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# **Evaluation of Massachusetts Office of District and School Turnaround Assistance to Commissioner's Districts and Schools**

## **Impact of School Redesign Grants**

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# Contents

	<b>Page</b>
Executive Summary .....	1
Methods.....	1
Findings.....	2
Conclusion .....	3
I. Introduction .....	4
AIR Evaluation .....	5
II. Methods.....	6
Sample.....	6
Outcome Measures.....	7
Analysis.....	7
III. Findings.....	9
Student Achievement .....	9
Attendance .....	14
IV. Conclusion .....	17
Reference .....	18
Appendix A. CITS Technical Approach.....	19
Appendix B. CITS Outcomes .....	26
Appendix C. CITS Outcomes by District .....	29
Appendix D. CITS Outcomes by Grades Served.....	36
Appendix E. CITS Outcomes by Special Population .....	41



## Executive Summary

The Massachusetts Office of District and School Turnaround (ODST) assists the Commissioner's Districts (the 10 largest districts in the state) and schools within those districts. The assistance focuses on turning around the lowest performing schools in the district while building district capacity to support improvement in other district schools. The three major strategies examined in this study are as follows:

- **District Liaisons.** Liaisons include ODST staff members who serve as project managers and coordinate support to the districts, overseeing implementation of the state's strategy for school turnaround.
- **Priority Partners.** Partners include external organizations that support turnaround efforts in four areas of support: maximizing learning time; the effective use of data; social, emotional, and health needs; and district systems of support.
- **School Redesign Grants (SRGs).** SRGs are competitive funds that support turnaround efforts in persistently underperforming schools. The first year grants were awarded was 2010-11.

American Institutes for Research (AIR)<sup>1</sup> contracted with the Massachusetts Department of Elementary and Secondary Education (Massachusetts ESE) to conduct an evaluation of ODST assistance to Commissioner's Districts and schools. This report summarizes the results from an impact analysis focused on the impact of the SRG receipt. SRGs are provided through federal School Improvement Grant (SIG) funding. Federal guidelines allow states flexibility in how they administer and monitor their distribution of SIG funds. The Massachusetts ESE allocates SIG funds as SRGs through a competitive application process. They commissioned this research to better understand how the process it designed has impacted or has failed to impact schools and how the process might be improved. This report answers the following research question: What is the impact of SRG receipt on student outcomes (e.g., academic achievement and attendance)?”

Using a comparative interrupted time series (CITS) design, AIR researchers examined whether, when compared with non-SRG schools and controlling for selected background characteristics, students in SRG schools experienced better academic outcomes and attendance.

## Methods

AIR used a CITS design to measure the impact of SRG receipt on student outcomes, including student achievement and attendance. The basic principle of CITS is that the SRG effect can be detected by comparing changes in the outcomes of SRG schools to changes in the outcomes in a comparison group during the same time period. This approach draws on information from both the treatment and comparison schools to estimate what performance in SRG schools would have been if the program had not been implemented. The deviation from this prediction is the estimated treatment effect of SRG receipt.

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<sup>1</sup> AIR is a behavioral and social science research organization founded in 1946. AIR carries out its work with strict independence, objectivity, and nonpartisanship. Its mission is to conduct and apply the best behavioral and social science research and evaluation to improve people's lives, with a special emphasis on the disadvantaged.

The sample for this study included all students in cohorts 1 (beginning grant year of 2010–11), 2 (beginning grant year of 2011–12), and 3 (beginning grant year of 2012–13) of the SRG schools, plus students within the same districts in comparison schools. Comparison schools were those in the same districts as the SRG schools but did not win an SRG. We used multilevel regression models to control for confounding factors (e.g., student characteristics), nesting of students within schools and years, and any changes in the given indicator across time that was not caused by the intervention itself. In addition, we controlled for student-level covariates (race, special education status, free- or reduced-price lunch status, and English language learner [ELL] status) and school-level factors (grant year, district, and whether the school was a high school) and allowed for baseline differences between schools.

## Findings

The impact study found the following:

- When considering prior achievement trends, students in the SRG schools performed better on the English language arts (ELA) and mathematics sections of the Massachusetts Comprehensive Assessment System (MCAS) compared with students in comparison schools. The effects were statistically significant after the first, second, and third years of SRG implementation on both the ELA and mathematics sections.
- Positive SRG impacts on achievement were found for schools serving Grades 3–8 across all three years on both the ELA and mathematics sections. For schools serving Grade 10, positive impacts were found in Years 1 and 2 on the ELA section and in Year 1 on the mathematics section.
- Positive impacts on both the ELA and mathematics sections were found in all three years of program implementation in Boston and for the first two years in Springfield and the other districts.
- SRG receipt was associated with a decrease in the achievement gap on both the ELA and mathematics sections between ELL and non-ELL students in SRG schools compared with the change in the achievement gap between students in the comparison schools. These effects were found in all three years of program implementation on the ELA section and in the first two years on the mathematics section. The achievement gap also was decreased for students who had free- or reduced-price lunch status versus those who did not have such status in the SRG schools compared with similar students in comparison schools in the first year on the mathematics section but then increased in the second year. No changes were detected for students with special education status.
- When considering prior achievement trends, students in the SRG schools appear to have slightly lower attendance rates compared with students in the comparison schools in the third year of SRG receipt. However, when examining these rates separately by school level, the effect appears to be negative for schools serving Grades 1–8 and positive for schools serving Grades 9–12 in the first year of program implementation. The effects appear negative for Years 2 and 3 in Boston, positive for Year 3 in Springfield, and positive for Year 1 in other districts.
- SRG grant receipt was associated with a decrease in the attendance gap between students who were in special education versus who were not in special education in the SRG



schools compared with the change in the attendance gap between similar students in the comparison schools in all three years of program implementation. No changes in the attendance gap were detected for ELL versus non-ELL students and students with or without free- or reduced-price lunch status in the SRG schools compared with the comparison schools.

## **Conclusion**

The results from this evaluation suggest that the disbursement of SIG grants in the process designed by ESE as SRGs have consistently positive effects on student academic achievement, particularly on standardized state assessments. Moreover, these results are generally robust across districts and school levels, and they are particularly strong for students who are ELLs. The results are neither strong nor consistent for attendance, suggesting that, overall, SRG receipt does not affect attendance.

## I. Introduction

It is widely known that many children in the United States attend low-performing schools—including schools that continue to fail their students even after years of reform interventions. To address these challenges, the 2010 Massachusetts *Act Relative to the Achievement Gap* gave additional powers to support turning around the lowest performing schools. Districts received greater power to intervene in the state’s lowest performing schools, and the Massachusetts ESE gained new and stronger policy tools to hold districts accountable for turning around the lowest performing schools. The resulting Framework for District Accountability and Assistance connected improvement efforts with districts and designated accountability levels (1–5) to schools based on their performance on and participation in standardized assessments. The highest performing schools are at Level 1, and the lowest performing schools are at Level 5.

To support school turnaround in the Commissioner’s Districts, the Massachusetts ESE created ODSST to provide assistance to these districts and schools within those districts to support school turnaround and enhance the district’s role in supporting struggling schools and ultimately turning them around. ODSST assistance focuses on building capacity and the efforts of the participating districts to facilitate school turnaround for their highest need schools. The model hinges on a cycle of continuous improvement, a five-stage cycle that guides schools in developing a plan for improvement, implementing and monitoring the plan, evaluating success, analyzing data, and using the results to set the direction for future actions. This cycle continues as the school and the district build on past successes, learn from challenges, and refine the plan to make positive changes in the school. The three major strategies to support these efforts in the Commissioner’s Districts and build district capacity are as follows:

- **District Liaisons.** ODSST staff members serve as project managers and coordinate support to the districts, overseeing implementation of the state’s strategy for school turnaround).
- **Priority Partners.** External partners support turnaround efforts regarding students’ social, emotional, and health needs. These partners maximize learning time, the effective use of data, and district systems of support.
- **SRGs.** SRGs are competitive funds that support turnaround efforts in persistently underperforming schools. SRGs are provided through federal school improvement grant (SIG) funding.

In many cases, the ODSST assistance is aimed directly at the most struggling schools (usually Level 4 or Level 5), such as a priority partner providing tutoring services at a school or the SRG funding improvement efforts at a school. The assistance also can come in the form of improved support to the school from the district, which is working with a district liaison to better meet the needs of their Level 4 and Level 5 schools. Another goal of this assistance (through the district liaisons, priority partners, and SRGs) is to strengthen district capacity to guide and monitor school improvement. With this increased capacity, it is proposed that districts will be able to intervene in other schools in the district, particularly Level 3 schools, to further affect improvement in the district. Ultimately, the proposed outcomes of these efforts are as follows:

- Student achievement improves in high need schools.

- District capacity to support school turnaround increases.
- Achievement gaps narrow.
- Performance improves in the district, particularly in the Level 3 and Level 4 schools, to “raise the floor” of district performance.

## **AIR Evaluation**

AIR contracted with the Massachusetts ESE to conduct an evaluation of ODST assistance to Commissioner’s Districts and schools. The evaluation examined both implementation and impact of the district liaisons, priority partners, and the SRGs. This evaluation report provides the results from an impact analysis focused on assessing the effect of the SRG receipt on student outcomes.

SRGs are provided through federal SIG funding. Federal guidelines allow states a great deal of flexibility in how they administer and monitor their distribution of SIG funds. The Massachusetts ESE commissioned this research to better understand how the process it designed has impacted or has failed to impact schools and how the process might be improved. The Massachusetts ESE allocates SIG funds as SRGs through a competitive application process. The request for proposals is designed according to specific indicators that research has demonstrated lead to school improvement, and the proposal evaluation criteria are developed to reflect these indicators. Proposals are individually reviewed and scored by three reviewers, who then meet with a trained facilitator to determine a final score, with individual readers allowed to dissent. Grants are awarded for a three-year period, with monitoring site visits conducted at the conclusion of each year. Schools are required to reapply following each concluded year to reflect on the successes and challenges of the year, address the findings of their monitoring site visits, and explain any changes in their plan moving forward.

In the remainder of this report, we begin by describing the methodology used to conduct this CITS analysis. Then we present the findings, organized by outcome type and subgroup. We conclude with a discussion section focused on the implications of these findings and on issues that may warrant further study and attention.

## II. Methods

AIR used a CITS design to measure the impact of SRG grant receipt on student outcomes. The sample, outcome measures, and analyses are summarized in the following sections.

### Sample

The sample for this study included all students in cohorts 1, 2, and 3 of the SRG schools, plus students within the same districts in comparison schools. Table 1 lists the SRG schools that comprised the sample for this analysis. Cohort 1 schools began implementation in the 2010–11 school year, cohort 2 schools began implementation in the 2011–12 school year, and cohort 3 schools began implementation in the 2012–13 school year.

