

**ACHIEVING HIGH SCHOOL GRADUATION:
Citizen Schools' Youth Outcomes in Boston**

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Executive Summary

Citizen Schools provides an enriched after-school program to low-income youth in sixth, seventh, and eighth grades with the purpose of preparing students to achieve long-term academic, social, career, and civic success. To accomplish its mission, Citizen Schools extends the student learning day by offering hands-on learning opportunities in areas that include career exposure, high school and college preparation, and academic enrichment. Since 2001, Citizen Schools has sponsored a longitudinal evaluation of the program's success in advancing the development of the academic skills of middle school participants as they progress through high school. *Achieving High School Graduation* is the seventh and final report in a series of reports presenting findings from the evaluation of the middle and high school experiences of former Citizen Schools participants in Boston. This report presents a final look at the academic trajectories of youth who participated in the Citizen Schools 8th Grade Academy program and explores whether former participants achieve positive academic outcomes and successfully complete high school.

The first four years of the evaluation found evidence that Citizen Schools participation supports students' transition from the middle grades into high school and their subsequent educational success. Former participants were found to be at greater educational risk than Boston Public Schools (BPS) students overall prior to enrolling in Citizen Schools, based on their fourth-grade performance on tests administered through the Massachusetts Comprehensive Assessment System (MCAS) (Fabiano, Pearson, & Williams, 2005). Despite the challenges that at-risk students face, evaluation findings indicated that Citizen Schools participants were more engaged and made greater academic gains in middle and high school relative to a matched comparison group. In addition, Citizen Schools participants reported experiencing positive relationships with adults and peers and feeling more confident in their public speaking skills as a result of program participation (Fabiano et al., 2005; Fabiano, Pearson, Reisner, & Williams, 2006). Findings from the fourth year of the evaluation demonstrated that participation in Citizen Schools during the middle school years was associated with increased levels of student engagement and achievement in the early high school years (Fabiano et al., 2006). In eighth grade, Citizen Schools participants attended school more and achieved at higher levels in English Language Arts (ELA) compared with matched nonparticipants.

The fifth year of the evaluation focused on the academic outcomes of participants and matched nonparticipants as they entered and progressed through high school. Following their participation in Citizen Schools' 8th Grade Academy, students enrolled in top-tier high schools at more than twice the rate of matched comparison students (Pearson, Vile, & Reisner, 2008). Analyses revealed positive impacts on school attendance and on academic achievement, with former participants having significantly higher pass rates in ninth-grade ELA courses, tenth-grade math courses, and the tenth-grade ELA MCAS. Another noteworthy finding of the fifth year report was that former Citizen Schools participants were more likely to be on track to graduate from high school on time than were matched nonparticipants (Pearson et al., 2008).

The sixth year report of the evaluation updated academic engagement and achievement analyses with data from the 2006-07 school year and incorporated new analyses of twelfth-grade outcomes and graduation rates. Evaluators found that former Citizen Schools participants were

more likely than BPS students overall to graduate from high school in four years, based on the class of 2007 (Vile, Arcaira, & Reisner, 2009). Evaluators also found that former participants were more likely to persist in a top-tier high school from ninth to eleventh grade than were matched nonparticipants who also enrolled in a top-tier high school in the ninth grade. Other findings in the sixth year supported previous years' findings: former participants were more likely than matched nonparticipants to select a top-tier high school, attend school at a high rate, pass grade-level math courses, and earn proficient or advanced levels on the tenth- grade mathematics and ELA MCAS.

This seventh year report updates analyses conducted for the sixth year report with data from the 2007-08 school year and takes a final look at the academic trajectories of former participants as they progressed through high school. Analyses compare students' selection of and persistence in a top-tier high school, school engagement (i.e., school attendance and suspension), academic achievement (i.e., course grades and standardized test scores), and progress toward and achievement of high school graduation (i.e., on-time promotion, on-track to graduation, and four-year graduation rate). Analyses compare former 8th Grade Academy participants with matched nonparticipants and, when possible, with BPS students overall.

In the final analysis of Citizen Schools' youth outcomes in Boston, evaluators found that former 8th Grade Academy participants were more likely than matched nonparticipants to enroll and persist in a top-tier high school. Former participants enrolled in top-tier high schools at more than twice the rate of matched comparison students. In addition, former participants were more likely to persist in a top-tier high school from ninth to eleventh grade and from ninth to twelfth grade. Overall, former participants enrolled and completed all four years of high school in a top-tier school at more than three times the rate of matched comparison students.

High school engagement findings were consistent with previous reports. Former Citizen Schools participants had, on average, significantly higher attendance rates in high school than did matched nonparticipants. Differences ranged from an additional week of school attended in the tenth grade to an additional two and a half weeks attended in eleventh grade. There were no statistical differences in suspension rates between former participants and matched nonparticipants.

Citizen Schools participation was associated with higher math performance, as measured by high school course grades and MCAS test scores. Evaluators found that former participants outperformed matched nonparticipants in their early high school math courses. Former participants were more likely than matched nonparticipants to pass math in ninth, tenth, and eleventh grade and were more likely to earn As and Bs than were their matches in their ninth- and tenth-grade math courses. While both participants and matched nonparticipants had similar, fairly high pass rates for the tenth-grade mathematics MCAS, participants earned higher scores, earning proficient and advanced levels at higher rates than their matches. Comparing participant performance to BPS district performance, evaluators found that former participants were more likely to pass the mathematics MCAS than the average BPS student. In addition, former participants attending non-exam schools were also more likely to pass the mathematics MCAS than the average BPS student attending a non-exam school.

Consistent with previous reports, evaluators found that former participants outperformed their matches on some ELA indicators but fared similarly to their peers on others. Former participants were more likely than their matches to pass their ELA courses in the ninth and twelfth grades. In addition, former participants were more likely than matched nonparticipants to earn As and Bs in their tenth-grade ELA courses. Similar to the mathematics MCAS results, evaluators found that former participants outperformed their matches in earning proficient and advanced levels in the ELA MCAS. Evaluators also found that former participants were more likely to pass the ELA MCAS than the average BPS student. Former participants attending non-exam schools were also more likely to pass the ELA MCAS than the average BPS student attending a non-exam school.

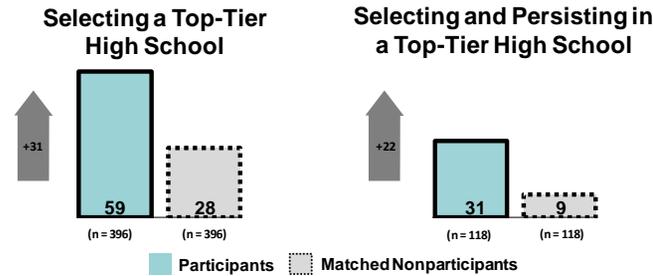
Former participants outperformed their matches on leading indicators predictive of high school completion. Upon entering tenth grade, former 8th Grade Academy participants were more likely than matched nonparticipants to be on track to graduate high school on time. This predicted difference was borne out, and evaluators found that former Citizen Schools participants graduated at significantly higher rates than their matches and the district overall.

Evaluators also conducted additional analyses comparing the high school completion rates of students attending top-tier high schools and other high schools. Former participants outperformed their matches on high school graduation rate, regardless of the quality of their high school. Former participants attending top-tier schools were more likely to graduate high-school on time than matched nonparticipants attending top-tier schools. Former participants attending non-top-tier schools also graduated at significantly higher rates than matched nonparticipants attending non-top-tier schools. In addition, former participants attending non-exam schools were more likely to graduate on time than the average BPS student attending a non-exam school.

Overall, this final report shows that participation in Citizen Schools was associated with successful high school transitions, compared to their peers who did not participate in the program. It also shows that program participation was associated with long-term benefits, especially the successful completion of high school. The summary exhibit on the next page highlights the academic indicators supporting this overall finding.

Indicators of Former Participants' Progress Toward High School Graduation

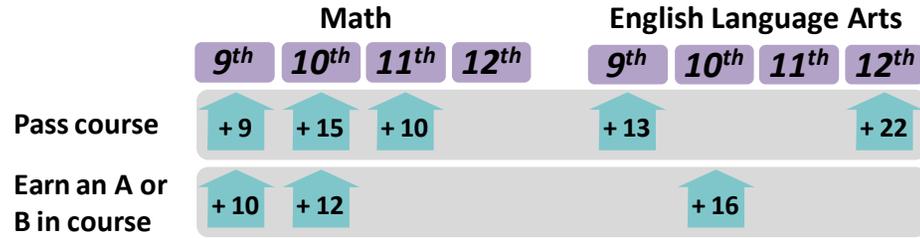
Enrolling in a Top-Tier High School



Former participants were more likely to select a top-tier school than matched nonparticipants.

Former participants were more likely to select and complete all 4 years of high school in a top tier school than their matches.

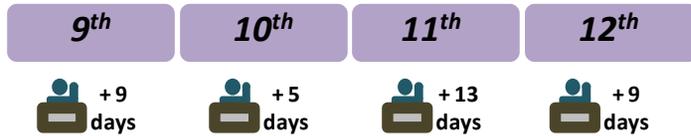
Student Achievement



Former participants outperformed matched nonparticipants in their early high school math courses.

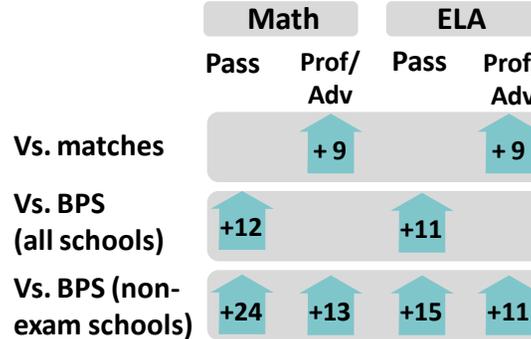
Former participants outperformed their matches on some ELA outcomes and fared similarly to their peers on others.

Student Engagement



Former participants had, on average, significantly higher attendance rates in high school than did matched nonparticipants. There were no statistical differences in suspension rates between former participants and matched nonparticipants.

MCAS



Former participants passed their math and ELA MCAS exams at rates similar to their matches. However, those who passed earned proficient and advanced levels at significantly higher rates their matches. Former participants were more likely to pass their exams than the average BPS student. In addition, former participants attending non-exam schools were more likely to pass and to earn higher scores on their exams than were BPS students attending non-exam schools.

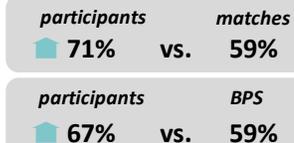
Progress Measures

Former participants were more likely than matched nonparticipants to be on track to graduate upon entering tenth grade.



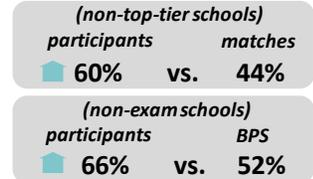
Former participants were more likely to graduate in four years than matched nonparticipants and the average BPS student.

4-Year Graduation Rates



Former participants attending non-top-tier and non-exam schools also outperformed their comparison groups.

4-Year Graduation Rates



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Evaluation Overview

Since 2001, Policy Studies Associates (PSA) has conducted a multi-phase evaluation assessing Citizen Schools' progress in advancing the academic success of educationally at-risk middle school students. This report presents a final look at the academic trajectories of youth who participated in Citizen Schools 8th Grade Academy up to the point of high school graduation. The evaluation used a quasi-experimental design that employed a matched comparison group of similar Boston Public Schools (BPS) students not enrolled in Citizen Schools to assess the program's impact on participants. Citizen Schools, BPS, and four Boston-area charter schools have annually provided PSA with data on the educational engagement and academic achievement of participants and former participants. In addition, BPS provided equivalent data for the matched comparison group, with the exception of information about their after-school experiences while in middle school.

Evaluation Context

The PSA evaluation of Citizen Schools in Boston has examined a sample of former participants who participated in 8th Grade Academy between 2001 and 2006. In 2001-02, Citizen Schools launched its 8th Grade Academy program to prepare and support students as they transition from middle school to high school. During the study period, 8th Grade Academy drew students from multiple schools, especially from those in which Citizen Schools had a school-year program serving sixth- and seventh-graders. Like the sixth- and seventh-grade program, 8th Grade Academy offers apprenticeships staffed by adult volunteers and community explorations along with other enrichment experiences. 8th Grade Academy also helps participants apply to and succeed in top-tier high schools and understand how to prepare for college. To do this, Citizen Schools staff provide families with information and resources about high schools in Boston and the high school application process. Looking ahead to the transition to college, Citizen Schools takes 8th Grade Academy participants on visits to colleges and job sites to connect participants' current learning with their futures. To help students develop social skills for high school and college-level success, 8th Grade Academy teaches participants leadership and personal decision-making skills. Citizen Schools created its alumni program in 2004 to support 8th Grade Academy graduates and their families during the high school transition period. The alumni program aims to help students keep in touch with their fellow 8th Grade Academy classmates; provide students with additional resources on college, career, and enrichment opportunities; celebrate their achievements; and bring them together with a network of Citizen Schools alumni.

