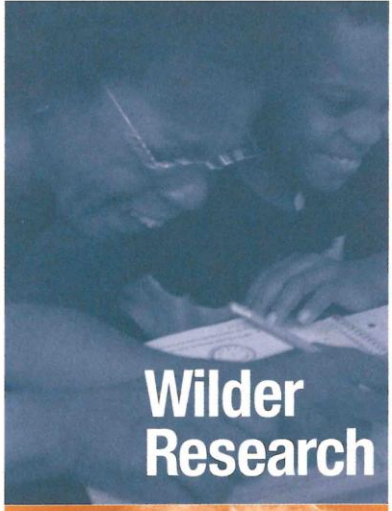

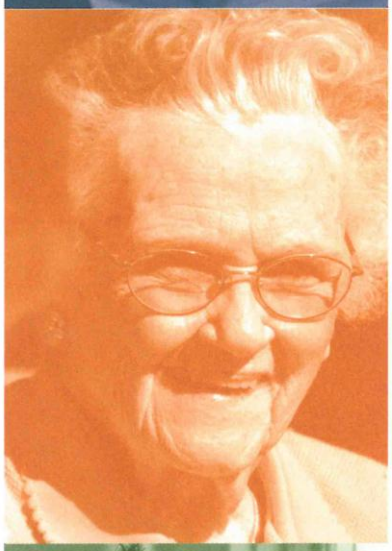

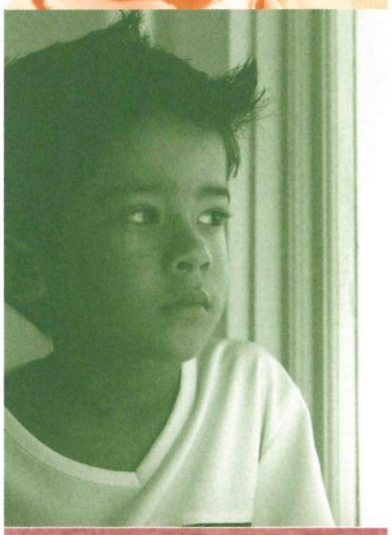

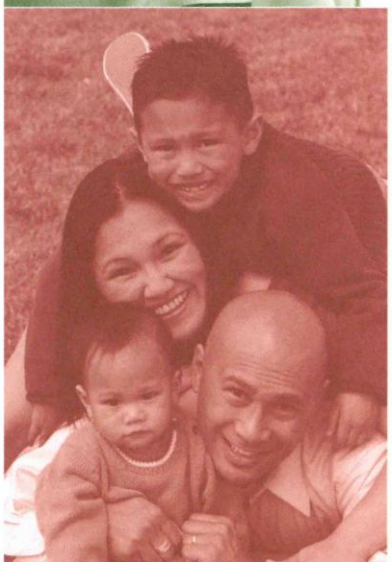

Evaluation of Breakthrough Saint Paul participant outcomes

JUNE 2011

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June 2011

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Summary

An evaluation study of Breakthrough Saint Paul was conducted by Wilder Research. Breakthrough Saint Paul has a two-fold mission that is pursued through a "students teaching students" model. The mission is:

1. To help highly motivated, under-resourced middle school students from Saint Paul Public Schools succeed in rigorous honors coursework and get to college.

2. To attract a diverse group of talented young people to the field of education.

For six weeks in the summers before seventh and eighth grade, and 13 Saturdays during the seventh and eighth grade school years, program participants take challenging enrichment classes designed and delivered by aspiring teachers (primarily college students) in the Breakthrough internship program. Professional mentor teachers provide guidance to the aspiring teachers. The program continues in high school where participants receive a laptop and Internet access so they can take online lessons and benefit from other supports provided by the program.

Evaluation overview

The evaluation study focused on the academic achievement of Breakthrough participants, the impact of the program on participants, and participants' views of the program. The evaluation addresses four questions:

1. How well are Breakthrough Saint Paul students doing on the academic outcomes established by the program?

2. Does Breakthrough Saint Paul have a substantial positive impact on the academic achievement of participating students, and, if so, how large is the impact? (Based on a comparison to academically and demographically similar students)

3. Do potential program impacts vary by the characteristics of program participants (e.g., gender, race, English proficiency)?

