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POLICY BRIEF

Sustained Positive Effects on Graduation Rates

Produced by New York City's Small Public High Schools of Choice

By Howard S. Bloom and Rebecca Unterman

During the past decade, New York City undertook a district-wide high school reform that is perhaps unprecedented in its scope, scale, and pace. Between fall 2002 and fall 2008, the school district closed 23 large failing high schools (with graduation rates below 45 percent),[1] opened 216 new small high schools (with different missions, structures, and student selection criteria), and implemented a centralized high school admissions process that assigns over 90 percent of the roughly 80,000 incoming ninth-graders each year based on their school preferences.

At the heart of this reform are 123 small, academically nonselective, public high schools. Each with approximately 100 students per grade in grades 9 through 12, these schools were created to serve some of the district's most disadvantaged students and are located mainly in neighborhoods where large failing high schools had been closed.[2] Hence, they provide a realistic choice for students with widely varying academic backgrounds. MDRC researchers call them "small schools of choice" (SSCs) because of their small size and the fact that they do not screen students based on their academic backgrounds.[3]

In June 2010, MDRC, a nonprofit, nonpartisan research organization, released a report on the effectiveness of 105 of the 123 new SSCs, which demonstrated that they are markedly improving academic progress and substantially improving graduation prospects, particularly for disadvantaged students. This report included data for over 21,000 students from four cohorts who entered ninth grade between fall 2005 and fall 2008.[4] Findings in the report were based on a series of randomized lotteries that were used when SSCs had more applicants than seats, in order to determine who got offered an opportunity to enroll in an SSC and who did not. SSC lotteries are a little-known byproduct of the current district-wide high school application processing system (HSAPS).[5] These lotteries make it possible to rigorously estimate the effects of enrolling in an SSC versus enrolling in some other New York City public high school, based on a comparison of subsequent outcomes for lottery winners and lottery losers and a procedure that accounts for who among them enroll in an SSC.[6]

In a large sample, like that used for the MDRC study, lottery winners and lottery losers are the same, on average, in all ways before they enter high school. Consequently, it is valid to attribute any differences in their future academic outcomes to their access to an SSC. Because students who lose an SSC lottery attend over 200 high schools that vary widely in their size, age, structure, academic programs, and effectiveness, the MDRC report judged SSCs against the

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overall effectiveness of a diverse group of other high schools.[7] The results released in 2010 indicated that, on average, the 105 SSCs studied increased student progress toward graduation during their first three years of high school and increased students' four-year graduation rates.

Given data that were available at the time, the first MDRC report could only follow the first student cohort (that entered in fall 2005) through four years of high school to examine its graduation rates. This policy brief extends the analysis by a year, which adds information on high school graduation rates for the 2006 cohort and provides a fifth year of follow-up for the 2005 cohort. This information makes it possible to address the following three questions:

- Was the positive average effect of SSCs on four-year graduation rates for the study's first student cohort sustained through the second cohort?
- Was this positive average effect sustained across subgroups of students with different prior academic proficiency, family income, race/ethnicity, and gender?
- Was the average four-year graduation effect sustained after five years?

The answer to all three of these questions is *yes*.

WHAT ARE SSCs?

SSCs were developed through a competitive proposal process that was designed to ensure that school founders met specified conditions and to stimulate innovative ideas from a range of stakeholders and institutions. SSCs emphasize academic rigor and strong and sustained personal relationships among students and faculty. In addition, most were founded with community partners who offer students relevant learning opportunities inside and outside the classroom and provide school faculty with additional staffing support and resources during start-up.[8] By integrating a demanding and comprehensive academic curriculum, personal attention to student academic progress, and real-world experiences with community partners, the new small schools intended to prepare students for both college and career.

In other cities, small high schools are often fashioned by reconfiguring large existing schools into smaller units in the same buildings with the *same* teachers and students; in contrast, the typical SSC was created largely "from scratch" with a principal, teachers, and students who were new to the school. At the same time, many SSCs are located with other SSCs in buildings that previously housed a large public high school that was closed.

