DIBELS are administered locally by classroom teachers as part of their school's standard assessment process and independent of the Future Forward program.

PALS is a criterion-referenced, teacher-administered assessment of foundational literacy that includes measures of Phonological Awareness, Alphabet Awareness, Letter Sound Knowledge, Spelling, Concept of Word, Word Recognition, and Oral Passage Reading (Invernizzi et al., 2003). Specific assessed content varies between grades. The results are combined to make a composite score, with internal reliabilities ranging from 0.76 to 0.83, inter-rater reliabilities of 0.92, and test-retest reliabilities between 0.92 and .96 (Invernizzi et al., 2015). The assessment also has strong evidence of predictive validity for student academic performance (Invernizzi et al., 2004). PALS composite scale scores were standardized within grade levels.

DIBELS 8th edition is a teacher-administered assessment of reading skills (University of Oregon, 2018). The composite score, which was used in the current study, combines the results of different measures of reading development such as Phonemic Awareness, Word Recognition,

Fluency, and Reading Comprehension. Composite score test-retest reliability is high, ranging from 0.70 to 0.93 depending on the grade level and form used. It also has high concurrent and predictive validity with the Iowa Test of Basic Skills (University of Oregon, 2018-2020).

DIBELS composite scores were standardized within grade levels for each administration separately.

Random Assignment

One hundred twenty-seven families consented to be in the study. Consenting occurred in the month of September in the two Alabama schools and in September and October in the Wisconsin school. After consenting was complete, students took the Star Early Literacy assessment. After all consented students completed Star Early Literacy, assignments were made within 36 regular-school-day classroom blocks. Sixty-five students were randomly assigned to receive Future Forward in the fall. The other 62 were assigned to receive BAU instruction. Star Early Literacy scores were used to balance assignment groups. Rerandomization within a school was done according to processes specified by Morgan and Rubin (2012) when the standardized difference between students assigned to Future Forward and BAU was greater than 0.10 standard deviations. Within each block (classroom) students had a 50% chance of being assigned to receive Future Forward in the fall. No replacements were made for students who dropped out of the program during the fall semester. Block (classrooms) ranged from 1 to 8 students with 33 out of 36 having between two and five students.

Study Participants

Eligible students included kindergarten, first, second, or third grade students without an Individualized Education Plan (IEP) and who were not English learners. Previous Future Forward participants were eligible for the program. Twenty-one of 127 study participants had

received Future Forward previously, 12 of which were assigned to Future Forward in the fall semester. Most of the 127 students were eligible for free or reduced lunch (88%), roughly one-third were Black, and half were White (Table 2). Although students assigned to Future Forward started the study with slightly better school attendance (Table 3), modeling this difference, accounting for block fixed effects, suggested the difference was not statistically significant ($\beta = 0.0015, p = .340$). Assignment groups were roughly equivalent at baseline on Star Early Literacy. The magnitude of the local assessment result difference between assignment groups was large (*Hedges' g* = 0.46), but again, modeling this difference, accounting for block fixed effects, suggests the difference was not statistically significant ($\beta = 0.336, p = .107$). While local reading assessments were completed by the school district before assignment, the results were not available to the research team until after assignments had been completed.

Attrition, and Students Included in the Final Analysis

Only five students attrited (3.9%), three assigned to BAU (4.8%) and two to Future Forward (3.1%). All five students transferred out of their school. Four of 83 Alabama students (4.8%) and one of 44 Wisconsin students (2.3%) left the study. Differential attrition in Alabama (4.7%) and Wisconsin (4.2%) were small. The overall (3.9%) and differential attrition (1.7%) rates are within the conservative levels of acceptability as established by the What Works Clearinghouse (2020). The final analytic sample after attrition included 59 students assigned to BAU reading and 63 to Future Forward. After attrition, Future Forward and BAU students continued to demonstrate better baseline local reading assessment results (Table 3).

Insert table 2 about here

Insert table 3 about here

Analytic Strategy

We used general linear models (GLM) with fixed block effects to estimate the impact of Future Forward using equation 1:

$$Y_{ij} = \beta_0 + \beta_1(FF_{ij}) + \beta_2(A_{ij}) + \beta_3(Star_{ij}) + \beta_4(Local_{ij}) + \sum_{m=1}^M \beta_{5.m}X_{mij} + \sum_{j=1}^{J-1} \beta_{6.j}Block_j + \varepsilon_{ij}$$

Where Y_{ij} is the regular-school-day attendance rate during participation in Future Forward, standardized winter Star Early Literacy score, or standardized winter DIBELS score for the i^{th} student in the j^{th} block; FF_{ij} is an indicator of assignment to Future Forward; β_1 is the impact of Future Forward; A_{ij} is the school attendance rate in the months before the study started; $Star_{ij}$ is the baseline standardized Star Early Literacy score; $Local_{ij}$ is the standardized baseline local assessment result (DIBELS or PALS standardized separately by grade level and assessment); X_{mij} is the m^{th} of M additional covariates representing demographic characteristics (e.g. gender and race); $Block_j$ is the fixed effect of assignment block (classrooms); within each block, all Future Forward and BAU students received the same literacy assessments; and ε_{ij} is the error term.

In addition to including the fixed block effects, error terms were clustered by assignment block (Athey & Imbens, 2017). No baseline data were missing for students in the analytic sample. For a robustness check, we ran a baseline model where we stripped out all model effects except block fixed effects and group assignment.

Differential effects of Future Forward on student subgroups (race, gender, F/R lunch eligibility, grade levels, baseline attendance, and baseline reading) were explored by separately including interaction terms for each characteristic with Future Forward assignment. The differential impacts of Future Forward on subgroups with significant interaction terms were then modeled separately.

Results

Implementation

Future forward ran from Oct 18th through Feb 4th in the Wisconsin school and September 28th through February 1st in the two Alabama schools. All tutoring was done in person. Sixteen tutors supported Future Forward (Table 4). All were female and all but one was White. The number of students each tutor worked with ranged from one to six. Tutoring implementation was intensive. The average student received a total of 25.5 sessions and 2.6 sessions per week during their one semester of participation (Table 5). This amount was close to what would be expected considering the 120 sessions students averaged across four semesters of participation during the i3 study of Future Forward (Jones & Christian, 2021). All but two students received the targeted intensity of tutoring (at least two sessions each week).

Family engagement implementation was more variable between sites and families. The average student's family was engaged a total of 6.2 times or 1.5 times per month. All three sites used a combination of phone calls, text messages, emails, family events, and home visits to engage families. In person communications, through home visits, family events, or online conference, was the most common way the FEC was able to connect with parents. FECs were able to have at least one face-to-face conversation with all but 11 families. Altogether, twenty-four (37%) families were engaged at least twice per month while 43 (66%) were engaged at least once per month (Table 4). Even considering that much of the Alabama family engagement remained virtual, it was more intensive in the two Alabama schools, which averaged over seven contacts per participating family, compared to the Wisconsin school, which averaged only four.

