

Efficacy Study of the Impact of Concentric Educational Solutions' Home Visit and Tutoring Programs on Students' Chronic Absenteeism, Academic Performance, and Behavior

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EXECUTIVE SUMMARY:

Efficacy Study of the Impact of Concentric Educational Solutions' Home Visit and Tutoring Programs on Students' Chronic Absenteeism, Academic Performance, and Behavior

The purpose of the present study was to evaluate the efficacy of Concentric Educational Solutions' (CES) home visit and tutoring programs in the 2021-22 school year for improving Baltimore City Public Schools students' chronic absenteeism, academic performance, and behavior. As described by CES, the home visit framework was intended to identify barriers that influence a student's willingness and ability to engage fully in school. The purpose of the tutoring and mentoring program was to support students with academic and attendance challenges by improving their academic performance and strengthening their confidence and learning skills.

This quasi-experimental mixed methods study analyzed quantitative data to examine the relationship between participation in CES's home visit and tutoring programs and academic performance, attendance, and behavior, comparing the outcomes for students participating in these programs and similar students not participating in the programs. In addition, the study examined survey data collected by CES about participating students' experiences and perceptions of the program. CRRE also conducted interviews with participating students, CES staff performing home visits and/or tutoring, and school and district administrators with knowledge of CES. The study examined data from the 2021-22 school year, including data provided by CES about students' participation in their programs; data provided by Baltimore City Public Schools (BCPS) about CES participants' and comparison students' academic performance, attendance, and behavior; student survey data provided by CES; and interview data.

Home Visit Framework

The CES participation data indicated that out of a total of 16,716 reported home visits among the 10,447 students with home visit data, the most common home visit contact type was for a CES Professional Student Advocate (PSA) to leave a letter at the door of a student's home (55.7%), followed by a CES staff member speaking to a parent or guardian (10.9%), and a PSA finding that the address provided was incorrect (6.5%). Only 3.8% of PSA home visits resulted in a CES PSA speaking with a student directly. Across all students receiving home visits, the average number of total PSA contacts was slightly more than 1.5 contacts per student.

Regression analyses showed that students receiving home visits gained slightly less in mathematics and reading than did propensity-matched comparison students, but these differences did not reach statistical significance. In subgroup analyses, significant

negative program impacts were observed in Grades 1 through 4 and for special education when examining i-Ready mathematics scores. By contrast, a significant positive impact was observed in Kindergarten when examining DIBELS scores. No other statistically significant subgroup impacts were observed. While comparison students outgained students receiving home visits on some measures, this should not necessarily be taken as an indication that home visits had a negative impact on participants. Students were selected to receive home visits because their high absence rates left them at risk of falling behind, and as discussed below, available data did not support matching treatment and comparison students on prior-year attendance. Thus, it may be that students receiving home visits were at greater risk of academic underperformance than comparison students, even after controlling for past academic performance and demographic factors.

When the impact of counts of various contact types was examined, PSAs speaking with students was positively associated with i-Ready Reading achievement gains, with each contact with a student associated with a nearly 8-point i-Ready Reading score gain; this association approached statistical significance ($p = .072$). There was also a positive, though nonsignificant, association between the PSA speaking with the student and mathematics i-Ready gains.

Students participating in the home visit framework missed considerably larger proportions of school days than did comparison students. However, without having any prior-year attendance data to compare to, this finding is of limited import since the large counts of absent days for home visit students may be capturing the very chronic absences that caused the student to be placed in the home visit program.

As discussed below, pre-intervention suspension data were not available and there were limitations in the 2021-22 suspension data, limiting the ability to draw inferences about the relationship between CES's home visit and tutoring programs and student behavior.

Tutoring and Mentoring Program

The CES participation data indicated that students participating in the tutoring and mentoring program averaged a total of slightly less than 34 total tutoring sessions, with students attending an average of nearly 23 sessions and being absent from an average of nearly 11 sessions.

Tutoring participants outgained comparison students by more than 3 points on the i-Ready mathematics assessment, and by more than 5 points on the i-Ready reading assessment, with the mathematics difference approaching statistical significance ($p = .079$). Tutoring students did not show achievement gains on the DIBELS assessment in relation to comparison students, with comparison students slightly outgaining tutoring participants by approximately 1.5 points, although this

difference was not statistically significant. Subgroup analyses showed that Grade 6 tutoring participants significantly outscored comparison students by over 17 points on the i-Ready mathematics assessment. No other statistically significant tutoring impacts were observed across subgroup on any of the three achievement outcomes.

When the number of tutoring sessions students attended was examined, there were directionally but not significantly positive associations between tutoring attendance measures and achievement gains in mathematics and reading.

Tutoring participants were absent for approximately 6% more days than were comparison students; however, as noted above, students were selected for tutoring because of their academic and attendance challenges, and the lack of prior-year attendance data limits the ability to make conclusions about the impact of CES tutoring on their attendance.

Perceptions of the Experience and Impact of CES's Home Visit Framework and Tutoring and Mentoring Program

Survey and interview data suggested that overall, students participating in CES's home visit framework or tutoring program, CES staff performing home visits and tutoring, and administrators were satisfied with CES's programs. Positive relationships between CES staff and students were a frequently mentioned strength.

Conclusion

The key results and conclusions of this evaluation are as follows:

- Tutoring participants outgained comparison students on the i-Ready mathematics and reading assessments. Specifically, tutoring participants outgained comparison students by more than 3 points in mathematics and by more than 5 points in reading. In the overall sample, these differences approached, but did not reach, statistical significance.
- Grade 6 tutoring participants significantly outscored comparison students by over 17 points on the i-Ready mathematics assessment. No other statistically significant tutoring impacts were observed across subgroups on any of the three achievement outcomes.
- Tutoring participants averaged approximately 23 tutoring sessions attended, out of approximately 34 total tutoring sessions scheduled. Average tutoring session attendance was approximately 68%.
- Students receiving home visits were outgained by comparison students on both i-Ready assessments. Comparison students outgained students receiving home visits by 3-to-4 points, on average. Students receiving home visits slightly

outgained comparison students on the DIBELS assessment by 0.6 points. These differences did not approach statistical significance. Furthermore, it should be noted that students were selected to receive home visits because of their comparatively high absence rates. While comparison students were matched to treatment students based on past performance and demographic factors, prior-year attendance data were not available, so it was not possible to select comparison students with attendance patterns similar to those of students receiving home visits, which limits the ability to draw conclusions about the impact of home visits.

- The most common home visit contact type was a PSA leaving a letter (58% of total contacts). PSAs spoke with a student in about 4% of total contacts, reaching slightly less than 6% of total students. PSAs averaged 1.6 total contacts per home visit recipient.
- In surveys and interviews, students indicated an overall favorable perception of tutoring and a belief that it was benefiting them at school.
- CES staff and BCPS school and district administrators interviewed generally reported that they believed CES's services were valuable and impactful.

Efficacy Study of the Impact of Concentric Educational Solutions' Home Visit and Tutoring Programs on Students' Chronic Absenteeism, Academic Performance, and Behavior

The Center for Research and Reform in Education (CRRE) is a research center affiliated with the School of Education at Johns Hopkins University (JHU) specializing in K-12 education program evaluations. In 2021, Concentric Educational Solutions (CES) contracted with CRRE to conduct several efficacy studies of their work in Baltimore City Public Schools (BCPS), including their C9 Program during the 2019-20 school year and their home visit framework and tutoring and mentoring program during the 2021-22 school year. This report focuses on the studies of the home visit framework and the tutoring and mentoring program in the 2021-22 school year.

According to its website, CES's mission is "to support students, families, and schools by identifying barriers that negatively impact education and provide resources and services to improve student outcomes." Its services include home visits, mentoring and tutoring, professional development, and technical assistance.

Home Visit Framework

As described by CES, their home visit framework was intended to increase participating schools' capacity to re-engage students who had many absences. CES's website identifies the following objectives for the program:

- Promote daily attendance in students
- Increase parent engagement and empowerment
- Reduce number of in-school and out-of-school suspensions
- Improve academic success
- Create seamless transitions back into school

For each school participating in the home visit framework, a school administrator worked with their CES point of contact to consider students identified as Tier 2 (missing between 10% and 20% of days) or Tier 3 (missing 20% of days or more) and select those who would benefit from home visits by CES. After discussing relevant information about the students selected for home visits, CES staff made visits to the students' homes. Visits were intended to create a supportive connection between home and school and to identify and address any barriers that were preventing students from attending school more regularly. CES's home visitors (also known as Professional Student Advocates, or PSAs) sought to talk with the student or parent/guardian when possible. When this was not possible, the home visitor talked with another family member or a family friend if available, left a letter or packet for the student and parent/guardian, or noted barriers toward making a visit such as having an inaccurate

or incomplete address (e.g., no apartment number given, address does not exist, vacant property). After the visit, the CES and the school's attendance core team debriefed the visits so that the school could make any necessary plans for addressing any barriers that had been identified and re-engaging the students.

Tutoring and Mentoring Program

According to CES, their tutoring and mentoring program was intended to strengthen students' academic performance and build their confidence and learning skills. CES's website identifies the following objectives for the program:

- Improve academic performance in core classes
- Enhance social-emotional competencies
- Improve attendance
- Improve attitudes towards school
- Reduce the number of in-school and out-of-school suspensions

As described by CES, the program was intended as a high-dosage, small-group tutoring program focused primarily on grade-level content in English Language Arts (ELA) and mathematics and using ESSA-approved tutoring curricula. The design called for students to receive hour-long tutoring in small groups (1:4 tutor-to-student ratio) four times per week. According to CES, in the 2021-22 school year, tutoring began in November. Administrators of schools participating in the tutoring and mentoring program worked with CES to customize the program to meet their needs, including to determine whether tutoring would happen during an intervention block, after school, or in a push-in format. CES further explained that student progress monitoring and biweekly meetings with school administrators were conducted as part of their work. CES noted that they also provided wrap-around support that could include home visits, parent phone calls, check-ins with students, or classroom observation.

We report on the results of an evaluation of the efficacy of the home visit framework and the tutoring and mentoring program for improving students' academic, attendance and behavior outcomes in participating BCPS schools during the 2021-22 school year.

Research questions addressed by the study are:

1. How does the **attendance** compare for students participating in the **home visit framework**, students participating in the **tutoring and mentoring program**, and similar students not participating?
2. How does the **behavior** compare for students participating in the **home visit framework**, students participating in the **tutoring and mentoring program**, and similar students not participating?

3. How does the **academic performance** compare for students participating in the **home visit framework**, students participating in the **tutoring and mentoring** program, and similar students not participating?
4. What are the experiences and perceptions about CES's programs, including the **home visit framework** and/or the **tutoring and mentoring** program held by
 - a. participating **students**
 - b. **CES staff performing home visits and/or tutoring**, and
 - c. **school and district administrators?**

Method

Research Design

This study analyzed extant ELA and mathematics achievement data, along with attendance and behavioral data, which was provided by Baltimore City Public Schools. Specifically, i-Ready Diagnostic assessment scores in reading and mathematics were examined as progress monitoring achievement data, while measures of days absent and percentages of days present were used as attendance outcomes, and suspension counts were used as behavioral outcomes. In addition, CES provided CRRE with counts of home visit contact types and tutoring session attendance data. Achievement, attendance, behavioral, and program participation data were all analyzed descriptively to examine general trends. In addition, a quasi-experimental design (QED) was used to compare CES impacts on achievement and attendance outcomes, with multiple regression used to conduct these contrasts.

