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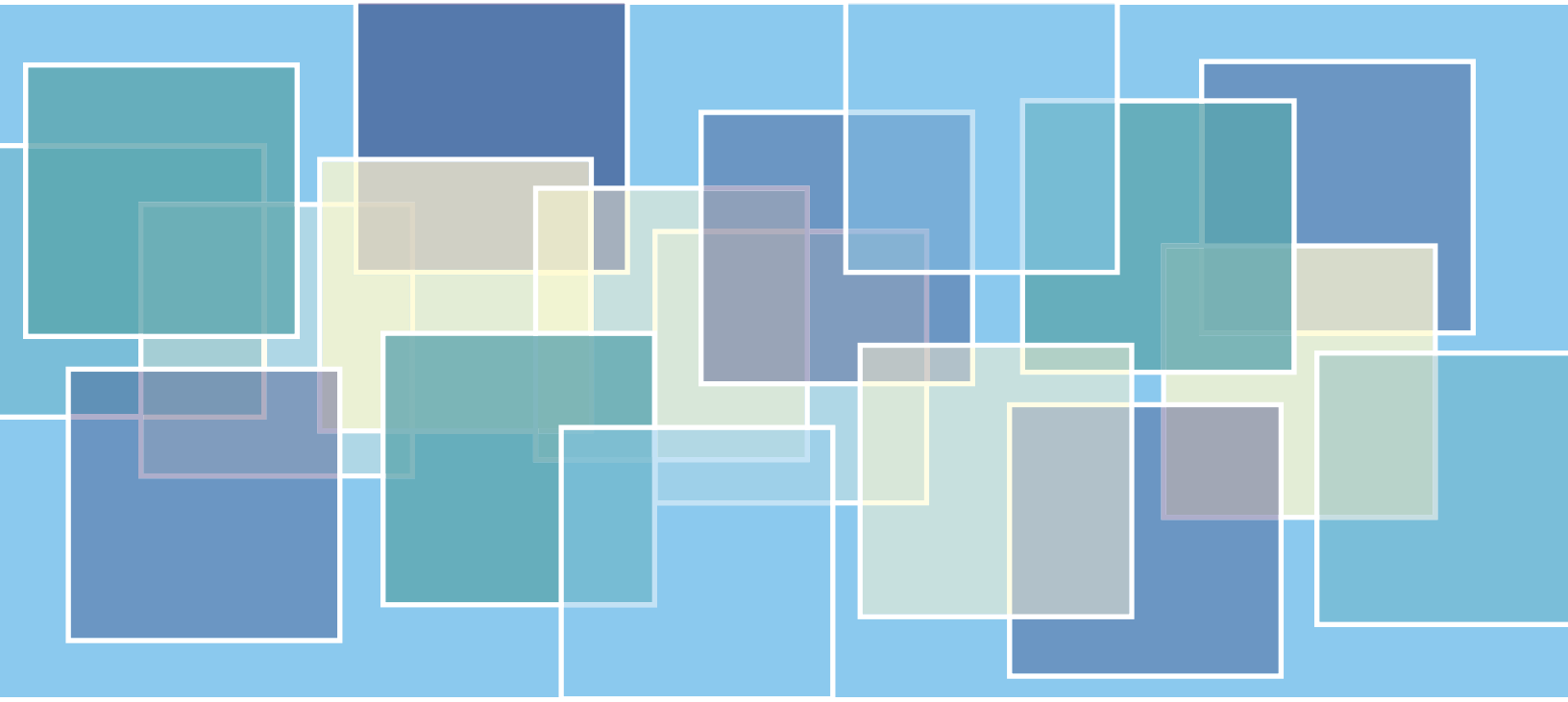
Analysis of the After School Program Component of

City Year Los Angeles's Whole School Whole Child Model



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Commissioned by:
City Year Los Angeles

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City Year is an education-focused nonprofit organization that partners with public schools to help keep students in school and on track to graduate. Founded in Boston in 1988, City Year works in 25 cities across the United States and has international affiliates in London and Johannesburg, South Africa. City Year corps members are 17- to 24-year-olds who commit to one year of full time service in elementary or middle schools. Working on 7- to 18-person school-based teams, City Year corps members provide a variety of services, including literacy and math tutoring for targeted students, in-class support for teachers, and after school programming that includes homework help, tutoring, and enrichment activities. City Year developed the Whole School Whole Child (WSWC) model to address the central factors affecting student academic success: attendance, behavior, and course performance.

In Los Angeles, WSWC operations began in the 2007-08 school year. During the 2012-13 and 2013-14 school years, City Year Los Angeles (CYLA) deployed teams of corps members in 22 elementary, middle, and high schools throughout the city to address the educational, civic, and social needs of urban youth who are vulnerable to dropping out of high school before graduation. The resulting WSWC model aims to support high achievement and positive school behaviors through offering both in-school and after-school supports. Among the many resources it deploys to achieve this purpose, the WSWC model emphasizes the corps member as a positive role model and a facilitator of active learning for elementary, middle, and high school students. The components of CYLA's WSWC model include the following:

SCHOOL CLIMATE: Through positive school climate activities, and mentoring activities, City Year corps members build strong relationships with students that encourage them to come to school more often and help to make the experience an enjoyable one that they look forward to each day. Corps members also support teachers by helping with differentiation of instruction (e.g., working with students who need extra attention in the areas of attendance, behavior, and course performance).

LITERACY AND MATH: Through one-on-one tutoring, small group tutoring, and learning enrichment activities, City Year corps members create and support activities in schools to directly increase student learning capacity and sense of academic efficacy. Corps members are present in the classroom and deliver interventions or academic coaching for a "Focus List" of students, selected based on their grades, standardized test performance, English language ability, as well as behavior and attendance history. Interventions may be delivered via pull-out or push-in. Corps members also provide whole-class supports, enhancing curriculum delivery and guiding and encouraging students in their work.

ATTENDANCE AND BEHAVIOR: For students on "focus lists" selected for attendance and behavior intervention, corps members provide regular coaching and build relationships with students both in and out of regular class time. Students receive formal attendance coaching at least weekly via a "Check-in, Check-out" goal setting protocol and formal behavior coaching through a City Year developed leadership development curriculum that is typically delivered during lunch time or advisory periods.

AFTER-SCHOOL PROGRAM (ASP): City Year corps members run an academic-focused after-school program that provides homework help, tutoring, and support for school-specific learning initiatives (such as blended learning). Enrichment lessons designed to support social-emotional development are also provided for an hour on average 1-2 times per week.

This report focuses on CYLA's after school programming (ASP), investigating the academic and socio-emotional outcomes associated with students' participation in ASP, both with and without intensive in-school support. Our analyses of CYLA's impact on student performance were guided by three primary research questions:

➤ Do greater improvements to outcomes occur when a student received both in-school and after school support?

➤ To what extent are there positive outcomes for students receiving after school supports only, without in-school supports?

➤ Do students identified as English Language Learners (ELL) show differing levels of improvement or benefit?

This brief begins with a summary of the study's key findings, a description of the study's methodology, and a brief explanation of the analyses we conducted. Next, we describe the characteristics of students in the schools with which CYLA partnered and the corps members who served in those schools. We then present the findings for our analyses of CYLA's impact on students' math and ELA grades and test scores, and its impact on students' skills report card scores for the 2013-14 and 2012-13 school years.

Key Findings

➤ Students who attended ASP for more than 80 hours were, on average, approximately two to three times more likely to increase their ELA grades in the 2013-14 school year than students who did not (N=1,382; p<0.001). Students attending more than 80 hours of ASP also scored significantly higher on the end of year Skills Report Card (N=1,382; p<0.001).

➤ Middle school students who participated in CYLA's in-school and afterschool interventions were, on average, 1.8 times more likely to maintain an A or B or to improve their math grade (N=427; p=0.04).

➤ Female students participating in any City Year programming were more likely to maintain their A or B grades or improve their grades in both ELA (on average, 1.6 times more likely, N=1,382; p<0.001) and math (1.4 times more likely, N=692; p<0.001) over the 2013-14 school year. In 2012-13, female students were 1.5 times more likely to improve or maintain their ELA grades (N=854;p<0.001).

➤ Students who received more than the median in-school tutoring hours in 2013-14, who also attended ASP, scored an average of 16 points higher on the spring SRI than students who attended less than the median in-school hours (N=902; p=0.03). This effect was even larger for female middle school students who gained, on average, 57 points on the SRI (N=985; $p\leq0.05$). On math SMI, students who participated in ASP for more than the mean number hours and received any in-school support also showed higher gains.

➤ ASP participation was associated with positive ELA outcomes for students classified as LEP or RFEP. In addition, for ASP participants classified as RFEP, PSA found positive effects on math outcomes and on the Skills Report Card.