4. How do participating students view the program, and in what ways do they think it has influenced or helped them?

These questions are addressed by examining the academic achievement of Breakthrough participants in seventh, eighth, and ninth grades during the 2009-10 school year; comparing Breakthrough participants' academic performance to a carefully matched comparison

group; and doing focus groups and interviews with the Breakthrough participants. The academic achievement indicators used included: number of credits earned in honors classes, grades in honors classes, grades in core classes (English, math, science, and social studies), grades in all classes, and scores on the state achievement tests in reading and math – i.e., Minnesota Comprehensive Assessments, Series II (MCA-II). Program impacts were assessed by one-to-one matching of Breakthrough participants with peers on academic, need-related, and demographic characteristics prior to the time Breakthrough participants entered the program. The matched comparison group was drawn from the pool of applicants not selected for the program. To obtain Breakthrough participants' opinions of the program and its potential influence, two focus groups were conducted with eighth graders and telephone interviews were conducted with ninth and tenth graders in the spring of 2011. These were the same participants for whom we obtained academic achievement data for the previous school year.

Findings

Academic performance of Breakthrough students

Breakthrough Saint Paul goals are for participants to take honors classes and to earn grades of "B-"or higher in honors classes and core classes. On average, Breakthrough participants took the equivalent of about two honors courses for a full year – eighth graders took slightly more than that and seventh and ninth graders slightly less. About 7 out of 10 Breakthrough seventh and eighth graders had average grades of "B-" or higher in honors classes, while 5 in 10 ninth graders reached this threshold. Turning to core classes, 7-8 out of 10 seventh and eighth graders earned grades of "B-"or higher in English, science, and social studies, with fewer doing so in math (about 6.5 in 10). A lower proportion of ninth graders had average grades of "B-" or higher in core classes (5-6 out of 10).

On the MCA-II reading test nearly 8 out of 10 seventh and eighth grades met or exceeded standards. In math, nearly 9 out of 10 seventh graders and 8 out of 10 eighth graders met or exceeded standards. Ninth graders do not take MCA-II reading and math tests.

With regard to demographic differences in academic achievement among Breakthrough participants, girls tended to earn higher grades than boys. Asian participants tended to have higher grades than other racial/ethnic groups. African-Americans tended to have somewhat lower math achievement based on the MCA-II than other racial/ethnic groups.

Breakthrough impact on academic achievement

Differences between Breakthrough participants and their matched pairs suggested a substantial positive impact of the program on academic achievement. This pattern was most consistent among seventh graders, followed by eighth graders, and then ninth graders. However, for number of credits earned in honors classes, the difference in favor of Breakthrough participants appeared to increase with each grade level.

Breakthrough seventh graders consistently performed better than their comparison group counterparts in grades earned in honors classes, core classes, and overall. Differences in grades tended to be somewhat narrower between Breakthrough eighth graders and their comparison group counterparts, but were generally in favor of Breakthrough participants. Ninth grade results were less consistent.

Breakthrough seventh and eighth graders outperformed their comparison group counterparts in both reading and math achievement on the MCA-II. This is especially noteworthy because the two groups were essentially equivalent on these measures in sixth grade (prior to program entry) due to the matching process. These results are perhaps the most compelling evidence of a substantial Breakthrough impact on academic achievement.

Breakthrough impact on subgroups of participants

Generally, the pattern of differences just described between Breakthrough and comparison students overall held when these analyses were repeated within demographic subgroups – females, males, African-Americans, Asians, Asian females, English Language Learners, non-English Language Learners, and currently active Breakthrough participants. Academic achievement advantages over the comparison students tended to be larger among currently active program participants than among those who had left the program.

Participants' views of the program

Breakthrough participants believe the program has positively influenced their attitude toward education, helped them to succeed in school, and helped them plan for the future. With regard to attitude, Breakthrough has helped to motivate students to learn and do well academically, build up students' confidence, and reinforce students' academic aspirations. Breakthrough helps students succeed in school by pushing them to enroll in honors classes in middle school so that they will be prepared for advanced classes in high school, providing rigorous summer classes that better prepare students for the next school year, supporting students to improve their grades, and making learning fun. The program got participants thinking and learning about college and planning realistically for the future, including learning what they need to do to prepare for college and what scholarship opportunities are available to help pay for college.