Analytic Approach

This evaluation uses a quasi-experimental design that matches participants with similar nonparticipants based on observable measures including demographic characteristics and test scores. Participant and nonparticipant groups are statistically equivalent at baseline, as shown in

Appendix A. This report presents analyses that compare the outcomes of former 8th Grade Academy participants with the outcomes of the matched comparison group of nonparticipants and, in some cases, with the outcomes of BPS students in the same grade-level cohorts. Comparing the outcomes of former 8th Grade Academy participants to two groups, the matched comparison group and BPS students as a whole, allows for the assessment of participant outcomes in two distinct contexts, a statistically similar group of students and the larger environment of the school system in which they are enrolled.

The design of the study is limited by hidden bias that may be present in unobservable measures, which may threaten the internal validity of the results. The primary cause of hidden bias occurs in the selection and attrition of participants and matched nonparticipants. Because of these two types of self-selection, the evaluation may overestimate or underestimate the impact of Citizen Schools. Evaluators believe self-selection into the program may overestimate the impact of Citizen Schools on measured outcomes. Participants chose to be part of Citizen Schools, and so they may have unmeasured traits correlated with outcomes studied in the evaluation. Evaluators also believe that attrition may inflate the measured outcomes of both the participant and nonparticipant groups and that the use of replacement matches may understate the true difference in high school progress and success between participants and nonparticipants. Participants and nonparticipants remaining in the sample are likely to achieve greater academic success than their peers who drop out of the sample. BPS data indicate that nonparticipants left the BPS system at a higher rate than did former Citizen Schools participants in the ninth-, tenth-, and eleventh-grade analysis groups. Because nonparticipants who drop out of the BPS system are replaced with nonparticipants who persist in the BPS system, evaluators believe that different patterns of attrition may result in understatement of the true difference between the groups. Appendix A provides further information on the matching process and the evaluation's analytical approach.

Apparent differences between participant and comparison groups are measured by statistical tests. Differences that are statistically significant are significant at the $p < .05$, $p < .01$, or $p < .001$ levels as noted in the text. In addition, PSA computed an effect size for differences between the participant and comparison groups. Effect size measures the magnitude or strength of the finding. Effect size was computed using the formulas outlined in the What Works Clearinghouse's (WWC) Procedures and Standards Handbook. In this report, Hedge's g is used to measure the magnitude of the difference between two means.

Many of the outcomes examined in the study are based on binary events. For example, students pass or fail their state tests; students complete or do not complete high school on time. For these dichotomous variables, WWC guidelines instruct researchers to calculate odds-ratios and Cox index¹ scores (ES_{Cox}) to determine effect size. To calculate an odds-ratio, evaluators compute the odds of reaching a particular outcome for both the intervention and control group. Odds are defined as the probability of reaching an outcome divided by the probability of not reaching that outcome [$p/(1-p)$]. Using the first finding in the study as an example, evaluators found that 59 percent of former participants selected a top-tier high school, compared to 28 percent of matched nonparticipants. The odds of selecting a top-tier high school is $1.44 =$

¹ The Cox index is standardized to be comparable to and interpreted in the same way as the effect sizes produced by the Hedge's g calculation.

$[0.59/(1-0.59)]$ for former participants, compared to $0.39 = [0.28/(1-0.28)]$ for matched nonparticipants. In calculating the odds-ratio, evaluators divided the odds of selecting a top-tier high school for former participants by the odds of selecting a top-tier high school for matched nonparticipants ($3.7 = 1.44/0.39$). Odds-ratios (OR) serve a useful interpretive function by describing how much more or less likely former participants are to achieve a particular outcome than are their comparison groups. The recently described example is interpreted as follows: former participants are 3.7 times more likely than matched nonparticipants to select a top-tier high school (OR=3.7).

Odds-ratios are also used in calculating Cox index scores, the WWC’s preferred measure of effect size for dichotomous variables. Cox index scores are calculated by taking the natural log (ln) of the odds-ratio and dividing by a constant of 1.65. Cox index scores are shown in the study where appropriate. Following WWC guidelines, evaluators also identified substantively positive findings. Though not statistically significant ($p > .05$), substantively positive findings exceed WWC minimum effect size standards ($ES \geq 0.25$) and warrant consideration. Findings in which Cox index scores exceed 0.25 are also noted in this report. Refer to Appendix A for more information on the study’s technical approach.

Evaluators added the final cohort of 8th Grade Academy participants to the evaluation sample in the fifth year of the evaluation (Pearson et al., 2008). The complete sample includes 448 former 8th Grade Academy participants from the classes of 2001-02 through 2005-06, as shown in Exhibit 1. This final report follows these 448 8th Grade Academy participants through the 2007-08 school year and assesses their school engagement, academic achievement, and progress toward high school graduation. In this report, the total number of individuals in any single analysis is limited by the number of 8th Grade Academy classes eligible to be included based on the cohort’s grade in high school and by the number of matched nonparticipant pairs for which data are available for that measure.

Exhibit 1
Citizen Schools Participants in the Evaluation,
by 8th Grade Academy Class

8th Grade Academy Class	N
2001-02 class	48
2002-03 class	85
2003-04 class	118
2004-05 class	103
2005-06 class	94
Total	448

Previous Report Findings

The first three years of the evaluation included the collection of survey data about students' experiences with Citizen Schools and the tracking of participants' performance on educational indicators during their middle school years. Findings from the first three years of the evaluation demonstrated that Citizen Schools participants were making the types of progress that were consistent with future success. Survey data revealed that Citizen Schools students had a strong sense of connection to the program and experienced positive relationships with adults and peers (Fabiano, Pearson, & Williams, 2005). Students also reported feeling more confident in public speaking as a result of program participation, and they reported frequent opportunities to participate in hands-on learning and take on leadership roles at Citizen Schools. Additionally, results from the first three years of the evaluation suggest that Citizen Schools had a positive impact on short-term academic outcomes during eighth grade, as shown in Exhibit 2. Among students in their first year of program participation, positive outcomes were found in school attendance and promotion rates, suspension rates, and seventh-grade scores on the English Language Arts (ELA) test administered as part of the Massachusetts Comprehensive Assessment System (MCAS). For students who continued participating in Citizen Schools for a second or third year, analysis also showed a positive impact on school attendance and promotion rates, mathematics grades of returning students in the seventh grade, and eighth-grade MCAS scores in mathematics.

Exhibit 2
Summary of Differences Between 8GA Participants and Matched Nonparticipants in Eighth Grade

Indicator	N	Participants	Matched Nonparticipants	Percentage-point Difference
School attendance rate	435	92%	86%	▲ + 6***
School suspension rate	435	17%	21%	▼ - 4
Pass English course in third marking period	315	87%	77%	▲ + 10***
Pass math course in third marking period	309	84%	80%	▲ + 4
Mathematics MCAS proficiency	387	45%	43%	▲ + 2

- * Participants outperformed matched nonparticipants, $p < .05$
- ** Participants outperformed matched nonparticipants, $p < .01$
- *** Participants outperformed matched nonparticipants, $p < .001$

The fourth, fifth, and sixth years of the evaluation focused on the academic outcomes of participants and matched nonparticipants as they entered and progressed through high school. Findings from the fourth year of the evaluation demonstrated that participation in Citizen Schools during the middle school years was associated with increased levels of student

engagement and achievement in the early high school years (Fabiano, Pearson, Reisner, & Williams, 2006). Former 8th Grade Academy participants enrolled in top-tier high schools at about twice the rate of matched nonparticipants. During their ninth-grade year, former participants earned higher grades than did matched nonparticipants in English courses. A noteworthy finding of the fifth year report was that former Citizen Schools participants were more likely to be on track to graduate from high school on time than were matched nonparticipants (Pearson, Vile, & Reisner, 2008). Analyses revealed positive impacts on school attendance and on the achievement of passing scores in ninth-grade ELA classes, tenth-grade math classes, and the ELA MCAS. In the most recent report, evaluators found that former Citizen Schools participants were more likely than BPS students overall to graduate from high school in four years, based on the class of 2007 (Vile, Arcaira, & Reisner, 2009). Other findings in the sixth year supported previous years' findings: former participants were more likely than matched nonparticipants to enroll in top-tier high schools, attend school at a high rate, pass their math course, and perform at the proficient level or above on the mathematics and ELA MCAS.

Overview of the Final Report

This report presents findings on former Citizen Schools participants' progress from high school selection to high school graduation. Specific analyses compare the selection of and persistence in top-tier high schools, school engagement (i.e., school attendance and suspension), academic achievement (i.e., course grades and standardized test scores), and progress toward and achievement of high school graduation (i.e., on-time promotion, on-track to graduation, and four-year graduation rate). Analyses compare former 8th Grade Academy participants with matched nonparticipants and, when possible, to BPS students overall. Appendix B provides definitions of the specific measures used in the analyses. The report is organized chronologically in the order in which a student progresses through high school.

High School Selection and Persistence

Former 8th Grade Academy participants took an important first step on the road to high school graduation by selecting and remaining enrolled in top-tier high schools more often than did matched nonparticipants. Over half of former participants enrolled in a top-tier high school in ninth grade, and the majority of those students persisted in a top-tier high school through twelfth grade.

High School Selection

Boston Public Schools offers families choices in selecting the high school attended by students. To help families navigate the high school selection process, Citizen Schools provides 8th Grade Academy participants and their parents with information and resources about Boston high schools, highlighting those high schools with a high degree of student success. For purposes of the evaluation, Citizen Schools developed a three-tier school quality rating system. A top-tier school is considered to have a high level of educational culture, support, and achievement, as indicated by measures such as MCAS passing rates, attendance rates, suspension rates, promotion rates, drop-out rates, graduation rates, resources available at the school, college preparation courses offered, and external partnerships.

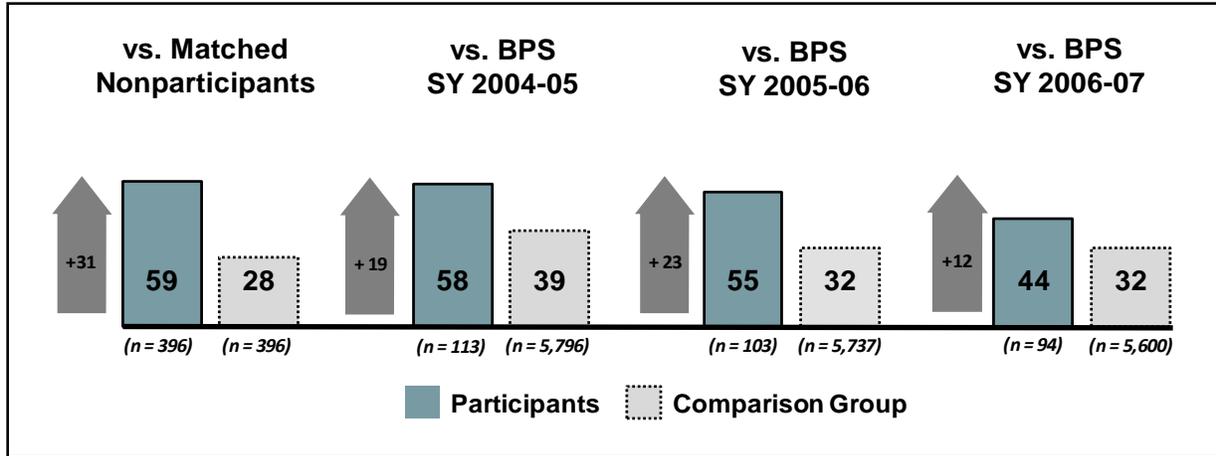
Former 8th Grade Academy participants were over three times more likely to select a top-tier high school than were matched nonparticipants, with an odds ratio (OR) of 3.7.² As shown in Exhibit 3, 59 percent of former participants enrolled in a top-tier high school compared with 28 percent of matched nonparticipants ($p < .001$, $ES_{Cox} = .80$).