Insert Table 4 about here

Insert table 5 about here

Impact

Unadjusted, there was very little change from fall to winter in the difference in school attendance between students assigned to Future Forward or BAU (Table 3). After adjusting for baseline attendance and reading, block effects, and student demographics (equation 1), Future Forward did not have a statistically significant impact on school attendance (Table 6). Regarding Star Early Literacy, unadjusted, Future Forward participants demonstrated greater growth than BAU students from the fall (0.08 standard deviations) to the winter assessment (0.29 standard deviations). After adjusting winter Star Early Literacy scores with equation 1, Future Forward was found to have had a statistically significant positive impact on Star Early Literacy ($\beta = 0.30$, $p = 0.003$). The impact estimate was consistent in the baseline model as well ($\beta = 0.40$, $p = 0.007$). We also examined the impact of Future Forward on local reading assessments (DIBELS) in the two Alabama schools. Consistent with Star Early Literacy results, Future Forward had a statistically significant impact on DIBELS according to both equation 1 ($\beta = 0.31$, $p = 0.002$) and the baseline model ($\beta = 0.45$, $p = 0.007$) (Table 6).

Insert Table 6 about here

To test for differential effects on Star Early Literacy, we first tested the significance of several interaction terms with Future Forward assignment. Tested interaction terms included grade level, gender, race (White or students of color)¹, free/reduced price lunch eligibility, baseline Star Early Literacy scores, baseline local assessment scores, and location (Alabama or Wisconsin). We tested the same interaction terms (except for location) as predictors for DIBELS scores in the two Alabama schools. The interaction of location with Future Forward assignment was a significant predictor of Star Early Literacy ($p = 0.002$). The interaction of race with Future

¹ We would normally test the impact of specific racial groups and not group all diverse students into one group. The decision to group racial groups was necessary because of sample size limitations.

Forward assignment was a significant predictor of both Star Early Literacy ($p = 0.008$) and DIBELS ($p = 0.006$). These results suggest the impact of Future Forward depended on the race of the participant and whether they were served by Future Forward in Alabama or Wisconsin. We then examined the differential impact of location and race by conducting four separate statistical models predicting Star Early Literacy scores, each including only White students, students of color (Black, Latinx, Asian), Wisconsin students, or Alabama students. The results of these models suggest much larger impacts of Future Forward on the Star Early Literacy results of students of color ($\beta = 0.60, p < 0.001$) and Alabama students ($\beta = 0.48, p = 0.001$) (Table 7). The results also suggest a much larger impact of the Alabama Future Forward program on the DIBELS scores of students of color ($\beta = 0.59, p < 0.001$). Conversely, the results suggest null effects on White students and students in Wisconsin.

Insert Table 7 about here

Future Forward motivating students to read

A mediating factor for Future Forward's impact is that it motivates students to read. A student's attitude toward reading should improve as reading is more supported at home (Wiescholek et al., 2018) and they gain new skills at school (McGeown et al., 2015). Figure 2 presents the number of students who *frequently* showed an interest in reading books. In the fall, before Future Forward, the same number of students assigned to Future Forward and BAU frequently showed an interest in reading books (32). In the winter, teachers reported that more Future Forward students (32) frequently showed an interest in reading books than BAU students (22) (Figure 2). Fewer students who had not participated in Future Forward retained their interest in reading books. Consistent with the differential effects on Star Early Literacy scores, the reduction in the interest in reading books was only apparent in Alabama. While these differences

were not statistically significant ($Exp(B) = 1.73, p = 0.536$), they do suggest a possible focus for future research.

Insert Figure 2 here

Summary and Discussion

Considering the limited study sample it is not surprising that Future Forward was not found to impact school attendance. However, even considering the small sample, Future Forward had statistically significant, positive impacts on Star Early Literacy ($\beta = 0.30$) and DIBELS ($\beta = 0.31$). These results are particularly impressive given the shortened participation period of one semester.

A significant limitation of the current study is that it is only measuring the impact of Future Forward on students in three schools, which were chosen because they were viewed as strong implementers of the program. It is not clear to what extent the results measured in this study would generalize to other schools. While certainly this concern is worth considering, it is noteworthy that the impacts on students measured in the current study were only found in the two Alabama schools (Star Early Literacy $\beta = 0.64$) and on students of color in Alabama (DIBELS $\beta = 0.59$). Considering this, it seems less likely that the results found in the current study are inflated. Still, it is certainly possible that the impact of students of color in the two Alabama schools was greater than you would expect on students of color in a randomly selected school.

The finding that Future Forward was especially impactful on Black students adds to a growing body of evidence from the EIR grant (Jones & Li, 2023; Jones, Reeves, & Li, 2023) and the i3 grant (Jones & Christian, 2021). Why Future Forward is consistently more impactful for Black students may be the result of Future Forward's school-family-community partnership

approach. Implicit bias of teachers negatively affects Black students, even in early primary grades (Gilliam, 2005). As a result, White teachers often hold lower expectations for their Black students (Gershenson et al., 2016) and may expect Black students to be more trouble (Gershenson & Papageorge, 2018). Witnessing Black students succeeding in Future Forward may help teachers see the potential in Black students. Future Forward may also help teachers and Black families see the potential in each other (Lawrence-Lightfoot, 2004; Koonce & Harper, 2005). The Future Forward partnership approach may create space for mutual trust and respect to develop (Graham-Clay, 2005; Lindle, 1989).

The change in the amount of time students participated reduced the local cost per student (tutor, family engagement coordinator, and instructional coordinator pay and benefits) from approximately \$4,000 to \$2,000. While this still represents a significant investment for schools, this cost is lower than most other reading programs that provide one-on-one tutoring (Shretha et al. 2022). Even with the reduced cost, Future Forward demonstrated a large, positive impact on the reading development of students of color that was much greater than what was measured after two years of participation in the i3 study (Jones & Christian, 2021). The measured 0.6 standard deviation impact on students of color suggests students of color in Future Forward demonstrated over twice as much growth from fall to winter on Star Early Literacy and DIBELS than students in BAU reading. This, and previous study results, suggests that Future Forward is a cost-effective reading intervention for students of color.

The implications of the finding that Future Forward participants seemed to be more likely to maintain their interest in reading is interesting but somewhat unclear. It is worth noting that in the previously mentioned study by Vaknin-Nusbaum et al. (2017), students who had lower reading achievement demonstrated lower reading motivation at the end of the year than they did

at the beginning. Possibly, students start the year highly motivated to read but lose interest as they struggle to learn (McGeown et al., 2015). Success in Future Forward may help students maintain that motivation. Future research could clarify this.