**Table 1. Sample of the SRG Schools for the CITS Analysis**

District	School	Cohort
Boston	Blackstone School	1
Boston	Dearborn School	1
Boston	Elihu Greenwood School	1
Boston	The English High	1
Boston	Harbor School	1
Boston	Jeremiah E. Burke High School	2
Boston	John F. Kennedy School	1
Boston	John P. Holland School	1
Boston	Orchard Gardens School	1
Boston	Paul A. Dever School	1
Boston	William Monroe Trotter	1
Brockton	East Middle School	3
Fall River	John J. Doran	2
Holyoke	Morgan Elementary	2
Holyoke	Wm. J. Dean Vocational Technical High School	2
Lowell	Charlotte M. Murkland Elementary	2
Lynn	E J Harrington	2
Lynn	William P. Connery Elementary School	3
Springfield	Alfred G. Zanetti	2
Springfield	Brightwood	2
Springfield	Chestnut Street Middle	2
Springfield	Elias Brookings	2
Springfield	Gerena	2
Springfield	High School of Commerce	3
Springfield	Homer Street	2

District	School	Cohort
Springfield	John F. Kennedy Middle	2
Springfield	M. Marcus Kiley Middle School	1
Springfield	White Street	2
Worcester	Chandler Elementary Community	2
Worcester	Burncoat Street Elementary School	3
Worcester	Union Hill School	2

Comparison schools were those for which we had data and within the same districts as the SRG schools but did not win an SRG. This allowed us to compare schools within the same district (i.e., district fixed effects).

## Outcome Measures

AIR examined the SRG impact on two outcomes: (1) student achievement and (2) student attendance. See Table A1 and Table A2 in Appendix A for the distribution of the outcome measures.

- **Student Achievement.** Student raw scores on MCAS in ELA and mathematics were the primary measure of student achievement. The MCAS raw scores were standardized across grade, years, and subject, and the standardized scores were pooled by subject.
- **Student Attendance.** Student attendance was calculated as the total number of days a student attended school out of the total number of days they were enrolled at the school. Students who attended 30 days or less were removed from the analysis.

## Analysis

AIR used a multilevel CITS method to measure the impacts of receiving an SRG on student outcomes. CITS is one of the strongest quasi-experimental designs that can be used when a comparison or control series can be constructed (Shadish, Cook, & Campbell, 2001). This method compares the outcomes of a treatment group and a comparison group after a treatment occurs relative to their baseline trends prior to program implementation to determine program impact. In doing so, this method measures program impact by comparing changes in the treatment group outcomes after program implementation to the changes in outcomes one would expect to find during the same time period in the absence of the program. The CITS analysis for the Massachusetts Urban District Assistance SRGs compares schools receiving SRGs<sup>2</sup> with other district schools serving approximately the same grade range of students.<sup>3</sup> Differences in the baseline trends for SRG schools and the comparison schools preceding program implementation are compared with differences in average outcomes one, two, and three years following SRG receipt to demonstrate the extent to which a sharp discontinuity exists in the outcome measures

<sup>2</sup> Data for UP Academy and Patrick F. Gavin Middle School were not available for 2012 and 2013 and thus have no postimplementation data; this school was therefore dropped from the analyses. The other 31 schools that received an SRG in the 2010, 2011, or 2012 school year cohorts are considered as the treatment groups in these analyses.

<sup>3</sup> Schools are grouped into those serving any grades between Grades 1–8 (e.g., 1–8, 1–5, 5–6, and 7–8) and those serving Grades 9–12.

of students in SRG schools one, two, and three years following SRG receipt. (See Appendix A for a detailed description of the CITS model.)

In addition to the overall model, AIR conducted several subgroup analyses to determine whether program impacts varied by population. The following subgroups were examined:

- Three subgroups of districts: the Boston Public Schools (11 schools), the Springfield Public Schools (10 schools), and six other districts combined (10 schools)
- High schools (four schools) and schools serving students in Grades 1–8 or 3–8 (27 schools)
- Special student populations identified by ELL status, free- or reduced-price lunch status, and special education status.

Finally, the models included indicators for the school year, the district, whether the school is a high school, and students' race and special student population classifications. See Table A1 through Table A3 in Appendix A for the distribution of all the variables across time and between the SRG and comparison schools.

### **III. Findings**

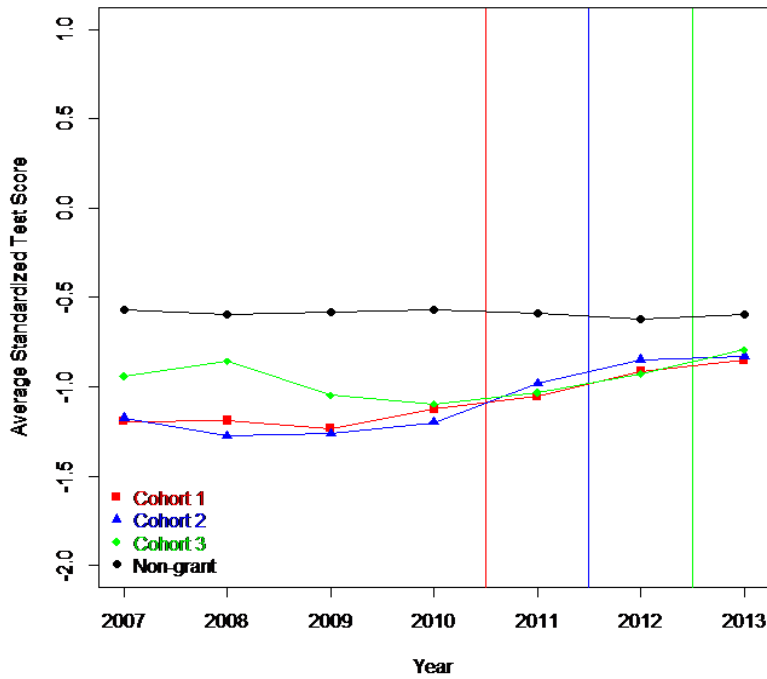
This section describes the overall and subgroup analyses for each student outcome.

#### **Student Achievement**

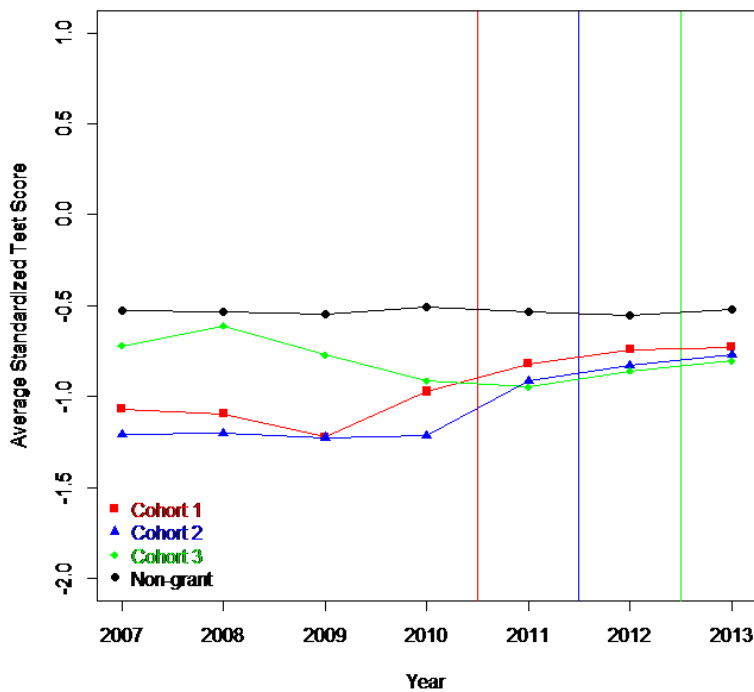
Overall, after program implementation, when considering prior achievement trends, students in the SRG schools performed better on the MCAS ELA and mathematics sections compared with students in the comparison schools. Figure 1 through Figure 4 show the mean standardized raw scores for ELA and mathematics proficiency by grade and time point for the SRG schools and the comparison schools. All three cohorts of SRG schools serving Grades 1–8 show steady gains during this time period, closing the gap between their test scores and those of other schools within their district. Patterns are less clear among high schools receiving SRGs, with slight declines in test scores among all schools.

Figure 1 and Figure 2 show that between 2007 and 2013, ELA and mathematics scores remained relatively flat for elementary and middle schools within those districts that were not receiving SRGs. These schools performed approximately one-half of a standard deviation lower, on average, compared with the mean performance of all schools in the state, and this performance remained stable. Schools receiving SRGs, however, were performing even worse in the years prior to receiving SRGs, more than a full standard deviation below the state mean for most measures. By 2013, these schools had substantially narrowed the gap between SRG and non-SRG schools. Tenth-grade scores show a less obvious pattern (Figure 3 and Figure 4), with both non-SRG and SRG schools within these districts showing slightly lower performance relative to the state mean during this time period.

**Figure 1. Mean Standardized ELA MCAS Score With Schools Serving Grades 3–8 by School Year and Treatment Status**

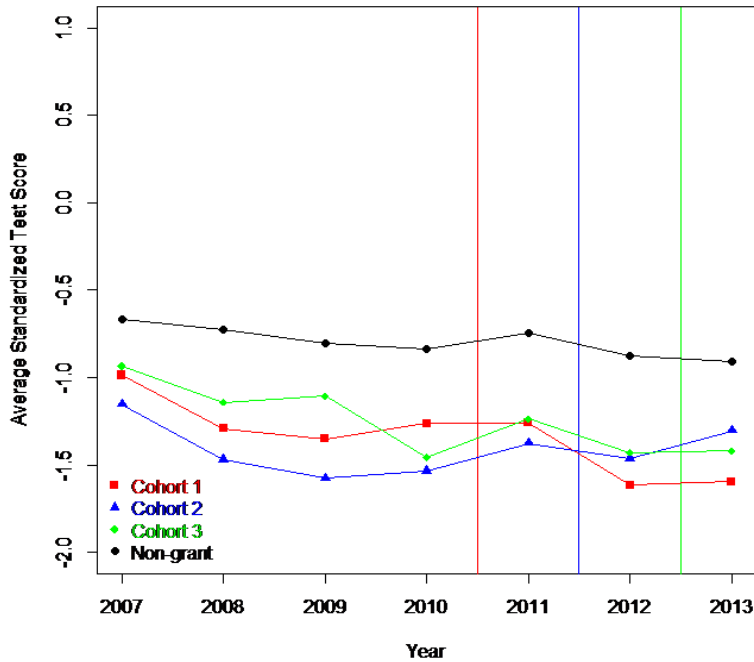


**Figure 2. Mean Standardized Mathematics MCAS Score With Schools Serving Grades 3–8 by School Year and Treatment Status**