SSCs are not just small in size. They are purposefully organized around smaller educational units that are designed to give students a better chance of being known by their teachers and other adults in the building. For example, many SSCs have created special student advisory structures that provide common planning time for teachers to discuss their students' progress and problems.

SSCs received start-up funding from philanthropic organizations plus technical assistance and policy support from the New York City Department of Education and intermediary organizations that were often experienced in managing the launching of new schools — which helped to facilitate school leadership development, staff hiring, and program start-up. Most SSCs began with only a ninth-grade class, adding a subsequent grade each year. Finally, SSCs received special allowances with respect to serving English Language Learners and special education students during their first two years of start-up.[9] The creation of SSCs was supported by a consortium of funders, led by the Bill &

Melinda Gates Foundation, the Carnegie Corporation of New York, and the Open Society Institute. SSCs were implemented in collaboration with the United Federation of Teachers and the Council of School Supervisors and Administrators.[10] Unlike charter schools, which typically operate independently of the school district in which they are located, SSCs are directly responsible to the New York City Department of Education.

WHY STUDY SSCs?

Almost all major urban school districts in the U.S. and all but four states have attempted to create new small schools or attempted to transform large schools into campuses with "small learning communities."[11] This movement had its beginnings in the 1960s, when urban educators and community organizations began to implement smaller school structures as an alternative to the large high schools that dominated the landscape, many of which were failing. By the late 1990s, small schools had emerged as a national reform strategy championed by such groups as the Coalition of Essential Schools and the National Association of Secondary School Principals. This strategy proliferated through district- and foundation-led initiatives in major cities like Chicago, Philadelphia, Boston, Oakland, and New York. In 2000, the Bill & Melinda Gates Foundation launched a national campaign to improve failing urban high schools, with small schools as a key strategy.[12]

The common theory of change underlying both small schools and small learning communities specifies that smaller educational units promote stronger relationships among students, among adults, and between students and adults. These relationships, in turn, are expected to increase student engagement and help teachers respond to students' academic and social needs, thereby increasing students' academic achievement.[13] Prior research on small schools has produced mixed results about their effectiveness. Some studies have found that they improve student outcomes, such as increasing levels of academic achievement and lowering rates of school dropout.[14] In addition, some studies suggest that these effects are most pronounced for disadvantaged students.[15] On the other hand, a major study of a large number of small schools initiatives suggests that they do not improve student academic outcomes appreciably.[16] In all of these cases however, the nonexperimental nature of the research limits its ability to support causal conclusions.

MDRC's findings about SSCs are relevant to current federal policy on high school reform, particularly the U. S. Department of Education's School Improvement Grants (SIGs) for failing schools. Reforms funded by SIGs include school transformation, school restart, school closing, and school turnaround. SSCs straddle several of these categories since they are typically replacements for schools that have closed and they operate as regular public schools. However, it is important to recognize that SSCs represent far more than just changes in school size and structure. They also represent innovative ways to use these structural changes to leverage human, financial, and curricular resources.

The coupling of small schools with a system of choice for all entering ninth-graders also has relevance for the national debate about charter schools. On the one hand, SSCs share many similarities with charters — they are small and personalized; most began with the help of intermediary sponsors that resemble charter management organizations; the students and teachers are there by choice; and the curricula are demanding. On the other hand, SSCs are overseen by the Department of Education

TABLE 1. Estimated Average Effects of SSCs on Four-Year Graduation Rates: Student Cohorts 1 and 2

OUTCOME (%)	TARGET SSC ENROLLEES	CONTROL GROUP COUNTERPARTS	ESTIMATED EFFECT	P-VALUE FOR ESTIMATED EFFECT
GRADUATION				
GRADUATED FROM HIGH SCHOOL	67.9	59.3	8.6 **	0.000
Local diploma granted	19.9	19.6	0.3	0.406
Regents diploma granted	41.5	34.9	6.5 *	0.041
Advanced Regents diploma granted	6.2	4.7	1.6	0.154
COLLEGE READINESS				
Passed Math Regents at 75 or higher	23.3	22.5	0.8	0.682
Passed English Regents at 75 or higher	37.3	29.7	7.6 **	0.002

NOTES: *There are 13,064 student observations for cohorts one and two combined. There are no statistically significant differences between estimated effects for the two cohorts. Because of rounding error and the complex calculations involved, results by diploma type do not sum exactly to those for overall graduation rates.*

with unionized teachers and principals; the schools are nonselective and open to students regardless of academic proficiency; and the school choice process was designed to engage all entering ninth-graders, not just the most motivated parents and children that might seek out charter schools.