Future Research

In 2021, Education Analytics was awarded an EIR Scale-up grant. To continue to allow Future Forward to support more students and reduce costs, participation will continue to be limited to one semester. A one semester model also provides more flexibility to schools implementing Future Forward. Looking past the EIR grant, with an understanding of how much benefit students receive from one semester of participation a school can decide how much Future Forward a student should receive. Students who need more support can participate for the whole school year or even two years, as was the case in the i3 study (Jones & Christian, 2021).

While the current study suggests that one semester of participation in Future Forward can significantly impact students of color, it is unclear how the shortened period of participation affects whether impacts will be sustained over time. A recent follow-up study of the i3 Future Forward program found that three years past participation, the program was still positively impacting reading achievement and school attendance of students of color who started the program with greater reading skills (Jones et al., 2023). The study also found that former Future Forward students with greater reading skills were less likely to receive specialized services. However, a student's participation in the i3 study spanned two years. It seems less likely that one semester of participation would have such a strong sustained impact on students. Again though, by understanding the compounding impact of one semester of Future Forward, the program can be more flexible to the needs of students, families, and schools.

Future research of Future Forward should also explore the program conditions that make the program unique among tutoring programs and particularly impactful for students of color. To what extent does the school-community-family partnership interrupt teacher implicit bias and mistrust between school and home? What changes occur in the relationships between teachers and families as students and families are engaged in Future Forward? How does participation change how teachers and families view each other? More in depth examination of the processes that result in positive impacts for students of color and their families will contextualize program impacts and provide schools with direction for how to replicate these impacts in other settings.

References

- Athey, S. & Imbens, G. W. (2016). The econometrics of randomized experiments. In the *Handbook of Economic Field Experiments*, 73–140.
- Baker, L. (2003) The role of parents in motivating struggling readers. *Reading & Writing Quarterly*, 19, 87-106, DOI: 10.1080/10573560308207
- Berkman, N. D., Sheridan, S. L., Donahue, K. E., Halpern, D. J., & Crotty, K. (2011). Low health literacy and health outcomes: an updated systematic review. *Annals of Internal Medicine*, 155(2), 97-107.
- Bronfenbrenner, U. (1979). *The Ecology of Human Development: Experiments by Nature and Design*. Cambridge, MA: Harvard University Press.
- Bryan, J. (2005). Fostering educational resilience and achievement in urban schools through school-family-community partnerships. *Professional School Counseling*, 8(3), 219.
- Cunningham, P. M., Hall, D. P., & Defee, M. (1998). Nonability-grouped, multilevel instruction: Eight years later. *Reading Teacher*, 51, 652-664.
- D’Agostino, J. V., & Murphy, J. A. (2004). A meta-analysis of Reading Recovery in United States schools. *Educational Evaluation and Policy Analysis*, 26(1), 23-28.
- D’Agostino, J. V., & Harmey, S. J. (2016). An international meta-analysis of Reading Recovery. *Journal of Education for Students Placed at Risk*, 21(1), 29-46.
- Dearing, E., Kreider, H., Simpkins, S., & Weiss, H. B. (2006). Family involvement in school and low-income children’s literacy: Longitudinal associations between and within families. *Journal of Educational Psychology*, 98(4), 653.
- DeWalt, D. A., Berkman, N. D., Sheridan, S., Lohr, K. N., & Pignone, M. P. (2004). Literacy and health outcomes. *Journal of General Internal Medicine*, 19(12), 1228-1239.

DIBELS. (2021). *What are DIBELS?*

<https://dibels.uoregon.edu/assessment/dibels#:~:text=The%20Dynamic%20Indicators%20of%20>

Epstein, J. L. (2001). *School, Family, and Community Partnerships: Preparing Educators and Improving Schools*. Boulder, CO: Westview Press.

Hernandez, D. (2012). *Double Jeopardy: How Third-grade Reading Skills and Poverty Influence High-School Graduation*. Baltimore, MD: Annie E. Casey Foundation.

Gershenson, S., Holt, S. B., & Papageorge, N. W. (2016). Who believes in me? The effect of student–teacher demographic match on teacher expectations. *Economics of Education Review*, 52, 209-224

Gershenson, S. & Papageorge, N. W. (2018). The power of teacher expectations: How racial bias hinders student attainment. *Education Next*, 18, 64-70.

Gilliam, W. (2005, May). *Prekindergartners Left Behind: Expulsion Rates in State Prekindergarten Systems*. Foundation for Child Development Policy Brief. Retrieved online at: <https://www.fcd-us.org/prekindergartners-left-behind-expulsion-rates-in-state-prekindergarten-programs/>

Gonzalez, N., Moll, L., and Amanti, C. (2005). *Funds of Knowledge: Theorizing Practices in Households, Communities, and Classrooms*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Graham-Clay S. (2005). Communicating with parents: Strategies for teachers. *School Community Journal*, 15, 117-129.

- Inns, A., Lake, C., Pellegrini, M., & Slavin, R. (2018). *A synthesis of quantitative research on programs for struggling readers in elementary schools*. Available at www.bestevidence.org. Manuscript submitted for publication
- Invernizzi, M., Swank, L., Juel, C., & Meier, J. (2003). *Phonological Awareness Literacy Screening-Kindergarten*. Charlottesville, VA: University Printing.
- Invernizzi, M., Justice, L., Landrum, T. J., & Booker, K. (2004). Early literacy screening in kindergarten: Widespread implementation in Virginia. *Journal of Literacy Research*, 36(4), 479-500.
- Invernizzi, M., Juel, C., Swank, L., & Meier, J. (2015). *Phonological Awareness Literacy Screening*. Charlottesville, VA: University of Virginia.
- Jones, C. J. (2018). SPARK Early literacy: Testing the impact of a family-school-community partnership literacy intervention. *School Community Journal*, 28, 247–264.
- Jones, C. J. & Christian, M. (2021). The results of a randomized control trial evaluation of the SPARK literacy program: An Innovative approach that pairs one-on-one tutoring with family engagement. *Journal of Education for Students Placed at Risk (JESPAR)*, 26(3), 185-209. <https://doi.org/10.1080/10824669.2020.1809419>
- Jones, C. J., Johnson, T., Bowser, J., Price, C., Litschwartz, S., & Pyatigorsky, M. (2023). *Implementation and Impact Results from the First Year of the EIR-Funded Expansion of the Future Forward Literacy Program*.
- Jones, C. J. & Li, D. (2023). *Testing the Impact and Scalability of the EIR-funded Expansion of the Future Forward Literacy Program*.
- Jones, C. J., Reeves, M. & Li, D. (2023). The 2020-21 Future Forward Literacy Program: Implementation and impact during the COVID-19 pandemic. *School Community Journal*.