When compared to BPS students overall, former participants were also more likely to enroll in a top-tier high school following their participation in 8th Grade Academy.³ Former participants were over two times more likely to select a top-tier high school than was the average BPS student in the 2004-05 school year (OR=2.2), with 58 percent of participants and 39 percent of BPS students enrolled in a top-tier high school in 2004-05 ($p < .001$, $ES_{Cox} = .47$). In 2005-06, former participants were also over twice as likely to select a top-tier high school than was the average BPS student in the 2005-06 school year, with an odds ratio of 2.6. Fifty-five percent of participants and 32 percent of BPS students enrolled in a top-tier high-school in the 2005-06 school year ($p < .001$, $ES_{Cox} = .58$). In 2006-07, the proportion of former participants enrolling in a top-tier high school declined from previous years, although former participants were still more likely than BPS students overall to enroll in a top-tier high school, with 44 percent of participants and 32 percent of BPS students enrolling in a top-tier high school (OR=1.7, $p < .001$, $ES_{Cox} = .31$).

² This analysis includes students who attended a high school rated by Citizen Schools. Among former participants and matched nonparticipants in the evaluation sample, 3 percent enrolled in a high school in ninth grade that was not rated, according to data provided by BPS and Citizen Schools.

³ This analysis includes students who attended a high school rated by Citizen Schools. Evaluators calculated the total number of ninth-grade BPS students enrolled in high schools rated by Citizen Schools in these years, including charter schools.

**Exhibit 3
Former Participants' Selection of Top-Tier High Schools,
Compared with Matched Nonparticipants and BPS Students**



Persistence in Top-Tier High Schools

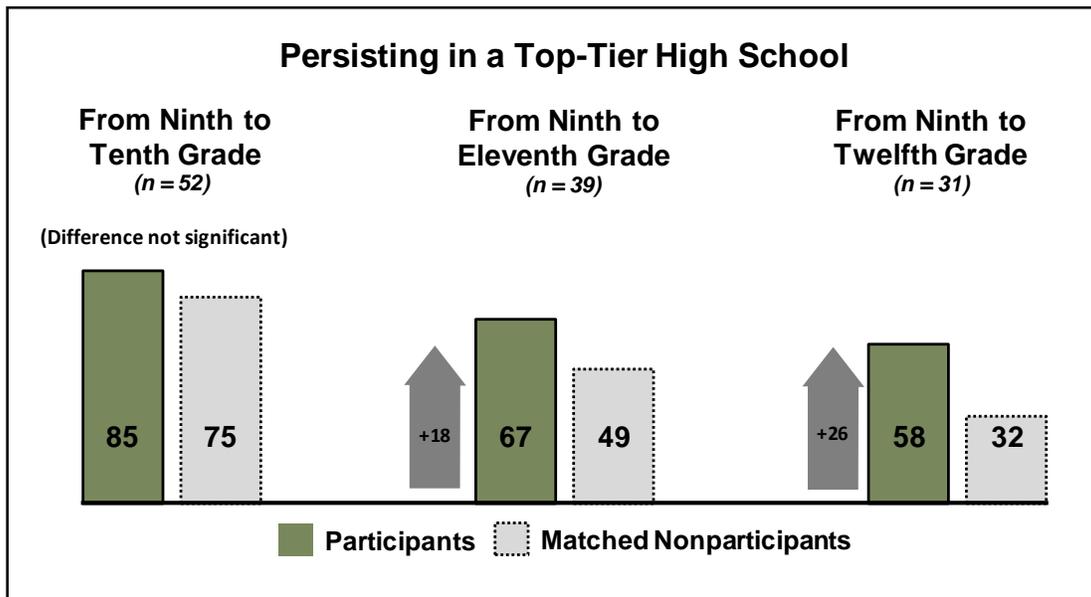
Attending a top-tier high school may expand the learning opportunities available to students and thus exert a positive influence on academic achievement (Abdulkadiroglu, Angrist, Cohodes, Dynarski, Fullerton, Kane, & Pathak, 2009; Massachusetts Department of Education, 2009). Enrolling in a top-tier high school in ninth grade and remaining enrolled in a top-tier high school through twelfth grade can help ensure receipt of the full benefits of a top-tier school. Over half of former participants who enrolled in a top-tier high school in freshman year remained enrolled in a top-tier high school for their entire high school career.

Former 8th Grade Academy participants who enrolled in a top-tier high school in ninth grade were more likely to persist in a top-tier high school than were their matched counterparts.⁴ As shown in Exhibit 4, 85 percent of former participants remained enrolled in a top-tier high school in tenth grade, compared with 75 percent of matched nonparticipants. Although considered a substantively positive effect according to the WWC Standards ($ES_{Cox}=.37$), this difference was not statistically significant. The gap between former participants and matched nonparticipants in the percentage of students persisting in a top-tier high school widened as students progressed through high school. Former participants were over two times more likely to stay enrolled in a top-tier high school from ninth to eleventh grade than were matched

⁴ This analysis includes participants enrolled in top-tier high schools in ninth grade, each of whom was matched to a nonparticipant also enrolled in a top-tier high school in ninth grade. Three high schools' rankings decreased from high to medium quality during the period of the evaluation. Evaluators considered students who enrolled in these schools in ninth grade before the change in ranking to be enrolled in a top-tier high school for each year they remained enrolled in the same school. Students who first enrolled in one of the three schools after the ranking change or who transferred to one of the three schools after the ranking change were not considered to be enrolled in a top-tier high school.

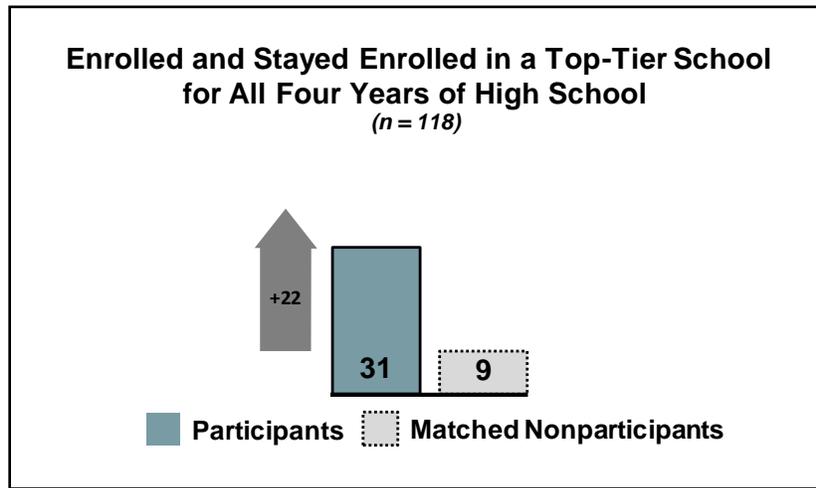
nonparticipants (OR=2.1). Sixty-seven percent of former participants persisted in a top-tier high school from ninth to eleventh grade, compared to 49 percent of matched nonparticipants, for a significant difference of 18 percentage points ($p < .05$, $ES_{Cox} = .45$). When looking at persistence in a top-tier high school for all four years, former participants were nearly three times more likely than matched nonparticipants to remain enrolled in a top-tier school, with an odds ratio of 2.9. Fifty-eight percent of participants remained in a top-tier school for all four years of high school, compared to 32 percent of matched nonparticipants ($p < .05$, $ES_{Cox} = .65$).

Exhibit 4
Former Participants' Persistence in Top-Tier High Schools,
Compared with Matched Nonparticipants



Evaluators also calculated the overall percentage of former participants who both enrolled and stayed enrolled in top-tier schools for all four years of high school. Evaluators found that 31 percent of former participants selected a top-tier school and persisted in such a school for all four years of high school, compared to 9 percent of matched nonparticipants, as shown in Exhibit 5. The difference was statistically significant, and evaluators computed that former participants were over four times more likely than matched nonparticipants to select and persist in a top-tier school through graduation than were matched nonparticipants (OR=4.3, $p < .001$, $ES_{Cox} = .88$).

Exhibit 5
Former Participants' Selection of and Persistence
in Top-Tier High Schools, Compared with Matched Nonparticipants



Summary Findings

Former 8th Grade Academy participants were more likely than matched nonparticipants to enroll and persist in a top-tier high school. Former participants were over three times more likely to select a top-tier school than were matched nonparticipants. In addition, former participants in a top-tier school were two times more likely to persist in a top-tier school from ninth to eleventh grade, were nearly three more likely to stay enrolled in a top-tier school from ninth to twelfth grade, and were over four times more likely to both enroll and complete all four years of high school in a top-tier school.



High School Engagement

Along with examining the school selection decisions of former participants, evaluators also studied a series of leading indicators, metrics considered to hold some predictive power in forecasting student achievement and success. This section describes the analysis of two engagement measures, school attendance and suspension rates. Evaluators found that former participants attended school more often than did matched nonparticipants at each grade level in high school, with differences ranging from an additional week of school in tenth grade to an additional two and a half weeks in eleventh grade. Former participants were suspended at rates similar to their matches.

School Attendance

On average, former 8th Grade Academy participants attended high school more often than did matched nonparticipants. As shown in Exhibit 6, differences range from a low of 3 percentage points, equivalent to about 5 additional school days, in tenth grade to a high of 7 percentage points, equivalent to about 13 additional school days, in eleventh grade.

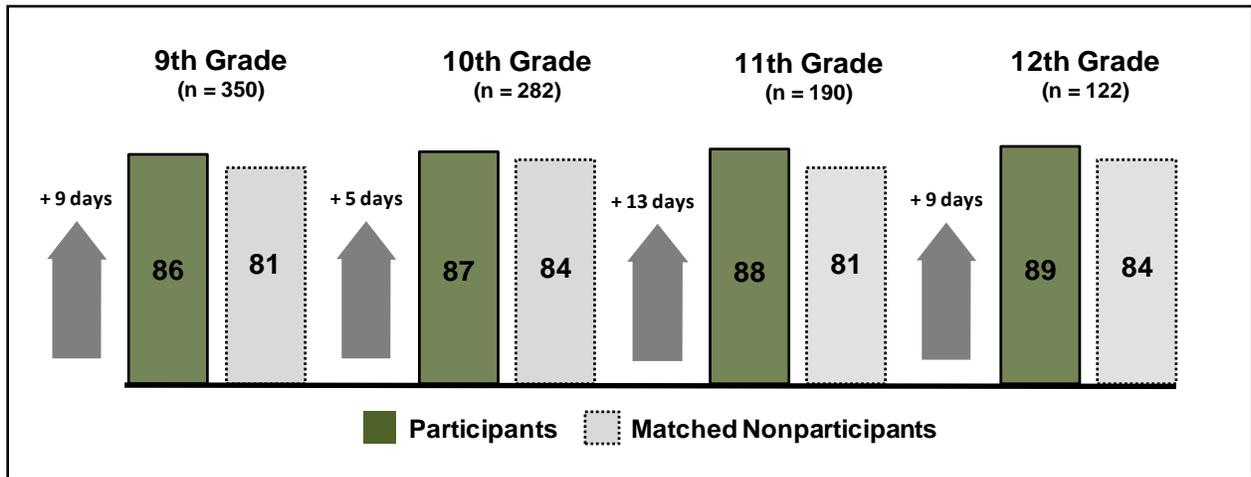
**Exhibit 6
Former Participants' Attendance Rates,
Compared with Matched Nonparticipants**

Difference Between Participants and Matched Nonparticipants		
Indicator	Percentage Points	Days Attended
Ninth-grade school attendance (<i>n</i> =350)	▲ + 5	▲ + 9 days
Tenth-grade school attendance (<i>n</i> =282)	▲ + 3	▲ + 5 days
Eleventh-grade school attendance (<i>n</i> =190)	▲ + 7	▲ + 13 days
Twelfth-grade school attendance (<i>n</i> =122)	▲ + 5	▲ + 9 days

Former participants attended school at significantly higher rates than did matched nonparticipants in every grade of high school. As shown in Exhibit 7, former participants had an average ninth-grade attendance rate of 86 percent, while matched nonparticipants had an average rate of 81 percent, for a difference of 5 percentage points or about 9 days of school ($p < .001$, $g = 0.24$). In tenth grade, former participants attended school at a rate of 87 percent, while matched nonparticipants attended school at a rate of 84 percent, for a difference of 3 percentage points or about 5 days of school ($p < .05$, $g = 0.15$). Former participants attended school two and half weeks longer than their matches in the eleventh grade. Former participants had an eleventh-grade attendance rate of 88 percent, while matched nonparticipants had a rate of 81 percent, for a difference of 7 percentage points or about 13 days of school ($p < .001$, $g = 0.32$). In twelfth grade,

former participants attended school at a rate of 89 percent, while matched nonparticipants attended school at a rate of 84 percent, for a difference of 5 percentage points or about 9 days of school ($p < .01$, $g = 0.30$).