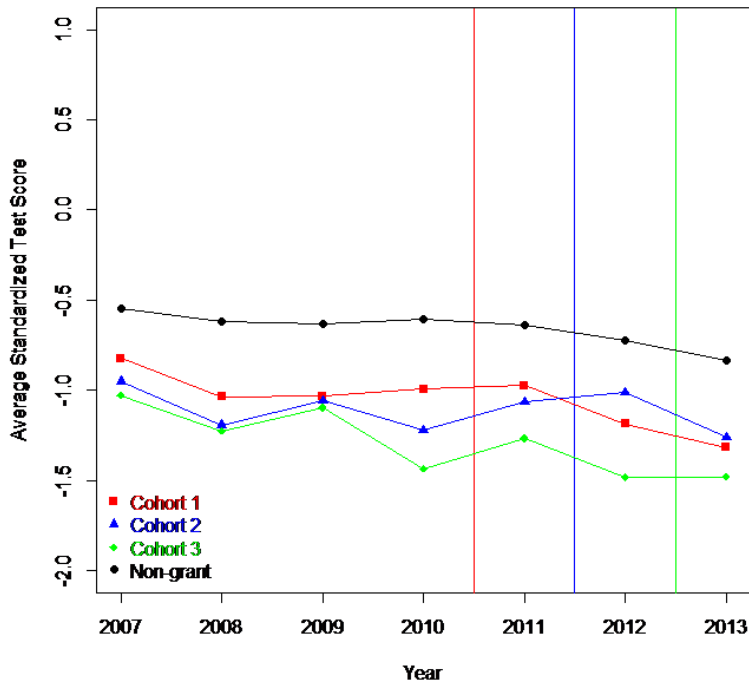




**Figure 3. Mean Standardized ELA MCAS Score With Schools Serving Grade 10 by School Year and Treatment Status**



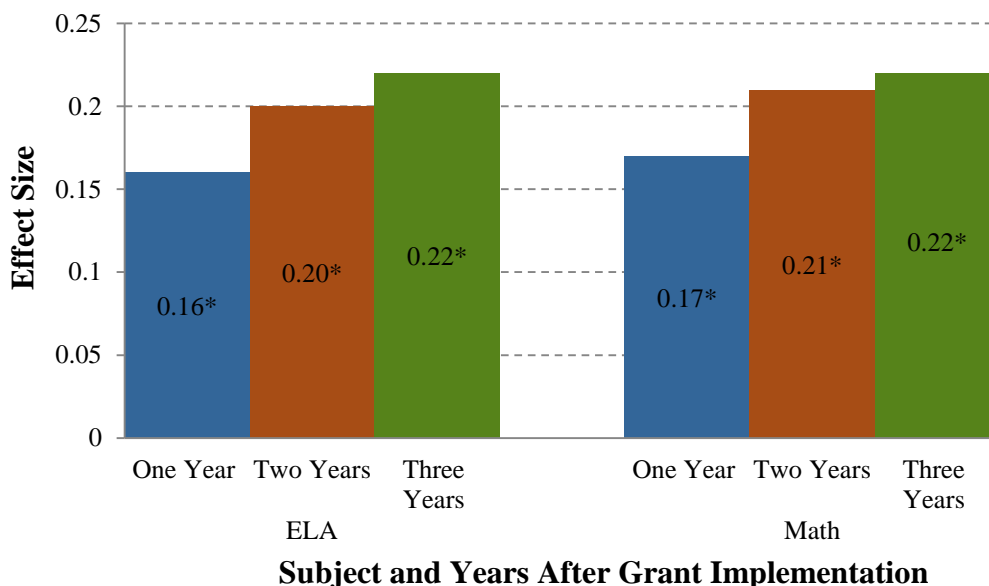
**Figure 4. Mean Standardized Mathematics MCAS Score With Schools Serving Grade 10 by School Year and Treatment Status**



Given prior trends in test scores one, two, and three years after receiving an SRG, students in SRG schools have ELA MCAS scores that are 0.16, 0.20, and 0.22 standard deviation higher,

respectively, than would be expected given test score changes in the comparison schools during the same time period (Figure 5). The effect sizes are 0.17, 0.21, and 0.22 standard deviation, respectively, for mathematics MCAS scores. (See Table B1 in Appendix B for the full results.) These results are substantial; considering that SRG schools were performing approximately half a standard deviation below other schools within their districts in 2007, the three-year results can be thought of as closing this gap by nearly half.

**Figure 5. MCAS ELA and Mathematics Achievement Score Effect Sizes by Year After Implementation**



### Subgroup Analyses

Subgroup analyses were conducted based on district, school level, and special student population classification. The findings are summarized in the following subsections.

**District.** The district subgroup analyses find a statistically significant positive impact of receiving a school redesign grant one and two years later for all three district subgroups; Boston, Springfield and Other (Appendix C, Table C1 through Table C3).<sup>4</sup> Significant positive impacts are found three years later only for Boston SRG schools on both the ELA and mathematics sections of MCAS.

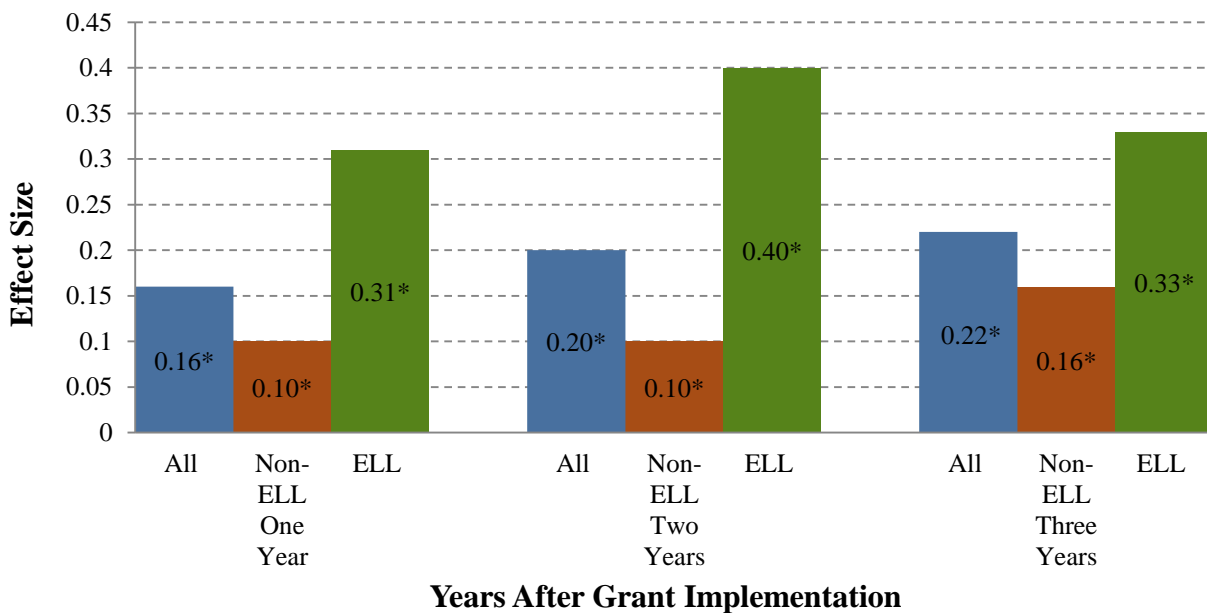
**Grade Range.** Subgroup analyses by grade range found a statistically significant positive impact of receiving an SRG one, two, and three years later in both ELA and mathematics for schools serving Grades 3–8. For SRG schools serving Grade 10, significant positive impacts one year later are found in ELA and mathematics, and two years later for ELA but not mathematics Appendix D, Table D1 and Table D2). It should be noted that because of the much smaller

<sup>4</sup> Districts were divided into these three groups because Boston and Springfield each accounted for approximately one third of the total number of SRG schools, while the remaining third consisted of a small number of schools from the remaining districts that did not allow for individual district analyses.

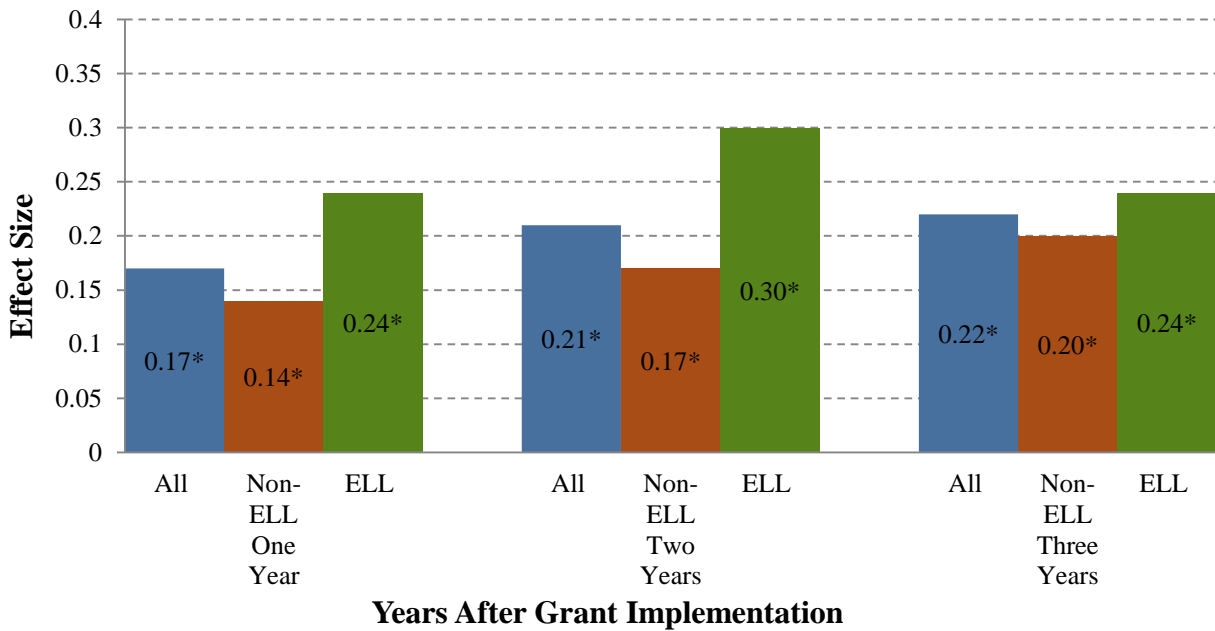
number of high school students observed, it is more difficult to capture a statistically significant effect.

**Special Student Population Classification.** The special student population analyses identified two statistical differences in the changes in achievement gaps between the SRG and comparison schools (Appendix E, Table E1). First, the achievement gap between ELL and non-ELL students decreased on both the ELA and mathematics sections relative to the achievement gap between similar students in the comparison schools; these results were significant one, two, and three years after program implementation (Figure 6 and Figure 7). Second, the achievement gap between students receiving free- or reduced-priced lunch and those who do not decreased on both the ELA and mathematics sections relative to the achievement gap between similar students in the comparison schools one year later, but it increased two years later. No statistical differences were found for changes in MCAS scores for students with a special education classification.