- Jones, C. J., Reeves, M., Li, D., & Gilman, L. (2023). What is the sustained impact of Future Forward on reading achievement, attendance, and special education placement five years after participation? *Educational Evaluation and Policy Analysis*. DOI: 10.3102/01623737231182629
- Keesey, S., Konrad, M., & Joseph, L. (2014). Word boxes improve phonemic awareness, letter-sound correspondences, and spelling skills of at-risk kindergartners. *Remedial and Special Education, 36*, 167-180.
- Koonce D. and Harper W. Jr. (2005). Engaging African American parents in the schools: A community-based consultation model. *Journal of Educational and Psychological Consultation, 16*, 55-74.
- Lawrence-Lightfoot, S. (2004). Building bridges from school to home. *Instructor, 114*(1), 24-28.
- Li, G. (2010). Social class, culture and “good parenting”: Voices of low-SES families. In Miller-Marsh, M. and Turner-Vorbeck, T. (Eds). *(Mis)Understanding Families: Learning from Real Families in Our Schools* (pp.162-178). New York, NY: Teachers College Press.
- Lin, Q. (2003). *Parent Involvement and Early Literacy*. Harvard Family Research Project.
- Lindle, J. C. (1989). What do parents want from principals and teachers? *Educational Leadership, 47*(2), 12-14.
- Lindo, E. J., Weiser, B., Cheatham, J. P., & Allor, J. H. (2018). Benefits of structured after-school literacy tutoring by university students for struggling elementary readers. *Reading & Writing Quarterly, 34*(2), 117-131.
- Little, P. M. (2009). *Supporting Student Outcomes through Expanded Learning Opportunities*. Harvard Family Research Project. Retrieved from: <http://www.hfrp.org/out-of-school-time/publications-resources/supporting-student-outcomes-through-expanded-learning->

opportunities

- Lopez, G. R. & Stoelting, K. (2010). Disarticulating parent involvement in Latino-impacted schools in the Midwest. In Miller-Marsh, M. and Turner-Vorbeck, T. (Eds). *(Mis)Understanding Families: Learning from Real Families in our Schools* (pp.19-36). New York, NY: Teachers College Press.
- Mehta, N. K., Lee, H., & Ylitalo, K. R. (2013). Child health in the United States: recent trends in racial/ethnic disparities. *Social Science & Medicine*, 95, 6-15.
- McGeown, S. P., Johnston, R. S., Walker, Jo, Howatson, K., Stockburn, A., & Dufton, P. (2015). The relationship between young children's enjoyment of learning to read, reading attitudes, confidence and attainment. *Educational Research*, 57, 389-402, DOI: 10.1080/00131881.2015.1091234
- Morgan, K. L. & Rubin, D. B. (2012). Rerandomization to improve covariate balance in experiments. *The Annals of Statistics*, 40(2), 1263-1282.
- Nieto, S. (2012). Honoring the lives of all children: Identity, culture, and language. In B. Falk (ed.) *Defending Childhood: Keeping the Promise of Early Education* (pp. 48-62). New York, NY: Teachers College Press.
- Puma, M. J., Olsen, R. B., Bell, S. H., & Price. C. (2009). *What to do When Data are Missing in Group Randomized Controlled Trials* (NCEE 2009-0049). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. <https://files.eric.ed.gov/fulltext/ED511781.pdf>
- Rabiner, D. L., Godwin, J., & Dodge, K. A. (2016). Predicting academic achievement and attainment: The contribution of early academic skills, attention difficulties, and social competence. *School Psychology Review*, 45(2), 250-267.

Renaissance Learning. (2021). *Star Assessments™ for Early Literacy Technical Manual*.

<https://help.renaissance.com/US/PDF/SEL/SELRPTechnicalManual.pdf>

Sheldon, S. B. & Epstein, J. L. (2004). Getting students to school: Using family and community involvement to reduce chronic absenteeism. *School Community Journal* 14, 39.

Shretha, P., Tracy, T., Mazal, M., Blakeney, A., Kennedy, N., & May, H. (2022). *Cost-Effectiveness of Reading Recovery and Alternate Interventions Under the Investing in Innovation Fund (i3) Scale-Up*. Paper presented at the annual meeting of the American Education Research Association.

Sudano, J. J., & Baker, D. W. (2006). Explaining US racial/ethnic disparities in health declines and mortality in late middle age: the roles of socioeconomic status, health behaviors, and health insurance. *Social science & medicine*, 62(4), 909-922.

University of Oregon. (2018). *Understanding the Research Behind DIBELS® 8th Edition* (Technical Report 1801). Eugene, OR: Author.

https://dibels.uoregon.edu/sites/dibels1.uoregon.edu/files/DIBELS8thEdition_TechRpt1801_ResearchBrief.pdf

University of Oregon. (2018-2020). *8th Edition of Dynamic Indicators of Basic Early Literacy Skills (DIBELS®): Technical Manual*. Eugene, OR: University of Oregon. Available: <https://dibels.uoregon.edu>

U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics (2022). Reading Performance - NCES. Retrieved from: https://nces.ed.gov/programs/coe/pdf/coe_cnb.pdf

Vaknin-Nusbaum, V., Nevo, E., Brande, S., & Gambrell, L. (2017). Developmental aspects of reading motivation and reading achievement among second grade low achievers and

typical readers. *Journal of Research on Reading*, 1(3), 438-454.

<https://doi.org/10.1111/1467-9817.12117>

Wasik, B. A. (1998). Using volunteers as reading tutors: Guidelines for successful practices. *The Reading Teacher*, 51(7), 562-570.

Wasik, B. A. & Jacobi-Vessels, J. (2016). Word play: Scaffolding language development through child-directed play. *Early Childhood Education Journal*. 10.1007/s10643-016-0827-5.

Wiescholek, S., Hilkenmeier, J., Greiner, C., & Buhl, M. (2018). Six-year-olds' perception of home literacy environment and its influence on children's literacy enjoyment, frequency, and early literacy skills. *Reading Psychology*, 39, 41-68. DOI: 10.1080/02702711.2017.1361495

What Works Clearinghouse. (2020). *Standards Handbook, Version 4.1*.