HOW MUCH DO SSCs HELP STUDENTS?

Previous Study Findings: Because students became part of the study sample in four annual cohorts, MDRC's first report on the effects of SSCs was based on four years of follow-up for the first cohort of entering ninth-graders, three years of follow-up for the second, two years of follow-up for the third, and one year of follow-up for the fourth cohort.

Based on data for all four cohorts, the report found that SSCs increased the percentage of students who were on track[17] toward graduation in ninth grade by 10.0 percentage points (to 58.5 percent for "target SSC enrollees" from 48.5 percent for their control group counterparts).[18]

The report found similar positive effects on progress toward graduation in ninth grade for subgroups of students who varied in terms of their reading and math proficiency before entering high school, their eligibility for free or reduced-price lunches, and their race/ethnicity and gender.

At two and three years after students entered high school, the study found that SSCs increased their progress toward graduation by roughly the same amount as they did during the first year. And at four years after students entered high school, the study found that SSCs increased high school graduation rates by 6.8 percentage points (to 68.7 percent for target SSC enrollees from 61.9 percent for their control group counterparts).

New Findings on Graduation and College Readiness for Two Student Cohorts: Findings in Table 1 indicate that SSC effects on four-year high school graduation rates are sustained through a second cohort of entering ninth-graders. Enrolling in an SSC instead of another type of New York City public high

school increased average four-year graduation rates for the first two cohorts combined by 8.6 percentage points (to 67.9 percent for target SSC enrollees from 59.3 percent for their control group counterparts).[19] Almost all of this graduation effect reflects an increase in receipt of New York State Regents diplomas. For this type of diploma, students must pass a minimum of five Regents examinations (English Language Arts, Mathematics, Science, Global History, and American History) with a score of 65 points or above and must pass all courses that are required by the state. None of the SSC graduation effect appears to reflect an increase in receipt of local diplomas, which have less stringent standards for scores on Regents examinations and are being phased out by New York State for the graduating class of 2012. Likewise, little if any of the SSC graduation effect reflects an increase in receipt of Advanced Regents diplomas, which have the most stringent standards and are received by very few students who apply to SSCs.

Table 1 also indicates that enrolling in an SSC increased students' college readiness in English but not in math, as measured by the percentage who scored 75 points or higher on the corresponding New York State Regents examinations.[20] This threshold is used by the City University of New York to exempt students from taking remedial courses in these subjects.

New Subgroup Findings on Graduation for Two Student Cohorts: Adding a second cohort of students to the analysis of SSC effects on four-year graduation rates increased the sample size by enough to make it possible to examine how these effects vary across subgroups of students with diverse backgrounds. Findings in Table 2 indicate that SSCs increased four-year high school graduation rates appreciably for all subgroups examined that had samples that were large enough to support findings.[21]

Consider the results for subgroups defined by students' prior academic proficiency, as measured by their eighth-grade state test scores in reading and math. New York State reports this proficiency in four levels. Levels 1 and 2 (did not meet or partially met standards) represent student performance that is below grade level. Levels 3 and 4 (fully met standards or met standards with distinction) represent performance that is at or above grade level. Since very few sample members score in the top category, no findings are reported for it. The findings indicate that SSCs increased four-year graduation rates appreciably for students in levels 1, 2, and 3 of reading and math prior proficiency.

Although specific estimates vary somewhat (from 7.7 to 11.3 percentage points for reading and from 8.6 to 11.4 percentage points for math), all of the effects are appreciable and statistically significant, indicating that every group benefited substantially from attending an SSC. For example the 11.4 percentage point gain in high school graduation rates produced by SSCs for students with a level 1 eighth-grade math proficiency score implies a 33 percent increase (11.4/34.5) in graduation rates for this subgroup of students with especially weak math preparation. However, there is no clear pattern to the variation in results across proficiency subgroups; so while the impacts are statistically significant, the reported *differences* between subgroups are not statistically significant. Therefore, one should not conclude, for instance, that SSCs worked differently for level 1 students than for level 2 students, even though the point estimates differ.

