Abstract Title Page
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Title: "Transforming the High School Experience: How New York City's New Small Schools Are Boosting Student Achievement and Graduation Rates"

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Abstract Body

Limit 5 pages single spaced.

Background / Context:

Description of prior research and its intellectual context.

Over the last decade, New York City has been the site of a systemwide high school reform effort that is unprecedented in its scope and pace. Since 2002, the school district has closed more than 20 failing high schools, opened more than 200 new secondary schools, and implemented a centralized high school admission process in which approximately 80,000 students a year indicate their school preferences from a wide-ranging choice of programs.

At the heart of these reforms lie the new schools that in this report are called "small schools of choice" (SSCs) — small, academically nonselective, public high schools that were opened between 2002 and 2008. Serving approximately 100 students per grade in grades 9 through 12 and open to students at all levels of academic achievement, the SSCs in this study were created to serve the district's most disadvantaged and historically underserved students. Prior to the 2002-2003 school year, these students would have had little option but to enroll in one of the city's large, zoned high schools when they made the transition from eighth to ninth grade. Many of the large schools were low-performing, with graduation rates below 50 percent.

Purpose / Objective / Research Question / Focus of Study:

Description of the focus of the research.

This report presents encouraging findings from an unusually large and rigorous study, supported by the Bill & Melinda Gates Foundation, of the effects of SSCs on students' academic achievement in high school. It emerges at a moment when policymakers, practitioners, and researchers have identified the high school years as the point of greatest weakness within the education pipeline. The rationale for this collective focus is clear: far too many students drop out of high school, and the consequences of entering adult life without a high school diploma are increasingly grave.

Setting:

The New York City public school system is the largest in the United States, with over 1.1 million students enrolled in more than 1,600 schools. Over the past decade, it has been the site of an ambitious effort to reform the high school system, of which the creation of SSCs was a central part. Beginning in 2002, the New York City Department of Education (DOE) accelerated and expanded efforts that had been under way since the mid-1990s to close large, low- performing schools and open new small schools in their stead. These reform efforts were supported by a consortium of funders led by the Bill & Melinda Gates Foundation — which ultimately invested over $150 million in New York City — and were implemented in partnership with the teachers and principals unions. The resulting changes in the high school landscape transpired with unprecedented scale and rapidity. By 2008, 23 high schools with graduation rates below 45 percent had been targeted for closure, and 216 new small schools, of which 123 were SSCs, had been opened.

Population / Participants / Subjects:

Description of the participants in the study: who, how many, key features or characteristics.

The full sample for the present study represents 297 SSC lotteries with 12,978 observations on lottery winners and 17,981 observations on control group members who were eighth-grade

HSAPS participants in the 2004-2005 through 2007-2008 school years. Because some students participate in more than one lottery, the total number of *students* in the full sample (21,085) is less than the total number of student *observations* (30,959).

Table 1 provides strong evidence of the baseline equivalence of the present sample of SSC lottery winners and control group members. This table compares the two groups in terms of a number of characteristics that typically predict high school success. The first column in the table reports means for SSC lottery winners. The second column reports means for control group members. The third column reports differences between means for the two groups and the fourth column reports the statistical significance (probability value, or p-value) of these differences or the probability that an observed difference for a sample could have occurred by chance if there were *no difference* in the population. As can be seen, all differences are quite small and none is statistically significant. Thus, differences in mean future outcomes for SSC lottery winners and their control group counterparts provide valid estimates of the effects of winning an SSC lottery.

On average, both groups (SSC lottery winners and the control group members) are students of color (roughly 90 percent are either Hispanic or black) and qualify for free-/reduced-priced lunch. Roughly 17 percent of the sample is overage for grade, about 70 percent were in the bottom two levels of reading proficiency (according to the NY State eighth grade reading test), and about 65 percent were in the bottom two levels of math proficiency (according to the NY state eighth grade math test).

Intervention / Program / Practice:

Description of the intervention, program or practice, including details of administration and duration.