As a complement to the quantitative analyses of student outcomes, stakeholder perceptions of CES's home visit framework and tutoring and mentoring program were analyzed. CES provided CRRE with some survey data from its annual survey of participants in the tutoring and mentoring program. In addition, interviews were conducted with five students, six CES staff members engaged in home visits and/or tutoring, and five school or district administrators. The distribution of responses to Likert-type survey items was examined, and thematic analysis of open-ended survey responses and interview transcripts or notes was conducted.

Participants

BCPS is a large urban school district of approximately 78,000 students located in the City of Baltimore, Maryland. According to the National Center for Education Statistics (<https://nces.ed.gov/>), BCPS is comprised largely of Black and White students (62% and 27%, respectively), with small percentages of Hispanic and Asian students. According to the Maryland Department of Education, 62.1% of BCPS students are economically disadvantaged. CES's home visit and tutoring programs served selected students from specific BCPS elementary, middle, and high schools during the 2021-22

school year. Home visits were conducted for selected students in Kindergarten through 12, while tutoring sessions were conducted for selected students in Grades 3 through 12.

CES provided an initial roster of 10,524 students who received home visits and 777 students who received tutoring. When CES participation data and BCPS student outcome data were matched, the resulting initial analytic sample consisted of 9,575 treatment students and 14,338 comparison students in the home visit analyses, and 763 treatment and 13,961 comparison students in the tutoring analyses. However, because of large amounts of missing achievement data for both treatment and comparison students, we also display demographics of treatment students with non-missing i-Ready scores. As described below, treatment students with non-missing i-Ready scores were propensity-matched to comparison students with non-missing i-Ready scores, and we display demographics of propensity-matched comparison students as well in the tables below. Demographics for home visit analyses are shown in Table 1, and demographics for tutoring analyses are shown in Table 2.

Table 1
Student characteristics of analytic sample, home visit study

Group	Treatment (All)	Treatment (with i-Ready)	Comparison (All)	Matched Comparison ¹
% Black	83.35	87.39	80.57	81.06
% White	2.80	1.65	4.50	4.24
% Hispanic	12.96	9.90	13.32	13.29
% Female	44.63	44.04	46.77	45.43
% Male	55.37	55.96	53.19	54.55
% Economically Dis.	72.72	75.66	68.04	69.92
% Special Education	24.42	23.28	21.56	22.23
% ELLs	11.48	8.34	12.73	12.83
<i>N</i>	9,575	3,213	14,344	4,319

¹Includes students matched to a treatment student for mathematics and/or reading.

Table 2
Student characteristics of analytic sample, tutoring study

Group	Treatment (All)	Treatment (with i-Ready)	Comparison (All)	Matched Comparison ¹
% Black	83.49	86.16	80.62	78.32
% White	3.67	2.53	4.46	3.83
% Hispanic	12.19	10.33	13.25	16.65
% Female	40.76	41.52	46.85	41.80
% Male	59.24	58.48	53.11	58.20
% Economically Dis.	71.69	73.49	68.00	65.51

% Special Education	29.49	28.07	21.37	23.11
% ELLs	10.85	9.36	12.69	17.72
<i>N</i>	763	513	13,961	835

¹Includes students matched to a treatment student for mathematics and/or reading

Across both studies, a large majority of students were Black (more than 80%) and economically disadvantaged (more than 65%). Comparison samples were comprised of slightly more White, Hispanic, and ELL students, while treatment samples were comprised of slightly more economically disadvantaged and special education students. However, none of these differences was statistically significant. This shows that both the overall samples, as well as the propensity-matched samples, were similar in terms of demographic makeup. Because prior-year attendance data were not available for treatment or comparison students, it was not possible to consider attendance when constructing the comparison sample, nor was it possible to report descriptively on prior-year attendance for the treatment and comparison samples. As described below in the Analytical Approach section, the propensity-matched samples were selected for their similarity to the treatment samples on prior achievement and demographics.

CES provided 296 survey responses from middle and high school students participating in the tutoring and mentoring program. Interviews were conducted with five students who participated in the tutoring and mentoring program, six CES staff members who made home visits and/or tutored, and five administrators.

Measures

i-Ready Diagnostic Assessment. Overall, i-Ready Diagnostic math scores were obtained for students in Kindergarten through Grade 12 who participated in CES's home visit and/or tutoring programs in the 2021-22 school year, as well as for the pool of comparison students who were selected by BCPS personnel. As the i-Ready Reading assessment is only administered to students in Grade 6 and higher, i-Ready Reading scores were obtained for students in Grades 6 through 12. We obtained students' BOY and EOY scores on both assessments. BOY reading and math scores served as pretest achievement measures, while EOY scores served as corresponding posttest measures. i-Ready Diagnostic assessment scores range from 0 to 800 and are vertically scaled and nationally normed across grades, meaning that scores can be directly compared to each other, regardless of a student's current grade level.

DIBELS. Composite DIBELS scores were obtained for students in Kindergarten through Grade 5 who participated in CES's home visit and/or tutoring programs in the 2021-22 school year, as well as for the pool of comparison students who were selected by BCPS personnel. We obtained students' BOY and EOY scores on this assessment. The DIBELS assessment is administered one-on-one by teachers to students and

measures fluency-related content including phonemic segmentation, word reading, and oral reading.

Attendance. CRRE requested attendance data from the 2020-21 and 2021-22 school years from BCPS. However, because of the Covid-19 pandemic, attendance data consisted entirely of blank entries for the 2020-21 school year; thus, we were only able to use 2021-22 attendance data. Students were selected for CES home visits because they had missed 10% or more of school days, so we would expect that participants' attendance would be considerably lower than that of students not enrolled in CES's home visit program. It is therefore a significant limitation that we did not have information about prior-year attendance to use as a baseline. Specific variables provided included counts of days attended, days absent, and days enrolled. Days absent was used as one of the attendance outcome variables of interest. We also created a variable measuring percentage of enrolled days absent by dividing days absent by days enrolled.

Behavioral data. CRRE requested behavioral data from the 2020-21 and 2021-22 school years from BCPS. However, as with attendance data, behavioral data from the 2020-21 school year were not tracked, limiting us to only analyzing 2021-22 behavioral data. BCPS provided data on each suspension in the 2021-22 school year, including length and type of suspension, along with the cause of the suspension. For our analyses, we examined counts of suspensions and average length of suspension as outcome variables of interest in this domain.

Program data. CES provided CRRE with home visit and tutoring program data from all students served in the 2021-22 school year, as recorded by CES PSAs. Home visit data consisted of counts of visit contact types for all program students, while tutoring data consisted of counts of sessions attended, sessions absent, total sessions, and sessions not held (although this last variable was not used in analyses).

Survey. CES provided responses to selected items on their student survey that were germane to the research questions of the study. In addition to items about students' age, grade, and whether or not they had participated in tutoring and/or received home visits, students were presented seven Likert-type items about their perceptions of the tutoring and mentoring program.

Interview protocols. Semi-structured audio interviews with student participants focused on topics such as their experience with tutoring and mentoring and, if relevant, home visits, including a typical day in tutoring; whether and how tutoring had influenced their grades and their feelings about school; their likes and dislikes about tutoring; their attitude toward their tutor; recommendations for improving the tutoring program; what they would tell a friend invited to participate in tutoring; and their experiences with and perceptions of the home visits. Semi-structured audio or video interviews with CES staff engaged in tutoring and/or home visits focused on

topics such as their understanding of the purpose of tutoring and/or home visits; their perceptions of the benefits, strengths, and areas for improvement of the tutoring and/or home visit program(s); their recommendations for further strengthening the program(s); and their experiences with home visits and their beliefs about the characteristics of effective home visits.

Semi-structured audio or video interviews with school and district administrators focused on topics such as their overall impressions of the tutoring and/or home visit program(s); their understanding of the purpose of the program(s); the benefits, strengths, and areas for improvement of the tutoring and/or home visit program(s); their recommendations for further strengthening the program(s); and what they would say to a colleague considering bringing the program(s) to their school or district.

Analytical Approach

Data for all students were analyzed descriptively by examining patterns in achievement, attendance, and behavioral outcomes, as well as patterns in CES home visit contact types and tutoring participation. Multiple linear regression analyses were originally intended to be used to determine CES home visit and tutoring impacts on achievement, attendance, and behavioral outcomes; however, because of the lack of usable attendance and behavioral data from the 2020-21 school year, we elected to use regression analyses only to analyze achievement data. Demographic variables including gender, ethnicity, grade level, ELL status, economically disadvantaged status, and special education status were included in all analytic models. Given the large number of schools (over 100) in which CES students were found, along with the small sample sizes (i.e., 10 or fewer students receiving home visits or tutoring) of CES students found in many schools, we did not include school effects in the main regression models, because of the instability this would introduce into model estimation.

To adjust for prior achievement and demographic differences between treatment and comparison groups, propensity score matching (PSM) was used to create comparison groups of students that were as similar as possible to treatment students. Propensity scores were computed using the `psmatch2` command in Stata (v 17.0), with one-to-one matching using the Mahalanobis distance metric. This procedure created comparison groups that were of equal size to the treatment group and, based on prior achievement and demographic variables, as similar as possible to treatment students. The result of the PSM procedure was that treatment students were individually matched with comparison students who were as similar as possible in terms of prior achievement and demographic variables, allowing for a stronger comparison of treatment and comparison students. The PSM procedure was conducted twice for each of the home visit and tutoring samples, once to identify a comparison sample for mathematics achievement analyses, and again to identify a comparison sample for ELA achievement analyses. The matched samples demonstrated baseline equivalence on both outcome measures and across all grade levels; full tables of baseline equivalence for these

samples can be found in Appendices A and B for home visit and tutoring samples, respectively.

Quantitative analysis of the survey data included descriptive statistics related to attitudes and perceptions of students participating in the tutoring and mentoring program. Qualitative survey data and focus group transcripts were analyzed using thematic and descriptive coding.

Results

We begin by descriptively examining CES home visit and tutoring participation data for students from the 2021-22 school year, as well as achievement, attendance, and behavioral outcomes for both treatment and comparison students across the 2021-22 school year. These analyses are followed by regression analyses examining the impacts of CES home visits and tutoring sessions on mathematics and reading i-Ready scores and DIBELS scores. We then examine results of additional regression analyses examining the impacts of selected CES home visit and tutoring measures on achievement gains, allowing us to separately estimate impacts of specific home visit contacts and tutoring session measures. We also overview the results of subgroup analyses on the main achievement analyses, where applicable.

Descriptive Analyses

CES home visits. Table 3 shows frequencies and percentages for all possible home visit contact types for treatment students in the 2021-22 school year. This table considers home visits to all identified treatment students.

Table 3
CES Home Visit Contact Type Frequencies (all students)

Outcome	Frequency	%
Left Letter	9,307	55.68
Spoke with Parent or Guardian	1,824	10.91
Incorrect Address (Spoke w/ Current Resident)	1,081	6.47
Spoke with Family Member	960	5.74
No Access	948	5.67
Spoke with Student	628	3.76
Vacant Property	553	3.31
No Apartment Number Given	468	2.80
Address not Valid/Vacant Lot	429	2.57
Left Packet	262	1.57
Spoke with Family Friend	151	0.91
Total	16,716	
Average Total Contacts per student	1.60	

(SD)**(1.00)**

Out of a total of 16,716 reported home visits among the 10,447 students with home visit data, the most common home visit contact type was for a CES PSA to leave a letter at the door of a student's home, as this occurrence was the outcome of nearly 56% of total home visits. The next most common contact types were a PSA speaking to a parent or guardian (10.9%) and a PSA finding that the address provided was incorrect (6.5%). Only 3.8% of PSA home visits resulted in a CES PSA speaking with a student directly; however, nearly 28% of home visits resulted in a PSA speaking with an individual at or near a student's listed address of residence. Across all home visit students, the average number of total PSA contacts was slightly more than 1.5 contacts per student, with total contacts ranging from as few as one contact to as many as 13 contacts.