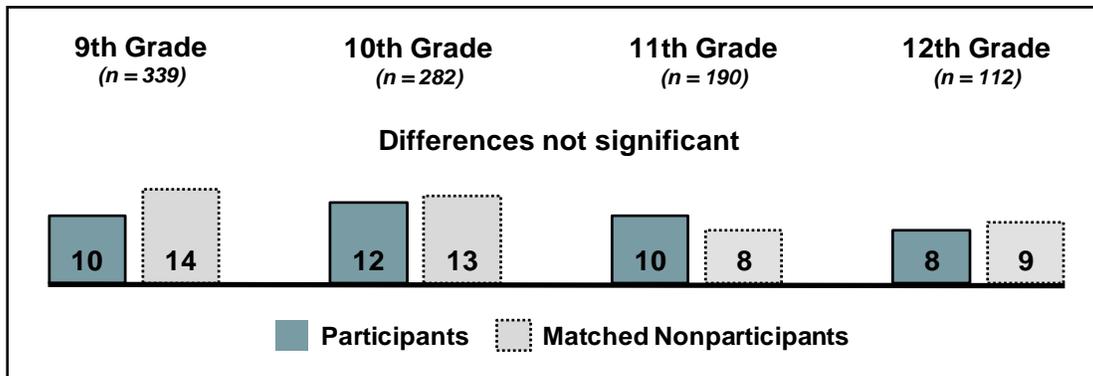
Exhibit 7
Former Participants' Attendance Rates by Grade,
Compared with Matched Nonparticipants



Suspensions

Former 8th Grade Academy participants and matched nonparticipants were suspended at similar rates at all grade levels. As shown in Exhibit 8, no significant difference was found in the suspension rates of former participants and nonparticipants at any grade level.

Exhibit 8
Former Participants' Suspension Rates by Grade,
Compared with Matched Nonparticipants



Summary Findings

Former participants attended school more often than did matched nonparticipants at each high school grade level, with differences ranging from 5 additional school days in tenth grade to 13 additional school days in eleventh grade. Former participants were suspended at rates similar to their matches.



High School Academic Achievement

Performance in core academic subjects has considerable consequences for student promotion and overall progress toward graduation. The following analysis examines academic achievement in mathematics and ELA, including student performance both in high school courses and in required high school exit examinations. Evaluators found that former participants outperformed their comparison groups on the majority of math course performance indicators examined. Consistent with earlier phases of the evaluation, former participants outperformed their peers on some ELA course performance indicators but fared similarly to their peers on others.

Examining MCAS performance, evaluators found that former participants outperformed their comparison groups on a majority of measures examined. Evaluators found that while former participants and matched nonparticipants passed their math and ELA examinations at similar rates, former participants earned higher scores, attaining proficient and advanced levels at significantly higher rates than their matched peers. Former participants also outpaced the district overall. Former participants had significantly higher MCAS pass rates than their BPS peers, with non-exam school participants outperforming their non-exam school BPS peers in passing and earning proficient and advanced levels on their math and ELA examinations.

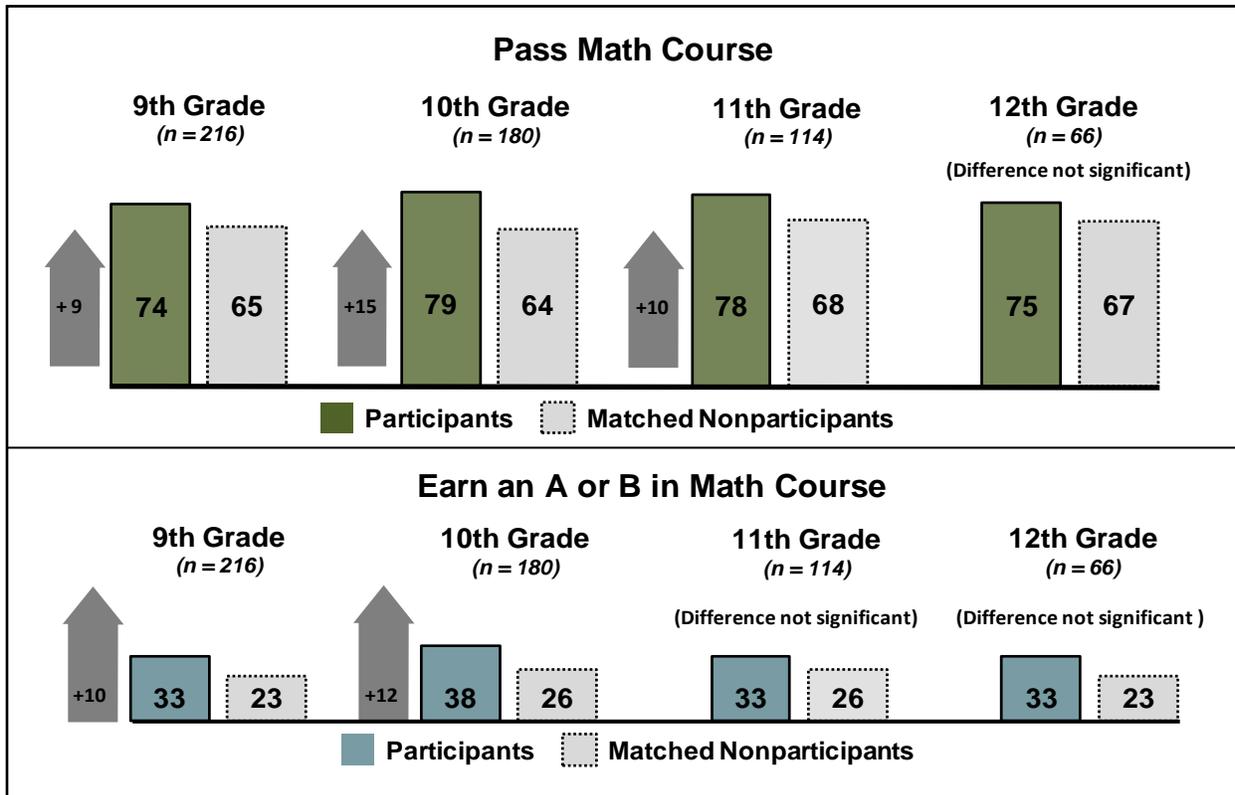
Math Course Performance

Evaluators analyzed both proficiency and excellence in grade-level coursework by examining the percent of former participants passing and the percent of former participants earning As or Bs in their math courses during the third marking period of the school year. Evaluators found that former participants outperformed matched nonparticipants on the majority of math indicators examined, particularly in the early high school grades.

Ninth-grade former participants had significantly higher pass rates in their math courses than did matched nonparticipants in the third marking period. As shown in Exhibit 9, former participants had a pass rate of 74 percent, compared to 65 percent for nonparticipants, for a difference of 9 percentage points ($p < .05$, $ES_{Cox} = 0.25$). Former participants also earned As and Bs at a higher rate than did matched nonparticipants. Thirty-three percent of ninth-grade former participants earned an A or B in their math courses, while 23 percent of nonparticipants earned those grades ($p < .05$, $ES_{Cox} = 0.31$). Tenth-grade former participants also outperformed their matched peers in passing their math courses. The odds for passing their tenth grade math courses were over two times greater for former participants than matched nonparticipants ($OR = 2.1$), with 79 percent of former participants passing their math courses, compared to 64 percent of matched nonparticipants ($p < .001$, $ES_{Cox} = 0.45$). In addition, former participants also earned higher grades than their matches. Thirty-eight percent of participants earned an A or B in their math courses, while 26 percent of matches did so, for a difference of 12 percentage points ($p < .01$, $ES_{Cox} = 0.35$). (These findings are notable considering that BPS's focus on early high school math with the 2009 Acceleration Agenda began after the period covered in the evaluation.)

Eleventh-grade former participants also outperformed their matches in passing their eleventh-grade math courses, with 78 percent of participants passing their courses, compared to 68 percent of matched nonparticipants ($p < .05$, $ES_{Cox} = 0.33$). Former participants earned As and Bs in their eleventh grade math courses at rates similar to their matches. Former participants passed their twelfth grade math courses at rates similar to their matches. Although the 10 percentage-point difference between former participants (33 percent) and matched nonparticipants (23 percent) earning As and Bs in their twelfth-grade math courses was not statistically significant, it is considered a substantively positive effect, according to WWC standards ($ES_{Cox} = .32$).

Exhibit 9
Math Course Performance of Former Participants
in the Third Marking Period, Compared with Matched Nonparticipants

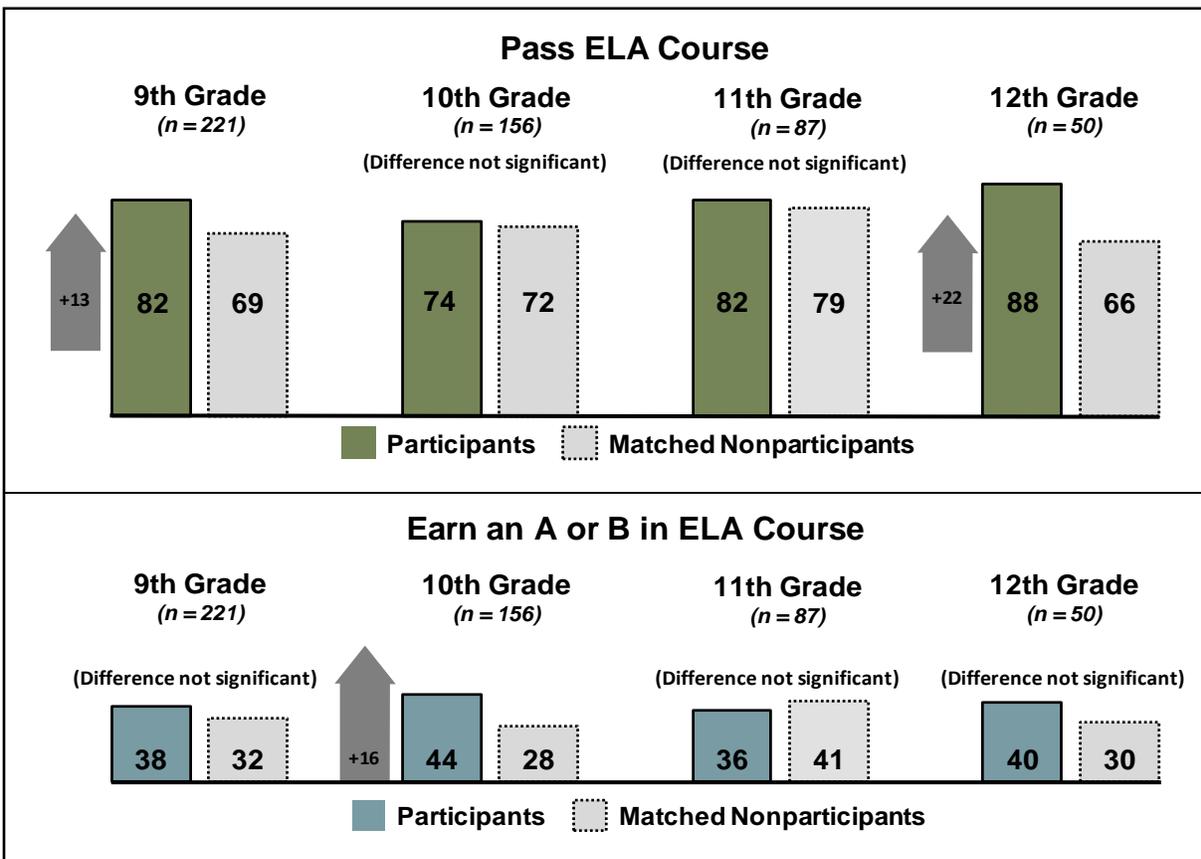


English Language Arts Course Performance

Consistent with previous reports, evaluators found that former participants outperformed their matches on some ELA indicators but fared similarly to their peers on others. As shown in Exhibit 10, former participants had significantly higher pass rates than matched nonparticipants in the ninth grade. Former participants were two times more likely to pass their ninth-grade ELA courses than matched nonparticipants ($OR = 2.0$), with 82 percent of former participants passing

their ELA courses, compared to 69 percent of matched nonparticipants ($p < .01$, $ES_{Cox} = 0.42$). While ninth-grade participants had a higher percentage of students earning As and Bs in their ELA courses, the difference was not statistically significant. Tenth-grade participants passed their ELA courses at rates similar to their peers but earned higher grades than their matches. Forty-four percent of tenth-grade participants earned an A or B in the third marking period, compared with 28 percent of matched nonparticipants ($p < .001$, $ES_{Cox} = 0.43$).