These subgroup findings by academic proficiency are especially striking given the dramatic differences that exist in the

TABLE 2. Estimated Effects of SSCs on Four-Year Graduation Rates for Student Subgroups: Student Cohorts 1 and 2

STUDENT CHARACTERISTIC	TARGET SSC ENROLLEES	CONTROL GROUP COUNTERPARTS	ESTIMATED EFFECT	P-VALUE FOR ESTIMATED EFFECT
8TH-GRADE READING PROFICIENCY				
Not meeting State Learning Standards (level 1)	37.3	29.6	7.7 *	0.044
Partially meeting State Learning Standards (level 2)	66.7	55.5	11.2 **	<.0001
Meeting State Learning Standards (level 3)	81.1	69.8	11.3 **	0.003
Exceeding State Learning Standards (level 4)	--	--	--	
8TH-GRADE MATH PROFICIENCY				
Not meeting State Learning Standards (level 1)	45.9	34.5	11.4 **	<.0001
Partially meeting State Learning Standards (level 2)	65.1	53.8	11.3 **	<.0001
Meeting State Learning Standards (level 3)	85.9	77.3	8.6 **	0.001
Exceeding State Learning Standards (level 4)	--	--	--	
LOW-INCOME STATUS				
Eligible for free/reduced-price lunch	66.9	55.7	11.2 **	0.000
Not eligible for free/reduced-price lunch	74.3	67.4	6.9 **	0.001
RACE/ETHNICITY, BY GENDER				
Black male	65.2	55.3	9.9 *	0.021
Black female	69.1	60.8	8.3 *	0.018
Hispanic male	61.3	53.7	7.7	0.065
Hispanic female	68.7	60.0	8.7 **	0.032
Other male	78.9	69.3	9.6	0.359
Other female	85.4	78.4	7.0	0.409
KNOWN/UNKNOWN STATUS				
Known	68.8	61.1	7.6 **	<.0001
Unknown	67.0	56.9	10.1 **	<.0001

NOTES: *Estimated subgroup effects are not statistically significantly different from each other within any category of subgroups. Because of analytic constraints, the total number of student observations varies across categories. Respectively, the number of student observations is 651, 8,223, 2,221, and 114 for reading proficiency levels 1 through 4; 2,612, 5,963, 2,768, and 53 for math proficiency levels 1 through 4; 9,841 and 2,409 for eligible and not eligible for free/reduced-price lunch; 1,708, 2,452, 1,866, 2,130, 283, and 261 for black males, black females, Hispanic males, Hispanic females, other males, and other females; and 6,389 and 4,820 for known and unknown.*

graduation *prospects* for each subgroup, as measured by its control group counterpart's graduation rate. For example, rates range from 29.6 to 55.5 to 69.8 percent for levels 1, 2, and 3 in reading, respectively. Therefore, SSCs increase high school graduation rates appreciably for students with extremely weak graduation prospects, modest prospects, and stronger prospects.

Findings for subgroups of students who were and were not eligible for free or reduced-price lunch tell a similar story. They indicate that SSCs increased graduation rates for both subgroups (by 11.2 and 6.9 percentage points) even though their graduation prospects differed substantially.

Findings for subgroups of students by race/ethnicity and gender further reinforce the preceding results. They indicate that SSCs increase graduation rates appreciably for all subgroups with a sample that is large enough to detect these effects.[22] Specifically, SSCs increase graduation rates for black males and females by 9.9 and 8.3 percentage points and for Hispanic males and females by 7.7 and 8.7 percentage points.[23]

The final subgroup findings in the table are based on whether or not students were known ahead of time to the SSC in whose lottery they participated.[24] A student can become known to an SSC by contacting it in person or by telephone, by visiting it, by meeting with its representatives at a high school fair, or in other ways. To promote informed school choice, the New York City Department of Education encourages eighth-graders and their parents to do all of these things, which require initiative and effort.