While the district established a variety of small school models, ranging from transfer schools designed to serve students who had struggled in conventional high schools to specialized schools intended to serve the district's highest-performing students, the predominant model was the small school of choice, which, notably among the other school types, was academically nonselective and small not only in size but also in function. That is, structures such as reduced teacher load and common planning time (in which teachers meet together to discuss their students' progress and problems) were recommended to ensure that all students were known well and to promote strong, sustained relationships between students and teachers. SSCs also had four other essential features:

- SSCs were predominantly located in disadvantaged communities whose neighborhood high schools were closing.
- SSCs were established via a demanding and competitive proposal process that emphasized the common design principles of academic rigor, personalization, and community partnerships. This process required a prospective school leadership team to articulate an educational philosophy and demonstrate how it would motivate teachers, community members, and partner organizations around it. Additionally, the new school leadership had to develop a viable improvement strategy from the ground up.
- SSCs benefited from an infusion of outside resources: new principals and teachers, partnerships with intermediary organizations that had expertise in starting new schools, and start-up funding from the district and its philanthropic partners.
- SSCs received policy protections during their start-up period, including opening with only one founding grade of students (ninth grade) and having access to supports to facilitate procurement and hiring — such as special training for school principals and teachers; an amendment to the collective bargaining agreement, which gave principals more hiring discretion; and the conversion from a management system of regional offices to one in

which schools had greater control over their budgets and educational programs.

Research Design:

Description of research design (e.g., qualitative case study, quasi-experimental design, secondary analysis, analytic essay, randomized field trial).

In the spring of 2004, the city introduced the High School Application Processing System (HSAPS), a centralized choice process that was to govern the placement of all entering ninth-grade students. HSAPS uses an objective, computer-based process to assign about 72,500 entering ninth-graders annually to about 400 public high schools. When they are in the eighth grade, students who participate in HSAPS indicate, in order of preference, up to 12 high schools they would like to attend. Each year, some schools have more applicants than seats available. When this occurs at an SSC, a lottery is created within HSAPS that randomly determines which students are assigned to that school.

The existence of these lotteries provides an unprecedented opportunity to launch a rigorous study of the effects of this group of schools on student academic achievement, because the lotteries create two randomized groups among students who chose a given SSC — those who won its lottery and were assigned to the SSC and those who lost its lottery and were assigned elsewhere. Future outcomes for these two groups can be compared to obtain valid estimates of the effects of SSCs on student achievement. The lotteries created by HSAPS together with the unusually large size of the randomized sample they produced allow for a high degree of validity and precision in the present analyses. Thus, one can have considerable confidence in them. Using these lotteries as the basis for its analysis, this report presents the estimated effects of *enrolling in* a small school of choice versus enrolling in one of the other high schools that are available to the average incoming ninth-grader.[2]

Data Collection and Analysis:

Description of the methods for collecting and analyzing data.

The analysis presented in this report uses data from the high school admissions process to identify a sample of students who chose SSCs, but who — because their chosen SSC had more applicants than seats available — were assigned via lottery either to that school or to a subsequent choice on their list. The analysis includes four annual cohorts of students who entered high school in the fall of 2005, 2006, 2007, and 2008, respectively — a total of 21,085 students who applied to the 105 SSCs that were oversubscribed, and for which lotteries were held, during the study period.

Most of the schools attended by students who did not enroll in an SSC were *older* and *larger* than the SSCs: all SSCs were created since 2002 while two-thirds of the schools attended by the non-SSC enrollees were established before then, and the ninth-grade classes averaged 129 students in SSCs and 635 students in the non-SSC schools.[3] However, it is important to remember that the SSCs are *not* being compared with the large, failing schools they replaced but rather with a wide range of schools that were also operating in a reform-rich atmosphere.

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[2] To estimate the effects of enrolling in an SSC, the estimated effects of winning an SSC lottery are adjusted to account for the proportion of SSC lottery winners who do not enroll in an SSC and the proportion of control group members who do enroll in an SSC, using a well- known statistical approach called instrumental variables analysis.