Table 4 shows the frequencies and percentages of treatment students who received at least one visit of a given home visit contact type. In other words, we are tabulating counts of students who received at least one letter or students who spoke to a PSA at least one time in person, for example. According to CES, if a home visit could have fit within more than one contact type, for instance if the PSA talked with both a student *and* a parent/guardian, the PSA decided which contact type to record, often based on which person they spoke with most during the visit. This means that each home visit is recorded exactly once, but that some interactions may have occurred more frequently than the participation data indicate.

Table 4

CES Home Visit Contact Visit Type Frequencies, by student (n = 10,447)

Outcome	Frequency	%
Left Letter	6720	64.32
Spoke with Parent or Guardian	1638	15.68
Incorrect Address (Spoke w/ Current Resident)	987	9.45
Spoke with Family Member	897	8.59
No Access	745	7.13
Spoke with Student	601	5.75
Vacant Property	488	4.67
No Apartment Number Given	407	3.90
Address not Valid/Vacant Lot	392	3.75
Left Packet	262	2.51
Spoke with Family Friend	145	1.39

Just under two-thirds (64.3%) of students had a letter left by a CES PSA. CES personnel spoke with a parent or guardian for about 16% of students, followed by PSAs arriving at an incorrect address (9.5%), and a PSA speaking with a family member

(8.6%). Less than 6% of students spoke directly with a PSA; however, nearly 37% of students had at least one home visit that resulted in a PSA speaking with someone at or near their residence. It is notable that over one-quarter of students receiving home visits had a PSA report either an incorrect address, no access to the property, a vacant property, no apartment number, or an otherwise invalid address on at least one visit. Given the residential mobility of some students and the fact that students and/or their parents/guardians may have been at work or out of the home for other reasons when the PSA visited, it is not surprising that considerable percentages of students receiving home visits had contact types that did not consist of any direct interaction with a CES PSA (e.g., leaving a letter or having no access to the property).

CES Tutoring Sessions. CES provided CRRE with counts of tutoring sessions for which students were present and absent, along with counts of total sessions and sessions not held. All of these tutoring measures were supplied at the student level. Table 5 shows average tutoring metrics for all CES tutoring participants in the 2021-22 school year.

Table 5

Descriptive statistics of CES tutoring participants (n = 764)

Tutoring Measure	Mean	SD	Minimum	Maximum
Sessions Present	22.89	22.87	0	153
Sessions Absent	10.75	11.43	0	61
Total Sessions	33.63	27.52	0	169
Sessions Not Held	27.63	20.70	0	145

Tutoring participants averaged a total of slightly less than 34 total tutoring sessions, with students attending an average of nearly 23 sessions and being absent for an average of nearly 11 sessions. Across all students, average tutoring attendance was 68.06%. It is important to note that this average does not include sessions not held; as explained by CES, "sessions not held" is a count of sessions that were scheduled at one point, but were rescheduled or otherwise did not take place, which is why these sessions were counted separately from the "sessions absent" metric.

CES Tutoring Home Visit contacts. CES also provided CRRE with counts of home visit contacts for students participating in CES tutoring programs. It is important to note that these home visit data are separate from home visits previously discussed in relation to the CES home visit program. Average counts of different types of home visit contacts for CES tutoring participants are displayed in Table 6.

Table 6

Descriptive statistics of CES tutoring home visit contacts (n = 387)

Contact Type	Mean	SD	Minimum	Maximum
--------------	------	----	---------	---------

Total Contacts	1.33	0.57	1	4
Hard Contact	0.36	0.60	0	3
Soft Contact	0.79	0.68	0	3
No Contact	0.12	0.39	0	3

CES tutoring participants averaged slightly more than one home visit contact, with a maximum of four home visit contacts observed. A majority (59.5%) of these contacts were soft contacts (e.g., leaving a letter), followed by hard contacts (27.4%; e.g., speaking to a student or a family member), and no contact (9.1%; e.g., vacant lot/inaccessible property or incorrect address).

Achievement Analyses

In this section, we highlight the results of the main impact achievement analyses for both home visit and tutoring programs. Each set of impact analyses is followed by subgroup analyses for grade levels and other selected student subgroups of interest. Finally, we overview the results of regression analyses estimating the impact of one unit of selected home visit contact type or tutoring attendance metric on achievement, in relation to comparison students who did not have any home visits or tutoring sessions.

Home visit achievement impacts. The results of the main achievement impact analyses are shown in Table 7. Students in Kindergarten through Grade 11 are considered in these analyses; Grade 12 students were excluded because of inadequate sample sizes. Descriptive analyses of unadjusted average scores, by grade and condition, can be found in Appendix C. It is important to consider that samples for these analyses consist of treatment students with non-missing mathematics and/or reading achievement scores, as well as comparison students identified by the propensity-matching procedure. Thus, sample sizes are slightly different for each impact analysis. It is also important to consider that large numbers of both treatment and comparison students were missing i-Ready or DIBELS data, as described in the Methods section, so they are not included in these analyses. These impact analyses control for prior (BOY) achievement, as measured by fall 2021 i-Ready and DIBELS composite scores, as well as demographic variables. In all three analyses, the sample consisted of treatment and matched comparison students with non-missing i-Ready or DIBELS achievement scores.

Table 7

Impact Analyses of CES Home Visits on mathematics and reading achievement scores

Variable	Estimate	Standard Error	<i>p</i> value	Effect Size
i-Ready Mathematics				
Received Home Visits	-3.972	2.478	.109	-0.08
Constant	440.540***	1.289	<.001	

Total N	5565			
i-Ready Reading				
Received Home Visits	-3.096	4.860	.524	-0.04
Constant	545.249***	2.543	<.001	
Total N	3610			
DIBELS				
Received Home Visits	0.624	1.157	.590	0.01
Constant	419.8127***	0.815	<.001	
Total N	1774			

Note: *** $p < .001$.

Results of these analyses show the CES home visit students generally gained slightly less in mathematics and reading as measured by i-Ready than did propensity-matched comparison students, but these differences did not reach statistical significance. Treatment students outgained comparison students on DIBELS, though this difference did not approach statistical significance. The regression estimate can be interpreted as the expected increase in BOY to EOY achievement score associated with participation in the CES home visit program. Thus, home visit recipients averaged slightly less than 4-point smaller i-Ready mathematics score gains, while home visit recipients averaged approximately 3-point smaller i-Ready reading score gains. On the other hand, students receiving home visits averaged slightly larger than half-point DIBELS gains than did comparison students. Effect sizes for these analyses were all relatively small, ranging from 0.01 to 0.08 SDs.

Subgroup impacts. Subgroup analyses were conducted to examine for potentially differential impacts of CES home visits on subgroups of interest. Specifically, we conducted subgroup analyses by student grade level, as well as for special education students. Full regression tables for these analyses are found in Appendix D. Significant negative program impacts were observed in Grades 1 through 4 and for special education when examining i-Ready mathematics scores. By contrast, a significant positive program impact was observed in Kindergarten when examining DIBELS scores. Significant program impacts are displayed in Table 8. No statistically significant subgroup impacts were evidenced in any of the i-Ready reading analyses.

Table 8

Subgroup achievement analyses with significant impacts

Subgroup	Estimate	Subgroup N	p value
i-Ready Mathematics			
Grade 1	-9.059	268	.027
Grade 2	-12.511	263	.002
Grade 3	-13.094	334	<.001
Grade 4	-12.048	342	.001
Special Education	-6.368	1255	<.001

DIBELS			
Kindergarten	8.072	300	.013

Tutoring achievement impacts. The results of the main impact analyses for the tutoring study are shown in Table 9. Students in Grades 3 through 11 are considered in these analyses, as Grades 3 through 12 received tutoring from CES in the 2021-22 school year but Grade 12 was excluded because of inadequate sample size. Descriptive analyses of unadjusted average scores, by grade and condition, can be found in Appendix D. As with the home visit impact analyses, samples for these analyses consist of treatment students with non-missing mathematics and/or reading achievement scores, as well as comparison students identified by the propensity-matching procedure. Thus, sample sizes are slightly different for each analysis. The analytic models are otherwise identical to those used in the home visit impact analyses.

Table 9
Impact Analyses of CES Tutoring on mathematics and reading achievement scores

Variable	Estimate	Standard Error	p value	Effect Size
i-Ready Mathematics				
Received Tutoring	3.190 [^]	1.813	.079	0.08
Constant	446.7601***	1.272	<.001	
Total N	882			
i-Ready Reading				
Received Tutoring	5.403	3.354	.108	0.08
Constant	532.895***	2.350	<.001	
Total N	724			
DIBELS				
Received Tutoring	-1.563	3.316	.638	-0.04
Constant	421.384***	2.269	<.001	
Total N	156			

Note: [^] $p < .10$; *** $p < .001$.

Results of these analyses show that tutoring participants outgained comparison students on both of the i-Ready assessments, with these differences approaching, but not quite reaching, statistical significance. Specifically, tutoring participants outgained comparison students by more than 3 points on the i-Ready mathematics assessment, and by more than 5 points on the i-Ready reading assessment. The mathematics impact approached statistical significance ($p = .079$), and both impacts had an effect size of 0.08 SDs. Tutoring students did not show achievement gains on the DIBELS assessment in relation to comparison students, with comparison students slightly outgaining tutoring participants by approximately 1.5 points. This difference in achievement gains was not statistically significant.

Subgroup analyses. As with the main home visit achievement analyses, we also conducted subgroup analyses by grade level and for special education students for the main tutoring achievement analyses. Full regression tables for tutoring subgroup analyses can be found in Appendix F. Grade 6 tutoring participants significantly outscored comparison students by over 17 points ($p = .049$) on the i-Ready mathematics assessment. No other statistically significant tutoring impacts were observed across subgroup on any of the three achievement outcomes.

Home visit contact type impacts. We also conducted analyses that examined the impacts of selected home visit contact types on mathematics and reading achievement gains. These analyses were similar to the main achievement impact analyses, with the treatment variable being replaced by the count of home visits received of a particular home visit contact type. We display the results of these analyses in Tables 10, 11, and 12.

Table 10

Associations between home visit contact types and mathematics achievement gains (n = 5565)

Home Visit Contact Type	Estimate	Standard Error	p value
Any contact type	-1.525*	0.710	.032
Spoke with Student	2.528	2.362	.285
Spoke with Parent/Guardian	-1.832	1.174	.119
Spoke with Family Member	-0.530	1.708	.756
Left Letter	-0.583	0.693	.400

Note: * $p < .05$.

In relation to mathematics achievement gains, total home visit contacts were negatively associated with i-Ready mathematics score gains. Specifically, each contact was estimated to be associated with an approximately 1.5-point smaller i-Ready mathematics gain in relation to comparison students. None of the other home visit contact type variables was significantly associated with mathematics achievement gains. It is notable that the only home visit contact type that had a positive (though nonsignificant) association with mathematics achievement was a PSA speaking with a student. As is discussed below, this contact type seemed to be particularly impactful; however, it is also possible that students whom PSAs encountered at home were different from those who were not at home in ways that might influence achievement and/or attendance.