Findings in Table 2 indicate that the roughly 57 percent of students in the subgroup sample who were known to their SSC experienced a 7.6 percentage point increase in four-year graduation rates; the roughly 43 percent of students in the sample who were not known experienced a 10.1 percentage point increase. Both findings are statistically significant although they are not statistically significantly different from each other. Thus, contrary to what might be expected, students who make an effort to become known to their SSC do *not* benefit more from attending it than students who do not make this effort.

New Findings on Five-Year Graduation Rates for the Study's First Student Cohort: Competing hypotheses exist about the likely effects of SSCs on five-year graduation rates. For example, SSCs might be especially effective at keeping struggling students engaged in school for a fifth year in order to meet their graduation requirements. If so, then SSC effects on five-year graduation rates might be greater than their effects on four-year graduation rates. On the other hand, SSC effects on four-year graduation rates might reflect their ability to "speed up" graduation for students who otherwise would need five years. In addition, due to their small staffs, SSCs might not have the capacity to provide the additional resources needed to adequately assist students in their fifth year. For either or both of these reasons, SSC effects on five-year graduation rates might be less than their effects on four-year graduation rates.

Table 3 presents estimates of SSC effects on graduation rates at five years after the study's first student cohort entered high school, as well as their four-year graduation rates (from MDRC's first report). These findings indicate that between year four and year five, graduation rates for target SSC enrollees and their control group counterparts increased by almost exactly the same amount. Hence, the effect of SSCs on graduation rates did not change.

TABLE 3. Estimated Average Effects of SSCs on Four-Year and Five-Year Graduation Rates: Student Cohort 1

OUTCOME (%)	TARGET SSC ENROLLEES	CONTROL GROUP COUNTERPARTS	ESTIMATED EFFECT	P-VALUE FOR ESTIMATED EFFECT
FOUR-YEAR GRADUATION				
GRADUATED FROM HIGH SCHOOL	68.7	61.9	6.8*	0.013
Local diploma granted	24.6	21.9	2.8	0.261
Regents diploma granted	39.5	34.6	4.9	0.074
Advanced Regents diploma granted	4.4	5.5	-1.1	0.366
FIVE-YEAR GRADUATION				
GRADUATED FROM HIGH SCHOOL	75.2	68.1	7.1*	0.018
Local diploma granted	27.3	24.4	3.0	0.265
Regents diploma granted	44.9	40.0	4.9	0.081
Advanced Regents diploma granted	4.7	5.8	-1.1	0.368

NOTES: *There are 5,363 and 5,428 student observations for the four-year and five-year analyses, respectively. The difference represents 65 students who reenrolled in a NYC public high school between their fourth and fifth years. Because of rounding error and the complex calculations involved, results by diploma type do not sum exactly to those for overall graduation rates*

Specifically, graduation rates increased from 68.7 percent in year four to 75.2 percent in year five (or by 6.5 percentage points) for target SSC enrollees and from 61.9 percent in year four to 68.1 percent in year five (or by 6.2 percentage points) for their control group counterparts. The effect of SSCs on five-year graduation rates (a 7.1 percentage point increase) therefore was almost identical to the effect of SSCs on four-year graduation rates (a 6.8 percentage point increase).[25] In addition, at five years, the majority of the SSC impact comes from receiving Regents diplomas, as was the case at four years.

WHY ARE THESE FINDINGS IMPORTANT?

To place these findings in perspective, consider: (1) the scale of the intervention evaluated, (2) the size of the effects it produced, (3) the nature of the population it served, (4) the diversity of subpopulations it benefited, (5) the institutional nature of the intervention, and (6) the rigor of the evaluation conducted.

1. The 105 SSCs studied serve about 45,000 students at full capacity. This is equivalent in size to the entire high school population of Houston, Texas, the seventh largest school district in the United States.

2. The estimated 8.6 percentage point effect of SSCs on four-year graduation rates is equivalent in magnitude to about 43 percent of the gap in graduation rates between white students and students of color in New York City.[26] Furthermore, this effect is relative to currently existing schools, not to the 23 large failing high schools that were closed, schools that had graduation rates that were much lower than the rates of the control group schools that the SSCs were compared with in this study.