<https://ies.ed.gov/ncee/wwc/Docs/referenceresources/WWC-Standards-Handbook-v4-1-508.pdf>

Figure 1: Future Forward theory of action

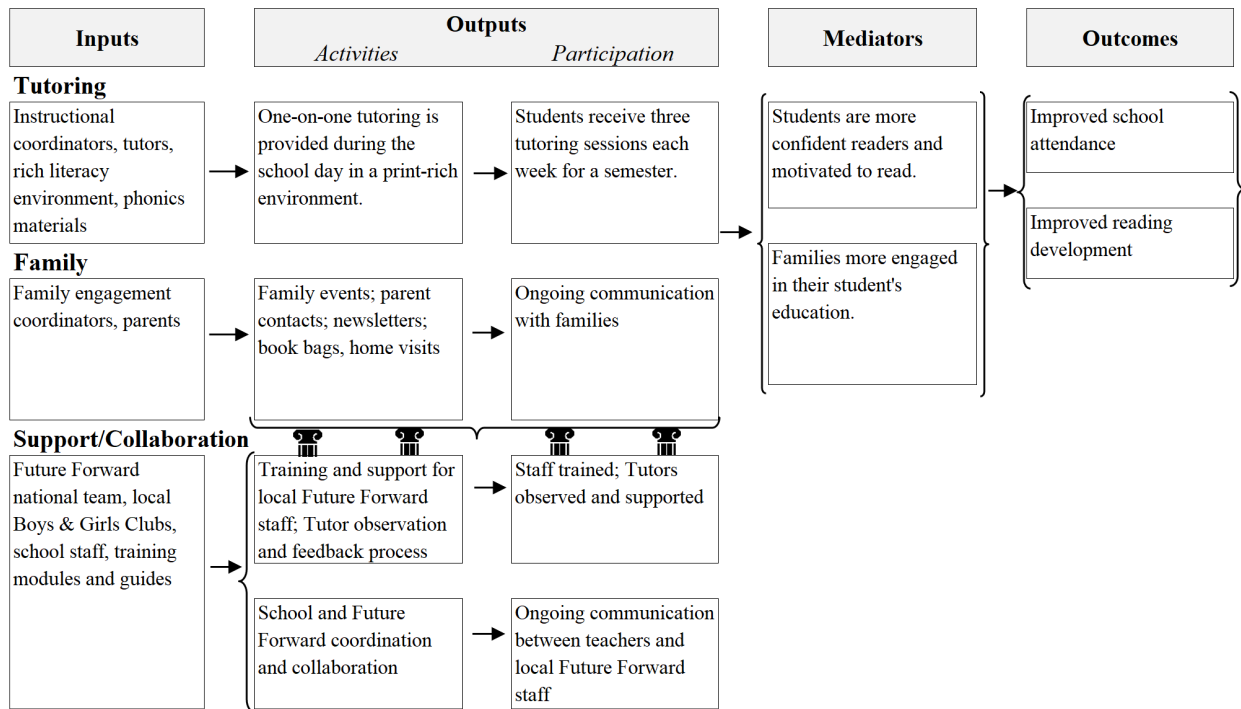


Table 1: Future Forward studies conducted as part of the EIR Mid-Phase grant

Year	Study design	Schools	Outcomes measured	Overall impact estimates	Differential impacts	Reference
2018-19	Pilot regression discontinuity impact study	14	Local measures of reading development	No significant impact ($\beta = 0.264$ standard deviations, $p = 0.103$).	None tested.	Jones et al., 2023
2019-20	Randomized control trial study interrupted by COVID-19; Only able to measure a partial program impact on school attendance	14	School attendance	Statistically significant positive overall impact ($\beta = 1.4\%$, $p = 0.021$).	Black students ($\beta = 2.4\%$, $p = 0.035$), students who started the program with low attendance ($\beta = 2.3\%$, $p = 0.006$), and Black students who started the program with low attendance ($\beta = 3.6\%$, $p = 0.030$).	Jones & Li, submitted for publication
2020-21	Randomized control trial study of a modified online version of Future Forward	9	Star Early Literacy	No significant impact ($\beta = 0.09$ standard deviations, $p = 0.378$).	Black male students reading above benchmark at baseline ($\beta = 0.65$ standard deviations, $p < .001$)	Jones, et al., 2023

Table 2: Study schools

School	Community Type	Reading Proficiency	Percent White	Percent Low-income	Grades of Participating Students
AL school 1	Urban	51%	43%	43%	Grades KG-3
AL school 2	Urban	57%	54%	28%	Grades KG-3
WI school 1	Rural	32%	73%	67%	Grades KG-2

Table 3: Characteristics of study participants

		Assignment Sample			Analytic Sample		
Demographic group		BAU	Future Forward	Total	BAU	Future Forward	Total
Grade Level	KG	20 (32%)	23 (35%)	43 (34%)	20 (34%)	21 (33%)	41 (34%)
	1st	16 (26%)	16 (25%)	32 (25%)	15 (25%)	16 (25%)	31 (25%)
	2nd	19 (31%)	21 (32%)	40 (32%)	17 (29%)	21 (33%)	38(31%)
	3rd	7 (11%)	5 (8%)	12 (9%)	7 (12%)	5 (8%)	12 (10%)
School	AL school 1	20 (32%)	20 (31%)	40 (32%)	19 (32%)	20 (32%)	39 (32%)
	AL school 2	22 (36%)	21 (32%)	43 (34%)	20 (34%)	20 (32%)	40 (33%)
	WI school 1	20 (32%)	24 (37%)	44 (35%)	20 (34%)	23 (37%)	43 (35%)
Race/ Ethnicity	Black	22 (36%)	26 (40%)	48 (38%)	20 (34%)	25 (40%)	45 (37%)
	White	37 (60%)	30 (46%)	67 (53%)	36 (61%)	30 (48%)	66 (54%)
	Other*	3 (5%)	9 (14%)	12 (9%)	3 (5%)	8 (13%)	11 (9%)
Gender	Female	32 (52%)	36 (55%)	68 (54%)	31 (53%)	35 (56%)	66 (54%)
	Male	30 (48%)	29 (45%)	59 (47%)	28 (48%)	28 (44%)	56 (46%)
F/R Lunch	No	8 (13%)	7 (11%)	15 (12%)	8 (14%)	7 (11%)	15 (12%)
	Yes	54 (87%)	58 (89%)	112 (88%)	51 (86%)	56 (89%)	107 (88%)
Total		62	65	127	59	63	122

*Other race/ethnicities included Asian, Latinx, and “other”

Table 4: Unadjusted attendance rates and standardized reading assessment results

Assignment sample					Analytic sample					
Fall (before assignment)					Fall (before assignment)			Winter		
Future					Future			Future		
Measures		BAU	Forward	Total	BAU	Forward	Total	BAU	Forward	Total
Attendance rate	Mean	91.6%	92.8%	92.3%	91.6%	93.0%	92.3%	91.8%	92.8%	92.3%
	SD	9.9%	9.0%	9.4%	10.0%	9.0%	9.5%	6.6%	9.0%	7.3%
	n	61	64	125	59	63	122	59	63	122
Local reading assessments (DIBELS and PALS)	Mean	-0.17	0.17	0.00	-0.16	0.21	0.03			
	SD	0.83	1.07	0.97	0.83	1.08	0.98			
	n	59	64	123	59	63	122			
*DIBELS in Alabama	Mean				-0.19	0.19	0.01	-0.22	0.21	0.00
	SD				0.82	1.10	1.00	0.90	1.05	1.00
	n				38	40	78	38	40	78
Star Early Literacy	Mean	-0.01	0.06	0.02	-0.01	0.08	0.04	-0.15	0.14	0.00
	SD	0.83	1.08	0.98	0.95	1.03	0.99	0.96	1.02	1.00
	n	62	65	127	59	63	122	59	62	121