Exhibit 10
English Course Performance of Former Participants
in the Third Marking Period, Compared with Matched Nonparticipants



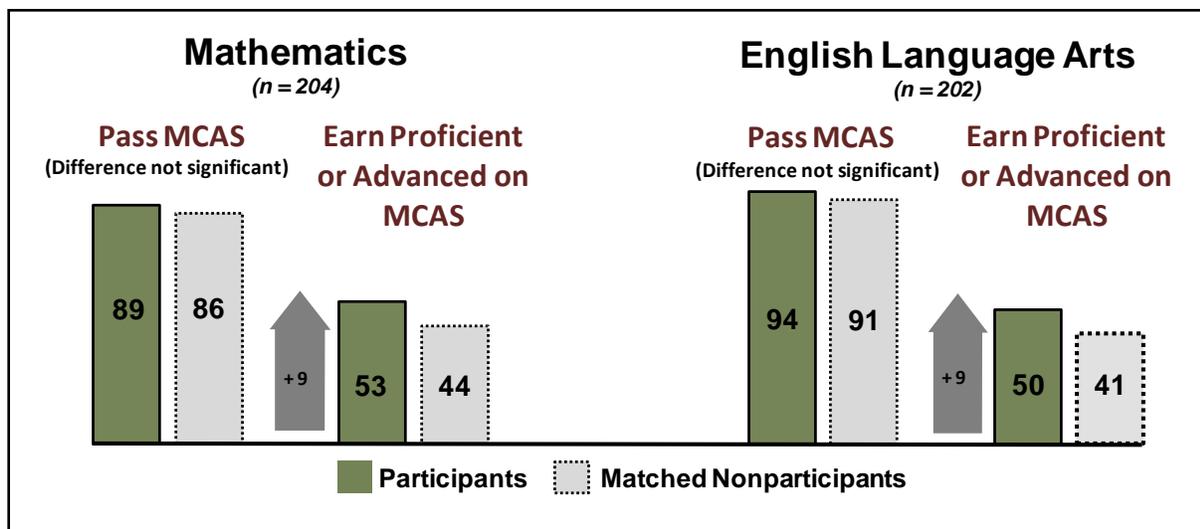
Former participants passed and earned As and Bs in their ELA courses at rates similar to their matches in the eleventh grade. However, former participants had significantly higher pass rates than matched nonparticipants in the twelfth grade. Former participants were nearly four times more likely to pass their twelfth-grade ELA courses than their matches ($OR = 3.8$), with 88 percent of participants passing their courses compared to 66 percent of matched nonparticipants ($p < .01$, $ES_{Cox} = .81$). While twelfth-grade participants had a higher percentage of students earning As and Bs than matched nonparticipants, the difference was not statistically significant. However, the 10 percentage point difference between former participants (40 percent) and matched nonparticipants (30 percent) is considered a substantively positive effect ($ES_{Cox} = .27$).

MCAS Performance

Evaluators examined former participants' math and ELA performance on their high school exit examinations and compared their results with those of their matches. To view the outcomes of former participants in the larger context of the school system they attend, evaluators also compared former participants' MCAS performance with the performance of BPS students overall during the years in which former participants took the test. In addition, evaluators also analyzed the tenth-grade math MCAS performance of former participants and BPS students not attending a BPS examination high school, in order to account for differences in the proportion of participants and BPS students attending those schools.

Comparing the MCAS performance of former participants with matched nonparticipants. Participants and matched nonparticipants passed their math and ELA MCAS examinations at similar rates. Both groups had relatively high MCAS pass rates, as shown in Exhibit 11. Former participants had a pass rate of 89 percent for the math MCAS, while nonparticipants had a pass rate of 86 percent. The difference was not statistically significant. Ninety-four percent of participants passed their ELA MCAS exam, compared to 91 percent for matched nonparticipants. Like the math MCAS, the difference was not statistically significant.

Exhibit 11
MCAS Performance of Former Participants in Mathematics and English Language Arts, Compared with Matched Nonparticipants



However, while former participants passed their MCAS at rates similar to their matches, former participants earned proficient and advanced levels at significantly higher rates than their matched peers. For the math MCAS, 53 percent of participants attained proficient or advanced levels on their exams, compared to 44 percent of matched nonparticipants ($p < .05$, $ES_{Cox} = .23$). For the ELA MCAS, 50 percent of participants earned proficient and advanced levels on their exams, while 41 percent of matched nonparticipants earned those scores ($p < .05$, $ES_{Cox} = .22$). In

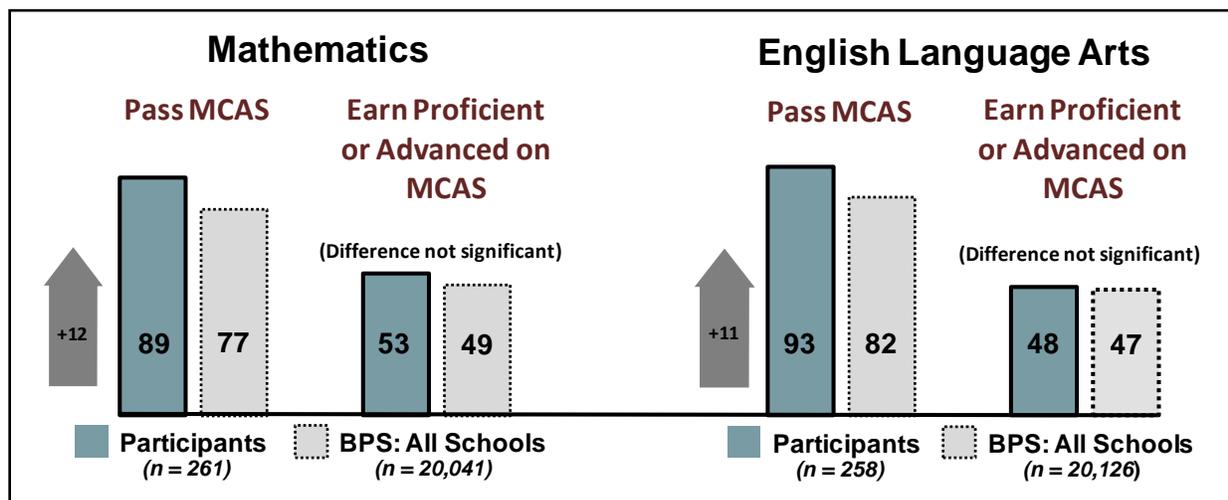
sum, while both participants and matched nonparticipants had similar, fairly high pass rates for the math and ELA MCAS exams, participants earned higher scores than their matches.

Comparing the MCAS performance of former participants with district performance.

As mentioned previously, evaluators compared the performance of former participants on the MCAS with the performance of BPS students overall during the years in which former participants took the test. Between 2004 and 2008, approximately 20,000 BPS students took the tenth-grade MCAS. Evaluators compared the percent of those students passing the MCAS and the percent achieving proficiency or higher on the exam to the percent of former 8th Grade Academy participants passing and the percent of those achieving proficiency or higher on the test.⁵

Comparing participant performance with district performance, evaluators found that participants were more likely to pass the tenth-grade math and ELA MCAS than were BPS students overall, as shown in Exhibit 12. The odds of passing the tenth-grade math MCAS were over two times greater for former participants than for the average BPS student (OR=2.3), with 89 percent of former participants passing their math MCAS, compared to 77 percent of BPS students ($p<.001$, $ES_{Cox}=0.50$). The odds of passing the tenth-grade ELA MCAS were over three times greater for former participants than for the average BPS student (OR=3.1) with 93 percent of former participants passing their ELA MCAS, compared to 82 percent of BPS students ($p<.001$, $ES_{Cox}=.69$). Participants were just as likely to earn proficient and advanced levels on their math and ELA MCAS as their BPS peers.

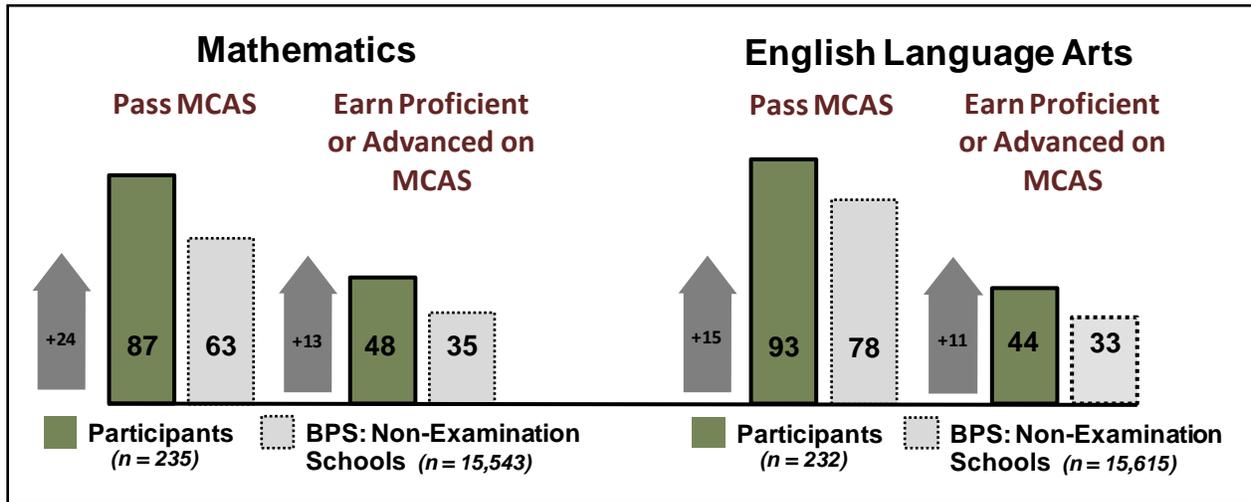
**Exhibit 12
MCAS Performance of Former Participants in Mathematics
and English Language Arts, Compared with BPS Students Overall**



⁵ This analysis includes all former 8th Grade Academy participants for whom evaluators had sufficient data to calculate MCAS proficiency. The sample size for this analysis is larger than for the MCAS analysis using matched comparison students. In that analysis, a participant is only included if his/her individually matched nonparticipant has valid MCAS data.

Comparing the MCAS performance of non-exam school former participants with their non-exam school peers. Evaluators also analyzed the tenth-grade math MCAS performance of former participants and BPS students not attending a BPS examination high school, in order to account for differences in the proportion of participants and BPS students attending those schools.⁶ BPS exam schools admit students on a competitive basis, based on results of an entrance exam and grade point average. By excluding exam schools from the analysis, tenth-grade pass and proficiency rates were lowered for both participant and nonparticipant groups, as expected since students in BPS exam schools typically score above the district average on the MCAS (Massachusetts Department of Education, 2009). However, former participants attending non-exam schools were significantly more likely to pass and to earn higher scores on the math and the ELA MCAS than were BPS students attending non-exam schools, as shown in Exhibit 13.

Exhibit 13
MCAS Performance of Former Participants Attending
Non-Examination Schools in Mathematics and English Language Arts,
Compared with BPS Students Attending Non-Examination Schools



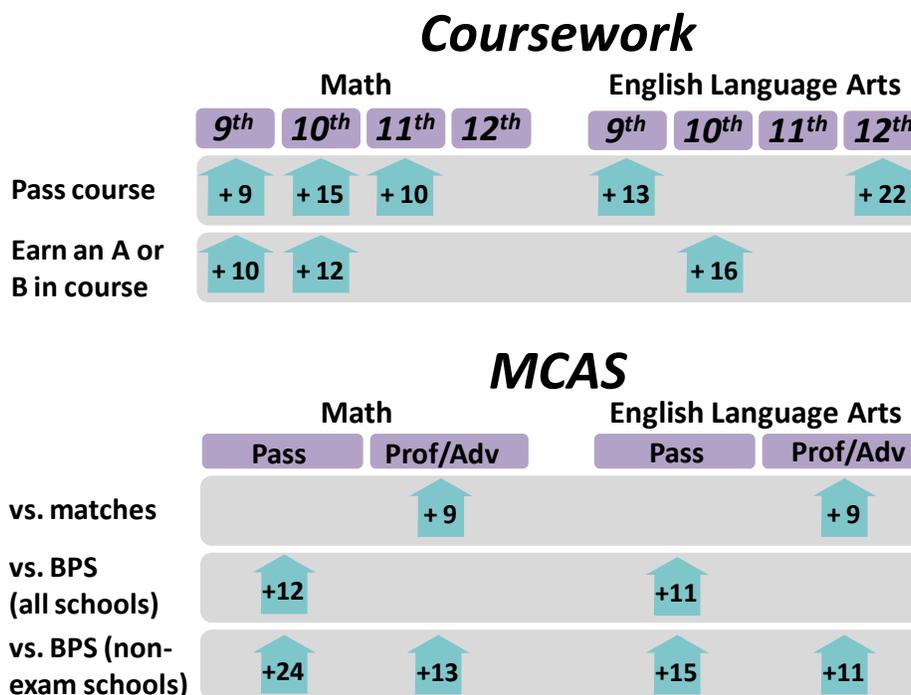
The odds of passing the tenth-grade math MCAS were four times greater for non-exam school former participants than the average BPS student attending a non-exam school (OR=4.0). Eighty-seven percent of former participants attending a non-exam school passed their math MCAS, compared to 63 percent of BPS students attending a non-exam school, for a difference of 24 percentage points ($p < .001$, $ES_{Cox} = .84$). Non-exam school former participants were also more likely to attain proficient and advanced levels on the math MCAS than were their BPS peers in non-exam schools (OR=1.7). Former participants attending non-exam schools had a proficiency rate of 48 percent, while BPS students attending non-exam schools had a proficiency rate of 35 percent, for a difference of 13 percentage points ($p < .001$, $ES_{Cox} = .32$).