3. SSC effects reflect a student population that is 93.2 percent black or Hispanic, 83.9 percent eligible for free or reduced-price lunch, 21.8 percent overage for

grade, and 70.5 percent below grade level in reading and 63.9 percent below grade level in math, based on state tests in these subjects in eighth grade.

4. SSC effects were experienced by students with widely varying graduation prospects, by students who were and were not eligible for free and reduced-price lunch, by students who were male and female, black and Hispanic, and by students who were known and not known to their SSCs.

5. New York City's SSCs were developed through a demanding proposal process that was designed to ensure specified conditions and to stimulate innovation from a range of stakeholders and institutions. This differs markedly from many small schools in other jurisdictions that are created by reconfiguring existing schools. Furthermore, SSCs operate within the school district, in contrast to charter schools, which operate more independently.

6. These findings are based on data for a very large sample that was created by a series of naturally occurring randomized lotteries. Hence, they provide unusually rigorous evidence about the causal effects of SSCs. And instead of relying on a single test score as a proxy for later life outcomes, the study measures actual grade progression, high school graduation, and Regents diplomas attained and scores achieved.

WHAT ARE THE NEXT STEPS FOR RESEARCH ON SSCs?

Over the next three years, with funding from the Bill and Melinda Gates Foundation, MDRC and its partners will expand and deepen their research on SSCs to address such questions as:

- Do SSCs increase college readiness and success in postsecondary education?
- How were SSCs created? How do they operate? What obstacles do they face? How are they dealing with these obstacles? What are their most important sources of financial and human resources? What factors do they believe are most important to their success?
- How do SSC effects vary by school and what factors predict this variation?
- What role does teacher selection, training, and quality play in producing SSC effects?

CONCLUSION

In summary, the present findings provide highly credible evidence that in a relatively short period of time, with sufficient organization and resources, an existing school district can implement a complex high school reform that markedly improves graduation rates for a large population of low-income, disadvantaged students of color.

ENDNOTES

1 The closure of the 23 large high schools happened over time — as they no longer accepted entering ninth-graders and, thus, phased out over four years.

2 Fifty SSCs are in the Bronx and 31 are in Brooklyn. Many of them are in the city's poorest neighborhoods.

3 Other new small secondary schools created by New York City during this time period include 38 general high schools for grades 9-12, which screen students based on their academic backgrounds; 21 transfer schools that are designed to help students who are overage for grade and under-credited; 33 middle/high schools for grades 6-12 or 7-12; and one specialized high school for high-performing students.

4 Bloom, Levy Thompson, and Unterman (2010).

5 SSC lotteries are not public events, but rather the result of the rules by which HSAPS assigns students to SSCs. Of the 123 SSCs created in New York City, 105 had at least one lottery for one of the four student cohorts in the present study.

6 Appendix A of Bloom, Levy Thompson, and Unterman (2010) describes how HSAPS creates SSC lotteries, how an SSC lottery creates a treatment group of SSC lottery winners and a control group of SSC lottery losers, and how this information was used, together with information about the schools in which students enrolled, to estimate the effects of *enrolling* in an SSC relative to enrolling in some other New York City public high school.

Corresponding findings for the effects of winning an SSC lottery are presented in Appendix B of the original report. These findings are consistent with those for the effects of enrolling in an SSC. The analysis in this policy brief uses the same methodology.

7 Because MDRC's study examines only *one component* of New York City's overall high school reform initiative (that is, the small schools of choice), it does not attempt to determine the overall effect of these reforms. Neither does it attempt to determine the effect of closing the 23 large failing high schools on students who would have attended them had they not been closed.

8 For example, a law firm provides internships and embeds real-world examples in the curriculum for the Urban Assembly School for Law & Justice, and the Urban Assembly New York Harbor School is growing one of the largest oyster beds in the region.

9 As a result of a court decision, the New York City Department of Education ended this practice.

10 As described by Randi Weingarten at a forum on small schools sponsored by the Alliance for Excellent Education in November of 2010, the United Federation of Teachers participated in the planning and approval process for many of the new small schools in New York City.