Study Methodology

For our analyses, PSA used data collected by CYLA staff, CYLA corps members, and CYLA partner schools. These data include students' academic and social/emotional outcomes, hours of participation in after school programming (ASP) and/or in-school tutoring, demographic characteristics, as well as corps member demographics and educational attainment. These data cover the 2012-13 and 2013-14 academic school years.[1]

Data Sources and Types

Student-level Data:

➤ **MATH AND ELA FOCUS LISTS AND IN-SCHOOL TUTORING.** CYLA corps members assessed students in each school and identified students in need of special assistance in English language arts or math for placement on either the ELA Focus List or the Math Focus List. Students on each of these focus lists received in-school tutoring in the subject for which they were identified. Throughout this report, we refer to these as in-school tutoring hours or focus list hours, e.g., "math focus list hours" or "in-school math tutoring."[2] (Corps members also identified students for Attendance and Behavior focus lists. All students received coaching in these domains in addition to in-school tutoring in reading or math.) Corps members recorded the number of hours students received of either in-school ELA or math tutoring.

➤ **AFTERSCHOOL PROGRAMMING (ASP) HOURS.** Corps members recorded both the number of hours students attended ASP and the number of sessions they attended.[3]

➤ **STUDENT ACADEMIC OUTCOMES.** Includes five outcome measures assessing fall to spring gains in three domains—math; ELA; and social, behavioral, and academic skills.

— *Scholastic Math and Reading Inventory (SMI and SRI).* In 2013-14, corps members assessed students' ELA and math achievement at three points in time using the SRI and SMI (range 0-1500). During the 2012-13 school year, students were assessed using a periodic assessment (range 0-1).

— *Course grades in ELA and Math.* CYLA obtained quarterly math and ELA grades for students who participated in any CYLA activity—in-school tutoring or afterschool programming (ASP)—from Los Angeles Unified School District (LAUSD).

— *Student social, behavioral, and academic skills outcomes.* CYLA corps members assessed students' improvement in these domains using the Skills Report Card (SRC). This inventory rates students' progress on a one to five scale, from "1-very much unlike the student" to "5-very much like the student," across eight domains—zest, grit, self-control (school work), self-control (interpersonal), optimism, gratitude, social intelligence, and curiosity. Corps members assessed students three times over the 2012-13 school year and six times over the course of the year in 2013-14.

➤ *Demographic characteristics.* CYLA collected data on students' race or ethnicity, gender, grade, school attended, and English Language Learner status for students included in all outcome analyses for both school years.

1 In the findings section, we present analyses of the 2012-13 and 2013-14 school years separately; the composition of the study population of students and corps members was not consistent across years. In preliminary discussion and descriptive sections, however, we discuss both years simultaneously.

2 In consultation with CYLA staff, we defined a student as having received in-school tutoring if the student received 10 or more hours of in-school math or ELA tutoring.

3 In consultation with CYLA staff, we defined a student as having participated in ASP if the student attended 15 or more ASP sessions out of a possible 150 sessions. Students who did not reach the ASP participation threshold but who received 10 or more hours of in-school math or ELA tutoring were classified as "in-school tutoring only." Similarly, students who did not reach the participation threshold for in-school tutoring, but who attended 15 or more ASP sessions, were classified as "ASP only."

Corps Member Characteristics

PSA received data from CYLA for the corps members who served at the sites we included in our analyses for both school years. These data included corps members' race or ethnicity, gender, highest math course taken, and highest level of education attained.

Data Analysis

We conducted separate analyses for each outcome—math grades, math test scores, ELA grades, ELA test scores—using different forms of regression analyses. For the 2013-14 data and 2012-13 data, we analyzed the change in students' test scores and the change in their SRC scores over the course of each of the school years using multi-level mixed models. These analyses nest students in schools, taking into account the variation in student test scores that may be best explained by factors inherent within each school. For example, if on a particular day, students at two schools took the same assessment, but one school had a fire drill during the assessment period. The variation in students' scores we observe at that school may be more related to school-level factors (the fire drill) than to the students' actual achievement. Multi-level modeling allows us to control for school-level factors; controlling for this variation at the school-level allows us to better detect effects at the student level.

We took a different analytic approach for our analyses of students' math and ELA grades. There is a large difference in the practical magnitude of a change in a students' grade by one point (e.g., from a C to a B) and a change in a students' test score by one point (e.g., from 789 to 790 on an assessment with a range of 0-1500). To account for this, we opted to run logistic regressions for our grade outcome analyses. Logistic regressions use a dichotomous outcome variable; for our analyses, this variable indicated whether a student's grade (math or ELA, depending on the subject in which the student received tutoring) improved or, if the student had an A or a B in the first grading period, remained the same over the course of the school year.

We conducted additional analyses by school level (elementary, middle, or high school) and activity (in-school tutoring only, in-school tutoring and ASP, and ASP only) for each outcome variable on the 2013-14 data. The larger number of students in the 2013-14 dataset allowed for these more focused analyses.

Further details about each outcome analysis, the forms of the outcome variables, and the independent variables used in the analyses can be found in the introductions to the impact findings section and subsections, as well as in the Appendix.

Study Limitations

Analyses of math and reading assessments may be somewhat unreliable due to the variability in scores. To calculate the outcome variable for both the Math SMI and ELA SRI analyses, we first subtracted the Lexile scale score from the first assessment in fall from the Lexile score on the final administration of the assessment in spring. This calculation yielded scores that were widely divergent, ranging from -778, for a student in the 10th grade who scored 1,047 on the initial SRI assessment yet had a recorded score of 269 on the final assessment, to a student in the 7th grade who scored 185 in fall and 1,212 in spring.

The wide variation in scores suggested measurement or recording errors for the test variable. In an attempt to address this suspected error, we removed from the analyses students whose change scores were outside two standard deviations

above or below the mean on the test change variable. This reduced the variance in student scores in the final analysis, but we remain concerned that the variance in students' scores may have impeded our ability to detect significant effects, particularly in sub-analyses.

Exhibit 1 shows the summary statistics for the change score outcome for the SRI (ELA) and SMI (Math) for all students in the initial data set and for the students included in the final analysis.

Exhibit 1: Change in Lexile scale score, fall to spring

	Test	Mean	Std. Dev.	Min.	Max
All students	ELA SRI N=1,321	46	152	-778	1027
	Math SMI N=1,035	89	194	-680	1140
Students included in analyses	ELA SRI N=902	53	114	-198	313
	Math SMI N=643	106	145	-210	455

Exhibit reads: The mean change in scale scores for all students on the ELA SRI was 46 points.

Characteristics of CYLA Students and Corps Members

Study Population

The study population includes 1,323 students enrolled in 23 partner schools in the 2012-13 school year and 2,577 students enrolled in 22 partner schools in the 2013-14 school years.[4]

The characteristics of CYLA students are similar for 2012-13 and 2013-14. That is, the majority of students whom CYLA served in 2012-13 and 2013-14 are Latino/Hispanic (approximately 90 percent in both years examined), and three-quarters are either designated as Limited English Proficient (LEP) or Reclassified Fluent English Proficient (RFEP) (Exhibit 2). The highest proportion of students included in the study population are middle school students enrolled in grades 6 through 9 (90 percent of the study population in 2012-13 and 72 percent of the study population in 2013-14).

4 Students included in the descriptive analysis received at least 10 hours of specialized support in English or math or attended only after school programming for 15 or more hours, and have beginning and end-of-year outcome measures such as subject-specific grades or test results.

Exhibit 2: Characteristics of students served by CYLA in 2012-13 and 2013-14

Student characteristics	Percent of students served by CYLA	
	2012-13	2013-14
Gender	*(N=1,323)*	*(N=2,577)*
Male	56%	55%
Female	44%	45%
Race/Ethnicity	*(N=707)*	*(N=2,576)*
Latino or Hispanic	90%	88%
Black	8%	11%
Other	2%	1%
School level	*(N=1,323)*	*(N=2,576)*
Elementary	5%	17%
Middle	75%	55%
High	20%	28%
English proficiency	*(N=1,323)*	*(N=2,575)*
LEP	32%	33%
RFEP	43%	41%
English/IFEP*	26%	25%

* Students identified as Initially Fluent English Proficient (IFEP) are included in this category.

Exhibit reads: Fifty-five percent of students served by City Year LA in 2013-14 are male.

Program Participation

Students in CYLA's partner schools receive targeted support in English Language Arts or math during the school day, in after school programs, or at both times. CYLA corps members play an important role in providing this support by working with teachers to differentiate instruction and work with students one-on-one in a tutoring capacity. Additionally, their presence as role models and their approach to coaching also provides students with socio-emotional support. The following section examines the characteristics of these corps members and the resulting hours of specialized instruction that students received in 2012-13 and 2013-14.

Characteristics of CYLA Corps Members

In the 2013-14 school year, 266 corps members served 2,577 students, an average of ten students per corps member. The student to corps member ratio is slightly lower in the year prior: 253 corps members worked with the 1,323 students in the study, a ratio of five students to every one corps member.