Table 11

Associations between home visit contact types and reading achievement (i-Ready) gains (n = 3610)

Home Visit Contact Type	Estimate	Standard Error	p value
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Any contact type	-1.239	1.446	.392
Spoke with Student	7.692 [^]	4.268	.072
Spoke with Parent/Guardian	-1.448	2.556	.571
Spoke with Family Member	-4.189	3.655	.252
Left Letter	-0.825	1.436	.565

Note: [^] $p < .10$.

Table 12

Associations between home visit contact types and reading achievement (DIBELS) gains (n = 1774)

Home Visit Contact Type	Estimate	Standard Error	p value
Any contact type	0.151	0.710	.832
Spoke with Student	6.119	5.917	.301
Spoke with Parent/Guardian	-0.649	1.626	.690
Spoke with Family Member	0.293	2.516	.907
Left Letter	-0.758	0.981	.440

Similar patterns of results were found when examining associations between home visit contact types and reading achievement gains. PSAs speaking with students was positively associated with reading gains, with each contact with a student associated with an approximately 8-point i-Ready reading score gain and an approximately 6-point DIBELS score gain. Neither of these associations reached statistical significance, although the i-Ready association approached significance ($p = .072$). All other counts of home visit contact types were small in magnitude and non-significant. The results of these analyses suggest similar patterns of associations across grade levels, as DIBELS is administered to students in Kindergarten through Grade 5, while i-Ready is the reading assessment for students in Grades 6 through 12.

Tutoring attendance impacts. Similar to home visit analyses, we also conducted analyses that examined the impacts of selected tutoring attendance measures on mathematics and reading achievement gains. These analyses were similar to the main achievement impact analyses, with the treatment variable being replaced by one of the tutoring attendance types. We display the results of these analyses in Tables 13, 14, and 15.

Table 13

Associations between tutoring attendance measures and mathematics achievement gains (n = 882)

Attendance Measure	Estimate	Standard Error	p value
Sessions Present	0.039	0.043	.360
Total Sessions	0.045	0.033	.182
Tutoring Attendance Rate	0.033	0.023	.145

None of the tutoring attendance variables was significantly associated with mathematics achievement gains. The regression estimate can be interpreted as the expected gain in i-Ready mathematics score for every session present or session scheduled. The estimate for attendance rate can be interpreted as the expected gain in i-Ready mathematics score for every one percent increase in tutoring session attendance rate. The results of these analyses indicate directionally (but not significantly) positive associations between tutoring attendance measures and mathematics achievement gains.

Table 14
Associations between tutoring attendance measures and reading achievement (i-Ready) gains (n = 724)

Attendance Measure	Estimate	Standard Error	<i>p</i> value
Sessions Present	0.009	0.090	.921
Total Sessions	0.043	0.071	.546
Tutoring Attendance Rate	0.368	0.424	.387

Table 15
Associations between tutoring attendance measures and reading achievement (DIBELS) gains (n = 156)

Attendance Measure	Estimate	Standard Error	<i>p</i> value
Sessions Present	0.009	0.056	.875
Total Sessions	-0.007	0.453	.870
Tutoring Attendance Rate	-0.005	0.041	.903

As with mathematics achievement, none of the tutoring attendance measures was significantly associated with reading achievement measures. Magnitudes of associations were smaller in the reading analyses than they were in mathematics analyses, for both i-Ready and DIBELS. Regression estimates can be interpreted in the same manner as in the mathematics tutoring attendance analyses.

We also conducted similar analyses examining the associations between tutoring home visit contacts and achievement gains. None of these associations reached statistical significance. Results of these analyses can be found in Appendix G.

Attendance Analyses

An important limitation to consider in the analysis of student attendance data is that BCPS did not track attendance data in the 2020-21 school year. Thus, we have no way of measuring “baseline” or “pre-intervention” rates of attendance for home visit or

tutoring participants. We report on descriptive analyses of 2021-22 attendance data from treatment and comparison students in both home visit and tutoring analyses.

Home visit and tutoring attendance patterns. We examined unadjusted attendance trends for treatment and comparison students in the 2021-22 school year. Table 16 shows average counts of days absent, as well as percentages of recorded days absent. It is important to consider that, because of the ongoing Covid-19 pandemic, students were enrolled an average of 156 counted school days in the 2021-22 school year, although many students were enrolled for a full 180-day calendar. We calculated a student’s percentage of days absent as the count of absent days divided by the count of enrolled days.

Table 16
Average attendance metrics by condition, 2021-22 school year

Measure	Home Visit Framework Participants (<i>n</i> = 9,575)	Tutoring Participants (<i>n</i> = 763)	Comparison (<i>n</i> = 13,936)
Days Absent	64.93	46.89	32.35
% Days Absent	42.16%	26.64%	20.74%

Students participating in the home visit framework missed considerably larger proportions of school days than did comparison students; specifically, students who received home visits averaged nearly twice the number of missed school days as did comparison students. Tutoring participants were also absent more days than were comparison students, but by a smaller margin. Tutoring participants were absent for approximately 6% more days than were comparison students. However, without having any prior-year attendance data to compare to, these statistics should be considered very cautiously. In addition, treatment students were identified throughout the 2021-22 school year to receive home visits; thus, the large counts of absent days for home visit students may be capturing the very chronic absences that caused the student to be placed in the home visit program. Thus, 2021-22 attendance data, while useful as a snapshot of attendance trends and comparisons, may not tell the complete story regarding the effectiveness of CES home visits in improving student attendance.

Behavioral Analyses

As with student attendance data, BCPS’s tracking of student behavioral data was limited to the 2021-22 school year, and we did not receive counts of suspensions during that year. Thus, we have no way of measuring pre-intervention suspension counts or rates for treatment or comparison students. Therefore, we report descriptive analyses of 2021-22 behavioral data from treatment and comparison students in both home visit and tutoring analyses.

Behavioral patterns of students participating in the home visit framework or tutoring program. We examined unadjusted behavioral trends for treatment and comparison students in both the home visit and tutoring analytic datasets. Table 17 shows counts of total suspensions and students with at least one suspension in the 2021-22 school year, as well as the average suspension length. It is important to note that BCPS provided data for students who had at least one suspension. We did not make the assumption that no suspension data for a student meant that the student had not been suspended. Thus, we only report on counts of suspensions provided by BCPS, but do not calculate percentage of students with at least one suspension.

Table 17
Average behavioral metrics by condition, 2021-22 school year

Measure	Home Visits	Tutoring	Comparison
Students with 1+ suspensions	957	104	1020
Total suspensions	1602	187	1563
Average suspension length (days)	7.20	8.85	6.33

The number of students with at least one suspension was relatively even for students participating in the home visit framework and comparison students, with slightly more comparison students registering at least one suspension. Students participating in the home visit framework had slightly more total suspensions than did comparison students, and the average length of a suspension was slightly longer for treatment students. Specifically, average suspension length was approximately one day longer for students who received home visits and about 2.5 days longer for tutoring participants. It is important to note that the pool of comparison students was several thousand students larger than the pool of home visit students, and much larger than the pool of tutoring participants. Again, though, without pre-intervention suspension data to compare to, these data serve more as a cross-sectional snapshot of behavioral trends within the 2021-22 school year.

Survey and Interview Results

Student Survey. Survey respondents were asked whether they were enrolled in a tutoring program, and 77 middle schoolers (82% of all middle school respondents) and 145 high schoolers (71% of all high school respondents) reported that they were enrolled in a tutoring program, with the other respondents choosing “no” or “not sure.” It is unclear why not all students reported participating in the tutoring program, since CES confirmed that all were enrolled. It may be that the students who indicated that they were not enrolled in a tutoring program (or were not sure) used a different term besides “tutoring program” or “tutoring and mentoring program” to refer to their participation. At some schools, push-in tutoring was provided while at other schools

tutoring was pull-out; it seems possible that students receiving push-in tutoring may not have seen the services provided as “tutoring.” It is also possible that these students did not attend any tutoring sessions or did not recall attending sessions, even though they were enrolled. The subsequent analysis includes only those students who reported that they were in a tutoring program.

Perceived Impact. On Likert-type items, well over 80% of middle schoolers and high schoolers reported that tutoring helped them understand their work and complete or do their work. (Note that middle schoolers were presented with a three-point scale, while high schoolers were presented with a five-point scale. The percentage refers to the middle schoolers selecting the highest level of agreement and the high schoolers selecting one of the two highest levels of agreement.) More than three-quarters of respondents indicated that tutoring helped them earn better grades and do better in school. See Figures 1 and 2 below.

Figure 1
Tutoring Benefits Reported by Middle School Survey Respondents

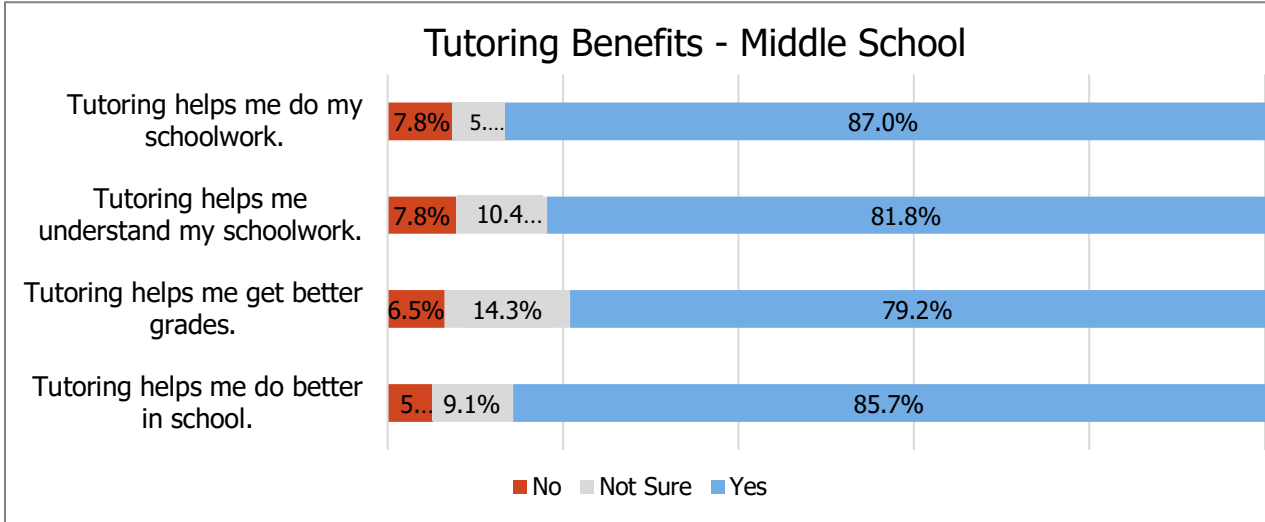
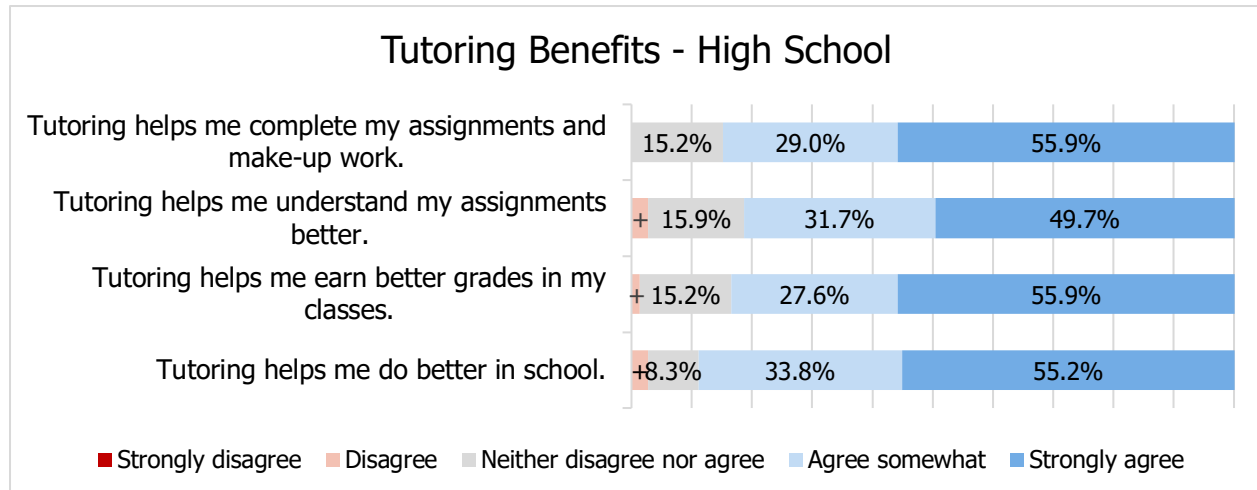


Figure 2
Tutoring Benefits Reported by High School Survey Respondents



Note: + < 5%.