Breakthrough participants felt college visits were one of the most helpful aspects of the program. Ninth graders valued the summer Breakthrough Leadership Program for providing opportunities to develop leadership, organization, and teamwork skills. Breakthrough high school students found the laptop program very helpful. Participants made a number of specific suggestions for improvement of program components that could be helpful in further developing the program.

Issues to consider

Providing more support for academic success in the first year of high school. Breakthrough students' grades declined in their first year of high school (ninth grade), and differences between them and comparison students narrowed or disappeared. This included honors classes, core classes, and overall. Some caution should be exercised with regard to this finding because it is based on a small group of students – data for the study were available on only one cohort of ninth grade Breakthrough participants. It is suggested that program staff continue to monitor the grades of high school participants to see if this finding holds true. If so, program staff may want to consider how the program might be strengthened to provide greater support for the academic success of first-year high school participants.

Participants' ideas for additional programming in high school. Breakthrough participants in high school expressed a desire for more programming in addition to the laptop program. They felt more frequent meetings with their cohort would help sustain interest in the program and maintain relationships they had established with other participants. They also suggested an optional summer program during the high school years.

Participants' suggestions regarding program components. Participants offered a number of suggestions about how specific aspects of the program might be improved. Some participants provided suggestions about how homework time might be better structured within the program. Many expressed a desire for more variety in lunches and snacks in the summer program, and higher quality food. Another suggestion was to offer a larger variety of activities during recreation time, including non-athletic activities. Several participants wanted more elective classes offered during the summer. Finally, some wanted the summer program day to be longer, while others wanted it to be shorter.

Extending the study to assess longer-term student outcomes. The current study was able to assess academic achievement of seventh and eighth graders, and to a more limited extent, ninth graders in the Breakthrough and comparison groups. It would be informative to continue to follow the study cohorts through high school and into college. This would enable longer-term impacts of the program to be assessed.

Introduction

Overview

Breakthrough Saint Paul contracted with Wilder Research to conduct an independent evaluation of its program. The program serves under-resourced Saint Paul Public Schools students with the aim of helping them to succeed in middle school and high school, prepare for college, and go on to attend and succeed in college. Wilder conducted an evaluation that assesses Breakthrough participants' performance in middle school and early in high school, and estimates the program's impact on their academic achievement. Participants' perceptions of the program and its influence on them are also measured. This report presents the results of the evaluation.

Program description

Breakthrough Saint Paul has a two-fold mission that is pursued through a "students teaching students" model. The mission is:

1. To help highly motivated, under-resourced middle school students from Saint Paul Public Schools succeed in rigorous honors coursework and get to college.

2. To attract a diverse group of talented young people to the field of education.

Breakthrough's model is intended to help students of color and low-income students enter and succeed in college. For six weeks in the summers before seventh and eighth grade, and 13 Saturdays during the seventh and eighth grade school years, program participants take challenging enrichment classes designed and delivered by aspiring teachers in the Breakthrough internship program. Professional mentor teachers provide guidance to the aspiring teachers. The program continues in high school where participants receive a laptop and Internet access so they can take online lessons and benefit from other supports provided by the program.

The Breakthrough program model is based on the recommendations of two studies of college access programs (Bedsworth, Colby & Doctor, 2006; Tierney, Colgar & Corwin, 2003). The following best practices recommended by these studies are included in the Breakthrough model: rigorous academic curriculum, college counseling, meaningful co-curricular activities, family engagement, positive peer groups, mentoring, and timing.

Breakthrough's teaching internship model attracts a diverse group of aspiring teachers among college students and high school seniors. In 2008-09, 39 percent of Breakthrough's

aspiring teachers were of color and 36 percent were male, compared to 13 percent and 24 percent, respectively, of teachers nationally. Breakthrough's internship has been ranked among the top ten college internships nationally by the *Princeton Review*. Aspiring teachers in the program receive intensive individual support from a teacher mentor, create courses based on their interests and knowledge, learn how to teach through teaching classes with no more than 10 students, and have a group of talented peers to support their efforts.