A large majority of corps members—approximately 70 percent each year—are female, and as shown in Exhibit 3, they represent a diverse array of racial and ethnic groups. Most of the corps members are college-educated, with 95 percent having at least attended some college.

Exhibit 3: Characteristics of CYLA corps members serving students in 2012-13 & 2013-14

Corps member characteristics	Percent of corps members	
	2012-13	2013-14
Gender	*(N=178)*	*(N=266)*
Male	30%	29%
Female	70%	71%
Race/Ethnicity	*(N=170)*	*(N=266)*
Latino or Hispanic	36%	35%
White	20%	21%
Black	18%	17%
Asian	12%	10%
Other	14%	18%
Highest level of education	*(N=178)*	*(N=266)*
Graduate degree	1%	2%
Bachelor's degree	88%	85%
Associate's degree	2%	0%
Some college	4%	9%
High school graduate	5%	4%
Some high school	<1%	0%

Exhibit reads: Twenty-nine percent of corps members serving students in 2013-14 are male.

Regarding their educational backgrounds, the distribution of corps members' math skills—as measured by the highest level of math completed in school—differed across the two study years. In 2012-13, more than a quarter of corps members were categorized as "Not math proficient," while in 2013-14, no corps members received this designation and less than one percent were categorized as only proficient in pre-algebra or lower (Exhibit 4). In 2013-14 the vast majority of corps members were proficient in Algebra II, Calculus, or higher. Analyses described later in this report explore whether corps members' level of math proficiency meaningfully interacts with CYLA students' math performance.

Exhibit 4: Highest level of math completed by CYLA corps members, 2012-13 & 2013-14

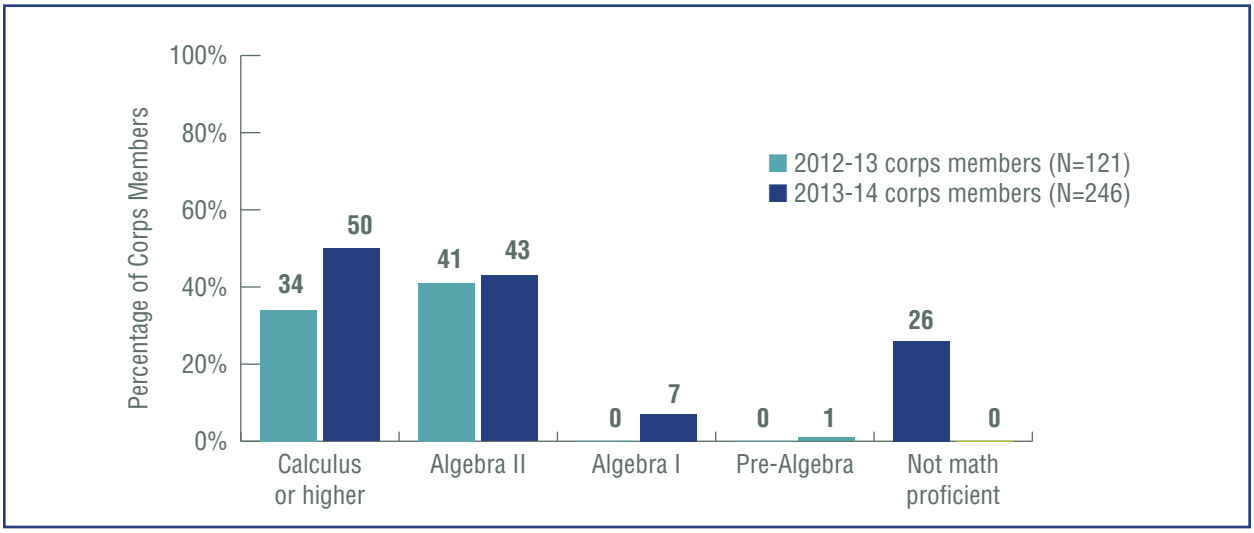

Exhibit reads: Fifty percent of corps members serving in 2013-14 have completed Calculus or higher.

Types of CYLA In-School and After School Support

Students receive academic support in either English language arts or math during school and/or after school. In all cases, the students also receive the socio-emotional support from City Year corps members.

For the purposes of outcomes and impact analyses, PSA categorized the students into five mutually exclusive focus lists of support: 1) in-school ELA; 2) in-school math; 3) in-school ELA and after-school; 4) in-school math and after-school; and 5) after school program (ASP) only. Distribution of students across these groups differs between the two years: in 2012-13, nearly half the student study population participated in after-school programs only. In 2013-14, the highest proportions of students participated in either in-school ELA support or in-school math support (Exhibit 5).

Exhibit 5: Distribution of students by City Year service, 2012-13 & 2013-14

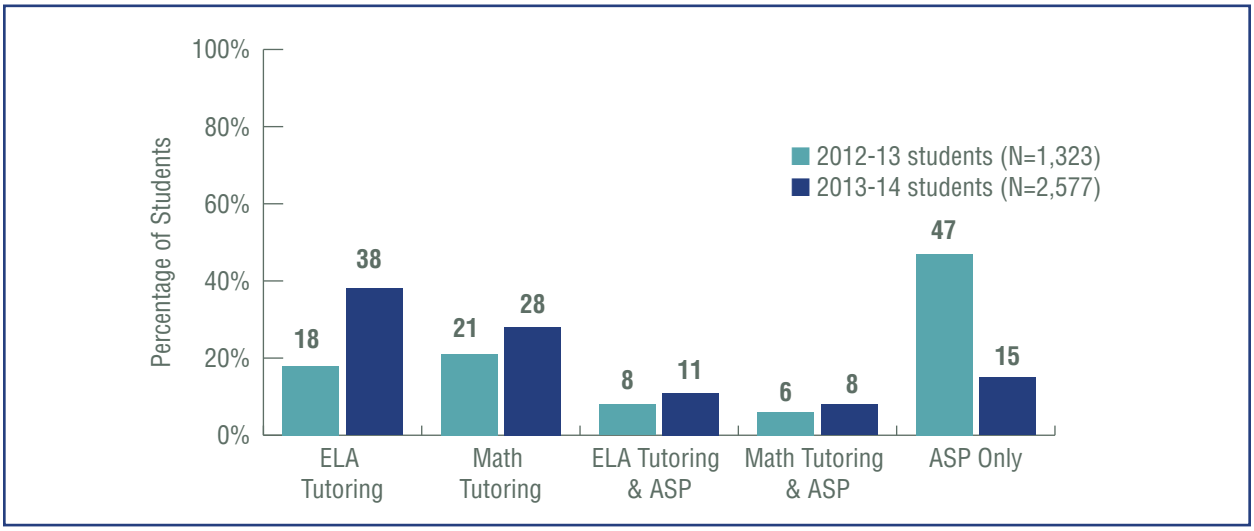

Exhibit reads: In 2013-14, 38 percent of the study population received in-school ELA tutoring services only.

Hours of Support

The number of hours of CYLA in-school support that a student received is similar for ELA and math. That is, on average, students receiving in-school ELA and math support received an average of 19 hours of tutoring in 2013-14 and 11 and 13 hours, respectively, in 2012-13. Students in after school programs, however, received a much higher dosage of support. On average, students in both years of study received more than three times the number of hours of ASP support than in-school support (Exhibit 6). However, it is important to note that the range of dosage (hours of support received) is large, whereby some students received less than one hour of after school support, while others received hundreds of hours. Accordingly, the median number of hours is also provided in Exhibit 6 to provide an additional measure of central tendency.

Exhibit 6: Change in Lexile scale score, fall to spring

Type of support	N	Mean Number of Hours	Median Number of Hours
ELA in-school tutoring			
2013-14	1,255	19	17
2012-13	568	11	12
Math in-school tutoring			
2013-14	936	19	18
2012-13	509	13	13
ASP			
2013-14	1,269	71	44
2012-13	942	60	41

Exhibit reads: In 2013-14, 1,255 students in the study received English Language Arts support for an average of 19 hours and a median of 17 hours.

Initial exploratory analyses of the number of hours of support by type of support and by school level suggest an association between the two variables. In 2012-13, differences in number of hours between the three school levels (elementary, middle and high school) are significant within each type of support category ($p<.01$). Similarly, there were significant differences in hours of support by school level for ELA hours and after-school hours in 2013-14 ($p<.01$), though not for math. The differences between school groups are particularly noticeable within ASP hours in both years, as elementary school students, on average, received more than 100 hours of after-school support, compared to close to 65 and 30 hours of after-school support among middle and high school students, respectively.

Exploratory Findings in Student Outcomes

Preliminary findings focus on five student outcomes: 1) change in student ELA assessments; 2) change in student ELA grades; 3) change in student math assessments; 4) change in student math grades; and 5) change in student socio-economic index scores. For each subject, PSA examined students' performance on beginning of year and end of year assessments and changes in subject grades within the same time period. Grade analysis is limited to students in middle school and high school. The following section presents preliminary findings that establish the baseline level of student performance in each subject and changes in performance over the course of each study year.