[3] While the schools attended by non-SSC enrollees were significantly larger, some of those larger schools (for approximately one-eighth of those students) had structures such as small learning communities in place to increase the level of personalization.

Findings / Results:

Description of the main findings with specific details.

SSCs have a substantial positive impact on the transition into high school during ninth grade, according to data using all four cohorts (see Table ES.1):

- SSC enrollees were 10.8 percentage points more likely than the students who enrolled in other schools to earn 10 or more credits during their first year — 73.1 percent compared with 62.3 percent.
- SSC enrollees were 7.8 percentage points less likely to fail more than one core subject (39 percent compared with 46.8 percent).
- Combining these two indicators, 58.5 percent of SSC enrollees were on track to graduate in four years compared with 48.5 percent of their counterparts who attended a different type of school — a 10 percentage point difference.
- During the first year of high school, SSC enrollees earn almost one full credit more (0.9 credit) toward graduation than do their control group counterparts.

These positive effects on the transition into high school during ninth grade were seen among nearly all subgroups as defined by students' academic proficiency, socioeconomic status, race/ethnicity, and gender.

For all students, second- and third-year follow-up data indicate that these effects are sustained and/or increased as they continue through high school (see Table ES.1). For the *first* cohort of students (the only cohort for whom there are four years of follow- up data), the evidence indicates that SSC improvements in students' academic progress and school engagement during the early years of high school translate into higher rates of on-time graduation after four years:

- SSCs increase overall graduation rates by 6.8 percentage points, from 61.9 percent for students who attend schools other than SSCs to 68.7 percent for SSC enrollees.
- A majority of the SSC effect on graduation rates reflects an increase in receipt of New York State Regents diplomas.4 For this type of diploma, students must pass a series of Regents examinations with a score of 65 points or above and pass all of their required courses.
- SSCs increase the proportion of students (by 5.3 percentage points) who passed the English Regents with a score of 75 points or higher, the threshold for exempting incoming students at the City University of New York from remedial courses. They did not have an effect on math Regents exams.

Conclusions:

Description of conclusions, recommendations, and limitations based on findings.

These findings speak to the nation's current focus on high school reform. Much of the national discussion focuses on three areas where the education community has struggled to demonstrate success: (1) improving the academic outcomes of the most disadvantaged students, particularly with respect to high school graduation and college readiness; (2) identifying turn-around strategies for historically underperforming schools; and (3) implementing effective

[4] Although the estimated effect of SSCs on the overall high school graduation rate is statistically significant, estimates of SSC effects on graduation rates by type of diploma ($p = 0.07$) miss the standard of statistical significance established for this study ($p = 0.05$). Thus, comparisons of effects across diploma types are suggestive only.

interventions at scale. This study sits at the nexus of all three themes, and its findings demonstrate that, in a relatively short period of time, an effective model can be implemented at scale and can improve the academic trajectories of large numbers of traditionally underserved students.

The effects of small high schools of choice described in this report should be understood through three important lenses: their scale, the particular package of reforms they represent, and the group of highly disadvantaged students for whom they occurred.

Effecting Change at Scale. At capacity, the 105 SSCs in the study sample will serve over 45,000 students. That is roughly equivalent to the entire high school population of Houston, which is the seventh largest school district in the country. Readers should understand the magnitude of the present report's findings in that context — imagine, *for a school district the size of Houston*, increasing the percentage of ninth-graders who are eligible for on-time promotion by 10.8 percentage points, the percentage of black males in ninth grade who are on track to graduate by 8.5 percentage points, or the percentage of high school graduates by 6.8 percentage points. Given the scale of the SSC initiative, even seemingly minor gains can be understood as affecting thousands of high school students. In fact, the 6.8 percentage point increase in four-year graduation rates is roughly equivalent in size to one-third of New York City's gap in graduation rates between white students and students of color. Additionally, because the reported effects of SSCs are not the product of a small, targeted intervention but rather of a large system of small schools, the effects can be understood as reflecting the mean performance of a model implemented at scale. Reported effects are not the product of the best or most popular of the SSCs, but of 105 schools on average. In other words, the findings represent a *real-world test* of an intervention launched at the scale of a large-sized urban school district.