Responses to the open-ended item about the benefits of tutoring echoed the themes from the Likert-type items. The most frequent theme related to the impact of tutoring on helping participants get their schoolwork done, with responses such as the following:

- "Finish all my homework"
- "It's cool it helps me get my work done and completed."
- "It has helped me turn in more assignments that I put off."
- "Help me complete unfinished work and now I'm caught up with everything."

Equally common among middle schoolers and somewhat less frequently mentioned by high schoolers was the influence of tutoring on their understanding of their schoolwork. Responses included the following:

- "Get better at math"
- "Understand my work more"
- "... entendiendo mejor los temas" [understand the topics better]
- "...I learn better"

In addition, tutoring helping them earn better grades or scores was mentioned by a number of students, with descriptions like "get my grades up," "pass," and "It helped me stay on top of my grades."

Along with the perceived impact on schoolwork and grades, students' responses to the open-ended item identified benefits related to attitudes and beliefs as well. Numerous respondents indicated tutoring helped with their focus, work habits, and/or study skills, and indicated tutoring's benefits related to their overall attitude, motivation, or environment. Comments included the following:

- "Helped us with focusing in class and accountability"

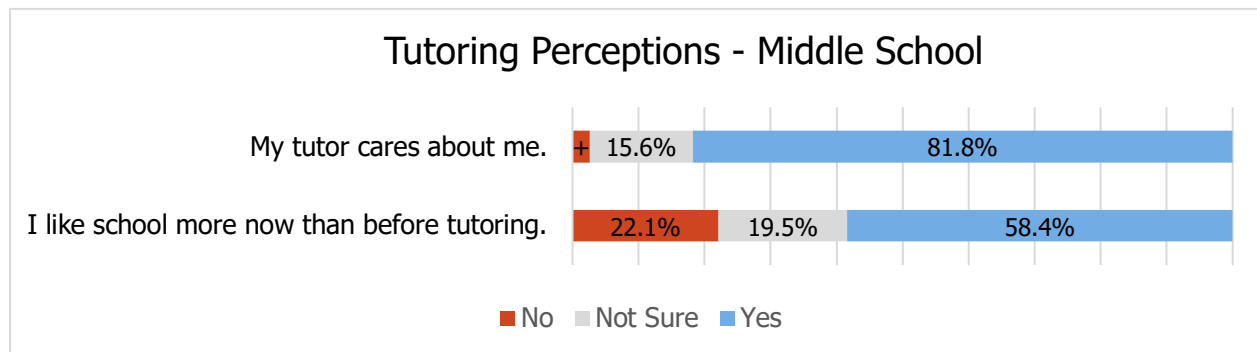
- “They keep me focused and make sure i’m on my a game and help me communicate what i need to have a better learning environment to my teachers”
- “I have been going to class more.”

In addition, multiple students indicated that tutoring had motivational or social-emotional benefits, with comments like the following:

- “Feel welcomed”
- “Helps me calm down from stress of not understand[ing] the work...”
- “They keep me motivated and doing good and continue to keep going to get my goals down and be better each and every day”
- “Helps me feel special :)”
- “It gave me a positive reason to come to school more often. Clarity with so much chaos”
- “It has helped me quite a lot. When I’m lost they’re there and they are helpful and understanding and patient. Which I appreciate.”

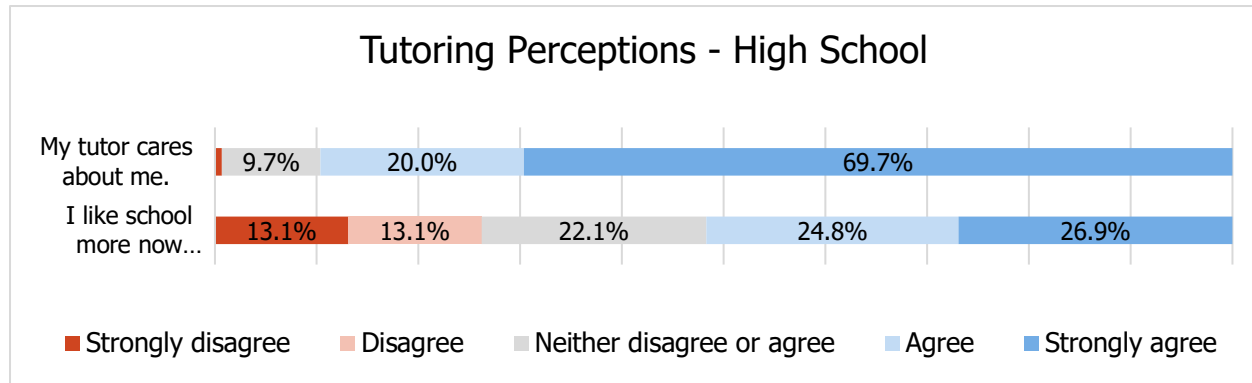
In addition to students’ perceptions of the benefits of tutoring, more than 80% of students reported that their tutor cared about them, and slightly over half of the students reported that tutoring had positively influenced their attitude about school. See Figures 3 and 4.

Figure 3
Tutoring Perceptions Reported by Middle School Survey Respondents



Note: + < 5%.

Figure 4
Tutoring Perceptions Reported by High School Survey Respondents



Note: + < 5%.

Overall Satisfaction and Recommendations. On CES's student survey, the vast majority of respondents indicated that overall, the tutoring and mentoring program was a good experience, with 92.2% of middle schoolers indicating that was true and with 55.9% of high schoolers strongly agreeing and an additional 26.9% of high schoolers agreeing that was true.

High school students were presented with an open-ended item inviting suggestions for the tutoring program. Of students who provided a substantive response (i.e., something besides "IDK" or "no"), the majority of responses were compliments or expressions of appreciation. Comments included the following:

- "Y'all make school more better"
- "Keep helping out"
- "Keep tutoring me"
- "They cool and helpful [two CES staff members' names] like big brothers"
- "Invite more people in to give everyone a chance to have a safe environment."

Specific suggestions mentioned by more than one student included offering tutoring to more students, making tutoring more frequent or longer, and providing more food or rewards.

Student Interviews. Students interviewed ($n = 5$) described their experiences with tutoring, their perceptions of its impact, and their attitudes about tutoring and their tutors. Students described meeting with their tutors during particular classes and as needed, and students had begun tutoring at different points during the year. As in the survey responses, students interviewed reported that tutoring had helped them academically, including by improving their grades and helping them to do their current or outstanding work. Students also noted that tutoring helped with their work habits and/or attitude, such as by encouraging them to do their best, pay attention, become more independent, stay on top of their work, or become motivated. As one student explained, tutoring "put me on track of where I needed to be." One student also reported that school was more enjoyable because of tutoring, and another reported

building a bond with their tutor. Students who had received home visits did not offer much detail about the visits, although one student explained that the visit was to check in and that the tutor had given their parent a good report. When asked what they liked about CES's services, students identified the following things: the availability of help, tutors helping them understand their work, their relationships with their tutors ("They made me want to come every day"), the encouragement and support provided by tutors, pizza party incentives, guidance creating a vision board, setting goals, and using motivational quotations to help them attain goals. When asked what they disliked or would change, no students had any critiques. One student volunteered that he would like to have the same tutors next year because he liked them so much.

CES Staff Interviews. CES staff overwhelmingly evinced pride in their work and expressed a belief that CES was making a difference for students.

Tutoring. Repeated themes in CES staff members' understanding of the purpose of the tutoring program were to remove barriers to success in school, help students succeed, and close the achievement gap. One tutor explained that the first objective of tutoring was to "improve academics," followed by "chang[ing] student perception of school" and then "chang[ing] student behavior." CES staff involved in tutoring reported benefits including improved academics and increased confidence. They saw a strength of the program as having home visits and tutoring connected so that, as one tutor explained, PSAs could become familiar with students' lives as a whole, not just their home life or school life. Other strengths identified included the personal rapport between PSAs and students and the adaptability to each school's needs, although this adaptability was also related to the challenge mentioned in determining how best to configure the program for a given school.

Home visits. With regard to home visits, all those interviewed explained the purpose of home visits as identifying and addressing barriers. These barriers might relate to transportation, technology, being bullied at school or on the bus, or "competing priorities" such as a job, parenting, or other family caregiving responsibilities. Several staff involved in home visits mentioned the importance of home visits for connecting home and school and for connecting families to a web of resources. As one PSA explained, their role is to "be the glue that helps parents and students connect back to the school or any additional resources they need so the kid can attend school and...have the proper education they deserve." Another said their role was "...to show the student that there is a network or village out there and to support and help them." This person went on to say, "I try to look at myself as a practical problem solver. Yes, it's okay to vent about your problems. Yes, it's okay to feel down or feel sad about something that didn't work out your way. But after a while, we've got to figure out what's the solution?" PSAs also mentioned the importance of being relatable and showing empathy toward students, taking a supportive and not punitive tone, and listening to students' voices. When asked about the benefits of the program, PSAs identified connecting the family to the school and to resources and communicating that the school and the PSA care about the students. PSAs also noted

their role in helping students have a “soft landing” at school after an extended absence by facilitating communication with the school and the teachers. Another said he aimed to “instill confidence and calm in the student that...we’ll figure this out,” that “it’s not too late,” and that “we’re going to literally be with them” since the PSA would be at the student’s school. As for areas for improvement and recommendations, several PSAs mentioned the need for more reliable addresses.

Administrator interviews. Overall, school and district administrators expressed positive views of CES’s programs, staff, and impact. Indeed, when asked what they would say to a friend in another school or district considering CES’s services, all the administrators said that they would encourage them to do it. As one administrator put it, “You’ve got folks who are there consistently, who are there to help the students..., a willingness to build the communication when there are struggles...and a desire to restoratively repair.” It was also mentioned as a strength that often the PSAs performing home visits and tutoring were familiar to the students because of their consistent presence at the school.

Tutoring. Administrators explained their purpose in using CES’s tutoring program as addressing students’ academic gaps and learning loss, particularly after Covid-19. When asked about benefits and strengths of the program, they most frequently mentioned relationships. In addition to the positive individual relationships between the PSAs and students, two administrators also mentioned a positive impact on school culture. Two administrators also mentioned academic benefits. When asked about their overall impressions of the program, repeated themes included consistency, academic progress, and relationship building. One administrator also appreciated that the tutors were trained for the work. With regard to areas for improvement, one administrator suggested more progress monitoring for academics and a measure of social-emotional learning progress, and another said that it took a while to get started at the beginning of the year and that there were initially staffing fluctuations. Another person said they would not change a thing.