English Language Arts Outcomes

In both 2012-13 and 2013-14, students receiving CYLA support significantly improved their performance in English Language Arts, as reflected in test scores and in grades.[5][6] Exhibit 7 includes the average results of these assessments, by school year. While the differences between the beginning and end of year scores are statistically significant in both years ($p<.01$), the effect size indicates a more meaningful difference in scores on the periodic assessment used in 2012-13 than on the SRI in 2013-14.[7]

Exhibit 7: Average scores on ELA assessments, 2012-13 & 2013-14

	2012-13 (Periodic Assessment)	2013-14 (SRI)
	(N=271)	*(N=1,129)*
Beginning of year assessment	0.45	453
End of year assessment	0.54	503
Effect size (d)	+0.64	+0.16

Exhibit reads: The average score on the beginning of year SRI in 2013-14 was 453 Lexiles. In 2012-13, the average score on the beginning of year periodic assessment was 0.45.

ELA grades reflect similar findings. PSA received grades in letter format (e.g., A through F) and transformed them into numeric values so that grades range from 0 (equivalent to F) to 5 (equivalent to A) and can be averaged across the study population. Preliminary findings show that the students in the study population significantly improved their grades from beginning of year to end of year, but the change in grade was more substantial in 2012-13 than 2013-14 (Exhibit 8).

Exhibit 8: Average grades in ELA, 2012-13 & 2013-14

	2012-13 ELA grades	2013-14 ELA grades
	(N=879)	*(N=1,325)*
Beginning of year grade	1.98	1.90
End of year grade	2.26	2.01
Average grade change	+0.28	+0.16

Exhibit reads: The average ELA grade in the beginning of year in 2013-14 was 1.90.

Math Outcomes

As with ELA, the assessment used to measure student proficiency in math changed from a periodic assessment administered to students in 2012-13 to the standardized SMI math assessment administered in 2013-14.[8]

5 The assessment used to measure student proficiency changed from a periodic assessment administered to students in 2012-13 to the standardized SRI reading assessment administered in 2013-14

6 The score range on the periodic assessment used in 2012-13 is from 0 to 1 point, while the SRI is a standardized assessment scored in Lexiles, with possible scores ranging from 0 to 1500 Lexiles.

7Effect sizes (indicated by Cohen's d) gauge the magnitude of the difference in scores between the two groups. Conventions for educational research suggest that effect sizes between 0.10 and 0.20 indicate a "small but meaningful" difference, between 0.21 and 0.50 an "important" difference, and 0.51 or higher an "impressive" difference (Cohen, 1988; Lipsey, 1990).

8 he score range on the periodic assessment used in 2012-13 is from 0 to 1 point, while the SMI is a standardized assessment scored in Lexiles, with possible scores ranging from 0 to 1500 Lexiles.

Preliminary findings in math show that in 2013-14, students significantly improved their quantile score on the SMI from beginning to end of year (p<.01) (Exhibit 8). However, in 2012-13, there was only a slight negative difference between students' average beginning of year score and end of year score on the periodic assessment, and this difference is not statistically significant. Exhibit 9 includes the results of these assessments by school year. The effect size in 2013-14 indicates an important increase in scores.

Exhibit 9: Average scores on math assessments, 2012-13 & 2013-14

	2012-13 (Periodic Assessment)	2013-14 (SMI)
	(N=192)	*(N=753)*
Beginning of year assessment	0.45	447
End of year assessment	0.45	545
Effect size (d)	0	+0.39

Exhibit reads: The average score on the beginning of year SRI in 2013-14 was 453 Lexiles. In 2012-13, the average score on the beginning of year periodic assessment was 0.45.

There are no statistically significant differences between beginning and end of year grades in math in either of the study years. PSA used the same methodology as with ELA to transform students' math letter grades into numeric values so as to calculate average scores across the student study population. In both years, the average student math grade increased only slightly by less than a tenth of a point (Exhibit 10).

Exhibit 10: Average grades in math, 2012-13 & 2013-14

	2012-13 Math grades	2013-14 Math grades
	(N=973)	*(N=1,146)*
Beginning of year grade	1.97	1.79
End of year grade	2.01	1.83
Average grade change	+0.04	+0.04

Exhibit reads: The average math grade in the beginning of year in 2013-14 was 1.79.

Socio-Emotional Outcomes

To provide a measure of a student's socio-emotional status throughout the year, City Year LA uses a Skills Report Card (SRC) that assigns scores of 1 to 5 (1 being very much unlike the student and 5 being very much like the student) on questions regarding zest, grit, self-control, optimism, gratitude, social intelligence, and curiosity. For the 2013-14 school year, PSA received data on six report cards completed throughout the year; for 2012-13, data from three report cards were available. For each report card, PSA created a socio-emotional index score of all measures. The first report card score serves as a baseline score, and the third or sixth report card score as a final score, depending on the study year (Exhibit 11).

In both study years, the average student SRC index score increased from the first to last report card, indicating improved socio-emotional status. The differences between the baseline and final scores are significant (p<.01), prompting the need for further exploration of contributing factors, discussed in the section that follows.

Exhibit 11: Average SRC index scores, 2012-13 & 2013-14

	2012-13	2013-14
	(N=111)	*(N=1,439)*
Baseline SRC index score	2.34	2.78
Final SRC index score	3.19	3.55
Average change in score	+0.83	+0.78

Exhibit reads: The average baseline SRC index score in 2013-14 was 2.78.

Impact Analyses and Findings

Our analyses of CYLA's after school programming investigated the impact of students' participation in CYLA programming on five outcome variables—the Scholastic Math Inventory (SMI), the Scholastic Reading Inventory (SRI), math grades, ELA grades, and the Skills Report Card (SRC). We analyzed each outcome separately, using either a multi-level mixed model, nesting students in schools, or a logistic regression. The type of analysis depended upon whether the outcome was constructed as a continuous variable (i.e., SRI, SMI, and SRC) or as a dichotomous indicator variable (i.e., math and ELA grades). For each outcome, we also ran additional single-level linear or logistic regression analyses by school level (elementary, middle, or high school) and activity (in-school tutoring, in-school tutoring and ASP, and, for outcomes where data were available, ASP only).

In addition to the independent variables measuring students' hours of participation in in-school tutoring, ASP, or both, we were also interested in the differential impact that ASP hours may have had for students classified as Limited English Proficient (LEP) or Reclassified Fluent English Proficient (RFEP). A variable indicating students' ELL status for school year 2014 was included in all of our analyses. In the final models, we also included controls for student characteristics (gender, inclusion on either the Attendance or Behavior Focus Lists, and baseline grade, test score, or SRC score) and corps member characteristics (e.g., gender, highest math course completed). The full list of independent variables included in the models can be found in the appendix.

In the following sections, we present the results of these analyses, organized by the study's three research questions.

RQ1. Do greater improvements to outcomes occur when a student received both in-school and after school support?

ENGLISH LANGUAGE ARTS (ELA) OUTCOMES. We found positive results for combined in-school and after school support in ELA, particularly among elementary and middle school students, as well as female students. We also found that certain dosages of in-school hours had positive effects on ELA outcomes.

➤ Students who attended ASP for more than 80 hours were, on average, more likely to increase their ELA grades in the 2013-14 school year.

— Students attending 80 to 160 hours of ASP were 1.8 times more likely to maintain or improve their ELA grade in 2013-14 (N=1,382; p<0.001).

— Students attending more than 160 hours of ASP were 2.9 times more likely to maintain or improve their ELA grade in 2013-14 (N=1,382; p<0.001).

➤ At all levels of ASP participation, students who received more than the median in-school tutoring hours in 2013-14 (approximately 17 hours) scored an average of 16 points higher on the spring SRI (N=902; p=0.02). In the 2012-13 school year, students in this group also showed gains on their spring ELA Periodic Assessment scores, but the effect was only marginally significant (N=136; β=0.07, p=0.07).

➤ Female students showed higher gains in ELA grades and SRI scores than did male students.

— Female students participating in any City Year programming were, on average, 1.6 times more likely to improve or maintain their ELA grades over the 2013-14 school year (N=1,382; p<0.001). In 2012-13, female students were 1.5 times more likely to improve or maintain their ELA grades (N=854; p<0.001).

— Female middle school students who received both in-school tutoring and attended ASP gained, on average, 57 points on the SRI (N=84; $p\leq0.05$).

— Female middle school students who attended ASP were almost two times more likely to improve or maintain their ELA grade (N=399; p<0.001).

➤ In 2012-13, students included on the Attendance Focus List significantly improved their ELA Periodic Assessment score by an average of 0.26 points (N=136; p=0.02).

➤ Among high school students, we found positive significant effects for students who received only in-school tutoring.