Notes:

DIBELS, PALS and Star results were standardized within grade levels for each administration;

* DIBELS is the winter local reading assessment that was only available as an outcome in the two Alabama schools;

Table 5: Future Forward tutor characteristics

School	Tutors	White	Other Race	Female	College Graduate	Has Teaching Experience	Students Served per Tutor
AL school 1	4	4	0	4	2	0	5
AL school 2	4	4	0	4	4	3	4-6
WI school 1	8	7	1	8	6	4	1-5

Table 6: Future Forward implementation

Tutoring				Family Engagement				
School	Average Total Sessions (<i>SD</i>)	Average Sessions Per Week (<i>SD</i>)	Students Receiving 2+ Sessions Per Week (%)	Average total contacts (<i>SD</i>)	Average contacts per month (<i>SD</i>)	Families contacted 2+ times each month (%)	Families contacted 1+ times each month (%)	
AL school 1	20.3 (5.1)	2.2 (0.6)	18 (90.0%)	7.4 (6.5)	1.9 (1.6)	9 (45%)	12 (60%)	20
AL school 2	22.9 (1.5)	2.5 (0.2)	20 (100%)	7.6 (4.3)	1.9 (1.1)	9 (45%)	17 (85%)	20
WI school 1	32.3 (3.6)	3.0 (0.3)	23 (100%)	4.1 (2.9)	1.0 (0.7)	4 (17%)	12 (52%)	23
Overall	25.5 (6.4)	2.6 (0.5)	61 (96.8%)	6.2 (4.9)	1.6 (1.2)	22 (35%)	41 (65%)	63

Table 7: Impact estimates of Future Forward

Measures	<i>Robust</i>			
	β	<i>SE</i>	<i>p</i>	<i>n</i>
School attendance rate	0.23	1.06	0.845	121
School attendance rate – Baseline model	0.68	1.28	0.596	121
Star Early Literacy	0.30	0.10	0.003	120
Star Early Literacy – Baseline model	0.40	0.15	0.007	120
DIBELS*	0.31	0.10	0.002	78
DIBELS* – Baseline model	0.45	0.17	0.007	78

Notes:

DIBELS and Star impacts are standardized; Attendance metric is attendance rate percentage presented as a whole number (attendance rate * 100);

* DIBELS is the winter local reading assessment that was only available as an outcome in the two Alabama schools;

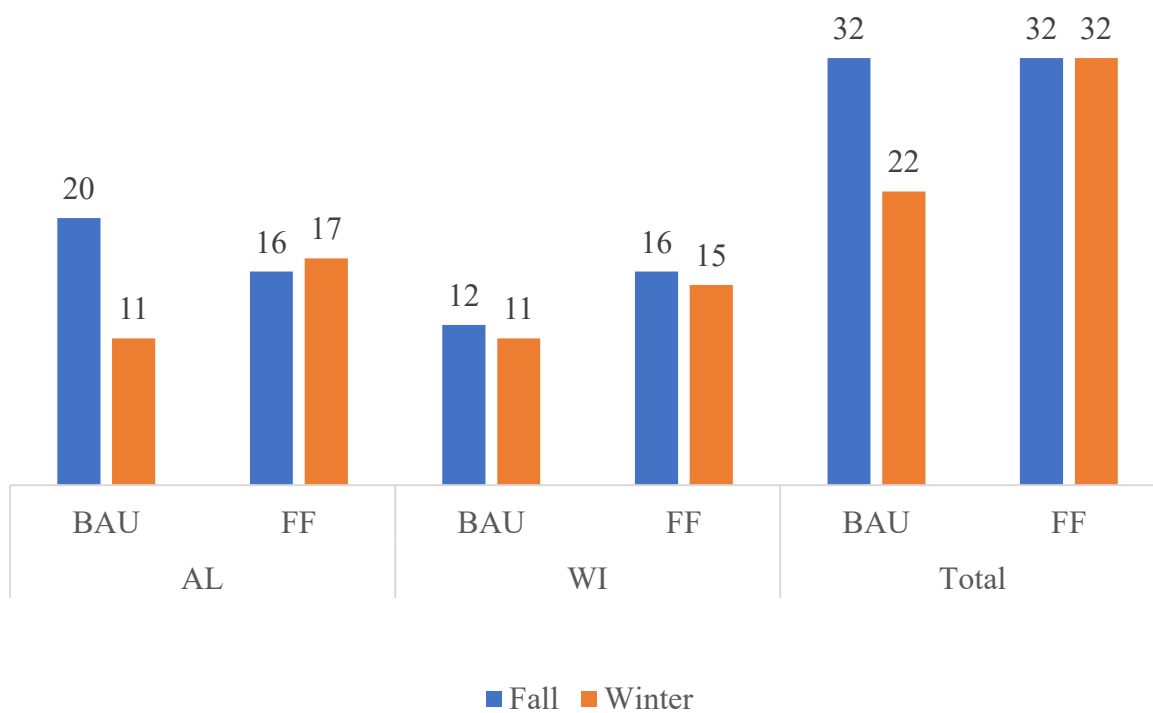
Table 8: Differential impact estimates of Future Forward on...

Measures of reading	β	<i>Robust SE</i>	<i>p</i>	<i>n</i>
Star Early Literacy				
White students	0.05	0.17	0.773	65
White students – Baseline model	0.05	0.16	0.756	65
Students of color	0.60	0.14	< 0.001	55
Students of color – Baseline model	0.83	0.21	< 0.001	55
WI students	-0.21	0.12	0.086	43
WI students – Baseline model	-0.10	0.15	0.516	43
AL Students	0.48	0.12	< 0.001	77
AL Students – Baseline model	0.64	0.19	0.001	77
DIBELS*				
White students	-0.06	0.16	0.712	28
White students – Baseline model	0.17	0.17	0.318	28
Students of color	0.59	0.17	0.001	50
Students of color – Baseline model	0.82	0.24	0.001	50

Notes:

DIBELS and Star results are standardized; Attendance impact is in attendance rate;

* DIBELS is the winter local reading assessment that was only available as an outcome in the two Alabama schools;

Figure 2: Number of students *frequently* showing an interest in reading books by state.