**Figure 6. MCAS ELA Achievement Score Effect Sizes by English Language Learner (ELL) Status and Year After Implementation**



**Figure 7. MCAS Mathematics Achievement Score Effect Sizes by English Language Learner (ELL) Status and Year After Implementation**

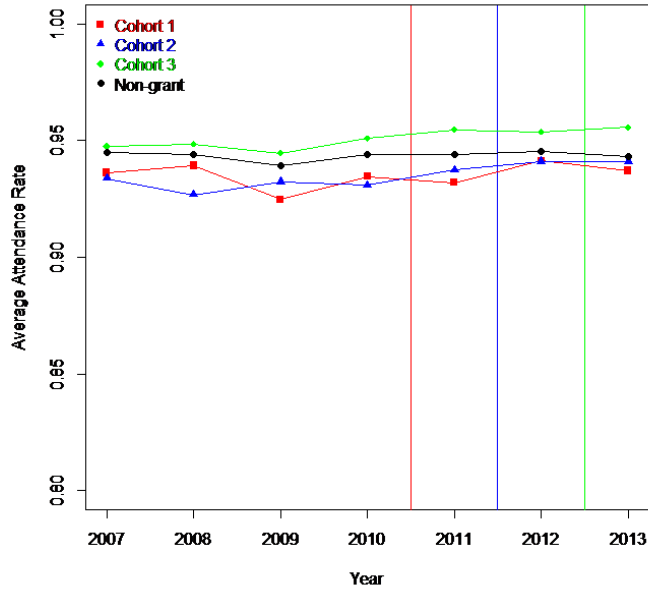


## Attendance<sup>5</sup>

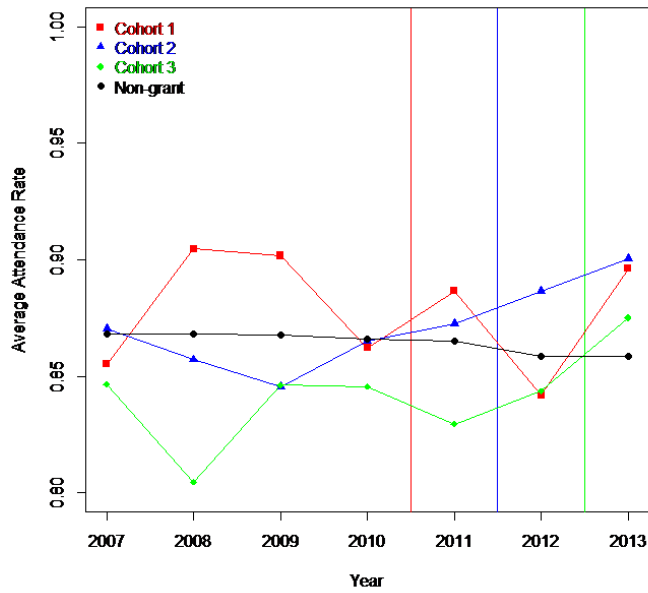
As shown in Figure 8, the attendance rate of students in the comparison schools serving Grades 1–8 remained relatively flat during the analysis window. Students in SRG schools seem to be increasing their attendance rate slightly during this time frame, but no obvious jumps or changes in slope are seen at the time of program implementation. Figure 9 shows that the attendance rate for high schools in the comparison group also is relatively flat as those for the SRG schools and shows no particular pattern (the small number of high schools in each cohort leads to greater random variation from year to year). After the introduction of SRGs, the only difference in the changes in student attendance rates between the students in the SRG and comparison schools relative to prior attendance rates is a slight negative effect in attendance three years after program implementation (Appendix B, Table B2).

<sup>5</sup> The analyses for attendance were run in the arcsine metric to account for the fact that most attendance rates were close to one. Because the results remained unchanged, we chose to report the results without the arcsine transformation (i.e., in the original metric) for ease of interpretation.

**Figure 8. Average Student Attendance Rate With Schools Serving Grades 1–8 by School Year and Treatment Status**



**Figure 9. Average Student Attendance Rate With Schools Serving Grades 9–12 by School Year and Treatment Status**



## Subgroup Analyses

**District.** For the district subgroups, the effects of attendance rate appear to be negative two and three years later in Boston, positive three years later in Springfield, and positive in the first year in the other districts (Appendix C, Table C4 through Table C6).

**Grade Range.** The subgroup analyses identified slight negative effects in attendance rate between the SRG and comparison schools in schools that serve Grades 1–8 and slight positive effects in the schools that serve Grades 9–12 in the first year (Appendix D, Table D3 and Table D4). No effects were detected in in the second and third years.

**Special Student Population Classification.** The special student population analyses identified one consistent statistical difference in the changes in the attendance rate gaps between the SRG and comparison schools (Appendix E, Table E2). The attendance rate gap between special education and non-special education students decreased relative to the attendance rate gap between similar students in the comparison schools; these results were significant one, two, and three years after program implementation.

## IV. Conclusion

This report describes the findings from a quasi-experimental impact analysis that examined the extent to which student outcomes were associated with SRG receipt. It is one component of a larger evaluation that AIR conducted to assess the implementation and impact of ODST assistance to Commissioner’s Districts and schools. The outcomes examined here include student achievement and attendance.

The results from this evaluation show that, when considering prior achievements trends, students in the SRG schools experienced greater gains on both the ELA and mathematics sections of MCAS compared with students in the comparison schools. These gains were particularly strong for students who are ELLs. Moreover, the gains were robust across districts and school levels and generally remained strong across all three years of program implementation. The results for attendance, on the other hand, were neither strong nor consistent, suggesting that SRG receipt does not generally affect attendance rates.

## Reference

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2001). *Experimental and quasi-experimental designs for generalized causal inference* (2nd ed.). Mason, OH: Cengage Learning.



## Appendix A. CITS Technical Approach

AIR used a multilevel CITS model that accounts for nesting by means of district fixed effects, time random effects, and school random effects to determine whether SRGs had an impact on student outcomes (specifically student achievement and attendance rate) one, two, and three years after program implementation. The model is represented by the following equation:

$$Y_{ij} = \beta_0 + \beta_1 Grant_j + \beta_2 Time_t + \beta_3 Grant_j Time_t + \beta_4 PY1_{ij} + \beta_5 PY2_{ij} + \beta_6 PY3_{ij} + \beta_7 Y11_t + \beta_8 Y12_t + \beta_9 Y13_t + District_j + HS_j + X_{ij} + v_j + u_{ij} + e_{ij}$$

In this model,  $Y_{ij}$  is the outcome measure (i.e., the standardized raw score or the attendance rate) for student  $i$  in school  $j$  at time  $t$ ;  $Grant_j$  is an indicator for school  $j$  that received an SRG (i.e., a treatment school);  $Time_t$  is the outcome trend across time (years 2007–2013 are coded 1 through 7, respectively);  $Y11_t$ ,  $Y12_t$ , and  $Y13_t$  are indicators for years 2011, 2012 and 2013; and  $PY1_{ij}$ ,  $PY2_{ij}$ , and  $PY3_{ij}$  are indicators for whether student  $j$  at time  $t$  was in a school that had received an SRG one, two, and three years, respectively, after program implementation. In this model, each indicator for a student is coded as 1 if it applies to a student and 0 otherwise. For example, a student who has an outcome observed in a cohort 2 SRG school in 2012 would be coded 1 for  $Grant_j$ , 1 for  $Y12$ , and 1 for  $PY1$  (because 2012 is the first year in the post-SRG time period for schools in Cohort 2). Because  $Grant_j Time_t$  is an interaction between  $Grant_j$  and  $Time_t$ , the student also would be coded as 1 multiplied by Time for  $Grant_j Time_t$ , which allows for different pretreatment trends for SRG and non-SRG schools. District fixed effects and an indicator for whether the school is a high school are included in the model, allowing students in SRG schools to be compared only with students in non-SRG schools serving similar grade levels in the same district. The model also includes a set of student-level characteristics  $X_{ij}$  (i.e., race, gender, ELL status, free- or reduced-price lunch status, and special education status) that also may account for differences in the student outcomes. Random effects were included to account for school, cohort, and student effects by adding a random error term for each school ( $v_j$ ), time ( $u_{ij}$ ), and student ( $e_{ij}$ ).

Accounting for all student outcomes across time, the  $\beta_4$ ,  $\beta_5$ , and  $\beta_6$  coefficients in the model represent the difference in differences of outcomes between the SRG schools and the comparison schools prior to and one, two, and three years after SRG receipt, respectively (i.e., the one-year, two-year, and three-year posttreatment effects). In other words, these coefficients are the differences in outcomes for schools receiving SRGs one, two, and three years after receiving an SRG compared with their outcomes before receiving an SRG, subtracting out the difference in outcomes found in the comparison schools during the same time period. The  $\beta_1$  coefficient compares the mean 2007 outcome score (i.e., the standardized MCAS raw score or the attendance rate) between students in treatment schools and comparison schools, the  $\beta_2$  coefficient represents the 2007–2010 trend in the outcome measure for the comparison schools, and the  $\beta_3$  coefficient is the difference in the 2007–2010 outcome trend between the comparison and SRG schools.  $\beta_7$ ,  $\beta_8$ , and  $\beta_9$  are the differences in mean outcome for comparison schools in 2011, 2012, and 2013, respectively, compared with the 2007–2010 outcome trend (i.e., what would have been expected of SRG schools in these years in the absence of an SRG).

For the special populations subgroup analysis, an additional term was added to the model to determine whether receiving an SRG had an impact on student outcomes after program implementation:

$$Y_{ij} = \beta_0 + \beta_1 Grant_j + \beta_2 Time_t + \beta_3 Grant_j Time_t + \beta_4 PY1_{ij} + \beta_5 PY2_{ij} + \beta_6 PY3_{ij} + \beta_7 Y11_t + \beta_8 Y12_t + \beta_9 Y13_t + \beta_{10} Grant_j Subgroup_{ij} + \beta_{11} PY1_{ij} Subgroup_{ij} + \beta_{12} PY2_{ij} Subgroup_{ij} + \beta_{13} PY3_{ij} Subgroup_{ij} + District_j + HS_j + X_{ij} + v_j + u_{ij} + e_{ij}$$

In this model, each subgroup analysis—ELL status, free- or reduced-price lunch status, and special education status—were run individually.  $PY1_{ij}Subgroup_{ij}$  through  $PY3_{ij}Subgroup_{ij}$  were added to indicate whether there was a difference in the difference in the differences of a student in a subgroup versus not a subgroup in an SRG school versus a comparison school after program implementation. Therefore, the  $\beta_{11}$  through  $\beta_{13}$  coefficients represent the one-, two-, and three-year changes of the gap between students in a subgroup or not in the SRG schools versus the gap of students in the non-SRG schools after program implementation.  $Grant_jSubgroup_{ij}$  is the preintervention time period difference in the differences between students in the subgroup versus not in a subgroup between SRG and non-SRG schools. Table A1 through Table A3 show the distribution of the variables included in the models.