— High school students who received in-school support but did not attend ASP gained, on average, 34 points on the SRI in the 2013-14 school year (N=222; p=0.02).

— High school students who received in-school support but did not attend ASP were also 2 times more likely to improve or maintain their ELA grades (N=223; p=0.01).

➤ High school students on the Attendance Focus List were significantly less likely to improve or maintain their ELA grade (N=397; *odds ratio*=0.54, p=0.02).

MATH OUTCOMES. Students who received in-school support and who participated in ASP showed a higher likelihood of maintaining an A or B or improving their math grade during the school year. These students, when they attended ASP for more than the mean number of hours, also increased their SMI scores. As with ELA outcomes, some effects were more highly pronounced among elementary and middle school students, as well as for female students.

➤ Compared with students who received only in-school support, students who both attended ASP and received any in-school supports maintained or improved their math grade in the 2013-14 school year.

— Students who attended 40 to 80 hours of ASP were, on average, 1.5 times more likely to maintain or improve their math grade (N=1,202; p=0.027).

— Students who attended 81 to 160 hours of ASP were, on average, 2.2 times more likely to maintain or improve their math grade (N=1,202; p<0.001).

— Students who attended more than 160 hours of ASP were, on average, 2.4 times more likely to maintain or improve their math grade (N=1,202; p<0.004).

— High school students who attended approximately 11 to 39 hours of ASP were, on average, 1.9 times more likely to maintain or improve their math grade compared with students who did not attend ASP (N=1,202; p=0.04).

➤ At the school level, we found significant positive effects of combined in-school and ASP support in the 2013-14 school year.

— Students in middle school who received both supports were 1.8 times more likely to maintain or improve their math grade (N=427; p=0.04).

— More specifically, we found that students in middle school who received 16 to 18 hours of in-school tutoring and attended ASP for approximately 80 to 160 hours were 8.1 times more likely to maintain or improve their math grade (N=422; p=0.02).

➤ Students who received any in-school support and who participated in ASP for more than the mean number of ASP hours (109 hours), showed higher gains on the end of year SMI.

— Students who received approximately 16 to 18 hours of in-school tutoring and attended ASP for more than 109 hours averaged a 152 point gain on the SMI between fall and spring (N=588; p=0.02).

— Students who received approximately 18 to 21 hours of in-school tutoring and attended ASP for more than 109 hours averaged a 108 point gain on the SMI between fall and spring (N=588; p=0.08). This effect is only marginally significant.

— Students who received over 21 hours of in-school tutoring and attended ASP for more than 109 hours averaged a 118 point gain on the SMI between fall and spring (N=588; p=0.04).

— Elementary school students who attended ASP for more than 109 hours and received more than the median number of hours of in-school tutoring averaged gains between 154 and 164 points on the spring SMI (N=129; p=0.03).

➤ Female students participating in any City Year programming were significantly more likely to improve or maintain their math grade in 2013-14.

— Female students participating in any City Year programming were, on average, 1.4 times more likely to improve or maintain their math grades over the 2013-14 school year (N=1,202; p=0.01).

— Female middle school students participating in any City Year programming were, on average, 1.5 times more likely to improve or maintain their math grades in the 2013-14 school year (N=809; p=0.01).

➤ Students on the Attendance Focus List were significantly less likely to maintain or improve their math grade in the 2013-14 school year (N=1,202; *odds ratio*=0.70, p=0.04).

SKILLS REPORT CARD (SRC) OUTCOMES

➤ Students who attended ASP more than 80 hours scored 0.18 points higher on the end of year SRC than students who did not (N=1,514; p<0.001).

— By school level, the effect of ASP hours on SRC score was significant only for elementary and middle school students who received both supports: respectively, their end of year SRC scores were, on average, 0.46 and 0.32 points higher than students who attended less than the median ASP hours (N=136; p=0.01 and N=170; p<0.001, respectively).

➤ Elementary school students who attended ASP in addition to receiving more than the median number of hours of in-school tutoring scored 0.4 points higher on the end of year SRC than those who did not (N=136; p=0.01).

➤ Female students who received in-school support, regardless of their participation in ASP, made significantly higher gains on the SRC throughout the 2013-14 school year than male students, averaging increases of 0.21 to 0.26 points across all school levels (N=1,514; p<0.001).

➤ Students included on the Attendance and/or Behavior Focus Lists were less likely than their peers who were not on those focus lists to make gains on the SRC during the school year.

— A student's inclusion on the Behavior Focus List was associated with a significantly negative effect on SRC scores from fall 2013 to spring 2014 (N=1,514; β=-0.11, p=0.01).

— Among students who only received in-school tutoring, inclusion on the Attendance Focus List was associated with negative gains on the 2013-14 end of year SRC (N=1,148; β=-0.12, p=0.03).

RQ2: To what extent are there positive outcomes for students receiving after school supports only, without in-school supports?

We found limited evidence of positive outcomes for students receiving only CYLA after school supports. The most pronounced effects were found among middle school students and were limited to ELA and math grades.

ELA GRADES

➤ Middle school students who did not receive in-school support but attended ASP for more than 80 hours were more likely to maintain or improve their ELA grade.

— Middle school students who did not receive in-school support but attended ASP for more than 80 hours were more likely than their peers who did not attend ASP to maintain or improve their ELA grade (N=399; p<0.001).

— Middle school students who attended ASP only for 80 to 160 hours were almost 2 times more likely to improve or maintain their ELA grade (N=985; *odds ratio*=1.74, p<0.001).

MATH GRADES

➤ Middle school students who did not receive in-school support and attended ASP for more than 80 hours were also more likely than their peers who did not attend ASP to maintain or improve their math grade.

— Middle school students who attended ASP only for 80 to 160 hours were 2.4 times more likely to improve or maintain their math grade (N=382; p<0.001).

— Middle school students who attended ASP only for more than 160 hours were 4.6 times more likely to improve or maintain their math grade (N=382; p<0.001).

➤ Female middle school students who only attended ASP were 1.7 times more likely to improve or maintain their math grade (N=382; p=0.03).

RQ3: Do students identified as English Language Learners (ELL) show differing levels of improvement or benefit?

Two subsets of ELL students – Reclassified Fluent English Proficient (RFEP) and Limited English Proficient (LEP) – showed differing levels of improvement in outcomes. These differences were particularly evident in ELA outcomes, where our analyses of ELL-classified students' participation in ASP yielded significant positive results. For RFEP-classified students in particular, we found significant gains in math outcomes and on the SRC.

ELA OUTCOMES

➤ RFEP students who received any type of support from CYLA were 1.4 times more likely to improve or maintain their ELA grade over the 2013-14 school year (N=1,382; p=0.04). In 2012-13, RFEP students were 1.6 times more likely to improve or maintain their ELA grades (N=854; p=0.04).

— RFEP students in middle school who received at least in-school support from CYLA were 2.3 times more likely to improve or maintain their ELA grade (N=985; p<0.001).

➤ In isolating the effect of ASP participation on ELLs, we found some positive CYLA effects on LEP and RFEP students.

— LEP students who attended more than the median number of ASP hours scored, on average, 69 points higher on the spring SRI (*N*=902; *p*=0.02).

— RFEP students who attended the median number of ASP hours or more scored, on average, 79 points higher on the spring SRI (*N*=902; *p*=0.01).

➤ The magnitude of ELL gains on the SRI varied by school level among LEP and RFEP students in elementary and middle school.

— Elementary school RFEP students who participated in ASP for the median number of hours or more showed an average gain of 198 points on the SRI (*N*=224; $p<0.001$).

— Middle school LEP and RFEP students who participated in ASP for the median number of hours or more showed average gains of, respectively, 206 points and 149 points on the SRI (*N*=419; *p*=0.01 and *p*=0.05, respectively).

MATH OUTCOMES

➤ RFEP students who participated in ASP, regardless of number of hours of support, were 1.5 times more likely to maintain or improve their math grades (*N*=1,202; *p*=0.05).

➤ Female LEP and RFEP students respectively were 2.9 and 3.2 times more likely to maintain or improve their math grade compared to male students (*N*=1,202; *p*=0.023 and *p*=0.008, respectively).

➤ Regardless of types of support provided to them, LEP students scored significantly lower on the spring SMI (*N*=588; γ_{05}=-41.97, $p<0.001$).

SKILLS REPORT CARD (SRC) OUTCOMES

➤ RFEP students receiving any type of support from CYLA significantly improved their SRC score in 2013-14 by an average of 0.12 points (*N*=1,514; *p*=0.01). In 2012-13, RFEP students scored, on average, 0.46 points higher on their spring SRC (*N*=111; *p*=0.01).

ADDITIONAL FINDINGS

In nearly all analyses of the outcomes associated with the effect of in-school support and ASP, we found that the baseline measure – such as fall SRI, fall SMI, and fall SRC score – is significantly and negatively associated with the final outcome. Meaning, students who score higher in the beginning of the year on these measures are likely to show decreased gains on their final outcomes.