Appendix A

Figure 1: Scatterplot of pre and post Star Early Literacy scores

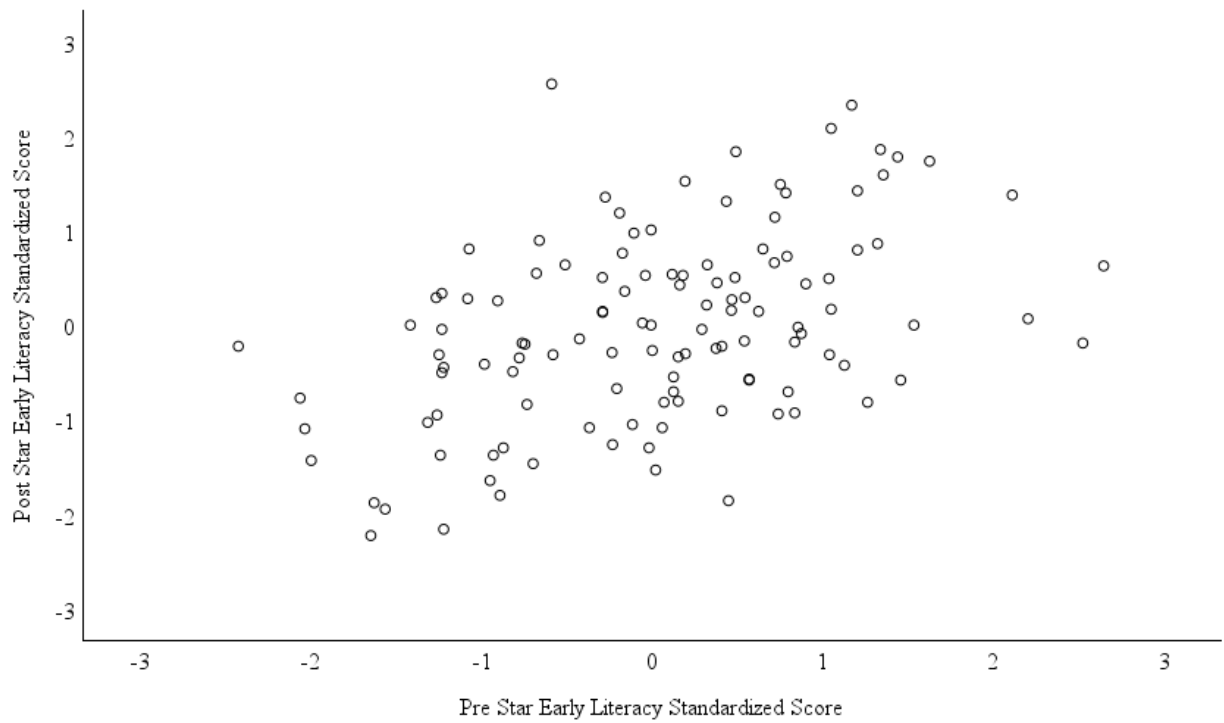


Figure 2: Scatterplot of pre and post DIBELS scores

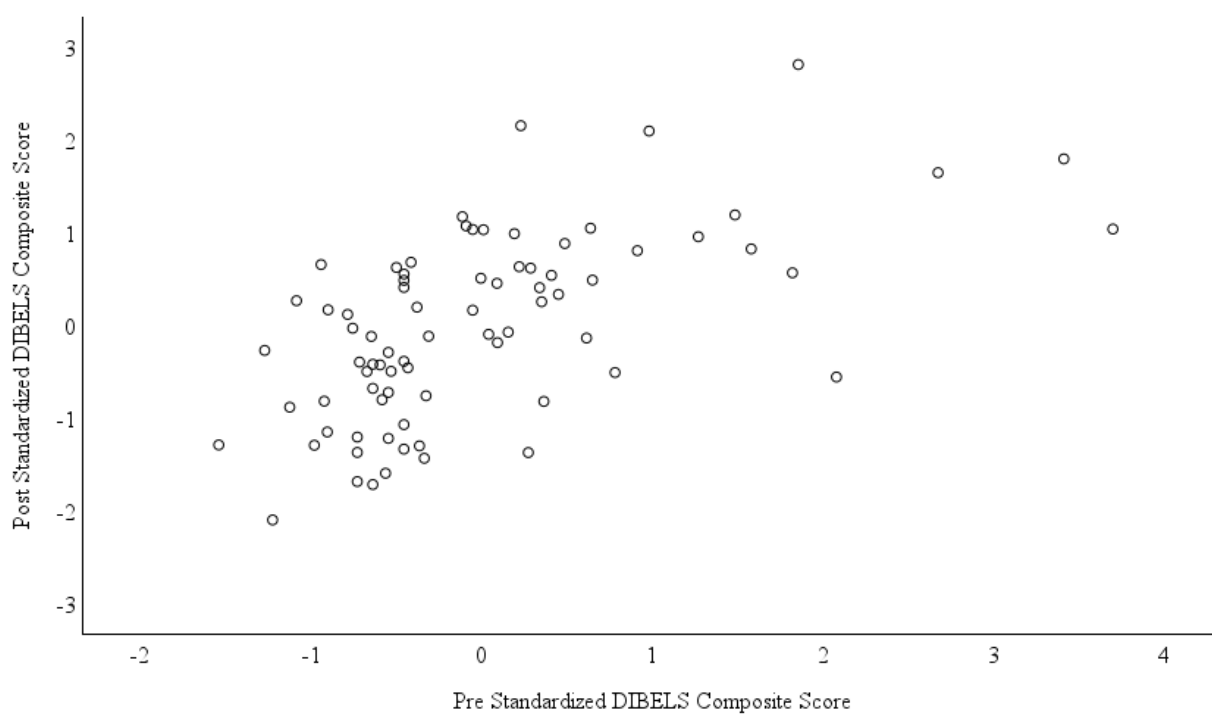
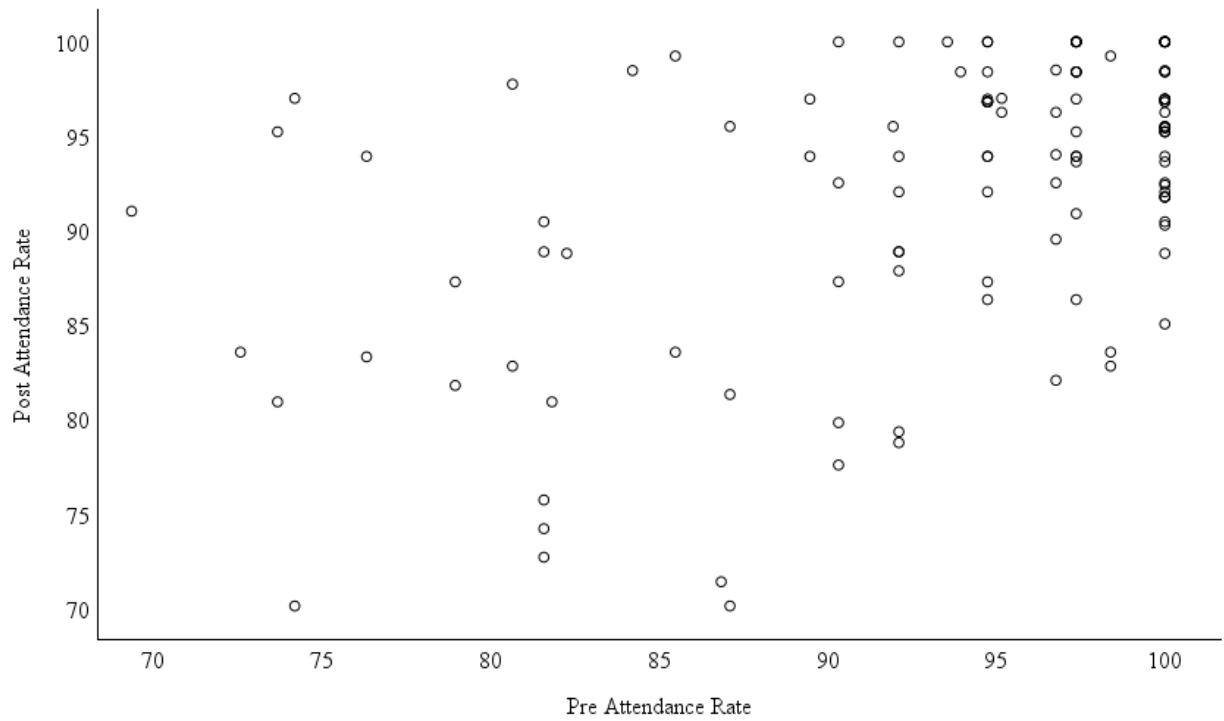