Home visits. The most frequent explanation by an administrator of the purpose of home visits was to re-engage students at school (or refer them to another context). Making it possible to connect with more parents and helping identify and address barriers were also repeated responses about the purpose of the program. As one administrator explained, the “overarching goals [are] to re-engage a child and get them on [the] path to a degree,” and they went on to say, “These home visits allow us to straddle that line of restorative and punitive.” When asked about the strengths and benefits of the program, repeated themes were the friendly, supportive, and restorative tone, the communication link between home and school, the problem-solving orientation, and the speed, diligence, or flexibility in conducting the home visits.

Discussion

The purpose of this evaluation was to conduct efficacy studies in Baltimore City Public Schools to compare 2021-22 achievement, attendance, and behavioral outcomes for students in CES's home visit framework and tutoring program and comparison students who were not enrolled in either program. Propensity score matching was used to identify comparison students who were most similar to home visit recipients and tutoring participants. We also included findings related to home visit contact and tutoring attendance statistics, as well as analyses examining associations between home visit and tutoring measures and achievement gains in mathematics and reading. In addition, we examined survey responses and notes or transcripts from interviews with students, CES staff, and BCPS school or district administrators.

Results from the main achievement impact analyses showed that tutoring participants outgained comparison students on the i-Ready mathematics and reading assessments from BOY to EOY of the 2021-22 school year. Results approached statistical significance in both subjects ($p = .079$ in mathematics and $.108$ in reading), with tutoring participants outgaining comparison students by nearly 3.5 points in mathematics and more than 5 points in reading. Effect sizes for both of these analyses were 0.08 SDs, indicating small, but notable, practical impacts of the CES tutoring program on i-Ready score gains. Subgroup analyses did not show any differential tutoring impacts by subgroups, although impacts were generally neutral to positive across most grade levels and for special education students.

Results from the main home visit achievement impact analyses showed that comparison students outgained treatment students on the i-Ready mathematics and reading assessments from BOY to EOY of the 2021-22 school year, while students receiving home visits slightly outgained comparison students on DIBELS. Specifically, comparison students outgained students receiving home visits by an average of 3-to-4 points across both i-Ready assessments and students receiving home visits outgained comparison students by less than one point, although none of these differences reached statistical significance. Subgroup analyses showed that comparison students significantly outgained home visit students on the i-Ready mathematics assessment in Grades 1 through 4, with differences in achievement gains ranging between 9 and 13 points. As discussed above, without prior-year attendance data for treatment and comparison students, it is possible that the groups differed from each other in ways that were not apparent in the available data and that home visit students were initially at greater risk than comparison students.

When examining attendance and behavioral patterns, comparison students generally had lower counts of days absent and total suspensions than did home visit recipients and tutoring participants. However, in interpreting these findings, it is important to note that baseline (prior year) attendance and behavioral data were not available to us, so it was not possible for us to examine changes in attendance and behavioral trends from the 2020-21 to 2021-22 school years. In a previous evaluation of CES's C9 home visit intervention, statistically significant gains in attendance rates

were observed for treatment students, when considering attendance before and after the intervention (Cook, Webb, & Ross, 2023). Thus, while attendance and behavioral statistics generally favored comparison students in this study, we were not able to examine changes in year-on-year trends, which would have been a more valid and useful comparison than only examining one year of data.

Associations between home visit and tutoring measures and achievement gains were generally nonsignificant. Home visit contact measures were generally slightly negatively associated with achievement gains. The only home visit outcome positively associated with achievement gains was a PSA speaking with a student. However, less than 4% of the home visits resulted in a CES PSA speaking with a student. Specifically, less than 6% of all home visit recipients spoke directly with a PSA. Making direct student contact with home visit recipients may be advantageous to CES in maximizing home visit program efficacy. In terms of tutoring attendance measures and related home visit outcomes, none of the tutoring measures were significantly associated with achievement gains.

Survey and interview results indicated broad stakeholder satisfaction with CES's work, including among students, CES staff performing tutoring and/or home visits, and school and district administrators. The relational and supportive tone of PSAs was frequently noted, as well as CES's responsiveness in meeting the needs of the school.

In interpreting the results of this evaluation, some important caveats should be considered. A major limitation of this evaluation is the large percentage of observations with missing achievement data. Achievement data were missing for approximately 70-75% of students across all analyses. This percentage of missingness was consistent across both treatment and comparison students. Thus, while missingness may have been systematic, it was unlikely to have differentially affected treatment or comparison students. In addition, although propensity score matching was used to identify comparison students who were as similar as possible to treatment students, it is likely that treatment students differed considerably from comparison students, possibly including prior-year attendance rates, even though baseline equivalence on achievement and demographic variables was generally met. These unobserved differences may have impacted patterns of achievement score gains observed across these analyses. It is also important to note that all analyses contained in this evaluation were correlational in nature. Thus, causal inferences cannot be drawn from the results of this evaluation.

Conclusions

The key results and conclusions of this evaluation are as follows:

- Tutoring participants outgained comparison students on the i-Ready mathematics and reading assessments. Specifically, tutoring participants

outgained comparison students by more than 3 points in mathematics and by more than 5 points in reading. In the sample overall, these differences approached, but did not reach, statistical significance.

- Grade 6 tutoring participants significantly outscored comparison students by over 17 points on the i-Ready mathematics assessment. No other statistically significant tutoring impacts were observed across subgroup on any of the three achievement outcomes.
- Tutoring participants averaged approximately 23 tutoring sessions attended, out of approximately 34 total tutoring sessions scheduled. Average tutoring session attendance was approximately 68%.
- Students receiving home visits were outgained by comparison students on both i-Ready assessments. Comparison students outgained students receiving home visits by 3-to-4 points, on average. Home visit students slightly outgained comparison students on the DIBELS assessment by 0.6 points. These differences did not approach statistical significance. Furthermore, it should be noted that students were selected to receive home visits because of their comparatively high absence rates. While comparison students were matched to treatment students based on past performance and demographic factors, prior-year attendance data were not available, so it was not possible to select comparison students with attendance patterns similar to those of students receiving home visits, which limits the ability to draw conclusions about the impact of home visits.
- The most common home visit contact type was a PSA leaving a letter (56% of total contacts). PSAs spoke with a student in about 4% of total contacts, reaching slightly less than 6% of total students. PSAs averaged 1.6 total contacts per home visit recipient.
- In surveys and interviews, students indicated an overall favorable perception of tutoring and a belief that it was benefiting them at school.
- CES staff and BCPS school and district administrators interviewed generally reported that they believed CES's services were valuable and impactful.

Appendix A: Baseline Equivalence Tables (Home Visits)

Table A1

Unadjusted baseline equivalence, i-Ready Math Analyses

	Overall Mean	Treatment Mean (SD)	Comparison Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Kindergarten	329.55	327.82 (16.86)	330.12 (21.84)	-2.30	20.72	-0.11
Grade 1	352.95	346.41 (23.77)	355.42 (24.68)	-9.01	24.44	-0.37
Grade 2	369.24	363.59 (21.61)	371.16 (27.54)	-7.57	26.17	-0.29
Grade 3	389.59	381.52 (28.04)	392.43 (25.99)	-10.91	26.54	-0.41
Grade 4	403.79	397.16 (26.08)	406.39 (29.26)	-9.23	28.40	-0.32
Grade 5	416.99	410.24 (31.84)	419.45 (31.52)	-9.21	31.61	-0.29
Grade 6	435.41	423.91 (28.80)	438.89 (35.76)	-14.98	34.28	-0.44
Grade 7	445.88	440.22 (33.70)	447.86 (36.48)	-7.64	35.78	-0.21
Grade 8	458.22	451.42 (31.27)	461.02 (38.67)	-9.60	36.67	-0.26
Grade 9	458.92	457.86 (34.86)	459.82 (36.95)	-1.96	36.00	-0.05
Grade 10	466.91	466.46 (39.82)	467.19 (37.85)	-0.73	38.62	-0.02
Grade 11	468.13	465.30 (37.21)	469.08 (38.45)	-3.78	38.14	-0.10
All students	428.75	429.55 (52.02)	428.39 (53.31)	1.16	52.92	0.02

Table A2

Unadjusted baseline equivalence, i-Ready Reading Analyses

	Overall Mean	Treatment Mean (SD)	Comparison Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Grade 6	508.77	487.97 (56.34)	514.29 (66.90)	-26.31	64.83	-0.41

Grade 7	524.23	513.24 (62.63)	527.92 (64.29)	-14.68	63.88	-0.23
Grade 8	548.18	537.05 (60.10)	552.55 (63.05)	-15.50	62.24	-0.25
Grade 9	542.06	539.94 (68.83)	543.80 (71.61)	-3.87	70.37	-0.05
Grade 10	557.50	557.78 (67.81)	557.35 (71.55)	0.44	70.23	0.01
Grade 11	561.18	554.06 (69.75)	563.37 (70.86)	-9.31	70.61	-0.13
All students	540.70	536.49 (68.80)	542.69 (70.30)	-6.21	69.82	-0.09

Table A3
Unadjusted baseline equivalence, DIBELS Analyses

	Overall Mean	Treatment Mean (SD)	Comparison Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Kindergarten	284.32	271.84 (33.54)	288.58 (49.15)	-16.73	45.70	-0.37
Grade 1	318.78	313.14 (20.45)	321.14 (27.16)	-8.00	25.37	-0.32
Grade 2	312.96	306.90 (21.99)	315.13 (25.66)	-8.23	24.75	-0.33
Grade 3	311.11	305.63 (31.90)	313.05 (33.18)	-7.42	32.85	-0.23
Grade 4	308.24	305.11 (30.83)	309.44 (32.99)	-4.33	32.41	-0.13
Grade 5	306.30	299.21 (39.78)	308.82 (42.46)	-9.60	41.78	-0.23
All students	307.46	301.43 (32.96)	309.68 (37.16)	-8.25	36.08	-0.23

Table A4
Baseline equivalence after PSM, i-Ready Mathematics Analyses

	Overall Mean	Treatment Mean (SD)	Comparison Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Kindergarten	327.86	327.82 (16.86)	327.89 (16.90)	-0.07	16.88	-0.004
Grade 1	347.24	346.41 (23.77)	348.07 (23.07)	-1.66	23.42	-0.07

Grade 2	364.79	363.59 (21.61)	365.84 (25.25)	-2.24	23.62	-0.09
Grade 3	383.88	381.52 (28.04)	386.27 (25.14)	-4.75	26.64	-0.18
Grade 4	396.70	397.16 (26.08)	396.40 (29.67)	0.76	27.99	0.03
Grade 5	410.68	410.24 (31.84)	411.13 (29.45)	-0.88	30.67	-0.03
Grade 6	424.11	423.91 (28.80)	424.31 (34.75)	-0.40	31.99	-0.01
Grade 7	437.96	440.22 (33.70)	435.78 (34.12)	4.44	33.92	0.13
Grade 8	452.08	451.42 (31.27)	452.71 (36.90)	-1.29	34.26	-0.04
Grade 9	458.06	457.86 (34.86)	458.28 (33.78)	-0.41	34.36	-0.01
Grade 10	465.40	466.46 (39.82)	464.28 (33.88)	2.17	37.04	0.06
Grade 11	466.13	465.30 (37.21)	466.78 (38.52)	-1.48	37.95	-0.04
All students	429.20	429.55 (52.02)	429.55 (51.68)	0.70	51.85	0.01