⁶ Twenty-two percent of BPS high school students, compared with 10 percent of former 8th Grade Academy participants, attended a BPS examination high school from 2004 to 2008.

Evaluators also found that former participants attending non-exam schools were more likely to pass and to score at proficient or advanced levels on the ELA MCAS than were BPS students attending non-exam schools. The odds of passing the tenth-grade ELA MCAS were over three times greater for non-exam school former participants than for the average BPS student attending a non-exam school (OR=3.6). Former participants in non-exam schools had a pass rate of 93 percent, while BPS students in non-exam schools had a pass rate of 78 percent, as shown in Exhibit 13 ($p<.001$, $ES_{Cox}=.77$). Former participants attending non-exam schools were 1.7 times more likely to earn proficient and advanced levels on their ELA MCAS exams than were their non-exam school peers, with 44 percent of non-exam school former participants earning those scores, compared to 33 percent of non-exam school BPS students ($p<.001$, $ES_{Cox}=.27$).

Summary Findings

Evaluators found that former participants outperformed their comparison groups on the majority of math course performance indicators examined. Consistent with earlier phases of the evaluation, former participants outperformed their peers on some ELA course performance indicators but fared similarly to their peers on others. On the MCAS, evaluators found that, while former participants and matched nonparticipants passed their math and ELA examinations at similar rates, former participants earned higher scores, attaining proficient and advanced levels at significantly higher rates than their matched peers.



High School Graduation

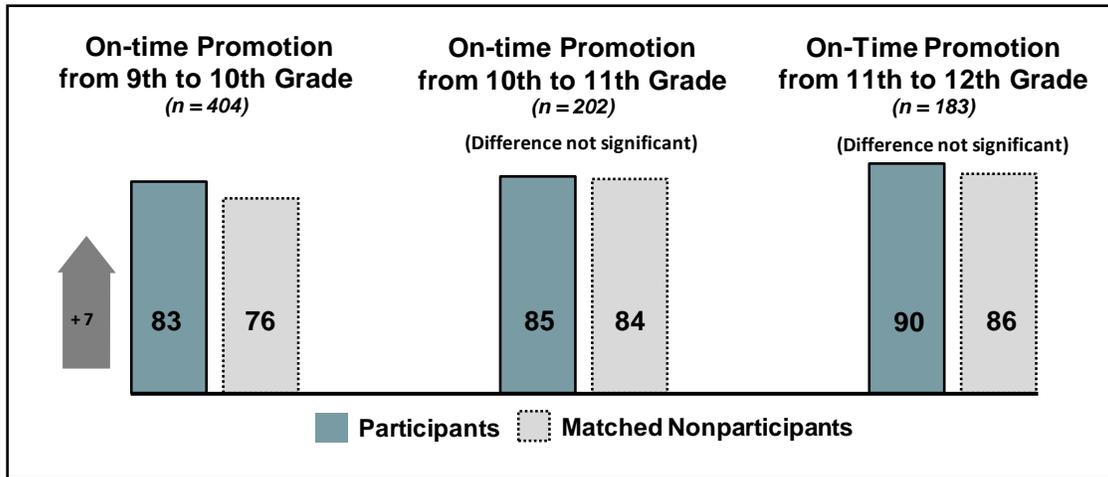
To assess participants' progress to graduation, evaluators examined two additional leading indicators, on-time promotion and on-track to graduate. While districts have commonly monitored on-time promotion rates, they have more recently invested in the development of early intervention systems that help identify students at risk of dropping out. The on-track to graduate indicator used in this study integrates student outcomes on key academic variables and estimates a student's likelihood of graduating high school on time.

Evaluators found that former 8th Grade Academy participants made positive progress toward graduation during high school. Former participants were more likely than matched nonparticipants to be promoted to tenth grade on time, but were about equally likely to be promoted to eleventh and twelfth grades on time. Former participants were more likely to be considered on-track to graduate than their matches. This section also presents the combined graduation rate for two 8th Grade Academy cohorts, the 8th Grade Academy classes of 2002-03 and 2003-04. Consistent with the findings in the sixth report, evaluators found that former participants were more likely to graduate from high school in four years than were matched nonparticipants and members of their respective BPS classes.

On-time Promotion

Evaluators examined the year-to-year promotion rates of participants and their matches and found that former participants had a significantly higher percentage of students promoted on time from ninth to tenth grade than did matched nonparticipants, as shown in Exhibit 14. Eighty-three percent of ninth-grade former participants were promoted on time to tenth grade, compared with 76 percent of their matched peers ($p < .01$, $ES_{Cox} = .26$). Former tenth-grade participants were promoted to eleventh grade at rates similar to their matches. While participants had a higher percentage of eleventh-graders promoted on-time to twelfth grade, the difference is not statistically significant.

Exhibit 14
On-Time Promotion Rates of Former Participants,
Compared with Matched Nonparticipants

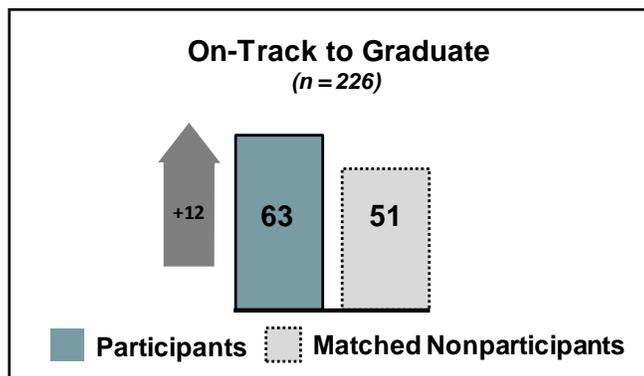


On-track Indicator

Allensworth and Easton (2005, 2007) found that the transition year of ninth grade is important in predicting whether a student will graduate from high school. Evaluators used the studies that Allensworth and Easton conducted in the Chicago Public Schools to create an on-track indicator of a student’s likelihood of graduating high school, using the data available in this study. In this evaluation, youth are considered to be on track for high school graduation if they were promoted to tenth grade on time and did not fail a core math or ELA course in ninth grade.

Evaluators found that a significantly higher percentage of former participants were on-track to graduate at the beginning of tenth grade, as compared to their matched peers. As shown in Exhibit 15, 63 percent of former participants were on-track upon entering tenth grade, compared with 51 percent of matched nonparticipants ($p < .01$, $ES_{Cox} = .30$).

Exhibit 15
Percent of Former Participants On-Track to Graduate High School,
Compared with Matched Nonparticipants

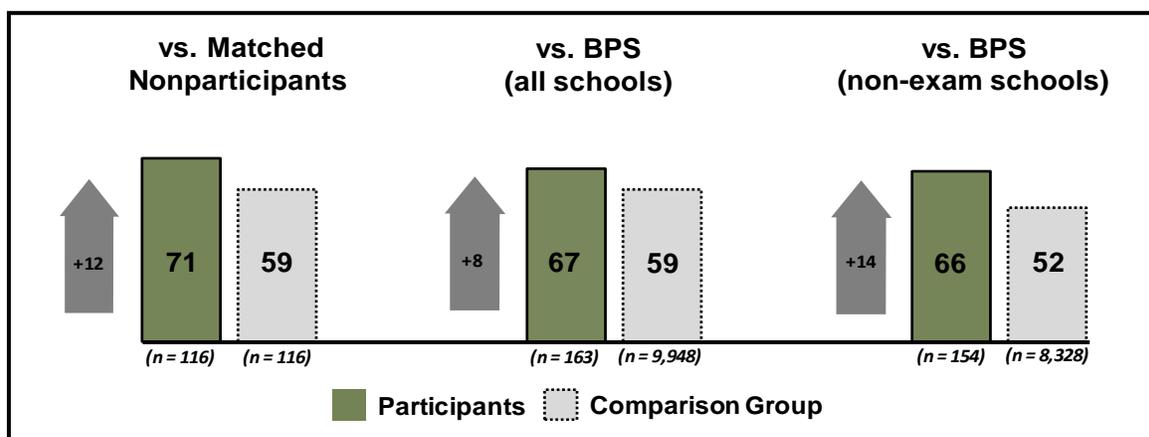


Four-year Graduation Rate

Evaluators calculated the combined four-year graduation rate for two 8th Grade Academy classes, the classes of 2002-03 and 2003-04, and compared their results with the results of matched nonparticipants. Evaluators also compared the four-year completion rates of former participants with BPS overall and conducted two subgroup analyses of (1) former participants and BPS students not attending BPS examination high schools⁷ and (2) former participants and matched nonparticipants enrolled in top-tier high schools. Evaluators found that former Citizen School participants graduated high school at significantly higher rates than their matches, BPS overall, their BPS peers in non-exam schools, and their matched peers attending top-tier high schools.

Seventy-one percent of former participants graduated on time, compared to 59 percent of matched nonparticipants, for a difference of 12 percentage points ($p < .05$, $ES_{Cox} = .32$), as shown in Exhibit 16. Compared to the overall district graduation rate, former participants also outperformed their peers. Sixty-seven percent of all former participants graduated on time, compared with the combined graduation rate of 59 percent for the BPS Classes of 2007 and 2008 ($p < .05$, $ES_{Cox} = .26$).⁸ This finding is important because, upon entering middle school, Citizen Schools participants were more educationally at-risk than BPS students overall, as reviewed in earlier reports in this series. Excluding exam schools from the analysis, 66 percent of former participants graduated from high school in four years. In comparison, 52 percent of BPS students attending non-exam schools graduated from high school in four years in 2007 and 2008 ($p < .001$, $ES_{Cox} = .35$).

Exhibit 16
Four-Year Graduation Rate of the 8th Grade Academy Classes of 2002-03 and 2003-2004 and Comparison Groups

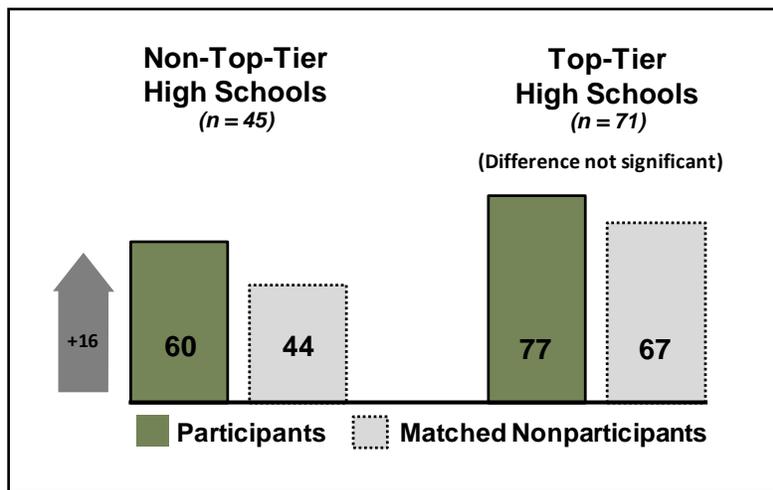


⁷ Participant graduation data were provided by BPS and the guidance counselors of the charter schools. BPS officials note that the process of verifying the graduation data maintained by the district is under development. The graduation rates presented in this report are limited by the quality of data provided by the district and school guidance counselors. Students without data in 2007 or 2008 are not included in the graduation rate calculation because evaluators do not know those students' circumstances. Students may not have data in 2007 or 2008 because they dropped out or because they transferred to a private school or a public school outside Boston.