Figure 3: Scatterplot of pre and post assignment school attendance rates



Appendix B

Table 1: Full model results predicting school attendance rates and reading outcomes

	β	<i>Robust</i> SE	Z	p
Attendance				
Future Forward Participant	0.23	1.06	0.22	0.845
Female students	1.03	1.45	0.71	0.475
Black students	-3.30	1.68	-1.96	0.050
White students	1.67	1.54	1.09	0.277
Eligible for free/reduced lunch	-1.87	2.53	-0.74	0.460
Baseline attendance rate	0.47	0.11	4.45	<.001
Baseline Star Early Literacy	0.64	0.93	0.69	0.507
Baseline local reading assessment (PALS/DIBELS)	0.21	0.66	0.34	0.490
Star Early Literacy				
Future Forward Participant	0.30	0.10	2.91	0.004
Female students	-0.39	0.12	-3.24	0.001
Black students	-0.24	0.15	-1.59	0.111
White students	-0.06	0.16	-0.40	0.692
Eligible for free/reduced lunch	0.32	0.20	1.56	0.120
Baseline attendance rate	0.00	0.01	0.40	0.686
Baseline Star Early Literacy	0.27	0.08	3.44	0.001
Baseline local reading assessment (PALS/DIBELS)	0.14	0.08	1.93	0.054
DIBELS				
Future Forward Participant	0.31	0.10	3.07	0.002
Female students	-0.14	0.14	-1.06	0.287
Black students	-0.32	0.33	-0.98	0.328
White students	-0.21	0.31	-0.67	0.502
Baseline attendance rate	0.00	0.01	0.25	0.806
Baseline Star Early Literacy	0.07	0.11	0.71	0.480
Baseline DIBELS	0.33	0.11	3.10	0.002

Star and local reading assessment (PALS/DIBELS) scores are standardized within grade level and administration; Free/reduced price lunch eligibility omitted from DIBELS model because all Alabama students were eligible.

Table 2: Differential effects model results predicting Star Early Literacy

	<i>Robust</i>			
	β	<i>SE</i>	<i>Z</i>	<i>p</i>
Student of color				
Future Forward participant	0.60	0.14	4.29	<.001
Female students	-0.55	0.22	-2.52	0.012
Eligible for free/reduced lunch	-0.92	0.20	-4.56	<.001
Baseline attendance rate	0.01	0.01	1.01	0.315
Baseline Star Early Literacy	0.10	0.08	1.34	0.180
Baseline local reading assessment (PALS/DIBELS)	0.23	0.10	2.28	0.023
White students				
Future Forward participant	0.05	0.17	0.29	0.773
Female students	-0.19	0.16	-1.21	0.226
Eligible for free/reduced lunch	0.33	0.20	1.61	0.107
Baseline attendance rate	0.02	0.01	1.58	0.115
Baseline Star Early Literacy	0.28	0.11	2.71	0.007
Baseline local reading assessment (PALS/DIBELS)	0.06	0.13	0.47	0.639
Students in Alabama				
Future Forward participant	0.48	0.12	4.04	<.001
Female students	-0.36	0.18	-2.00	0.045
Black students	-0.12	0.18	-0.68	0.494
White students	-0.03	0.23	-0.13	0.899
Baseline attendance rate	0.01	0.01	1.47	0.141
Baseline Star Early Literacy	0.24	0.10	2.36	0.018
Baseline DIBELS	0.24	0.08	3.03	0.002
Students in Wisconsin				
Future Forward participant	-0.21	0.12	-1.72	0.086
Female students	-0.11	0.19	-0.57	0.569
Black students	-0.13	0.28	-0.46	0.646
White students	0.11	0.12	0.87	0.383
Eligible for free/reduced lunch	0.35	0.18	1.93	0.054
Baseline attendance rate	0.03	0.01	3.16	0.002
Baseline Star Early Literacy	0.23	0.08	2.94	0.003
Baseline PALS	0.05	0.1	0.51	0.608

Star and local reading assessment (PALS/DIBELS) scores are standardized within grade level and administration; Free/reduced price lunch eligibility omitted from Alabama model because all Alabama students were eligible.

Table 3: Differential effects model results predicting DIBELS in Alabama

	<i>Robust</i>			
	β	<i>SE</i>	<i>Z</i>	<i>p</i>
Students of color				
Future Forward	0.59	0.17	3.43	0.001
Female students	-0.07	0.35	-0.21	0.831
Baseline attendance rate	0.01	0.02	0.50	0.617
Baseline Star score	0.05	0.21	0.23	0.820
Baseline DIBELS	0.45	0.14	3.10	0.002
White students				
Future Forward	-0.06	0.16	-0.35	0.712
Female students	0.24	0.29	0.82	0.413
Baseline attendance rate	0.02	0.01	1.79	0.073
Baseline Star score	0.05	0.19	0.27	0.784
Baseline DIBELS	0.99	0.09	11.30	< .001

Star and DIBELS scores are standardized within grade level and administration; Free/reduced price lunch eligibility omitted from models because all Alabama students were eligible.