Table A5

Baseline equivalence after PSM, i-Ready Reading Analyses

	Overall Mean	Treatment Mean (SD)	Comparison Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Grade 6	486.54	487.97 (56.34)	485.17 (59.36)	2.80	57.90	0.05
Grade 7	512.63	513.24 (62.63)	512.05 (60.82)	1.20	61.72	0.02
Grade 8	536.83	537.05 (60.10)	536.63 (55.95)	0.41	57.94	0.01
Grade 9	543.38	539.94 (68.83)	547.50 (59.01)	-7.57	64.55	-0.12
Grade 10	556.49	557.78 (67.81)	555.16 (69.11)	2.63	68.46	0.04
Grade 11	561.32	554.06 (69.75)	566.20 (69.58)	-12.14	69.65	-0.17
All students	538.16	536.49 (68.80)	539.83 (66.47)	-3.35	67.65	-0.05

Table A6
Baseline equivalence after PSM, DIBELS Analyses

	Overall Mean	Treatment Mean (SD)	Comparison Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Kindergarten	270.95	271.84 (33.54)	270.02 (35.09)	1.83	34.31	0.05
Grade 1	313.10	313.14 (20.45)	313.07 (18.72)	0.07	19.60	0.003
Grade 2	306.51	306.90 (21.99)	306.12 (21.49)	0.78	21.74	0.04
Grade 3	305.02	305.63 (31.90)	304.40 (29.80)	1.23	30.87	0.04
Grade 4	304.73	305.11 (30.83)	304.36 (32.27)	0.75	31.57	0.02
Grade 5	300.44	299.21 (39.78)	301.68 (40.38)	-2.47	40.08	-0.06
All students	301.53	301.43 (32.96)	301.63 (33.17)	-0.21	33.07	-0.01

Appendix B: Baseline Equivalence Tables (Tutoring)

Table B1

Unadjusted baseline equivalence, i-Ready Math Analyses

	Overall Mean	Treatment Mean (SD)	Comparison Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Grade 3	391.81	376.95 (27.76)	392.43 (25.99)	-15.48	26.06	-0.59
Grade 4	405.89	400.63 (23.09)	406.39 (29.26)	-5.76	28.76	-0.20
Grade 5	419.57	422.28 (21.28)	419.45 (31.52)	2.82	31.20	0.09
Grade 6	438.51	430.37 (24.11)	438.89 (35.76)	-8.52	35.34	-0.24
Grade 7	447.64	443.73 (31.80)	447.86 (36.48)	-4.13	36.24	-0.11
Grade 8	460.99	460.56 (31.30)	461.02 (38.67)	-0.46	38.22	-0.01
Grade 9	457.93	448.78 (32.65)	459.82 (36.95)	-11.04	36.25	-0.30
Grade 10	466.26	453.85 (24.33)	467.19 (37.85)	-13.33	37.08	-0.36
Grade 11	468.14	453.06 (31.96)	469.08 (38.45)	-16.01	38.11	-0.42
All students	443.30	440.34 (36.29)	443.55 (43.13)	-3.21	42.63	-0.08

Table B2

Unadjusted baseline equivalence, i-Ready Reading Analyses

	Overall Mean	Treatment Mean (SD)	Comparison Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Grade 6	513.38	492.63 (57.51)	514.29 (66.90)	-21.66	66.54	-0.33
Grade 7	527.00	508.81 (72.80)	527.92 (64.29)	-19.11	64.72	-0.30
Grade 8	552.31	549.47 (62.99)	552.55 (63.05)	-3.08	63.04	-0.05
Grade 9	539.00	516.39 (65.40)	543.80 (71.61)	-27.41	70.56	-0.39

Grade 10	556.79	549.05 (51.77)	557.35 (71.55)	-8.30	70.42	-0.12
Grade 11	562.77	552.53 (58.61)	563.37 (70.86)	-10.84	70.26	-0.15
All students	541.19	525.41 (65.48)	542.69 (70.30)	-17.28	69.89	-0.25

Table B3

Unadjusted baseline equivalence, DIBELS Analyses

	Overall Mean	Treatment Mean (SD)	Comparison Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Grade 3	312.17	291.55 (12.78)	313.05 (33.18)	-21.50	32.63	-0.66
Grade 4	308.92	302.73 (27.84)	309.44 (32.99)	-6.71	32.62	-0.21
Grade 5	308.91	311.00 (17.21)	308.82 (42.46)	2.19	41.71	0.05
All students	310.02	302.09 (23.03)	310.48 (36.50)	-8.39	35.91	-0.23

Table B4

Baseline equivalence after PSM, i-Ready Mathematics Analyses

	Overall Mean	Treatment Mean (SD)	Comparison Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Grade 3	379.93	376.95 (27.76)	382.76 (20.96)	-5.81	24.51	-0.24
Grade 4	400.15	400.63 (23.09)	399.68 (23.27)	0.95	23.18	0.04
Grade 5	422.14	422.28 (21.28)	422.00 (21.90)	0.28	21.58	0.01
Grade 6	422.78	430.37 (24.11)	416.62 (39.23)	13.75	33.35	0.41
Grade 7	444.16	443.73 (31.80)	444.61 (32.34)	-0.88	32.07	-0.03
Grade 8	462.02	460.56 (31.30)	463.56 (28.88)	-3.00	30.15	-0.10
Grade 9	450.354	448.78 (32.65)	452.39 (27.63)	-3.60	30.30	-0.12
Grade 10	454.86	453.85 (24.33)	455.90 (20.76)	-2.05	22.64	-0.09

Grade 11	452.48	453.06 (31.96)	451.91 (32.08)	1.15	32.02	0.040
All students	440.52	440.34 (36.29)	440.70 (36.08)	-0.36	36.19	-0.01

Table B5

Baseline equivalence after PSM, i-Ready Reading Analyses

	Overall Mean	Treatment Mean (SD)	Comparison Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Grade 6	491.67	492.63 (57.51)	490.64 (57.42)	1.99	57.47	0.03
Grade 7	508.77	508.81 (72.80)	508.72 (66.90)	0.09	69.91	0.00
Grade 8	543.53	549.47 (62.99)	538.88 (68.05)	10.58	65.88	0.16
Grade 9	519.92	516.39 (65.40)	526.86 (59.30)	-7.47	62.59	-0.12
Grade 10	540.02	549.05 (51.77)	532.08 (68.26)	16.97	61.11	0.28
Grade 11	547.77	552.53 (58.61)	543.29 (61.60)	9.24	60.17	0.15
All students	525.54	525.41 (65.48)	525.68 (63.83)	-0.27	64.66	-0.00

Table B6

Baseline equivalence after PSM, DIBELS Analyses

	Overall Mean	Treatment Mean (SD)	Comparison Mean (SD)	Adjusted T v C Difference	Pooled Unadjusted SD	Stan. Mean Diff.
Grade 3	291.54	291.55 (12.78)	291.52 (12.45)	0.03	12.61	0.00
Grade 4	301.59	302.73 (27.84)	300.35 (26.73)	2.38	27.32	0.09
Grade 5	314.36	311.00 (17.21)	317.43 (26.99)	-6.43	22.86	-0.28
All students	302.55	302.09 (23.03)	303.01 (25.61)	-0.92	24.35	-0.04

Appendix C: Descriptive Home Visit Achievement Analyses

Table C1

Average i-Ready mathematics scores, by grade, 2021-22 school year

Condition	BOY	EOY	Change
Kindergarten			
Home Visits ($n = 107$)	327.82	359.68	31.86
Matched Comparison ($n = 107$)	327.89	359.31	31.42
All Comparison ($n = 324$)	330.12	361.84	31.72
Grade 1			
Home Visits ($n = 133$)	346.41	367.06	20.65
Matched Comparison ($n = 135$)	348.07	375.15	27.08
All Comparison ($n = 352$)	355.42	381.27	35.85
Grade 2			
Home Visits ($n = 123$)	363.59	378.63	15.01
Matched Comparison ($n = 140$)	365.84	391.08	25.24
All Comparison ($n = 198$)	371.16	395.25	24.09
Grade 3			
Home Visits ($n = 168$)	381.52	394.71	13.19
Matched Comparison ($n = 166$)	386.27	409.89	23.62
All Comparison ($n = 478$)	392.43	413.79	21.36
Grade 4			
Home Visits ($n = 165$)	397.16	409.66	12.50
Matched Comparison ($n = 177$)	396.40	419.10	22.70
All Comparison ($n = 421$)	406.39	426.08	19.69
Grade 5			
Home Visits ($n = 161$)	410.24	420.43	10.19
Matched Comparison ($n = 159$)	411.13	424.43	13.30
All Comparison ($n = 440$)	419.45	433.06	13.61
Grade 6			
Home Visits ($n = 195$)	423.91	435.75	11.84
Matched Comparison ($n = 205$)	424.31	434.96	10.65
All Comparison ($n = 645$)	438.89	450.42	11.53
Grade 7			
Home Visits ($n = 224$)	440.22	446.89	6.67
Matched Comparison ($n = 232$)	435.78	445.91	10.13
All Comparison ($n = 638$)	447.86	457.23	9.37
Grade 8			
Home Visits ($n = 243$)	451.42	459.38	7.96
Matched Comparison ($n = 253$)	452.71	460.66	7.95
All Comparison ($n = 590$)	461.02	469.67	8.65
Grade 9			
Home Visits ($n = 741$)	457.86	461.79	3.93

Matched Comparison ($n = 654$)	458.28	462.14	3.86
All Comparison ($n = 866$)	459.82	463.42	3.60
Grade 10			
Home Visits ($n = 343$)	466.46	467.13	0.67
Matched Comparison ($n = 327$)	464.28	461.54	-2.74
All Comparison ($n = 549$)	467.19	466.57	-0.76
Grade 11			
Home Visits ($n = 177$)	465.30	465.69	0.39
Matched Comparison ($n = 227$)	466.78	468.09	1.31
All Comparison ($n = 531$)	469.08	469.62	0.54

Table C2

Average i-Ready reading scores, by grade, 2021-22 school year

Condition	BOY	EOY	Change
Grade 6			
Home Visits ($n = 163$)	487.97	503.66	15.69
Matched Comparison ($n = 171$)	485.17	499.35	14.18
All Comparison ($n = 615$)	514.29	531.59	17.30
Grade 7			
Home Visits ($n = 211$)	513.24	524.15	10.91
Matched Comparison ($n = 218$)	512.05	522.44	10.39
All Comparison ($n = 629$)	527.92	539.68	11.76
Grade 8			
Home Visits ($n = 221$)	537.05	545.90	8.85
Matched Comparison ($n = 248$)	536.63	544.99	8.36
All Comparison ($n = 564$)	552.55	561.11	8.56
Grade 9			
Home Visits ($n = 698$)	539.94	540.81	0.87
Matched Comparison ($n = 583$)	547.50	555.00	7.50
All Comparison ($n = 847$)	543.80	550.94	7.14
Grade 10			
Home Visits ($n = 344$)	557.78	561.45	3.67
Matched Comparison ($n = 335$)	555.16	555.06	-0.10
All Comparison ($n = 847$)	557.35	557.18	-0.17
Grade 11			
Home Visits ($n = 168$)	554.06	557.25	3.19
Matched Comparison ($n = 250$)	566.20	564.92	-1.28
All Comparison ($n = 547$)	563.37	564.79	1.42

Table C3

Average DIBELS scores, by grade, 2021-22 school year

Condition	BOY	EOY	Change
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Kindergarten			
Home Visits ($n = 115$)	271.84	424.33	152.49
Matched Comparison ($n = 110$)	270.02	414.86	144.84
All Comparison ($n = 337$)	288.58	427.34	138.76
Grade 1			
Home Visits ($n = 148$)	313.14	426.56	113.42
Matched Comparison ($n = 148$)	313.07	427.09	114.02
All Comparison ($n = 354$)	321.14	441.46	120.32
Grade 2			
Home Visits ($n = 129$)	306.90	413.60	106.70
Matched Comparison ($n = 128$)	306.12	411.16	105.04
All Comparison ($n = 360$)	315.13	424.92	109.79
Grade 3			
Home Visits ($n = 167$)	305.63	418.90	113.27
Matched Comparison ($n = 165$)	304.40	418.16	113.76
All Comparison ($n = 471$)	313.05	429.28	116.23
Grade 4			
Home Visits ($n = 167$)	305.11	419.46	114.35
Matched Comparison ($n = 171$)	304.36	416.88	112.52
All Comparison ($n = 437$)	309.44	423.12	113.68
Grade 5			
Home Visits ($n = 161$)	299.21	420.54	121.33
Matched Comparison ($n = 160$)	301.68	426.74	125.06
All Comparison ($n = 454$)	308.82	433.70	124.88

Appendix D: Home Visit Subgroup Analyses

Table D1

i-Ready mathematics regression results with SPED interaction

	Estimate	Standard Error	<i>p</i> value
Home Visit	-0.473	0.817	.563
Home Visit*SPED	-5.896**	1.710	.001
SPED	-1.866	1.312	.155
Constant	439.506***	0.518	<.001

Note. ** $p < .01$; *** $p < .001$.