⁸ Transfers in and out of BPS are included in the four-year graduation rate. Authors' calculation based on publically available school-level graduation rates for 2007 and 2008 (BPS Communications Office, 2010).

As described earlier, former 8th Grade Academy participants were over three times more likely to select a top-tier high school than matched nonparticipants (OR=3.7). In order to account for differences in the proportion of participants attending top-tier schools, evaluators disaggregated results by the quality of high schools selected by students and compared the on-time graduation rates of former participants and matched nonparticipants attending top-tier and non-top-tier high schools. As expected, former participants and matched nonparticipants attending top-tier high schools had higher on-time graduation rates overall than former participants and matched nonparticipants attending non-top-tier schools, as shown in Exhibit 17. In addition, former participants also outperformed their matches, regardless of the quality of their high school. Former participants attending non-top-tier high schools were nearly two times more likely to graduate on time than matched nonparticipants attending non-top-tier high schools (OR=1.9). Sixty percent of former participants attending non-top-tier schools graduated in four years, compared to 44 percent of their matched peers attending non-top-tier schools ($p < .05$, $ES_{Cox} = .40$). Former participants attending top-tier schools also had higher on-time graduation rates than matched nonparticipants attending top-tier schools (77 percent vs. 67 percent). The 10 percentage point difference, though not significant, is considered substantively positive ($ES_{Cox} = .29$).

Exhibit 17
Four-Year Graduation Rate of the 8th Grade Academy Classes of 2002-03 and 2003-2004, Compared with the BPS Classes of 2007 and 2008, by Quality of High School

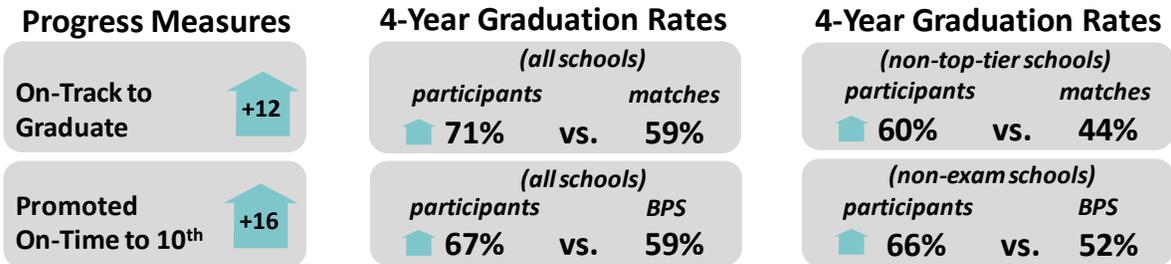


Summary Findings

Former participants made positive progress towards graduation, as shown in the summary exhibit. Former 8th Grade Academy participants were more likely than matched nonparticipants to be on track to graduate upon entering tenth grade. Former Citizen Schools participants also graduated at significantly higher rates than their matches and the district overall. In addition, former participants also outperformed their matches, regardless of the quality of their high school. Former participants attending non-top-tier high schools were nearly two times more

likely to graduate on time than were matched nonparticipants attending non-top-tier high schools. Former participants attending top-tier schools also had higher on-time graduation rates than did matched nonparticipants attending top-tier schools. In addition, former participants attending non-exam schools were more likely to graduate on time than their BPS peers in non-exam schools.

Progress to Graduation



Conclusions

Overall, this final report concludes that participation in Citizen Schools is associated with successful transitions from middle school to high school and with positive long-term trends related to the successful completion of high school, as summarized in Exhibit 18.

Evaluators found that former 8th Grade Academy participants were more likely than matched nonparticipants to enroll and persist in a top-tier high school. Former participants were over three times more likely to select a top-tier school than matched nonparticipants. In addition, former participants were two times more likely to persist in a top-tier school from ninth to eleventh grade, were nearly three times more likely to stay enrolled in a top-tier school from ninth to twelfth grade, and were four times more likely to both enroll and complete all four years of high school in a top-tier school.

Evaluators confirmed earlier findings on high school engagement. Evaluators found that former Citizen Schools participants attended high school more often than matched nonparticipants, with differences ranging from an additional week of school attended in tenth grade to an additional two and a half weeks attended in eleventh grade.

Evaluators confirmed that Citizen Schools participation was associated with higher math performance. Evaluators found that former participants outperformed matched nonparticipants in their early high school math courses. Former participants were more likely than matched nonparticipants to pass math in ninth, tenth, and eleventh grade and were more likely to earn As and Bs than their matches in their ninth- and tenth-grade math courses. While both participants and matched nonparticipants had similar, fairly high pass rates on the tenth-grade math MCAS, participants earned higher scores, attaining proficient and advanced levels at higher rates than their matches. Comparing participant performance to BPS district performance, evaluators found that former participants were two times more likely to pass the math MCAS than was the average BPS student. In addition, former participants attending non-exam schools were four times more likely to pass the math MCAS than the average BPS student attending a non-exam school.

Evaluators confirmed several positive trends in English Language Arts. Consistent with previous reports, evaluators found that former participants outperformed their matches on some ELA indicators but fared similarly to their peers on others. Former participants were more likely than their matches to pass their ELA courses in ninth and twelfth grade. In addition, former participants were more likely than matched nonparticipants to earn As and Bs in their tenth-grade ELA courses. Similar to the math MCAS results, evaluators found that former participants outperformed their matches in earning proficient and advanced levels in the ELA MCAS. Evaluators also found that former participants were three times more likely to pass the ELA MCAS than was the average BPS student. Former participants attending non-exam schools were also three times more likely to pass the ELA MCAS than was the average BPS student attending a non-exam school.

And finally, evaluators confirmed the long-term benefits of program participation on successful high school completion. Evaluators found that former 8th Grade Academy

participants were more likely than matched nonparticipants to be on track to graduate upon entering tenth grade. Former Citizen Schools participants graduated high school on time at significantly higher rates than their matches and the district overall. In addition, former participants also outperformed the comparison group regardless of the quality of their high school. Former participants attending non-exam schools had higher on-time graduation rates than their non-exam school peers and former participants attending non-top-tier schools had higher on-time graduation rates than their matches attending non-top-tier schools. More detailed summary data on each of these indicators are presented in Appendix C.

Exhibit 18
Summary of Statistically Significant Differences Between Participants and Comparison Students by Grade, in Percentage Points

Progress Area	Indicator	Difference Between Participants and Comparison Group
Selection and persistence in a top-tier high school	Top-tier high school selection rate	▲ +31
	Ninth- to eleventh-grade persistence rate	▲ +18
	Ninth- to twelfth-grade persistence rate	▲ +26
	Selection of and completion of high school in a top-tier school rate	▲ +22
High school engagement	Ninth-grade attendance rate	▲ + 5
	Tenth-grade attendance rate	▲ + 3
	Eleventh-grade attendance rate	▲ + 7
	Twelfth-grade attendance rate	▲ + 5
High school achievement	Ninth-grade math course pass rate	▲ + 9
	Tenth-grade math course pass rate	▲ +15
	Eleventh-grade math course pass rate	▲ +10
	Ninth-grade A or B in math course rate	▲ +10
	Tenth-grade A or B in math course rate	▲ +12
	Mathematics MCAS pass rate ¹	▲ +12
	Mathematics MCAS proficiency rate	▲ + 9
	Ninth-grade ELA course pass rate	▲ +13
	Twelfth-grade ELA course pass rate	▲ +22
	Tenth-grade A or B in ELA course rate	▲ +16
	English Language Arts MCAS pass rate ¹	▲ +11
	English Language Arts MCAS proficiency rate	▲ + 9
Progress toward high school graduation	On-time promotion to tenth grade rate	▲ + 7
	On-track to graduation rate	▲ +12
	On-time high school graduation rate	▲ +12

¹ Difference is between former participants and BPS overall. All unnoted differences are between former participants and matched nonparticipants.

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Appendix A

Analytic Approach

Analytic Approach

Measuring Impact

The evaluation employs a quasi-experimental design that compares the school engagement and academic achievement of Citizen Schools participants to a group of similar students who did not participate in the after-school program. The purpose of this analysis is to measure program impact over time. Given the benefits of individual matching, the evaluation employs one-to-one matching, whereby matched nonparticipants are selected based on their similarity to an individual Citizen Schools participant. The records that the evaluators receive on matched nonparticipants are stripped of individual identifiers but include a scrambled identification number to permit linkage of nonparticipant records from year to year.

Participants are compared with matched nonparticipants using paired samples t-tests with a one-tailed test of significance to analyze the impact of Citizen Schools participation on school engagement and academic achievement (i.e., the evaluation tests whether participants outperform matched nonparticipants and not vice versa). Both the participant and his/her individually matched nonparticipant must have valid data on a measure to be included in the analysis for that measure. Analyses comparing participants to students district-wide are based on two-tailed tests of significance (i.e., the evaluation tests whether participants perform differently from BPS students overall).

Matching Participants to Nonparticipants

Many factors are statistically associated with students' school engagement and academic achievement, including family income, gender, race, and eligibility for specialized educational services, such as special education and education for English language learners. Therefore, to measure the impact of Citizen Schools participation, analyses must compare participants and nonparticipants who are similar in terms of these and other characteristics. To select such matches, PSA and Citizen Schools identified and ranked a set of characteristics to serve as the matching criteria. In consultation with PSA, a programmer in the BPS Office of Information Services selected the matched nonparticipants based on these matching criteria and prepared the data files of participants and nonparticipants that the evaluators analyzed and present in this report. Given the high rate of student mobility in the BPS system and the fact that the evaluation could not follow up with nonparticipants to obtain missing data, the programmer was asked to identify three matched nonparticipants for every participant.

The matching criteria included the following characteristics: gender, race, grade in school, eligibility for free or reduced-price lunch, student test scores on the fourth-grade MCAS tests in mathematics and English Language Arts, school attended, bilingual education status, and special education status. With the exception of constants like gender, race, and students' scores on the fourth-grade MCAS tests, these data were to be based on the year prior to a student's participation in Citizen Schools. Five of the characteristics—gender, race, grade in school, free

or reduced-price lunch eligibility, and MCAS test scores—were to serve as the core matching variables. Ideally, a nonparticipant would match a participant exactly on each of these variables. The remaining characteristics were then to be considered in the following order of priority: school and then bilingual status and special education status.

As shown in Exhibit A-1, the groups of matched nonparticipants and participants included in each analysis section are similar on all matching and ranking criteria. Among both groups within each grade, about three-quarters are African American, between 18 and 21 percent are Hispanic, and the remaining students are either Asian, Native American, or white. About half of participants and matched nonparticipants are female. Nearly equal percentages of participants and matched nonparticipants were enrolled in special education (about 20 percent) and in bilingual education (3 percent or less) at baseline within each grade. Participants and matched nonparticipants scored at proficiency on their fourth-grade ELA and math MCAS exams at similar rates. No statistically significant differences between participants and matched nonparticipants were found within any of the four grade-level analysis groups except for tenth grade free- or reduced-price lunch status. The observed difference in the percentage of participants and matched nonparticipants qualifying for free- or reduced-price lunch in tenth grade is significant at the $p < .05$ level. Evaluators attempted rematching to diminish the difference in free and reduced priced lunch status between participant and match groups but were unable to further minimize group difference due to the limited pool of matches available at this point in the study. The nonparticipants selected in the analysis are the best available matches. In addition, while the difference in free and reduced price lunch status is statistically significant, evaluators do not view it as substantial. Both participant and match groups are overwhelmingly low-income (84 percent for participants and 91 percent for matched nonparticipants in tenth grade). In raw numbers, the difference is an additional eight low-income students in the tenth grade match group.

Evaluators made a change to the matching process beginning in the fifth year of the evaluation in order to minimize the need to replace matches and to increase the sample size. In the fifth report, unlike earlier reports, students are included in analysis regardless of on-time promotion. For example, the analyses of tenth-grade indicators in this report may include tenth-graders who were promoted on time to tenth grade as well as tenth-graders who repeated eighth or ninth grade. In cases where students repeated tenth grade, evaluators analyzed data from their first tenth-grade year only. As a result of this change, the analysis sample increased as participant/matched-nonparticipant pairs that were excluded in previous reports because one or both of them were not promoted on time were included in the fifth-report analyses.