The SSC Package of Reforms. Students enrolled in SSCs did not just attend schools that were *small*. SSC enrollees attended schools that were purposefully organized around smaller, personalized units of adults and students, where students had a better chance of being known and noticed, and where teachers knew enough about their charges to provide appropriate academic and socioemotional supports. SSCs were not only *new* but were mission-driven. Their recent establishment via a demanding authorization process, which rejected more school proposals than it approved, required that a prospective school leadership team articulate an educational philosophy and demonstrate how it would motivate teachers, community members, and partner organizations around it. And the district's commitment to acting as a steward for new schools throughout the start-up period generated a set of supports and protections as these schools got up and running. Finally, SSCs benefited from an influx of external ideas, talent, and resources.

Serving Disadvantaged Students. SSCs were intended to be a viable and accessible option for the district's most disadvantaged students, and over the course of the study period, they served a population that almost exclusively comprised low-income students of color. The fact that SSCs targeted and served this population gives the reported findings even greater policy significance, as it is precisely economically disadvantaged students of color who find themselves at the bottom end of the nation's persistent achievement gap, and who are least likely to graduate from high school on time, if at all. Furthermore, the robust positive SSC effects for many different types of students, including young men of color, hold out great hope for educational policymakers, practitioners, and researchers who wish to effect change, by demonstrating that it is possible to transform a large number of high schools in ways that benefit many disadvantaged students.

Appendices

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Appendix A. References

References are to be in APA version 6 format.

Appendix B. Tables and Figures

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New York City Small Schools of Choice

Table 1

Baseline Characteristics of SSC Lottery Participants: First Year of High School, Cohorts 1 to 4

Characteristic (%)	SSC Lottery Winners	Control Group Members	Estimated Difference	P-Value for Estimated Difference
Race/ethnicity				
Hispanic	47.3	47.9	-0.6	0.480
Black	43.6	43.2	0.4	0.641
Other	7.9	7.5	0.3	0.428
Male	46.0	45.5	0.5	0.525
Eligible for free/reduced-price lunch	84.0	84.5	-0.5	0.467
English language learner	8.4	7.6	0.8	0.114
Special education[a]	6.6	6.7	-0.1	0.826
Overage for 8th grade[b]	16.7	18.1	-1.4	0.153
8th-grade reading proficiency[c]				
Did not meet standards (level 1)	6.9	6.6	0.3	0.486
Partially met standards (level 2)	60.5	61.4	-0.8	0.328
Fully met standards (level 3)	28.4	27.6	0.8	0.287
Met standards with distinction (level 4)	0.7	0.7	0.1	0.580
8th-grade math proficiency[c]				
Did not meet standards (level 1)	18.8	19.2	-0.3	0.628
Partially met standards (level 2)	45.1	44.9	0.3	0.759
Fully met standards (level 3)	32.8	31.9	0.9	0.238
Met standards with distinction (level 4)	2.3	2.2	0.1	0.598

Total number of student observations = 30,959

SOURCES: MDRC's calculations use High School Application Processing System and New York City Department of Education (DOE) state test data for eighth-graders from the 2004-2005 to 2007-2008 school years, as well as data from DOE enrollment files from the 2005-2006 to 2008-2009 school years.

NOTES: Values for SSC lottery winners are the simple means for all lottery winners. Values for the difference between SSC lottery winners and control group members are obtained from a regression of a given baseline characteristic on a series of indicator variables that identify each lottery plus an indicator variable that equals 1 for lottery winners and 0 for lottery losers. The coefficient on the latter indicator variable equals the difference in the mean baseline

characteristic for lottery winners and control group members. The value for control group members equals the corresponding value for SSC lottery winners minus the estimated difference between lottery winners and control group members. To facilitate computation, all variables are centered on the mean value for the lottery they represent. This approach is equivalent to directly accounting for each lottery by adding a 0/1 indicator variable for it (Wooldridge, 2000). In some cases, rounding may cause slight discrepancies.