Contents of the report

The evaluation questions and the methods used to address these questions are discussed. The evaluation methods section describes the study participants, explains how a matched comparison group was developed, indicates the measures used, and describes how the data were collected and analyzed.

Results presented in the report include the following:

1. Academic achievement of Breakthrough Saint Paul participants in grades 7 through 9

2. Academic achievement of Breakthrough participants compared to their peers

3. Analysis of academic results by demographic groups (gender, race/ethnicity, English proficiency)

4. Breakthrough participants' views of the program and its impact

Evaluation questions and methods

The evaluation addresses four questions:

1. How well are Breakthrough Saint Paul students doing on the academic outcomes established by the program?

2. Does Breakthrough Saint Paul have a substantial positive impact on the academic achievement of participating students, and, if so, how large is the impact? (Based on a comparison to academically and demographically similar students.)

3. Do potential program impacts vary by the characteristics of program participants (e.g., gender, race, English proficiency)?

4. How do participating students view the program, and in what ways do they think it has influenced or helped them?

Study samples

Breakthrough participants

The study sample included three cohorts of Breakthrough Saint Paul students. These students were in the 7th, 8th, and 9th grades during the 2009-10 school year. The number of students originally enrolled in each of these cohorts was 49, 46, and 40, respectively, for a total of 135 students across the three cohorts. Some of these students are no longer active in the program due to dropping out, dismissal, or other reasons.

All 135 Breakthrough students were included in the data analysis to determine how well Breakthrough participants were doing on the academic outcomes established by the program (study question 1). As part of this analysis we separated out currently active participants to see how they were doing relative to the whole group (both active and inactive). We also checked for differences in academic performance by participants' characteristics (gender, race/ethnicity, and ELL status).

In the spring of 2011, currently active Breakthrough participants in these three cohorts offered their views about the program through focus groups and telephone interviews (study question 4). Cohorts 1 and 2, in ninth and tenth grade at the time, were invited to participate in a telephone interview conducted by Wilder Research staff. Of the 51 eligible participants from these two cohorts, 37 completed the interview (20 ninth graders and 17 tenth graders), for a response rate of 73 percent. Cohort 3, those in eighth grade,

were randomly selected (24 selected out of 46 eligible) to participate in two focus groups. Twelve Breakthrough eighth graders participated in each focus group.

Figure 1 provides a profile of the Breakthrough Saint Paul student participants included in the study. It indicates that 31 of the 135 (23%) original participants are no longer active in the program. Six in 10 students are female. The largest racial/ethnic groups are African-American and Asian. Other groups represented include Latino, American Indian, and White. Almost all participants are from low-income families, with nearly 9 in 10 eligible for free or reduced-price lunch. Close to half of Breakthrough participants (45%) were English Language Learners (ELL) or limited English proficient. Over half (56%) had a primary language other than English, with the most frequent language after English being Hmong (28%), followed by Spanish (7%) and Vietnamese (4%).

1. Characteristics of Breakthrough Saint Paul participants

Characteristic		Number	Percent
Total		135	100%
Program status	Currently active	104	77%
	No longer active	31	23%
Grade level in 2009-10	7th	49	36%
	8th	46	34%
	9th	40	30%
Gender	Female	81	60%
	Male	54	40%
Race/ethnicity	African-American	53	39%
	Asian	51	38%
	Other	31	23%
Eligibility for free/reduced-price lunch[a]	Not eligible	16	12%
	Reduced	22	16%
	Free	96	72%
English Language Learner status	ELL	61	45%
	Not ELL	74	55%
Primary language[b]	English	55	44%
	Hmong	35	28%
	Spanish	9	7%
	Vietnamese	5	4%
	Other	20	16%

[a] *Data missing for one participant.*

[b] *Data missing for 11 participants.*

Data sources: *Saint Paul Public Schools and Breakthrough Saint Paul*

Matched comparison group

To assess the impact of Breakthrough on academic achievement of program participants (study questions 2 & 3), Breakthrough students were matched with other Saint Paul Public Schools students who did not participate in Breakthrough. Comparison students were drawn from the pool of students who applied for admission into the program during the same years as the Breakthrough students in the study but were not accepted (pool of 305 students). By drawing students from the applicant pool for the comparison group, we avoid introducing interest/motivation to participate in the program as a potential bias influencing results of comparisons between the groups. (Students and their parents had to complete a relatively lengthy application that required students to provide written responses to a variety of open-ended questions plus write an essay.) Hence, through this approach, we are controlling, to some extent, for an interest/motivation factor that could impact academic outcomes.