We also included demographic variables to control for corps member and student characteristics. Other than student gender, none of these variables proved to have a significant effect on student outcomes.

Concluding Observations and Options for Additional Research

The results of the current study suggest a number of avenues for further exploration, including the following:

➤ C**OMPARATIVE ANALYSES OF STUDENTS ATTENDING CYLA SCHOOLS WITH A SET OF MATCHED COMPARISON STUDENTS ATTENDING SCHOOLS NOT SERVED BY CYLA.** CYLA corps members work not only with students with whom they formally interact through in-school tutoring or ASP, rather corps members are present in the school, serving as a consistent present for all students and as additional support for teachers. An analysis using matched comparison students would allow investigation of the whole school "spillover" impacts of CYLA's work for all students. Furthermore, comparing the differences on achievement outcomes for students in CYLA programming with students in non-CYLA schools would allow for a more specific investigation of the counterfactual for CYLA's work—what are the differences in outcomes for students who do not participate in CYLA programming in a school with which CYLA does not have a partnership?

➤ **ANALYSES OF ELA AND MATH OUTCOMES FOR STUDENTS PARTICIPATING IN CYLA PROGRAMMING USING STATE ASSESSMENT DATA.** Student test scores varied widely both within and across schools. We suspect that some of this variation is due to measurement error, as noted in the study limitations. A similar analysis using state assessment data would provide an additional outcome variable with which to test CYLA's impact on student performance. Additionally, these assessments would be consistent across schools within a given school year.

Appendix A:
Variables and Statistical Models

Variables and Statistical Models

PSA used both multilevel linear and logistic models to determine the effects of CYLA programming on the five outcome variables of interest (SRI, SMI, ELA grades, math grades, and Skills Behavior Checklist) for school years 2012-13 and 2013-14. The variables included in the final models are listed below in Exhibit A1, with explanations of how they were coded from the original data CYLA provided to PSA. The estimated coefficients and standard errors produced for the variables in the final prediction models are shown in subsequent exhibits, accompanied by a short description of the models and analytic methods.

Exhibit A1:
Summary of variables used in the analysis and variable coding

Variable label	Description
Scholastic Reading Inventory (SRI)	Student's change in SRI Lexile score between fall and spring served as the outcome variable for 2013-14 ELA test analyses.
Scholastic Math Inventory (SMI)	Student's change in SMI Lexile score between fall and spring served as the outcome variable for 2013-14 math test analyses.
Periodic Assessment (ELA)	For 2012-13 test analyses, our outcome variable for ELA test analyses was the change in student's ELA periodic assessment score between fall and spring.
Periodic Assessment (Math)	For 2013-14 test analyses, our outcome variable for math test analyses was the change in student's math periodic assessment score between fall and spring.
Grades (ELA)	Across both years, we used this indicator variable as the outcome for ELA grade analyses—if a student had improved their ELA grade, or maintained an A or B ELA grade, between the end of the first 10 week grading period and the end of the school year, we coded this variable "1." We coded this variable as "0" if the student's ELA grade had gone down over the school year, or if the student had maintained a C, D, or F grade, between the end of the first grading period and the end of school year.
Grades (Math)	We constructed this outcome variable for math grades across both years applying the same process to students' math grades as is described for ELA grades, above.
Skills Report Card (SRC)	We calculated the change in students' SRC scores over the course of the year by subtracting the student's score of the first and last administration. In 2013-14, for which PSA had scores for all six administrations of the SRC, we used the score that fell latest in the school year (administration time 5 or 6) as the final administration. This allowed us to keep in the analyses students who were missing data for time 6 but who had complete data for administration number 5. As a check of our decision to calculate the mean across all items, we conducted analyses to measure the internal consistency of the items, which yielded a Cronbach's α=0.92. A factor analysis of scale items provided further support for our decision to use a single index; one factor explained over 90 percent of the variance in the responses across all items.
After school programming (ASP) hours	We defined a student as having attended ASP if the student attended 15 or more ASP sessions. Students who did not reach this threshold but who received more than 10 hours in-school tutoring in math or ELA were reclassified as having received only in-school tutoring. Each outcome variable analyzed a distinct subset of students. Variables capturing ASP hours were outcome specific; we included only the students who formed the group for that outcome analysis. As an example, if a student were receiving in-school tutoring in math and also attending ASP, their hours of ASP were not included in the calculation of the variable indicating quartiles of ASP hours attended used in the ELA grade analysis.

(Continued)

Exhibit A1: (cont.)
Summary of variables used in the analysis and variable coding

Variable label	Description
In-school tutoring hours (Math and ELA)	We defined as student as having received In-school tutoring in math or ELA if they received at least 10 hours of in-school tutoring. (Students received either in-school tutoring in math or in-school tutoring in ELA; no students who received tutoring in both subjects were included in our final analyses). Students who did not received 10 hours of in-school tutoring in math or ELA but who did attend ASP for 15 or more sessions were reclassified as having only attended ASP. As with the construction of ASP hours variables, in-school hours variables are outcome analysis specific.
ELL Status	Categorical indicating students' ELL Status in 2012-13 or 2013-14.
Gender (Female)	Dichotomous variable coded "1" the student was identified as female and "0" if the student was identified as male.
Baseline test score (SRI/SMI/Periodic Assessment)	Students' assessment scores at the fall administration.
Baseline grades (Math and ELA)	Variables indicating students' first period grades in either math or ELA. F=0; D=1; C=2; B=3; A=4.
Baseline SRC	Students' SRC index score at the fall administration.
Focus List Behavior	Indicator variable coded "1" if CYLA identified the student as included on the Behavior Focus List and "0" otherwise.
Focus List Attendance	Indicator variable coded "1" if CYLA identified the student as included on the Attendance Focus List and "0" otherwise.
Corps member gender (Female)	Dichotomous variable coded "1" the corps member was identified as female and "0" if the corps member was identified as male.
Student race or ethnicity	Categorical variable indicating a students' race or ethnicity.
Corps member race or ethnicity	Categorical variable indicating a corps members' race or ethnicity.
Corps member took calculus	Dichotomous indicator variable coded as "1" if the corps member reported having completed calculus and "0" otherwise.
Corps member highest level of education	Categorical variable indicating the highest level of education the corps member had attained.
School-level, Percent of corps members who took calculus	Continuous school-level aggregate variable indicating the percent of corps members assigned to the school who had completed calculus.
School-level, Percent of corps members working with a student of the same race	Continuous school-level aggregate variable indicating the percent of corps members at a school who were assigned to work with a student of the same race.
School performance (quartile)	School-level mean of students' change in math or ELA test scores between fall and spring of the 2012-13 or 2013-14 years; performance quartiles range from 0 (Mean math or ELA achievement change for students at the school in the bottom 25 percent of schools in our dataset) to 3 (Mean math or ELA achievement change for students at the school in the top 25 percent of schools in our dataset).
California school demographic index	California Department of Education measure of school demographic characteristics related to student achievement. Used as a school-level control variable for achievement and demographics.

Exhibit A2:
Multilevel mixed effects models predicting 2013-14 school year change in Scholastic Reading Inventory (ELA) assessment scores

	Without ELL and ASP interaction terms Coefficient (SE)	With ELL and ASP interaction terms Coefficient (SE)
Intercept, β_{00}	154.86*** (19.57)	159.22*** (19.57)
Attended ASP for 90 or more hours, γ_{01} *(Median ASP hours=90)*	-17.69 (12.42)	-75.26*** (24.89)
LEP students who attended ASP for 90 or more hours, γ_{02} *(Median ASP hours=90)*		68.79** (29.62)
RFEP students who attended ASP for 90 or more hours, γ_{03} *(Median ASP hours=90)*		78.62** (30.90)
Received 17 or more hours of ELA in-school tutoring, γ_{04} *(Median in-school tutoring hours=17)*	15.92** (7.29)	16.90** (7.27)
LEP students, γ_{05}	-36.11*** (9.79)	-42.98*** (10.26)
RFEP students, γ_{05}	0.08 (9.24)	-7.25 (9.65)
Female students, γ_{06}	5.11 (7.02)	6.15 (7.01)
Baseline ELA SRI score, γ_{07}	-0.15*** (0.02)	-0.15*** (0.02)
Students on the Attendance Focus List, γ_{08}	-6.46 (9.32)	-6.01 (9.28)
Students on the Behavior Focus List, γ_{09}	4.80 (8.01)	4.97 (7.99)
Random effects		
School mean, u_{0j}	<.00001	<.00001
Level-1 effect, r_{ij}	10695.71***	10610.22***
Wald χ^2 (26)	195.39***	204.24***
N=902, Schools=19		

*** indicates p<0.01; indicates ** p<0.05;
* indicates p<0.1 (marginal significance)

Exhibit reads: Controlling for all other variables in the model, students who were classified as LEP who attended ASP for more than the mean number of hours had a statistically significant gain on the SRI of 69 points between fall 2013 and spring 2014.