Table D2

i-Ready mathematics regression results with Grade-level interaction

	Estimate	Standard Error	<i>p</i> value
Home Visit (Kindergarten)	-1.178	4.409	.789
Home Visit*Grade 1	-7.881	4.870	.106
Home Visit*Grade 2	-11.333*	4.892	.021
Home Visit*Grade 3	-11.916*	4.649	.010
Home Visit*Grade 4	-10.870*	4.635	.019
Home Visit*Grade 5	-4.142	4.690	.377
Home Visit*Grade 6	0.283	4.500	.950
Home Visit*Grade 7	-3.736	4.401	.396
Home Visit*Grade 8	-1.432	4.346	.742
Home Visit*Grade 9	-1.066	3.914	.785
Home Visit*Grade 10	2.375	4.180	.570
Home Visit*Grade 11	-1.969	4.504	.662
Constant	440.647***	1.294	<.001

Note: * $p < .05$; *** $p < .001$.

Table D3

i-Ready reading regression results with SPED interaction

	Estimate	Standard Error	<i>p</i> value
Home Visit	-3.078	4.861	.527
Home Visit*SPED	-1.652	3.486	.635
SPED	-6.827*	2.655	.010
Constant	545.467***	2.584	<.001

Note. * $p < .05$; *** $p < .001$.

Table D4

i-Ready reading regression results with Grade-level interaction

	Estimate	Standard Error	p value
Home Visit (Grade 11)	2.628	6.426	.683
Home Visit*Grade 6	-1.438	6.672	.829
Home Visit*Grade 7	-1.600	6.254	.798
Home Visit*Grade 8	-2.175	6.129	.723
Home Visit*Grade 9	-10.841*	5.154	.035
Home Visit*Grade 10	0.637	5.677	.911
Constant	544.714***	2.551	<.001

Note: * $p < .05$; *** $p < .001$.

Table D5
DIBELS regression results with SPED interaction

	Estimate	Standard Error	p value
Home Visit	0.474	1.263	.707
Home Visit*SPED	0.916	3.096	.767
SPED	-10.719***	2.219	<.001
Constant	419.816***	0.815	<.001

Note: *** $p < .001$.

Table D6
DIBELS regression results with Grade-level interaction

	Estimate	Standard Error	p value
Home Visit (Grade K)	8.072*	3.235	.013
Home Visit*Grade 1	-8.424*	4.273	.049
Home Visit*Grade 2	-9.161*	4.401	.037
Home Visit*Grade 3	-7.941	4.191	.058
Home Visit*Grade 4	-7.941	4.191	.058
Home Visit*Grade 5	-11.849**	4.205	.005
Constant	419.795***	0.814	<.001

Note: * $p < .05$; ** $p < .01$; *** $p < .001$.

Appendix E: Descriptive Tutoring Achievement Analyses

Table E1

Average i-Ready mathematics scores, by grade, 2021-22 school year

Condition	BOY	EOY	Change
Grade 3			
Tutoring ($n = 20$)	376.95	404.00	27.05
Matched Comparison ($n = 21$)	382.76	402.95	20.19
All Comparison ($n = 478$)	392.43	413.79	21.36
Grade 4			
Tutoring ($n = 40$)	400.63	426.30	25.67
Matched Comparison ($n = 40$)	399.68	417.83	18.15
All Comparison ($n = 421$)	406.39	426.08	19.69
Grade 5			
Tutoring ($n = 18$)	422.28	440.17	17.89
Matched Comparison ($n = 17$)	422.00	439.94	19.94
All Comparison ($n = 440$)	419.45	433.06	13.61
Grade 6			
Tutoring ($n = 30$)	430.37	450.17	19.80
Matched Comparison ($n = 37$)	416.62	422.05	5.43
All Comparison ($n = 645$)	438.89	450.42	11.53
Grade 7			
Tutoring ($n = 37$)	443.73	460.19	16.46
Matched Comparison ($n = 36$)	444.61	447.47	2.86
All Comparison ($n = 638$)	447.86	457.23	9.37
Grade 8			
Tutoring ($n = 43$)	460.56	473.65	13.09
Matched Comparison ($n = 41$)	463.56	469.68	6.12
All Comparison ($n = 590$)	461.02	469.67	8.65
Grade 9			
Tutoring ($n = 179$)	448.78	452.93	4.15
Matched Comparison ($n = 171$)	452.39	455.70	3.31
All Comparison ($n = 866$)	459.82	463.42	3.60
Grade 10			
Tutoring ($n = 41$)	453.85	452.83	-1.02
Matched Comparison ($n = 40$)	455.90	458.30	-1.60
All Comparison ($n = 549$)	467.19	466.57	-0.76
Grade 11			
Tutoring ($n = 33$)	453.06	449.03	-4.03
Matched Comparison ($n = 34$)	451.91	456.35	4.44
All Comparison ($n = 531$)	469.08	469.62	0.54

Table E2
Average *i-Ready* reading scores, by grade, 2021-22 school year

Condition	BOY	EOY	Change
Grade 6			
Tutoring ($n = 27$)	492.63	519.56	26.93
Matched Comparison ($n = 25$)	490.64	513.08	12.44
All Comparison ($n = 615$)	514.29	531.59	17.30
Grade 7			
Tutoring ($n = 32$)	508.81	523.03	14.22
Matched Comparison ($n = 32$)	508.72	518.69	9.97
All Comparison ($n = 629$)	527.92	539.68	11.76
Grade 8			
Tutoring ($n = 47$)	549.47	559.19	9.72
Matched Comparison ($n = 60$)	538.88	534.62	-4.26
All Comparison ($n = 564$)	552.55	561.11	8.56
Grade 9			
Tutoring ($n = 180$)	516.39	532.42	16.03
Matched Comparison ($n = 161$)	523.86	534.98	11.12
All Comparison ($n = 847$)	543.80	550.94	7.14
Grade 10			
Tutoring ($n = 44$)	549.05	555.09	6.04
Matched Comparison ($n = 50$)	532.08	531.70	-0.38
All Comparison ($n = 847$)	557.35	557.18	-0.17
Grade 11			
Tutoring ($n = 32$)	552.53	553.19	0.66
Matched Comparison ($n = 34$)	543.29	545.41	1.12
All Comparison ($n = 547$)	563.37	564.79	1.42

Table E3
Average *DIBELS* scores, by grade, 2021-22 school year

Condition	BOY	EOY	Change
Grade 3			
Tutoring ($n = 20$)	291.55	399.95	108.40
Matched Comparison ($n = 21$)	291.52	407.29	115.77
All Comparison ($n = 471$)	313.05	429.28	116.23
Grade 4			
Tutoring ($n = 37$)	302.73	419.05	116.32
Matched Comparison ($n = 34$)	300.35	414.97	114.62
All Comparison ($n = 437$)	309.44	423.12	113.68
Grade 5			
Tutoring ($n = 21$)	311.00	440.86	129.86
Matched Comparison ($n = 23$)	317.43	443.04	125.61

All Comparison ($n = 454$)	308.82	433.70	124.88
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Appendix F: Tutoring Subgroup Analyses

Table F1

i-Ready mathematics regression results with SPED interaction

	Estimate	Standard Error	<i>p</i> value
Home Visit	3.741	2.093	.074
Home Visit*SPED	-2.205	4.189	.599
SPED	-3.953	3.243	.223
Constant	446.706***	1.279	<.001

Note. *** $p < .001$.

Table F2

i-Ready mathematics regression results with Grade-level interaction

	Estimate	Standard Error	<i>p</i> value
Home Visit (Grade 5)	4.207	2.227	.059
Home Visit*Grade 3	0.596	9.271	.949
Home Visit*Grade 4	0.941	8.165	.908
Home Visit*Grade 6	13.157	8.906	.140
Home Visit*Grade 7	5.523	7.144	.440
Home Visit*Grade 8	-6.368	8.712	.465
Home Visit*Grade 9	-5.066	3.512	.150
Home Visit*Grade 10	-4.059	6.371	.524
Home Visit*Grade 11	2.844	12.454	.819
Constant	446.722***	1.279	<.001

Note. *** $p < .001$.

Table F3

i-Ready reading regression results with SPED interaction

	Estimate	Standard Error	<i>p</i> value
Home Visit	7.595	3.912	.053
Home Visit*SPED	.8.201	7.535	.277
SPED	-4.237	5.814	.466
Constant	532.977***	2.351	<.001

Note. *** $p < .001$.

Table F4

i-Ready reading regression results with Grade-level interaction

	Estimate	Standard Error	<i>p</i> value
Home Visit (Grade 11)	5.294	4.131	.200
Home Visit*Grade 6	-12.069	16.480	.464

Home Visit*Grade 7	16.058	12.684	.206
Home Visit*Grade 8	-0.108	13.409	.994
Home Visit*Grade 9	-5.796	6.067	.336
Home Visit*Grade 10	10.271	10.168	.313
Constant	533.024***	2.353	<.001

Note: *** $p < .001$.

Table F5

DIBELS regression results with SPED interaction

	Estimate	Standard Error	p value
Home Visit	-1.794	3.593	.618
Home Visit*SPED	1.397	8.170	.864
SPED	-8.075	6.310	.203
Constant	421.357***	2.282	<.001

Note: *** $p < .001$.

Table F6

DIBELS regression results with Grade-level interaction

	Estimate	Standard Error	p value
Home Visit (Grade 3)	0.751	3.717	.840
Home Visit*Grade 4	-9.843	7.189	.173
Home Visit*Grade 5	-4.284	6.390	.504
Constant	421.418***	2.276	<.001

Note: *** $p < .001$.

Appendix G: Tutoring Home Visit Regression Analyses

Table G1

Associations between tutoring home visit outcomes and achievement gains

Home Visit Measure	Estimate	Standard Error	<i>p</i> value
i-Ready Mathematics			
Total Contacts	1.847	1.639	.260
Hard Contacts	-1.807	2.812	.521
Soft Contacts	2.582	2.120	.224
i-Ready Reading			
Total Contacts	4.432	2.737	.106
Hard Contacts	8.520	4.715	.071
Soft Contacts	-0.117	3.670	.975
DIBELS			
Total Contacts	-3.425	3.093	.271
Hard Contacts	-0.893	6.956	.898
Soft Contacts	-6.080	4.091	.141