**Table A1. Mean ELA and Mathematics Scale Scores by Grade and Treatment Status**

Grade	School Year	ELA				Mathematics			
		N		Raw Scores		N		Raw Scores	
		Treatment	Comparison	Treatment	Comparison	Treatment	Comparison	Treatment	Comparison
Third	2007–08	1,370	10,404	26 (10)	32 (10)	1,406	10,490	21 (8)	26 (8)
	2008–09	1,355	10,211	25 (9)	30 (9)	1,372	10,304	22 (9)	26 (8)
	2009–10	1,383	10,556	24 (9)	30 (9)	1,417	10,636	20 (9)	26 (8)
	2010–11	1,413	10,277	26 (10)	31 (9)	1,437	10,454	21 (9)	25 (9)
	2011–12	1,277	10,315	29 (10)	32 (9)	1,310	10,456	24 (9)	26 (9)
	2012–13	1,376	10,655	29 (10)	31 (10)	1,414	10,766	24 (9)	26 (9)
	2013–14	1,412	10,889	29 (9)	31 (9)	1,442	10,986	25 (8)	26 (8)
Fourth	2007–08	1,348	10,149	38 (11)	46 (11)	1,381	10,196	25 (11)	33 (11)
	2008–09	1,321	10,294	37 (12)	46 (11)	1,334	10,391	25 (11)	32 (11)
	2009–10	1,353	10,220	35 (11)	43 (11)	1,371	10,332	26 (11)	33 (12)
	2010–11	1,317	10,473	36 (11)	44 (12)	1,342	10,577	26 (11)	33 (11)
	2011–12	1,337	10,371	38 (12)	43 (12)	1,372	10,535	28 (12)	33 (12)
	2012–13	1,242	10,324	40 (12)	44 (11)	1,275	10,446	29 (11)	32 (11)
	2013–14	1,386	10,562	39 (12)	43 (12)	1,408	10,709	29 (11)	32 (11)
Fifth	2007–08	1,188	10,296	26 (10)	32 (10)	1,205	10,376	24 (12)	31 (12)
	2008–09	1,197	9,787	26 (9)	32 (9)	1,214	9,842	23 (12)	30 (12)
	2009–10	1,199	10,111	27 (9)	33 (9)	1,213	10,194	23 (12)	32 (13)
	2010–11	1,236	10,057	27 (10)	32 (10)	1,261	10,187	25 (12)	31 (12)
	2011–12	1,190	10,372	27 (9)	31 (10)	1,217	10,514	28 (11)	32 (12)

Grade	School Year	ELA				Mathematics			
		N		Raw Scores		N		Raw Scores	
		Treatment	Comparison	Treatment	Comparison	Treatment	Comparison	Treatment	Comparison
	2012–13	1,176	10,238	28 (9)	31 (9)	1,199	10,362	28 (12)	31 (12)
	2013–14	1,071	9,799	28 (10)	31 (10)	1,096	9,881	29 (12)	32 (12)
Sixth	2007–08	1,292	9,918	28 (10)	32 (9)	1,303	9,984	23 (11)	30 (12)
	2008–09	1,328	9,601	28 (9)	33 (9)	1,349	9,687	25 (13)	33 (13)
	2009–10	1,213	9,304	29 (10)	34 (9)	1,229	9,376	25 (12)	32 (12)
	2010–11	1,369	9,533	27 (9)	32 (9)	1,387	9,633	24 (12)	32 (13)
	2011–12	1,401	9,450	27 (10)	32 (10)	1,419	9,571	25 (12)	31 (13)
	2012–13	1,315	9,677	28 (10)	31 (10)	1,340	9,762	27 (12)	32 (12)
	2013–14	1,331	9,620	28 (9)	31 (9)	1,372	9,744	26 (12)	31 (12)
	2007–08	1,478	10,237	42 (13)	46 (12)	1,494	10,303	23 (11)	28 (12)
Seventh	2008–09	1,501	9,841	41 (12)	46 (12)	1,528	9,917	22 (11)	28 (13)
	2009–10	1,499	9,529	40 (12)	46 (11)	1,535	9,618	23 (12)	30 (13)
	2010–11	1,260	9,464	38 (12)	45 (12)	1,273	9,573	23 (12)	31 (13)
	2011–12	1,287	9,800	39 (13)	45 (12)	1,293	9,922	24 (11)	31 (12)
	2012–13	1,166	9,865	39 (13)	44 (12)	1,188	9,986	24 (11)	30 (12)
	2013–14	1,165	10,150	39 (12)	44 (12)	1,192	10,250	24 (11)	30 (12)
	Eighth	2007–08	1,506	10,516	29 (10)	33 (10)	1,526	10,515	20 (11)
2008–09		1,553	9,945	29 (10)	33 (9)	1,577	9,970	22 (11)	28 (12)
2009–10		1,522	9,765	29 (10)	34 (10)	1,551	9,824	21 (11)	28 (13)
2010–11		1,432	9,491	29 (11)	33 (10)	1,442	9,597	24 (11)	31 (13)

Grade	School Year	ELA				Mathematics			
		N		Raw Scores		N		Raw Scores	
		Treatment	Comparison	Treatment	Comparison	Treatment	Comparison	Treatment	Comparison
	2011–12	1,222	9,479	29 (10)	34 (9)	1,224	9,541	24 (12)	31 (13)
	2012–13	1,159	9,765	29 (10)	34 (10)	1,173	9,822	22 (12)	29 (13)
	2013–14	1,146	9,945	29 (10)	33 (10)	1,169	10,062	24 (11)	29 (12)
Tenth	2007–08	737	10,124	41 (11)	47 (12)	711	9,885	27 (13)	34 (14)
	2008–09	694	9,937	39 (12)	48 (12)	633	9,723	24 (12)	34 (15)
	2009–10	726	9,834	40 (13)	49 (12)	682	9,707	23 (11)	32 (14)
	2010–11	648	9,771	37 (12)	47 (12)	648	9,660	23 (12)	34 (14)
	2011–12	556	9,705	41 (12)	49 (12)	543	9,585	25 (12)	33 (14)
	2012–13	631	9,269	39 (12)	48 (12)	639	9,212	24 (12)	35 (14)
	2013–14	500	9,406	41 (12)	50 (12)	488	9,340	23 (11)	33 (14)

*Note.* Standard deviation is reported in parentheses.

**Table A2. Mean Attendance Rate by School Grade Range and Treatment Status**

Grade	School Year	N		Attendance Rate	
				Mean	
		Treatment	Comparison	Treatment	Comparison
1-8	2007	11,572	85,780	0.93 (0.08)	0.95 (0.06)
	2008	11,538	83,857	0.93 (0.08)	0.95 (0.06)
	2009	11,398	83,790	0.92 (0.08)	0.94 (0.06)
	2010	11,232	84,230	0.93 (0.07)	0.94 (0.06)
	2011	11,041	85,603	0.93 (0.07)	0.94 (0.06)
	2012	10,933	86,879	0.94 (0.07)	0.95 (0.06)
	2013	11,094	87,891	0.94 (0.06)	0.95 (0.06)
9-12	2007	3,179	34,591	0.85 (0.15)	0.90 (0.12)
	2008	2,722	33,995	0.84 (0.15)	0.90 (0.12)
	2009	2,577	33,394	0.85 (0.16)	0.90 (0.12)
	2010	2,644	33,516	0.85 (0.15)	0.90 (0.12)
	2011	2,366	33,165	0.86 (0.13)	0.90 (0.12)
	2012	2,266	32,284	0.86 (0.14)	0.91 (0.12)
	2013	2,096	32,674	0.88 (0.12)	0.91 (0.12)

Note. Standard deviation is reported in parentheses.

**Table A3. Student Demographics by Treatment Status and Year**

School Year	N		Special Education		Free- or Reduced-Price Lunch Program		ELLs	
	Treatment	Comparison	Treatment	Comparison	Treatment	Comparison	Treatment	Comparison
2007–08	9,441	74,932	24.6%	19.4%	85.8%	72.9%	24.4%	15.3%
2008–09	10,102	79,285	25.2%	19.8%	85.5%	71.5%	25.1%	16.2%
2009–10	10,499	80,114	24.0%	20.0%	86.4%	73.7%	27.4%	18.2%
2010–11	10,236	80,697	24.6%	20.0%	89.7%	76.4%	31.7%	22.6%
2011–12	9,767	82,014	24.0%	20.2%	90.2%	77.1%	34.0%	23.9%
2012–13	9,435	82,017	22.5%	20.2%	89.7%	76.7%	34.5%	24.4%
2013–14	9,374	83,408	21.3%	19.5%	91.2%	78.5%	32.6%	23.2%

School Year	N		Hispanic		Black		White		Asian		Other or More Than One Race	
	Treatment	Comparison	Treatment	Comparison	Treatment	Comparison	Treatment	Comparison	Treatment	Comparison	Treatment	Comparison
2007–08	9441	74984	51.3%	33.1%	30.5%	26.1%	12.5%	29.6%	3.2%	8.9%	2.4%	2.2%
2008–09	10104	79348	52.8%	34.5%	31.0%	25.8%	10.6%	28.5%	2.9%	8.8%	2.7%	2.3%
2009–10	10516	80192	54.5%	35.5%	30.2%	25.6%	9.0%	27.5%	3.1%	8.9%	3.0%	2.5%
2010–11	10266	80890	55.3%	36.5%	29.3%	25.0%	8.9%	26.6%	3.4%	8.9%	2.8%	2.7%
2011–12	9767	82014	56.9%	37.4%	28.5%	24.7%	8.3%	26.0%	3.5%	9.1%	2.6%	2.8%
2012–13	9447	82064	56.7%	37.4%	28.4%	25.1%	8.4%	25.4%	3.7%	8.9%	2.7%	3.1%
2013–14	9374	83408	56.4%	38.3%	28.0%	24.4%	8.7%	24.7%	3.9%	9.1%	2.8%	3.3%

## Appendix B. CITS Outcomes

Table B1 and Table B2 present the CITS outcomes for student achievement and attendance rate, respectively. For each model, the coefficients on Grant  $\times$  Post Year 1, Grant  $\times$  Post Year 2, and Grant  $\times$  Post Year 3 represent the overall effects of an SRG one, two, and three years after receiving the grant. These effects represent the changes in the outcomes of students in the SRG schools after program implementation compared with changes in outcomes of students in the comparison schools while controlling for other student-level demographics (i.e., special education status, free- or reduced-price lunch status, ELL status, gender, and race). Student achievement outcomes are standardized; thus effect sizes should be interpreted as standard deviation changes. Attendance outcomes are presented as rates; thus effect sizes should be interpreted as percentage point changes.

Because of the cohort structure of program implementation (cohort 1 received an SRG at the start of the 2011 school year, cohort 2 at the start of the 2012 school year, and cohort 3 at the start of the 2013 school year) and outcome data were available only through 2013, the effects of receiving a grant one year later (the first school year after receiving the grant) are estimated for all schools, the effects of receiving a grant two years later are estimated for schools in cohorts 1 and 2, and the effects of receiving a grant three years later are estimated only for schools in cohort 1.



**Table B1. CITS Outcomes: Student Achievement**

	<b>ELA</b>	<b>Mathematics</b>
Grant ( $\beta_1$ )	-0.29** (0.07)	-0.28** (0.07)
Time ( $\beta_2$ )	0.02** (0.00)	0.02** (0.01)
Grant $\times$ Time ( $\beta_3$ )	-0.01* (0.00)	0.00 (0.00)
Grant $\times$ Post Year 1 ( $\beta_4$ )	0.16** (0.01)	0.17** (0.01)
Grant $\times$ Post Year 2 ( $\beta_5$ )	0.20** (0.02)	0.21** (0.02)
Grant $\times$ Post Year 3 ( $\beta_6$ )	0.22** (0.02)	0.22** (0.02)
Year 2011 ( $\beta_7$ )	-0.01 (0.02)	0.00 (0.02)
Year 2012 ( $\beta_8$ )	-0.05* (0.02)	-0.02 (0.03)
Year 2013 ( $\beta_9$ )	-0.07** (0.02)	-0.04 (0.03)
High school	0.10** (0.01)	0.18** (0.01)
Special education	-1.01** (0.00)	-0.86** (0.00)
Free- or reduced-price lunch program	-0.25** (0.00)	-0.22** (0.00)
English language learner	-0.79** (0.00)	-0.54** (0.00)
Hispanic	-0.22** (0.00)	-0.26** (0.00)
Black	-0.25** (0.00)	-0.37** (0.00)
Asian/other	0.07** (0.00)	0.21** (0.00)
Male	-0.18** (0.00)	0.07** (0.00)
Brockton	-0.10 (0.07)	-0.11 (0.07)
Fall River	-0.17** (0.07)	-0.32** (0.07)
Holyoke	-0.42** (0.10)	-0.39** (0.10)
Lowell	0.02 (0.07)	-0.06 (0.08)
Lynn	0.08 (0.07)	0.02 (0.07)
Springfield	-0.07 (0.06)	-0.15** (0.06)
Worcester	0.15** (0.06)	0.05 (0.06)
Constant ( $\beta_0$ )	0.09** (0.03)	-0.01 (0.03)
Time random-effects parameters	0.00 (0.01)	0.00 (0.01)
School random-effects parameters	0.12 (0.34)	0.12 (0.34)
Residual random-effects parameters	0.81 (0.90)	0.79 (0.89)

Note. Standard errors are presented in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .

**Table B2. CITS Outcomes: Attendance Rate**

	<b>Attendance Rate</b>
Grant ( $\beta_1$ )	-0.006 (0.007)
Time ( $\beta_2$ )	-0.001 (0.000)
Grant $\times$ Time ( $\beta_3$ )	0.002** (0.000)
Grant $\times$ Post Year 1 ( $\beta_4$ )	0.000 (0.001)
Grant $\times$ Post Year 2 ( $\beta_5$ )	-0.001 (0.001)
Grant $\times$ Post Year 3 ( $\beta_6$ )	-0.004* (0.002)
Year 2011 ( $\beta_7$ )	0.002 (0.001)
Year 2012 ( $\beta_8$ )	0.005** (0.002)
Year 2013 ( $\beta_9$ )	0.006** (0.002)
High school	-0.025** (0.001)
Special education	-0.019** (0.000)
Free- or reduced-price lunch program	-0.014** (0.000)
English language learner	0.010** (0.000)
Hispanic	-0.009** (0.000)
Black	0.009** (0.000)
Asian/other	-0.015** (0.000)
Male	0.000* (0.000)
Brockton	0.003 (0.007)
Fall River	-0.009 (0.007)
Holyoke	-0.009 (0.010)
Lowell	0.006 (0.008)
Lynn	0.012 (0.007)
Springfield	-0.006 (0.006)
Worcester	0.027** (0.006)
Constant ( $\beta_0$ )	0.941** (0.003)
Time random-effects parameters	0.000 (0.001)
School random-effects parameters	0.001 (0.037)
Residual random-effects parameters	0.006 (0.075)

Note. Standard errors are presented in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .

## Appendix C. CITS Outcomes by District

Table C1 through Table C6 show the CITS outcomes for student achievement and attendance rate separately for three groups of districts: the Boston Public Schools, the Springfield Public Schools, and six other districts combined. Separate analyses were conducted in this way because Boston and Springfield each comprise approximately one third of the total number of schools receiving an SRG. Conducting analyses separately by district allows for determining whether receiving an SRG had a statistically significant effect specifically for schools in Boston, Springfield, and the other six districts. This is potentially important because with the large proportion of schools in Boston and Springfield, the main results are driven largely by the schools in these two districts. It is therefore possible that the main results might find a statistically significant program effect, but the subgroup analyses reveal that the impact is statistically significant only for schools in one of these district subgroups. The reverse also is possible; the main findings may be null, whereas one or more of the groups of schools has statistically significant effects. For each model, the coefficients on the Grant  $\times$  Post Year 1, Grant  $\times$  Post Year 2, and Grant  $\times$  Post Year 3 represent the effects of receiving an SRG one, two, and three years after receiving the grant for all schools within the district(s) included in the subgroup. Because some districts did not have schools in all cohorts, not all subgroups have effects for all postimplementation years.

**Table C1. CITS Outcomes: Boston Student Achievement**

	<b>ELA</b>	<b>Mathematics</b>
Grant ( $\beta_1$ )	-0.42** (0.11)	-0.39** (0.11)
Time ( $\beta_2$ )	0.02* (0.01)	0.01 (0.01)
Grant $\times$ Time ( $\beta_3$ )	0.01 (0.01)	0.02* (0.01)
Grant $\times$ Post Year 1 ( $\beta_4$ )	0.18** (0.03)	0.26** (0.03)
Grant $\times$ Post Year 2 ( $\beta_5$ )	0.29** (0.04)	0.28** (0.03)
Grant $\times$ Post Year 3 ( $\beta_6$ )	0.25** (0.04)	0.27** (0.04)
Year 2011 ( $\beta_7$ )	-0.02 (0.03)	-0.01 (0.05)
Year 2012 ( $\beta_8$ )	-0.09** (0.03)	-0.03 (0.06)
Year 2013 ( $\beta_9$ )	-0.10* (0.04)	-0.06 (0.07)
High school	0.09** (0.01)	0.18** (0.01)
Special education	-0.94** (0.01)	-0.78** (0.01)
Free- or reduced-price lunch program	-0.16** (0.01)	-0.11** (0.01)
English language learner	-0.76** (0.01)	-0.46** (0.01)
Hispanic	-0.21** (0.01)	-0.26** (0.01)
Black	-0.32** (0.01)	-0.41** (0.01)
Asian/other	0.05** (0.01)	0.30** (0.01)
Male	-0.20** (0.00)	0.04** (0.00)
Constant ( $\beta_0$ )	0.05 (0.04)	-0.10* (0.05)
Time random-effects parameters	0.00 (0.02)	0.00 (0.03)
School random-effects parameters	0.12 (0.34)	0.12 (0.35)
Residual random-effects parameters	0.80 (0.89)	0.77 (0.88)

*Note.* Standard errors are presented in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .

**Table C2. CITS Outcomes: Springfield Student Achievement**

	<b>ELA</b>	<b>Mathematics</b>
Grant ( $\beta_1$ )	-0.26 (0.14)	-0.30 (0.16)
Time ( $\beta_2$ )	-0.00 (0.01)	-0.01 (0.01)
Grant $\times$ Time ( $\beta_3$ )	-0.01* (0.01)	0.00 (0.01)
Grant $\times$ Post Year 1 ( $\beta_4$ )	0.07** (0.02)	0.09** (0.02)
Grant $\times$ Post Year 2 ( $\beta_5$ )	0.06* (0.03)	0.06* (0.03)
Grant $\times$ Post Year 3 ( $\beta_6$ )	0.00 (0.05)	-0.03 (0.04)
Year 2011 ( $\beta_7$ )	0.03 (0.02)	0.03 (0.02)
Year 2012 ( $\beta_8$ )	0.04 (0.02)	0.04 (0.02)
Year 2013 ( $\beta_9$ )	0.05 (0.03)	0.09** (0.03)
High school	0.11** (0.04)	0.28** (0.04)
Special education	-0.98** (0.01)	-0.77** (0.01)
Free- or reduced-price lunch program	-0.34** (0.01)	-0.29** (0.01)
English language learner	-0.84** (0.01)	-0.56** (0.01)
Hispanic	-0.28** (0.01)	-0.34** (0.01)
Black	-0.23** (0.01)	-0.38** (0.01)
Asian/other	0.03* (0.02)	0.07** (0.01)
Male	-0.16** (0.01)	0.09** (0.01)
Constant ( $\beta_0$ )	0.17** (0.06)	-0.04 (0.07)
Time random-effects parameters	0.00 (0.01)	0.00 (0.01)
School random-effects parameters	0.15 (0.39)	0.19 (0.44)
Residual random-effects parameters	0.85 (0.92)	0.77 (0.88)

*Note.* Standard errors are presented in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .

**Table C3. CITS Outcomes: Other Districts Student Achievement**

	ELA	Mathematics
Grant ( $\beta_1$ )	-0.31** (0.11)	-0.27** (0.10)
Time ( $\beta_2$ )	0.03** (0.00)	0.02** (0.00)
Grant $\times$ Time ( $\beta_3$ )	0.01 (0.01)	0.01* (0.01)
Grant $\times$ Post Year 1 ( $\beta_4$ )	0.24** (0.03)	0.15** (0.03)
Grant $\times$ Post Year 2 ( $\beta_5$ )	0.30** (0.03)	0.24** (0.03)
Grant $\times$ Post Year 3 ( $\beta_6$ )	—	—
Year 2011 ( $\beta_7$ )	-0.01 (0.01)	-0.01 (0.01)
Year 2012 ( $\beta_8$ )	-0.04* (0.01)	-0.02 (0.02)
Year 2013 ( $\beta_9$ )	-0.08** (0.02)	-0.05* (0.02)
High school	0.14** (0.03)	0.11** (0.03)
Special education	-1.07** (0.00)	-0.94** (0.00)
Free- or reduced-price lunch program	-0.29** (0.00)	-0.28** (0.00)
English language learner	-0.81** (0.00)	-0.59** (0.00)
Hispanic	-0.21** (0.00)	-0.23** (0.00)
Black	-0.20** (0.00)	-0.31** (0.01)
Asian/other	0.07** (0.01)	0.18** (0.01)
Male	-0.18** (0.00)	0.08** (0.00)
Fall River	-0.04 (0.08)	-0.19* (0.08)
Holyoke	-0.30** (0.11)	-0.27** (0.10)
Lowell	0.15 (0.09)	0.08 (0.08)
Lynn	0.20* (0.09)	0.14 (0.08)
Worcester	0.26** (0.08)	0.17* (0.07)
Constant ( $\beta_0$ )	-0.03 (0.06)	-0.10 (0.06)
Time random-effects parameters	0.00 (0.01)	0.00 (0.01)
School random-effects parameters	0.10 (0.32)	0.09 (0.30)
Residual random-effects parameters	0.81 (0.90)	0.80 (0.89)

*Note.* Standard errors are presented in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .

**Table C4. CITS Outcomes: Boston Attendance Rate**

	<b>Attendance Rate</b>
Grant ( $\beta_1$ )	-0.007 (0.011)
Time ( $\beta_2$ )	-0.002 (0.001)
Grant $\times$ Time ( $\beta_3$ )	0.002** (0.001)
Grant $\times$ Post Year 1 ( $\beta_4$ )	-0.002 (0.002)
Grant $\times$ Post Year 2 ( $\beta_5$ )	-0.007** (0.002)
Grant $\times$ Post Year 3 ( $\beta_6$ )	-0.07* (0.003)
Year 2011 ( $\beta_7$ )	0.004 (0.004)
Year 2012 ( $\beta_8$ )	0.006 (0.005)
Year 2013 ( $\beta_9$ )	0.006 (0.006)
High school	-0.026** (0.001)
Special education	-0.018** (0.000)
Free- or reduced-price lunch program	-0.009** (0.000)
English language learner	0.017** (0.000)
Hispanic	-0.006** (0.001)
Black	0.010** (0.001)
Asian/other	0.024** (0.001)
Male	-0.001** (0.000)
Constant ( $\beta_0$ )	0.938** (0.004)
Time random-effects parameters	0.000 (0.002)
School random-effects parameters	0.001 (0.037)
Residual random-effects parameters	0.007 (0.085)

*Note.* Standard errors are presented in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .

**Table C5. CITS Outcomes: Springfield Attendance Rate**

	<b>Attendance Rate</b>
Grant ( $\beta_1$ )	0.001 (0.017)
Time ( $\beta_2$ )	0.003** (0.001)
Grant $\times$ Time ( $\beta_3$ )	0.001 (0.000)
Grant $\times$ Post Year 1 ( $\beta_4$ )	-0.003 (0.002)
Grant $\times$ Post Year 2 ( $\beta_5$ )	0.001 (0.002)
Grant $\times$ Post Year 3 ( $\beta_6$ )	0.013** (0.004)
Year 2011 ( $\beta_7$ )	-0.002 (0.003)
Year 2012 ( $\beta_8$ )	0.004 (0.004)
Year 2013 ( $\beta_9$ )	0.004 (0.005)
High school	-0.014** (0.002)
Special education	-0.016** (0.001)
Free- or reduced-price lunch program	-0.018** (0.001)
English language learner	-0.004** (0.001)
Hispanic	-0.018** (0.001)
Black	0.001 (0.001)
Asian/other	0.012** (0.001)
Male	0.001** (0.000)
Constant ( $\beta_0$ )	0.929** (0.008)
Time random-effects parameters	0.000 (0.002)
School random-effects parameters	0.002 (0.049)
Residual random-effects parameters	0.008 (0.087)

*Note.* Standard errors are presented in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .



**Table C6. CITS Outcomes: Other Districts Attendance Rate**

	<b>Attendance Rate</b>
Grant ( $\beta_1$ )	0.002 (0.011)
Time ( $\beta_2$ )	-0.001* (0.000)
Grant $\times$ Time ( $\beta_3$ )	0.000 (0.000)
Grant $\times$ Post Year 1 ( $\beta_4$ )	0.004** (0.002)
Grant $\times$ Post Year 2 ( $\beta_5$ )	0.003 (0.002)
Grant $\times$ Post Year 3 ( $\beta_6$ )	—
Year 2011 ( $\beta_7$ )	0.002 (0.001)
Year 2012 ( $\beta_8$ )	0.006** (0.001)
Year 2013 ( $\beta_9$ )	0.007** (0.002)
High school	-0.030** (0.002)
Special education	-0.019** (0.000)
Free- or reduced-price lunch program	-0.017** (0.000)
English language learner	0.008** (0.000)
Hispanic	-0.007** (0.000)
Black	0.014** (0.000)
Asian/other	0.012** (0.000)
Male	0.000 (0.000)
Fall River	-0.011 (0.008)
Holyoke	-0.010 (0.011)
Lowell	0.006 (0.009)
Lynn	0.011 (0.009)
Worcester	0.025** (0.008)
Constant ( $\beta_0$ )	0.946** (0.006)
Time random-effects parameters	0.000 (0.001)
School random-effects parameters	0.001 (0.033)
Residual random-effects parameters	0.004 (0.063)

*Note.* Standard errors are presented in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .

## Appendix D. CITS Outcomes by Grades Served

Table D1 through Table D4 the CITS outcomes for student achievement and attendance rate separately for schools serving any grades between kindergarten and Grade 8 (e.g., schools serving Grades 1–8, 1–5, 5–8, and 7–8) and those serving Grades 9–12. Conducting analyses separately by grade range served allows for determining whether receiving an SRG had a statistically significant effect separately among schools serving Grades 1–8 and those serving Grades 9–12. This is potentially important because it is possible that the impact of SRGs differ depending on whether the school serves primary or high school students. For each model, the coefficients on the Grant  $\times$  Post Year 1, Grant  $\times$  Post Year 2, and Grant  $\times$  Post Year 3 represent the effects of receiving an SRG one, two, and three years after receiving a grant for all schools in the grade range subgroup.

**Table D1. CITS Outcomes: Schools Serving Grades 3–8—Student Achievement**

	ELA	Mathematics
Grant ( $\beta_1$ )	-0.35** (0.06)	-0.35** (0.06)
Time ( $\beta_2$ )	0.02** (0.01)	0.02* (0.01)
Grant $\times$ Time ( $\beta_3$ )	-0.00 (0.00)	0.00 (0.00)
Grant $\times$ Post Year 1 ( $\beta_4$ )	0.16** (0.02)	0.17** (0.02)
Grant $\times$ Post Year 2 ( $\beta_5$ )	0.19** (0.02)	0.21** (0.02)
Grant $\times$ Post Year 3 ( $\beta_6$ )	0.21** (0.02)	0.20** (0.02)
Year 2011 ( $\beta_7$ )	-0.02 (0.02)	-0.01 (0.03)
Year 2012 ( $\beta_8$ )	-0.05* (0.02)	-0.03 (0.03)
Year 2013 ( $\beta_9$ )	-0.08** (0.03)	-0.04 (0.04)
Special education	-1.01** (0.00)	-0.86** (0.00)
Free- or reduced-price lunch program	-0.27** (0.00)	-0.25** (0.00)
English language learner	-0.74** (0.00)	-0.52 (0.00)
Hispanic	-0.21** (0.00)	-0.25** (0.00)
Black	-0.25** (0.00)	-0.36** (0.00)
Asian/other	0.08** (0.01)	0.20** (0.01)
Male	-0.19** (0.00)	0.07** (0.00)
Brockton	-0.16* (0.07)	-0.13 (0.07)
Fall River	-0.22** (0.06)	-0.36** (0.06)
Holyoke	-0.53** (0.09)	-0.48** (0.09)
Lowell	-0.07 (0.07)	-0.13 (0.07)
Lynn	0.05 (0.07)	0.03 (0.07)
Springfield	-0.06 (0.05)	-0.12* (0.05)
Worcester	0.07 (0.06)	-0.01 (0.06)
Constant ( $\beta_0$ )	0.18** (0.03)	0.08* (0.04)
Time random-effects parameters	0.00 (0.01)	0.00 (0.02)
School random-effects parameters	0.09 (0.30)	0.09 (0.30)
Residual random-effects parameters	0.81 (0.90)	0.80 (0.89)

*Note.* Standard errors are presented in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .

**Table D2. CITS Outcomes: Schools Serving Grade 10—Student Achievement**

	ELA	Mathematics
Grant ( $\beta_1$ )	-0.13 (0.19)	-0.05 (0.21)
Time ( $\beta_2$ )	-0.00 (0.01)	0.00 (0.00)
Grant $\times$ Time ( $\beta_3$ )	-0.03** (0.01)	-0.05** (0.01)
Grant $\times$ Post Year 1 ( $\beta_4$ )	0.16** (0.05)	0.17** (0.05)
Grant $\times$ Post Year 2 ( $\beta_5$ )	0.19** (0.06)	0.10 (0.06)
Grant $\times$ Post Year 3 ( $\beta_6$ )	0.12 (0.11)	0.09 (0.11)
Year 2011 ( $\beta_7$ )	0.04 (0.02)	0.02 (0.02)
Year 2012 ( $\beta_8$ )	0.02 (0.03)	0.06** (0.02)
Year 2013 ( $\beta_9$ )	0.02 (0.04)	-0.05* (0.02)
Special education	-1.06** (0.01)	-0.88** (0.01)
Free- or reduced-price lunch program	-0.16** (0.01)	-0.10** (0.01)
English language learner	-1.28** (0.01)	-0.66 (0.01)
Hispanic	-0.28** (0.01)	-0.33** (0.01)
Black	-0.28** (0.01)	-0.40** (0.01)
Asian/other	-0.03* (0.01)	0.22** (0.01)
Male	-0.15** (0.01)	-0.09** (0.01)
Brockton	-0.30 (0.18)	-0.49** (0.19)
Fall River	-0.67** (0.22)	-0.82** (0.23)
Holyoke	-0.18 (0.22)	-0.32 (0.23)
Lowell	-0.05 (0.28)	-0.32 (0.30)
Lynn	-0.14 (0.16)	-0.43* (0.17)
Springfield	-0.33* (0.14)	-0.51** (0.14)
Worcester	0.31* (0.15)	0.08 (0.16)
Constant ( $\beta_0$ )	0.01 (0.06)	-0.03 (0.06)
Time random-effects parameters	0.00 (0.01)	0.00 (0.00)
School random-effects parameters	0.13 (0.36)	0.15 (0.38)
Residual random-effects parameters	0.77 (0.88)	0.70 (0.84)

*Note.* Standard errors are presented in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .

**Table D3. CITS Outcomes: Schools Serving Grades 1–8—Attendance Rate**

	<b>Attendance Rate</b>
Grant ( $\beta_1$ )	-0.007 (0.006)
Time ( $\beta_2$ )	-0.001 (0.001)
Grant $\times$ Time ( $\beta_3$ )	0.001** (0.000)
Grant $\times$ Post Year 1 ( $\beta_4$ )	-0.002** (0.001)
Grant $\times$ Post Year 2 ( $\beta_5$ )	0.002 (0.001)
Grant $\times$ Post Year 3 ( $\beta_6$ )	-0.002 (0.001)
Year 2011 ( $\beta_7$ )	0.003 (0.002)
Year 2012 ( $\beta_8$ )	0.006** (0.002)
Year 2013 ( $\beta_9$ )	0.006* (0.003)
Special education	-0.016** (0.000)
Free- or reduced-price lunch program	-0.014** (0.000)
English language learner	0.008** (0.000)
Hispanic	-0.006** (0.000)
Black	0.010** (0.000)
Asian/other	0.014** (0.000)
Male	-0.001** (0.000)
Brockton	-0.001 (0.006)
Fall River	-0.016** (0.006)
Holyoke	-0.016 (0.009)
Lowell	-0.002 (0.007)
Lynn	0.004 (0.006)
Springfield	-0.005 (0.005)
Worcester	0.018** (0.005)
Constant ( $\beta_0$ )	0.952** (0.003)
Time random-effects parameters	0.000 (0.001)
School random-effects parameters	0.001 (0.029)
Residual random-effects parameters	0.003 (0.057)

*Note.* Standard errors are presented in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .

**Table D4. CITS Outcomes: Schools Serving Grades 9–12—Attendance Rate**

	<b>Attendance Rate</b>
Grant ( $\beta_1$ )	-0.006 (0.026)
Time ( $\beta_2$ )	0.001** (0.000)
Grant $\times$ Time ( $\beta_3$ )	0.003** (0.001)
Grant $\times$ Post Year 1 ( $\beta_4$ )	0.014** (0.003)
Grant $\times$ Post Year 2 ( $\beta_5$ )	-0.010* (0.004)
Grant $\times$ Post Year 3 ( $\beta_6$ )	0.006 (0.006)
Year 2011 ( $\beta_7$ )	-0.001 (0.001)
Year 2012 ( $\beta_8$ )	0.003* (0.001)
Year 2013 ( $\beta_9$ )	0.005** (0.001)
Special education	-0.028** (0.001)
Free- or reduced-price lunch program	-0.015** (0.001)
English language learner	0.017** (0.001)
Hispanic	-0.017** (0.001)
Black	0.007** (0.001)
Asian/other	0.018** (0.001)
Male	0.002** (0.000)
Brockton	-0.040 (0.025)
Fall River	-0.074* (0.032)
Holyoke	-0.049 (0.029)
Lowell	-0.024 (0.039)
Lynn	0.010 (0.023)
Springfield	-0.026 (0.018)
Worcester	0.055* (0.022)
Constant ( $\beta_0$ )	0.886** (0.008)
Time random-effects parameters	0.000 (0.000)
School random-effects parameters	0.003 (0.053)
Residual random-effects parameters	0.012 (0.110)

*Note.* Standard errors are presented in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .

## Appendix E. CITS Outcomes by Special Population

Table E1 and Table E2 show the CITS outcomes for student achievement and attendance rate for three special populations of students: ELLs, special education, and free- or reduced-price lunch. The coefficients on the Grant  $\times$  Post Year 1, Grant  $\times$  Post Year 2, and Grant  $\times$  Post Year 3 represent the overall effects on outcomes of a school receiving an SRG one, two, and three years after receiving a grant. These effects represent the changes in the outcomes of students in the SRG schools after program implementation compared with changes in the outcomes of students in the comparison schools while controlling for other student-level demographics (i.e., special education status, free- or reduced-price lunch status, ELLs, gender, and race). Interactions between being in a treatment school and being a special population student are included in these models to determine whether being in a school that received an SRG had differential impact for special populations of students. The coefficients on Subgroup  $\times$  Post Year 1, Subgroup  $\times$  Post Year 2, and Subgroup  $\times$  Post Year 3 represent the differences in the effect of being in a school that received an SRG between students who are and are not of the special population (i.e., the difference-in-difference-in-difference).

**Table E1. Regression Outcomes for Special Populations Within the SRG and Comparison Schools: Student Achievement**

	English Language Learners		Free-or Reduced-Price Lunch		Special Education	
	ELA	Mathematics	ELA	Mathematics	ELA	Mathematics
Grant ( $\beta_1$ )	-0.25** (0.07)	-0.27** (0.01)	-0.26** (0.07)	-0.30** (0.07)	-0.31** (0.07)	-0.30** (0.07)
Time ( $\beta_2$ )	0.02** (0.00)	0.02** (0.01)	0.02** (0.00)	0.02** (0.01)	0.02** (0.00)	0.02** (0.01)
Grant $\times$ Time ( $\beta_3$ )	-0.00 (0.00)	0.00 (0.00)	-0.01* (0.00)	0.00 (0.00)	-0.01* (0.00)	0.00 (0.00)
Grant $\times$ Post Year 1 ( $\beta_4$ )	0.10** (0.02)	0.14** (0.02)	0.09* (0.04)	0.10** (0.04)	0.17** (0.02)	0.18** (0.02)
Grant $\times$ Post Year 2 ( $\beta_5$ )	0.10** (0.02)	0.17** (0.02)	0.22** (0.04)	0.30** (0.04)	0.19** (0.02)	0.21** (0.00)
Grant $\times$ Post Year 3 ( $\beta_6$ )	0.16** (0.03)	0.20** (0.03)	0.22** (0.05)	0.18** (0.05)	0.22** (0.03)	0.22** (0.02)
Grant $\times$ Subgroup ( $\beta_{10}$ )	-0.20** (0.01)	-0.04** (0.01)	-0.03* (0.01)	0.02 (0.01)	0.06** (0.01)	0.10** (0.01)
Grant $\times$ Post Year 1 $\times$ Special Population ( $\beta_{11}$ )	0.21** (0.02)	0.10** (0.02)	0.07 (0.04)	0.08* (0.04)	-0.01 (0.03)	-0.02 (0.03)
Grant $\times$ Post Year 2 $\times$ Special Population ( $\beta_{12}$ )	0.30** (0.03)	0.13** (0.02)	-0.02 (0.04)	-0.10** (0.04)	0.04 (0.03)	0.03 (0.03)
Grant $\times$ Post Year 3 $\times$ Special Population ( $\beta_{13}$ )	0.17** (0.04)	0.04 (0.04)	-0.00 (0.05)	0.05 (0.05)	0.01 (0.04)	0.04 (0.04)
Year 2011 ( $\beta_7$ )	-0.01 (0.02)	0.00 (0.02)	-0.01 (0.02)	0.00 (0.02)	-0.01 (0.02)	0.00 (0.02)
Year 2012 ( $\beta_8$ )	-0.05* (0.02)	-0.02 (0.03)	-0.04* (0.02)	-0.02 (0.03)	-0.05* (0.02)	-0.02 (0.03)
Year 2013 ( $\beta_9$ )	-0.07** (0.02)	-0.04 (0.03)	-0.07** (0.02)	-0.04 (0.03)	-0.07** (0.02)	-0.04 (0.03)
Special education	-1.01** (0.00)	-0.86** (0.00)	-1.01** (0.00)	-0.86** (0.00)	-1.02** (0.00)	-0.87** (0.00)
Free- or reduced-price lunch	-0.25** (0.00)	-0.22** (0.00)	-0.25** (0.00)	-0.23** (0.00)	-0.25** (0.00)	-0.22** (0.00)
English language learner	-0.78** (0.00)	-0.54 (0.00)	-0.79** (0.00)	-0.54** (0.00)	-0.79** (0.00)	-0.54** (0.00)



	English Language Learners		Free-or Reduced-Price Lunch		Special Education	
	ELA	Mathematics	ELA	Mathematics	ELA	Mathematics
Hispanic	-0.22** (0.00)	-0.26 (0.00)	-0.22** (0.00)	-0.26** (0.00)	-0.22** (0.00)	-0.26** (0.00)
Black	-0.25** (0.00)	-0.37** (0.00)	-0.25** (0.00)	-0.37** (0.00)	-0.25** (0.00)	-0.37** (0.00)
Asian/other	0.07** (0.00)	0.21** (0.00)	0.07** (0.00)	0.21** (0.00)	0.07** (0.01)	0.21** (0.00)
Brockton	-0.10 (0.07)	-0.11 (0.07)	-0.10 (0.07)	-0.11 (0.07)	-0.10 (0.07)	-0.11 (0.07)
Fall River	-0.17** (0.07)	-0.32** (0.07)	-0.17** (0.07)	-0.32** (0.07)	-0.17** (0.07)	-0.32** (0.07)
Holyoke	-0.42** (0.10)	-0.39** (0.10)	-0.42** (0.10)	-0.39** (0.10)	-0.42** (0.10)	-0.39** (0.10)
Lowell	0.02 (0.07)	-0.06 (0.08)	0.02 (0.07)	-0.06 (0.08)	0.02 (0.07)	-0.06 (0.08)
Lynn	0.08 (0.07)	0.02 (0.07)	0.08 (0.07)	0.02 (0.07)	0.08 (0.07)	0.02 (0.07)
Springfield	-0.07 (0.06)	-0.15** (0.06)	-0.07 (0.06)	-0.15** (0.06)	-0.07 (0.06)	-0.15** (0.06)
Worcester	0.15** (0.06)	0.05 (0.06)	0.15** (0.06)	0.05 (0.06)	0.15** (0.06)	0.05 (0.06)
Constant ( $\beta_0$ )	0.09** (0.03)	-0.01 (0.03)	0.09** (0.03)	-0.01 (0.03)	0.09** (0.03)	-0.01 (0.03)
Time random-effects parameters	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)
School random-effects parameters	0.12 (0.34)	0.12 (0.34)	0.12 (0.34)	0.12 (0.34)	0.12 (0.34)	0.12 (0.34)
Residual random-effects parameters	0.81 (0.90)	0.79 (0.89)	0.81 (0.90)	0.79 (0.89)	0.81 (0.90)	0.79 (0.89)

Note. Standard errors are presented in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .



**Table E2. Regression Outcomes for Special Populations Within SRG and Comparison Schools: Attendance Rate**

	<b>English Language Learners</b>	<b>Free- or Reduced-Price Lunch</b>	<b>Special Education</b>
Grant ( $\beta_1$ )	-0.006 (0.007)	-0.006 (0.007)	-0.005 (0.007)
Time ( $\beta_2$ )	-0.001 (0.000)	-0.001 (0.000)	-0.001 (0.000)
Grant $\times$ Time ( $\beta_3$ )	0.002** (0.000)	0.002** (0.000)	0.002** (0.000)
Grant $\times$ Post Year 1 ( $\beta_4$ )	0.001 (0.001)	0.001 (0.002)	-0.001 (0.001)
Grant $\times$ Post Year 2 ( $\beta_5$ )	-0.001 (0.001)	-0.001 (0.002)	-0.003* (0.001)
Grant $\times$ Post Year 3 ( $\beta_6$ )	-0.003 (0.002)	-0.002 (0.003)	-0.005** (0.002)
Grant $\times$ Subgroup ( $\beta_{10}$ )	0.000 (0.001)	0.000 (0.001)	-0.004** (0.001)
Grant $\times$ Post Year 1 $\times$ Special Population ( $\beta_{11}$ )	-0.002 (0.002)	-0.001 (0.002)	0.008** (0.002)
Grant $\times$ Post Year 2 $\times$ Special Population ( $\beta_{12}$ )	-0.002 (0.002)	0.000 (0.002)	0.006** (0.002)
Grant $\times$ Post Year 3 $\times$ Special Population ( $\beta_{13}$ )	-0.002 (0.002)	-0.002 (0.003)	0.007* (0.003)
Year 2011 ( $\beta_7$ )	0.002 (0.001)	0.002 (0.001)	0.002 (0.001)
Year 2012 ( $\beta_8$ )	0.005** (0.002)	0.005** (0.002)	0.005** (0.002)
Year 2013 ( $\beta_9$ )	0.006** (0.002)	0.006** (0.002)	0.006** (0.002)
Special education	-0.019** (0.000)	-0.019** (0.000)	-0.018** (0.000)
Free- or reduced-price lunch	-0.014** (0.000)	-0.014** (0.000)	-0.014** (0.000)
English language learner	0.010** (0.000)	0.010** (0.000)	0.010** (0.000)
Hispanic	-0.009** (0.000)	-0.009** (0.000)	-0.009** (0.000)
Black	0.009** (0.000)	0.009** (0.000)	0.009** (0.000)
Asian/other	0.015** (0.000)	0.015** (0.000)	0.015** (0.000)
Brockton	0.003 (0.007)	0.003 (0.007)	0.003 (0.007)
Fall River	-0.009 (0.007)	-0.009 (0.007)	-0.009 (0.007)
Holyoke	-0.009 (0.010)	-0.009 (0.010)	-0.009 (0.010)
Lowell	0.006 (0.008)	0.006 (0.008)	0.006 (0.008)
Lynn	0.012 (0.007)	0.012 (0.007)	0.012 (0.007)

	<b>English Language Learners</b>	<b>Free- or Reduced-Price Lunch</b>	<b>Special Education</b>
Springfield	-0.006 (0.006)	-0.006 (0.006)	-0.006 (0.006)
Worcester	0.027** (0.006)	0.027** (0.006)	0.027** (0.006)
Constant ( $\beta_0$ )	0.941** (0.003)	0.941** (0.003)	0.941** (0.003)
Time random-effects parameters	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
School random-effects parameters	0.001 (0.037)	0.001 (0.037)	0.001 (0.037)
Residual random-effects parameters	0.006 (0.075)	0.006 (0.075)	0.006 (0.075)

*Note.* Standard errors are presented in parentheses.

\*  $p < .05$ . \*\*  $p < .01$ .

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