Exhibit A3:
Multilevel mixed effects models predicting 2013-14 school year change in Scholastic Mathematics Inventory (Math) assessment scores

Variables	Coefficient (SE)
Intercept β_{00}	328.99*** (55.81)
Attended ASP for 109 or more hours (mean hours) and received 16 to 17.9 hours of math in-school tutoring *(In-school math tutoring hours within 25th to 49th percentiles)*, γ_{01}	151.60** (62.81)
Attended ASP for 109 or more hours (mean hours)and received 18 to 21 hours of math in-school tutoring *(In-school tutoring math hours within 50th to 74th percentiles)*, γ_{02}	107.48* (60.92)
Attended ASP for 109 or more hours (mean hours) and received more than 21 hours of math in-school tutoring *(In-school math tutoring hours within 75th to 100th percentiles)*, γ_{03}	118.18** (57.74)
LEP students, γ_{04}	-41.97*** (14.40)
RFEP students, γ_{05}	12.64 (13.62)
Female students, γ_{06}	-14.37 (10.56)
Fall baseline SMI score, γ_{07}	-0.39*** (0.03)
Students on the Attendance Focus List, γ_{08}	-19.01 (13.84)
Students on the Behavior Focus List, γ_{09}	-31.68** (12.52)
Female corps members, γ_{010}	-18.52 (11.75)
School-level, Percent of corps members who took calculus, γ_{011}	11.65 (63.44)
School-level, Percent of corps members working with a student of the same race, γ_{012}	-0.43 (122.02)
Received 16 to 17.9 hours of math in-school tutoring *(In school tutoring hours within 25th to 49th percentile)*, γ_{013}	-10.79 (15.80)
Received 18 to 21 hours of math in-school tutoring *(In school tutoring hours within 50th to 74th percentile)*, γ_{014}	-1.21 (16.32)
Received 21 or more hours of math in-school tutoring *(In school tutoring hours within 50th to 74th percentile)*, γ_{015}	3.04 (17.02)
Attended ASP for 109 or more hours *(Mean ASP hours=109)*, γ_{016}	-141.68*** (50.52)
Random effects	
School mean, u_{0j}	2496.86
Level-1 effect, r_{ij}	15709.32
Wald $\chi^2(16)$	170.27***
N=588, Schools=19	

*** indicates p<0.01; indicates ** p<0.05;
* indicates p<0.1 (marginal significance)

Exhibit reads: Students who attended ASP for 109 or more hours who also received approximately 16 to 18 hours of in-school math tutoring had a statistically significant gain of 152 points on their SMI assessment scores between fall 2013 and spring 2014.

Exhibit A4:
Logistic regression model predicting school year 2013-14 change in ELA grade

Independent variable	Odds ratio (SE)
Intercept	1.41 (0.58)
Attended ASP for 11 to 40 hours *(Attendance hours within 1st to 24th percentiles)*	1.17 (0.20)
Attended ASP for 41 to 80 hours *(Attendance hours within 25th to 49th percentiles)*	1.37* (0.23)
Attended ASP for 81 to 159 hours ASP *(Attendance hours within 50th to 74th percentiles)*	1.78*** (0.32)
Attended ASP for 160 or more hours *(Attendance hours within 75th to 100th percentiles)*	2.90*** (0.92)
Received 19 or more hours of ELA in-school tutoring *(Mean ELA in-school tutoring hours=19)*	1.07 (0.15)
LEP students	0.94 (0.15)
RFEP students	1.38** (0.21)
Female students	1.55*** (0.18)
Students on the Attendance Focus List	0.85 (0.13)
Students on the Behavior Focus List	0.77* (0.11)
2014 first quarter ELA grade	0.79*** (0.04)
School-level, Percent of corps members who took calculus	1.48 (0.62)
School-level, Percent of corps members working with a student of the same race	0.19*** (0.11)
Medium-low performing schools *(School-level mean ELA test change within 25th to 49th percentile)* †	1.39* (0.27)
Medium-high performing schools *(School-level mean ELA test change within 50th to 74th percentile)* †	1.07 (0.21)
Highest performing schools *(School-level mean ELA test change within 75th to 100th percentile)* †	1.76*** (0.38)
N	854
Pseudo R-squared†	0.05

*** indicates p<0.01; indicates ** p<0.05;
* indicates p<0.1 (marginal significance)

Exhibit reads: Students who attended approximately 41 to 80 hours were 1.4 times more likely to maintain or improve their ELA grade, controlling for other variables in the model, though this effect was only marginally significant.

† School fixed effects models only slightly improved model fit. For model parsimony, we included control variables for school-level ELA achievement. Final model fits data significantly better than the empty model, p<0.001.

Exhibit A5:
Logistic regression model predicting school year 2013-14 change in math grade

Independent variable	Odds ratio (SE)
Intercept	1.32** (0.39)
Attended ASP for 43 to 80 hours *(Attendance hours within 25th to 49th percentiles)*	1.45** (0.25)
Attended ASP for 81 to 158 hours ASP *(Attendance hours within 50th to 74th percentiles)*	2.21** (0.39)
Attended ASP for 159 or more hours *(Attendance hours within 75th to 100th percentiles)*	2.43*** (0.68)
Received 15.5 to 17.5 hours of in-school math tutoring *(In-school hours in 25th to 49th percentiles)*	2.58*** (0.78)
Received 17.6 to 21 hours of in-school math tutoring *(In-school hours in 50th to 74th percentiles)*	1.08 (0.22)
Received 21.1 or more hours of in-school math tutoring *(In-school hours in 75th to 100th percentiles)*	1.45* (0.28)
LEP students	0.93 (0.18)
RFEP students	0.57*** (0.10)
Female students	1.31* 0.21)
Students on the Attendance Focus List	0.82*** (0.05)
Students on the Behavior Focus List	0.72* (0.12)
2014 first quarter math grade	0.92 (0.15)
School-level, Percent of corps members working with a student of the same race	0.97** (0.02)
California state measure of school demographic characteristics†	0.43 (0.26)
N	1,202
Pseudo R-squared†	0.05

*** indicates p<0.01; indicates ** p<0.05;
* indicates p<0.1 (marginal significance)

Exhibit reads: Students who attended ASP for between 43 and 80 hours were 1.5 times more likely to improve their math grade

† School fixed effects models only slightly improved model fit. For model parsimony, we included a control variable for school-level achievement. Final model fits data significantly better than the empty model, p<0.001.

Exhibit A6:
Multilevel mixed effects models predicting 2013-14 school year change in Skills Report Card scores

Variables	Coefficient (SE)
Intercept, β_{00}	2.20*** (0.13)
Attended ASP for 80 or more hours *(Median ASP hours=80)*, γ_{01}	0.18*** (0.06)
Received 17.4 hours or more in-school math or ELA tutoring *(Median hours for all in-school tutoring=17.4 hours)*, γ_{02}	0.14*** (0.04)
LEP students, γ_{03}	0.03 (0.05)
RFEP students, γ_{04}	0.12*** (0.05)
Female students, γ_{05}	0.21*** (0.04)
Fall baseline SRC score, γ_{06}	-0.71*** (0.03)
Students on the Attendance Focus List, γ_{07}	0.46*** (0.12)
Students on the Behavior Focus List, γ_{08}	2.20*** (0.13)
School-level, Mean change in SRC scores, γ_{09}	0.18*** (0.06)
Random effects	
School mean, u_{0j} Level-1 effect, r_{ij}	0.4 <0.001
Wald $\chi^2(19)$	902.15***
N=1,514, Schools=22	

*** indicates p<0.01; indicates ** p<0.05;
* indicates p<0.1 (marginal significance)

Exhibit reads: Students who attended ASP for more than the median number of hours scored 0.18 points higher (out of 5 points) on the SRC between fall and spring.