Evaluation Limitations

The design of the study is limited by hidden bias that may be present in unobservable student characteristics. This hidden bias may threaten the internal validity of the results, thus overestimating or underestimating the impact of Citizen Schools. The primary causes of hidden bias in this evaluation occur in the selection and attrition of participants and matched nonparticipants.

Exhibit A-1
Demographics and Prior Achievement of Participants and Matched Nonparticipants, in Percents

	Ninth Grade		Tenth Grade		Eleventh Grade		Twelfth Grade	
Characteristics	Participants	Matched Nonparticipants	Participants	Matched Nonparticipants	Participants	Matched Nonparticipants	Participants	Matched Nonparticipants
Race/Ethnicity	(n=359)	(n=415)	(n=262)	(n=296)	(n=169)	(n=197)	(n=107)	(n=128)
African American	74	73	74	73	73	72	71	74
Asian	2	2	2	2	2	3	3	2
Hispanic	19	20	19	20	20	21	19	18
Native American	1	1	0	1	1	1	0	0
White	4	4	4	4	4	4	7	6
Gender	(n=440)	(n=440)	(n=300)	(n=300)	(n=201)	(n=201)	(n=128)	(n=128)
Female	50	50	51	51	51	51	55	55
Male	50	50	49	49	49	49	45	45
Free- or Reduced-Price Lunch Eligibility	(n=388)	(n=380)	(n=265)	(n=254)	(n=175)	(n=165)	(n=106)	(n=101)
Eligible	86	90	84*	91*	85	90	83	88
Special Education Status	(n=440)	(n=440)	(n=300)	(n=300)	(n=201)	(n=201)	(n=128)	(n=128)
Enrolled	23	19	23	23	21	23	18	19
Bilingual Education Program Status	(n=440)	(n=440)	(n=300)	(n=300)	(n=201)	(n=201)	(n=128)	(n=128)
Enrolled	3	2	1	1	2	2	2	1
Fourth-Grade ELA MCAS	(n=329)	(n=360)	(n=232)	(n=250)	(n=157)	(n=177)	(n=108)	(n=119)
Percent Proficient	8	10	8	10	3	5	1	2
Fourth-Grade Math MCAS	(n=334)	(n=363)	(n=235)	(n=251)	(n=160)	(n=178)	(n=108)	(n=119)
Percent Proficient	6	6	7	6	7	6	10	8

* Difference is significant (p<.05)

Participants choose, or self-select, to be part of Citizen Schools and therefore could have unmeasured traits that may be correlated with outcomes studied in the evaluation. For example, participants in Citizen Schools may perform better academically than matched nonparticipants even without participation in Citizen Schools because of unmeasured differences in the academic motivation of students or their families. Further contributing to the possible hidden bias are the unknown after-school experiences of matched nonparticipants. It may be that the most academically motivated students were already enrolled in another after-school program before the Citizen Schools recruitment and enrollment period. Citizen Schools recruits educationally at-risk youth in September, after youth have the opportunity to enroll in other after-school programs available to BPS students. Overall, evaluators believe self-selection to the program may inflate the measured impact of Citizen Schools in this evaluation, but the level of inflation may be reduced by the recruitment practices of Citizen Schools.

In addition to self-selection to the program, attrition is another source of bias in this study. The evaluation is unable to track participants and nonparticipants once they leave the BPS system and does not obtain accurate information on these students' reasons for leaving BPS. The availability of three matched nonparticipants mitigates the effect of attrition and allows the evaluation to continue to compare participants against a statistically similar comparison group of the same size. The evaluation ranks each participant's three nonparticipant matches based on how similar they are to the participant on the matching criteria detailed above.⁹ Whenever possible, participants are compared to their most similar nonparticipant match. Over the course of the evaluation, as students progress through the BPS system, it sometimes becomes necessary to compare a participant to his/her second or third most similar nonparticipant. This replacement occurs if a matched nonparticipant leaves the BPS system. This means that a participant's matched nonparticipant may change from year to year (i.e., they are compared to a different nonparticipant in the ninth-grade and tenth-grade analyses) but not within a year (i.e., a participant is assigned the same match for the analysis of ninth-grade suspension and ninth-grade course grades). If a participant's best match leaves the BPS system and later returns, the participant and best match will be paired again in the year that the matched nonparticipants returns to the BPS system. It is unknown whether a participant's original matched nonparticipant who leaves the BPS data system fares worse (e.g., because he or she dropped out of school) or better (e.g., because he or she transferred to a top-tier private school), compared with the replacement match. Exhibit A-2 shows the percent of participants in each analysis section of the report who were paired with their first, second, or third most similar matched nonparticipant.

⁹ In addition to the matching criteria, students without fourth-grade MCAS scores were ranked using course grades from the first marking period in the year prior to participation in the evaluation.

Exhibit A-2
Participants in Analysis Pool Matched to First, Second,
and Third Most Similar Matched Nonparticipant, in Percents

Grade Level	N	First Match	Second Match	Third Match
Ninth-grade analysis	440	65	25	10
Tenth-grade analysis	300	57	30	13
Eleventh-grade analysis	201	54	29	17
Twelfth-grade analysis	128	45	38	17

Evaluators believe that attrition may inflate the measured outcomes of both the participant and nonparticipant groups and that the use of replacement matches may understate the true difference in high school progress and success between participants and nonparticipants. Participants and nonparticipants remaining in the sample are likely to achieve greater academic success than their peers who drop out of the sample. BPS data indicate that nonparticipants left the BPS system at a higher rate than did former Citizen Schools participants in the ninth-, tenth-, and eleventh-grade analysis groups. Because nonparticipants who drop out of the BPS system are replaced with nonparticipants who persist in the BPS system, evaluators believe that disparate patterns of attrition may result in understatement of the true difference between the groups.

Appendix B

Evaluation Measures

Evaluation Measures

The *quality of the high school* in which a student enrolled during the ninth-grade year is determined through a ranking system created by Citizen Schools.

Persistence in a top-tier high school includes students who enrolled in a top-tier high school in ninth grade and is computed as the percent of those students who remain in a top-tier high school for defined time periods.

On-time promotion is computed as the percent of students who are promoted within defined time periods.

School attendance rate is based on the number of days a student attended school divided by the number of days his/her school was open.

School suspension rate is the percent of students who were suspended during a school year, regardless of the within-year frequency of each student's suspension(s).

Course grades in English Language Arts and math reflect whether students passed their course in these subject areas in the third marking period of the school year. Evaluators present the percent of students passing their courses based on their schools' definitions of passing. In schools within the BPS system, a D- or higher is considered passing. At some Boston-area charter schools, students must earn a C- or higher to pass a course. Analysis was limited to students' selected or assigned course in the third marking period. Courses vary in their relative difficulty and grading practices.

English Language Arts and Mathematics MCAS tests provide two categories of measures for this evaluation. The evaluation reports the *percent of students scoring at the proficient or advanced level* on the fourth- and tenth-grade MCAS tests. For the tenth-grade MCAS tests, which students are required to pass in order to graduate from high school, evaluators also report the *percent of students passing the test* (i.e., scoring at the "needs improvement" level or above, which is the state standard for passing).

On-track to graduation rate is based on a composite indicator developed by the evaluators. The indicator is based on prior research and incorporates measures of grade promotion and final grades in core English Language Arts and math courses.

Four-year graduation rate is computed as the percent of students receiving a diploma within four years of enrolling in ninth grade.

Appendix C
Analysis Results for Measured Outcomes

Outcomes Measured	N	Former 8GA Participants	Comparison Group*	Difference in Percentage Points	Effect Size (Hedge's g or Cox Index score)	Odds Ratio	p-value
Top-tier high school selection rates	396	59%	28%	+31	0.80	3.72	<.001
Selection rates (vs. BPS 2004-05)	113	58%	39%	+19	0.47	2.16	<.001
Selection rates (vs. BPS 2005-06)	103	55%	32%	+23	0.58	2.60	<.001
Selection rates (vs. BPS 2006-07)	94	44%	32%	+12	0.31	1.67	<.001
Persistence to 10th	53	85%	75%	+9	0.37	1.83	.114
Persistence to 11th	39	67%	49%	+18	0.45	2.11	.045
Persistence to 12th	31	58%	32%	+26	0.65	2.91	.022
Selection and persistence to 12th grade	118	31%	9%	+21	0.88	4.27	<.001
9th grade attendance	350	87%	81%	+6	0.24	na	<.001
10th grade attendance	282	87%	84%	+3	0.15	na	.037
11th grade attendance	190	88%	81%	+7	0.32	na	<.001
12th grade attendance	122	89%	84%	+5	0.30	na	.009
9th grade suspension	339	10%	14%	-4	-0.20	0.72	.070
10th grade suspension	282	12%	13%	-2	-0.10	0.85	.254
11th grade suspension	190	10%	8%	+2	0.11	1.21	.283
12th grade suspension	112	8%	9%	-1	-0.07	0.89	.405
Pass 9th ELA course	221	82%	69%	+13	0.42	2.01	.001
Pass 10th ELA course	156	74%	72%	+1	0.04	1.07	.393
Pass 11th ELA course	87	82%	79%	+2	0.09	1.16	.354
Pass 12th ELA course	50	88%	66%	+22	0.81	3.78	.003
Earn A or B in 9th ELA course	221	38%	32%	+6	0.16	1.30	.091
Earn A or B in 10th ELA course	156	44%	28%	+16	0.43	2.03	<.001
Earn A or B in 11th ELA course	87	36%	41%	-6	-0.15	0.78	.225
Earn A or B in 12th ELA course	50	40%	30%	+10	0.27	1.56	.151
Pass 9th math course	216	74%	65%	+9	0.25	1.51	.024
Pass 10th math course	180	79%	64%	+15	0.45	2.11	<.001
Pass 11th math course	114	78%	68%	+11	0.33	1.71	.020
Pass 12th math course	66	74%	67%	+8	0.22	1.44	.150
Earn A or B in 9th math course	216	33%	23%	+10	0.31	1.66	.011
Earn A or B in 10th math course	180	38%	26%	+12	0.35	1.77	.004
Earn A or B in 11th math course	114	33%	26%	+7	0.20	1.40	.109
Earn A or B in 12th math course	66	33%	23%	+11	0.32	1.70	.064

*Matched nonparticipants serve as the comparison group unless otherwise noted.

Outcomes Measured	N	Former 8GA Participants	Comparison Group*	Difference in Percentage Points	Effect Size (Hedge's g or Cox index score)	Odds Ratio	p-value
Pass ELA MCAS	202	94%	91%	+3	0.23	1.45	.159
Earn ADV or PROF on ELA MCAS	202	50%	41%	+9	0.22	1.43	.018
Pass math MCAS	203	89%	86%	+3	0.16	1.30	.159
Earn ADV or PROF on math MCAS	203	53%	44%	+9	0.23	1.45	.021
Pass ELA MCAS (vs. BPS)	258	93%	82%	+11	0.69	3.11	<.001
Earn ADV or PROF on ELA MCAS (vs. BPS)	258	48%	47%	+1	0.03	1.04	.350
Pass math MCAS (vs. BPS)	261	89%	77%	+12	0.50	2.30	<.001
Earn ADV or PROF on math MCAS (vs. BPS)	261	53%	49%	+4	0.09	1.17	.106
Pass ELA MCAS (vs. BPS non-exam schools)	232	93%	78%	+15	0.77	3.57	<.001
Earn ADV or PROF on ELA MCAS (vs. BPS non-exam schools)	232	44%	33%	+11	0.27	1.57	<.001
Pass math MCAS (vs. BPS non-exam schools)	235	87%	63%	+24	0.84	4.01	<.001
Earn ADV or PROF on math MCAS (vs. BPS non-exam schools)	235	48%	35%	+13	0.32	1.69	<.001
On-time promotion to 10th grade	404	83%	76%	+7	0.26	1.53	.007
On-time promotion to 11th grade	282	85%	84%	+1	0.03	1.06	.404
On-time promotion to 12th grade	183	90%	86%	+4	0.22	1.43	.105
On-track to graduate by 10th grade	226	63%	51%	+12	0.30	1.63	.004
Four-year graduation rate	116	71%	59%	+12	0.32	1.70	.026
Four-year graduation rate (non-top-tier high school)	45	60%	44%	+16	0.40	1.93	.041
Four-year graduation rate (top-tier high school)	71	77%	67%	+10	0.29	1.61	.239
Four-year graduation rate (vs. BPS)	163	67%	59%	+8	0.21	1.41	.011
Four-year graduation rate (vs. BPS non-exam schools)	154	66%	52%	+14	0.35	1.79	<.001

*Matched nonparticipants serve as the comparison group unless otherwise noted.