11 By 2008, 46 of 50 states and the District of Columbia had received multimillion-dollar federal grants for small learning communities (U.S. Department of Education, n.d.).

12 While the Gates Foundation's stated goal was to support the creation of schools that possessed seven "Attributes of High Performing Schools," it was the structural focus on school size (not to exceed 100 students per grade) that became a key strategy of the foundation's grantmaking (Evan et al., 2006).

13 See Finn and Voelkl (1993); Lee and Loeb (2000); Wasley et al. (2000); Klem and Connell (2004).

14 For student achievement, see Haller, Monk, and Tien (1993); Howley (1989); Howley and Huang (1991); Lee and Smith (1997). For dropout rates, see Pittman and Haughwout (1987); McMullen, Sipe, and Wolf (1994).

15 See Lee, Bryk, and Smith (1993); Lee and Smith (1995); Lee and Smith (1997).

16 See Evan et al. (2006).

17 The "on-track" measure was developed by the Consortium on Chicago School Research. High school students who are on track to graduate by the end of their first year — meaning that they have earned at least 10 credits and are failing no more than one core subject — are three and a half times more likely to graduate in four years than are other students (Allensworth and Easton, 2005).

18 Target SSC enrollees are sample members for whom SSC effects are reported. Appendix A of Bloom, Levy Thompson, and Unterman (2010) describes how this group is defined and how findings for it are obtained.

19 The estimated average effect of SSCs on four-year graduation rates was 9.9 percentage points for the second cohort and 6.8 for the first cohort. Both of these estimates are statistically significant, although the difference between them is not. Hence, one cannot say with confidence that SSCs worked better for the second cohort than the first.

20 These findings on college readiness for cohorts one and two combined tell the same story as those for cohort one in MDRC's first report.

21 To estimate SSC effects for student subgroups, the sample for each SSC lottery is stratified by the student characteristics that define each subgroup. Because not all lotteries contain students from each stratum, the total sample represented by each type of student characteristic (e.g., by reading proficiency or race/ethnicity) varies.

22 The sample for "other males" comprised only 283 student observations; for "other females," the sample was only 261 student observations.

23 The estimated SSC effect for Hispanic males is not statistically significant at the 0.05 level, although it is statistically significant at the 0.10 level, which is used by many researchers. Furthermore, this finding is consistent with those for the other three subgroups of students of color and is not statistically significantly different from them. Hence, the data suggest that SSCs increase four-year graduation rates for Hispanic males, although the evidence for this subgroup is weaker than that for the others.

24 Bloom, Levy Thompson, and Unterman (2010) describe how each SSC lottery includes either students who were known to the SSC or students who were not known to it, but not both. Lottery winners and losers are thus perfectly matched in this regard.

25 The slight discrepancy between the reported difference in changes over time of graduation rates for target SSC enrollees and their control group counterparts and the change over time in the estimated impact of SSCs on the graduation rate is due to rounding.

26 MDRC computations based on 2011 data from the NYC Department of Education indicate a gap between citywide four-year graduation rates for white students and students of color equal to 21.0 percentage points for the fall 2005 cohort and 18.8 percentage points for the fall 2006 cohort. The average gap is thus 19.9 percentage points.

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ABOUT THE AUTHORS

Howard S. Bloom is MDRC's Chief Social Scientist, and Rebecca Unterman is a Research Associate in MDRC's K-12 Education Policy Area.

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BUILDING KNOWLEDGE TO IMPROVE SOCIAL POLICY

16 East 34th Street
New York, NY 10016-4326

Sustained Positive Effects on Graduation Rates

Produced by New York City's Small Public High Schools of Choice

By Howard S. Bloom and Rebecca Unterman

Taking advantage of lottery-like features in New York City's high school admissions process, this study provides rigorous evidence that new small public high schools are narrowing the educational attainment gap and markedly improving graduation prospects, particularly for disadvantaged students. The new findings in this policy brief demonstrate that these schools are having a sustained effect on graduation rates, with positive impacts for virtually every subgroup, including male and female students of color, students with low eighth-grade proficiency in math and English, and students eligible for free and reduced-priced lunch. In addition, the small high schools show positive impacts on five-year graduation rates and on a measure of college readiness.