Exhibit A7:
Multilevel mixed effects models predicting 2013-14 school year change in Scholastic Reading Inventory (ELA) assessment scores

	Without ELL and ASP interaction terms Coefficient (SE)	With ELL and ASP interaction terms Coefficient (SE)
Intercept, β_{00}	0.47*** (0.13)	0.30*** (0.09)
Attended ASP for 90 or more hours *(median ASP hours=90)*, γ_{01}	0.07* (0.04)	0.05* (0.03)
IFEP students who attended ASP for 90 or more hours *(median ASP hours=90)*, γ_{02}		0.35 (0.24)
LEP students who attended ASP for 90 or more hours *(median ASP hours=90)*, γ_{03}		0.11 (0.12)
RFEP students who attended ASP for 90 or more hours *(median ASP hours=90)*, γ_{04}		0.19* (0.11)
Received 17 or more hours of in-school tutoring *(median in-school tutoring hours=15)*, γ_{05}	-0.03 (0.05)	-0.14 (0.10)
IFEP students, γ_{06}	0.05 (0.07)	-0.02 (0.06)
LEP students, γ_{07}	0.04 (0.05)	(0.00) (0.04)
RFEP students, γ_{08}	0.01 (0.05)	0.01 (0.04)
Female students, γ_{09}	0.05 (0.03)	0.04 (0.03)
Baseline ELA periodic score, γ_{010}	-0.71*** (0.13)	-0.58*** (0.09)
Students on the Attendance Focus List, γ_{011}	0.26** (0.12)	0.09 (0.10)
Students on the Behavior Focus List, γ_{012}	0.03 (0.07)	-0.01 (0.05)
Random effects		
School mean, u_{0j}	<.00001	<.00001
Level-1 effect, r_{ij}	<.00001	0.04
Wald χ^2 (26)	95.03***	101.45***
N=136 Schools=17		

*** indicates p<0.01; indicates ** p<0.05;
* indicates p<0.1 (marginal significance)

Exhibit reads: Students who attended ASP for 90 or more hours gained, on average, 0.07 points (on a zero to one scale) between the fall and spring administrations of the ELA periodic assessment, though this effect was only marginally significant.

Exhibit A8:
Multilevel mixed effects models predicting 2012-13 school year change in Math periodic assessment scores

Variables	Coefficient (SE)
Intercept, β_{00}	0.17 (0.13)
Attended ASP for 60 or more hours *(mean hours)* and received 13-15.4 hours of math in-school tutoring *(In-school math tutoring hours within 25th to 49th percentiles)*, γ_{01}	-0.03 (0.10)
Attended ASP for 60 or more hours *(mean hours)* and received 15.5 to 19.9 hours of math in-school tutoring *(In-school tutoring math hours within 50th to 74th percentiles)*, γ_{02}	-0.04 (0.09)
Attended ASP for 60 or more hours *(mean hours)* and received more than 20 hours of math in-school tutoring *(In-school math tutoring hours within 75th to 100th percentiles*, γ_{03}	-0.01 (0.10)
IFEP students, γ_{04}	0.02 (0.07)
LEP students, γ_{05}	-0.01 (0.04)
RFEP students, γ_{06}	0.01 (0.04)
Female students, γ_{07}	-0.04 (0.03)
Fall baseline periodic assessment score, γ_{08}	-0.42*** (0.08)
Students on the Attendance Focus List, γ_{09}	-0.04 (0.03)
Students on the Behavior Focus List, γ_{010}	-0.04 (0.03)
Female corps members, γ_{011}	0.03 (0.04)
School-level, Percent of corps members who took calculus, γ_{012}	-0.13 (0.10)
School-level, Percent of corps members working with a student of the same race, γ_{013}	0.24 (0.31)
Received 13-15.4 hours of math in-school tutoring *(In school tutoring hours within 25th to 49th percentile)*, γ_{014}	-0.00 (0.04)
Received 15.5 to 19.9 hours of math in-school tutoring *(In school tutoring hours within 50th to 74th percentile)*, γ_{015}	-0.08 (0.05)
Received 20 hours of math in-school tutoring *(In school tutoring hours within 50th to 74th percentile*), γ_{016}	0.03 (0.05)
Attended ASP for 60 or more hours *(Mean ASP hours=60)*, γ_{017}	0.00 (0.06)
Random effects	
School mean, u_{0j} Level-1 effect, r_{ij}	<0.0001 0.03
Wald $\chi^2(17)$	60.50***
N=191, Schools=7	

*** indicates p<0.01; indicates ** p<0.05;
* indicates p<0.1 (marginal significance)

Exhibit reads: Controlling for all other variables in the model and for the nesting of students in schools, students with higher fall baseline scores scored significantly lower, losing 0.42 points, on the spring administration of the math periodic assessment.

Exhibit A9:
Logistic regression model predicting school year 2012-13 change in ELA grade

Independent variable	Odds ratio (SE)
Intercept	0.87 (0.43)
Attended ASP for 27 to 50 hours *(Attendance hours within 25th to 49th percentiles)*	0.77 (0.16)
Attended ASP for 51-98 hours ASP *(Attendance hours within 50th to 74th percentiles)*	0.82 (0.18)
Attended ASP for 99 or more hours *(Attendance hours within 75th to 100th percentiles)*	1.20 (0.26)
Received 11 or more hours of ELA in-school tutoring *(Mean ELA in-school tutoring hours=11)*	0.88 (0.17)
IFEP students	1.08 (0.34)
LEP students	0.99 (0.22)
RFEP students	1.55** (0.32)
Female students	1.53*** (0.22)
Students on the Attendance Focus List	0.43 (0.23)
Students on the Behavior Focus List	1.00 (0.42)
2012-13 first quarter ELA grade	0.92 (0.06)
School-level, Percent of corps members who took calculus	2.03 (1.24)
School-level, Percent of corps members working with a student of the same race	1.21 (0.92)
Medium-low performing schools *(School-level mean ELA test change within 25th to 49th percentile)* †	1.32 (0.40)
Medium-high performing schools *(School-level mean ELA test change within 50th to 74th percentile)* †	0.74 (0.23)
Highest performing schools. *(School-level mean ELA test change within 75th to 100th percentile)* †	1.21 (0.35)
N	1,382
Pseudo R-squared †	0.05

*** indicates p<0.01; indicates ** p<0.05;
* indicates p<0.1 (marginal significance)

Exhibit reads: Students classified as RFEP students were 1.55 times more likely to improve or maintain their ELA grade during the 2012-13 school year.

† School fixed effects models only slightly improved model fit. For model parsimony, we included control variables for school-level ELA achievement. Final model fits data significantly better than the empty model, p<0.001.

Exhibit A10:
Logistic regression model predicting school year 2012-13 change in math grade

Independent variable	Odds ratio (SE)
Intercept	0.18 (0.26)
Attended ASP for 26-48 hours *(Attendance hours within 25th to 49th percentiles)*	1.27 (0.94)
Attended ASP for 49-92 hours ASP *(Attendance hours within 50th to 74th percentiles)*	0.59 (0.40)
Attended ASP for 92 or more hours *(Attendance hours within 75th to 100th percentiles)*	1.92 (1.67)
Received 13-16 hours of in-school math tutoring *(In-school hours in 25th to 49th percentiles)*	0.89 (0.41)
Received 16-19 hours of in-school math tutoring *(In-school hours in 50th to 74th percentiles)*	0.93 (0.42)
Received 20 or more hours of in-school math tutoring *(In-school hours in 75th to 100th percentiles)*	1.49 (0.69)
IFEP students	0.54 (0.43)
LEP students	0.79 (0.34)
RFEP students	0.71 (0.30)
Female students	1.08 (0.36)
Students on the Attendance Focus List	0.73 (0.28)
Students on the Behavior Focus List	0.61 (0.22)
2012-13 first quarter math grade	9.08** (7.92)
School-level, Percent of corps members working with a student of the same race	11.25 (38.53)
School-level, Percent of corps members who took calculus	0.55 (0.63)
N	190
Pseudo R-squared †	0.05

*** indicates p<0.01; indicates ** p<0.05;
* indicates p<0.1 (marginal significance)

Exhibit reads: Students classified as RFEP students were 1.55 times more likely to improve or maintain their ELA grade during the 2012-13 school year.

† School fixed effects models only slightly improved model fit. Final model fits data significantly better than the empty model, p<0.001.

Exhibit A11:
Multilevel mixed effects models predicting 2012-13 school year change in Skills Report Card scores

Variables	Coefficient (SE)
Intercept, β_{00}	1.56*** (0.41)
Attended ASP for 41or more hours *(Median ASP hours=80)*, γ_{01}	0.06 (0.14)
Received 17.1 hours or more in-school math or ELA tutoring *(Median hours for all in-school tutoring=17.1 hours)*, γ_{02}	0.11 (0.12)
IFEP students, γ_{02}	0.48 (0.33)
LEP students, γ_{04}	0.30* (0.17)
RFEP students, γ_{05}	0.46*** (0.17)
Female students, γ_{06}	0.19 (0.15)
Fall baseline SRC score, γ_{07}	-0.50*** (0.10)
Students on the Attendance Focus List, γ_{08}	0.07 (0.22)
Students on the Behavior Focus List, γ_{09}	0.39 (0.25)
School-level, Mean change in SRC scores, γ_{010}	-0.08 (0.75)
Random effects	
School mean, u_{0j} Level-1 effect, r_{ij}	0.08 <0.35
Wald $\chi^2(19)$	34.62***
N=111, Schools=18	

*** indicates p<0.01; indicates ** p<0.05;
* indicates p<0.1 (marginal significance)

Exhibit reads: Controlling for other variables in the model, students classified as RFEP significantly improved their SRC scores between fall and spring, gaining, on average 0.46 points on the five point scale index.

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