A two-tailed t-test was applied to the estimated difference. Statistical significance levels are indicated as: ** = 1 percent; * = 5 percent.

A chi-square test was used to assess the statistical significance of the overall difference between lottery winners and control group members reflected by the full set of baseline characteristics in the table. The resulting chi-square value is not statistically significant (p-value = 0.387).

Cohorts 1, 2, 3, and 4 consist of students in the study who were eighth-graders in the spring of 2005, 2006, 2007, and 2008, respectively.

[a]This sample includes special education students who can be taught in the regular classroom setting. Special education students classified by the DOE as requiring collaborative team teaching services or self-contained classes are not part of the sample.

[b]Lottery participants are classified as "overage for eighth grade" if they were 14 or older on September 1 of the eighth-grade school year.

[c]Students scoring at proficiency levels 1 and 2 are not considered to be performing at grade level for state math and reading exams. Due to missing test scores, the sum of levels 1-4 may not add to 100 percent.

New York City Small Schools of Choice

Table 2

Estimated Effects of SSC Enrollment in Years 1 to 4 of High School

Outcome	Target SSC Enrollees	Control Group Counterparts	Estimated Effect		Effect Size (Standard Deviation)		P-Value for Estimated Effect
Year 1 of high school (cohorts 1 to 4)							
9th-grade on-track indicator[a] (%)	58.5	48.5	10.0	**			0.000
Earned 10 or more credits	73.1	62.3	10.8	**			0.000
Failed more than 1 semester of a core subject	39.0	46.8	-7.8	**			0.000
Total credits earned toward graduation[b]	11.3	10.4	0.9	**	0.21	**	0.000
Total number of student observations = 29,811							
Year 2 of high school (cohorts 1 to 3)							
Earned 20 or more credits (%)	69.4	58.3	11.1	**			0.000
Total credits earned toward graduation[b]	22.3	19.8	2.6	**	0.31	**	0.000
Total number of student observations = 21,822							
Year 3 of high school (cohorts 1 and 2)							
Earned 30 or more credits (%)	69.5	62.4	7.1	**			0.000
Total credits earned toward graduation[b]	32.2	29.7	2.4	**	0.23	**	0.000
Total number of student observations = 13,297							
Year 4 of high school (cohort 1)							
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
Total number of student observations = 5,363							

SOURCES: MDRC's calculations use High School Application Processing System data from eighth-graders in 2004-2005 to 2007-2008, as well as data from New York City Department of Education attendance, course credits, Regents exam, transactional, and enrollment files from the 2005-2006 to 2008-2009 school years.

NOTES: This table presents the estimated effects for students who have follow-up course credits data. Appendix A describes how values in the column labeled "Target SSC Enrollees" are estimated. Appendix A also describes how values in the column labeled "Estimated Effect" are estimated. Values in the column labeled "Control Group Counterparts" are differences between corresponding values in the first and third columns.

A two-tailed t-test was applied to the estimated effect. Statistical significance levels are indicated as: ** = 1 percent; * = 5 percent.

Cohorts 1, 2, 3, and 4 consist of students in the study who were eighth-graders in the spring of 2005, 2006, 2007, and 2008, respectively.

[a]The on-track composite measure indicates whether students earned at least 10 credits in their first year of high school and had no more than one semester of failure in a core subject in that school year (English, math, science, and social studies).

[b]The "total credits earned toward graduation" measure is the aggregate number of course credits earned toward fulfilling the New York State graduation requirements. The credit requirements are as follows: 31 core subject credits, including 8 credits each of English and social studies; 6 credits each of math and science; 2 credits of arts; 1 credit of health; and 13 additional credits, including 4 credits of physical education, 2 credits of a foreign language, and 7 credits of electives.