Students were selected for Breakthrough based on motivation and need. Need was defined by the following factors: member of a racial group under-represented in college, receive free or reduced-price lunch (family income indicator), would be first generation in their family to attend college, primary language spoken at home is not English, relationship stress in student's life (e.g., parent incarcerated, parent with terminal illness), and attends a Title I school. Selected students had to have at least two of these need factors and, on average, they have three.

In developing the comparison group, we tried to minimize the potential impact of selection factors by closely matching Breakthrough students with students from the applicant pool who had similar academic, need-related, and demographic characteristics. A multi-stage, one-to-one matching methodology was used to match Breakthrough and comparison students on seven observable characteristics. Student pairs were required to match exactly on the following three characteristics: grade level in 2009-10, sixth grade reading achievement test level score, and sixth grade math achievement level score. The test used was the Minnesota Comprehensive Assessments, Series II (MCA-II), which is administered annually to Minnesota students in the spring. Students' test results are categorized into four levels: exceeds standards, meets standards, partially meets standards, and does not meet standards. The sixth grade tests are taken just before students have any exposure to the program since the Breakthrough program begins in the summer after sixth grade, before students enter seventh grade.

In addition, pairs were matched as closely as possible on the following four characteristics according to sixth-grade records: free/reduced-price lunch eligibility, ELL status, race/ethnicity, and gender. In doing the matching, these characteristics were ranked in the order just indicated, based on the strength of their relationship to academic achievement.

We were able to find an exact match for 113 (out of the 135) Breakthrough students on the three required characteristics. About half of the 113 pairs (48%) matched exactly on all seven characteristics, and 91 percent matched on at least five of the seven characteristics.

Figure 2 indicates how many of the 113 Breakthrough-comparison group pairs are in each of the three cohorts – in seventh, eighth, and ninth grade during the 2009-10 school year.

2. Breakthrough and Comparison matched pairs by study cohort

Grade level in 2009-10	Study Cohort	Breakthrough		Comparison	
		Number	Percent	Number	Percent
9th	1	29	26%	29	26%
8th	2	43	38%	43	38%
7th	3	41	36%	41	36%
Total	1, 2, & 3	113	100%	113	100%

Data sources: *Saint Paul Public Schools and Breakthrough Saint Paul*

Figure 3 shows the levels at which the pairs scored on their sixth-grade reading and math achievement tests (MCA-II). Recall that the pairs needed to match exactly on the test levels. Note that 44 percent exceeded standards in reading and 31 percent did so in math, while 39 percent met standards in reading and 58 percent met standards in math. Hence, most student pairs met or exceeded standards in reading (83%) and math (89%) in the spring of sixth grade.

Average (mean) scale scores in reading and math are also shown in Figure 3 for the Breakthrough and comparison groups. The average scale score was exactly the same for the two groups in math, and there was less than a one-point difference in reading. Hence, the two groups were essentially the same in reading and math achievement before the Breakthrough students entered the program.

3. Student achievement (MCA-II) in reading and math in 6th grade: Breakthrough and Comparison matched pairs

	6th grade Reading				6th grade Math			
	Breakthrough		Comparison		Breakthrough		Comparison	
MCA-II[a] Level	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Exceeds standards	50	44%	50	44%	35	31%	35	31%
Meets standards	44	39%	44	39%	66	58%	66	58%
Partially meets standards	16	14%	16	14%	8	7%	8	7%
Does not meet standards	3	3%	3	3%	4	4%	4	4%
Total	113	100%	113	100%	113	100%	113	100%
MCA-II Scale Score								
Mean[b]	659.6		659.0		659.4		659.4	
(Standard deviation)	(11.6)		(10.8)		(10.6)		(10.2)	
Number	113		113		113		113	

[a] *Minnesota Comprehensive Assessments-Series II (MCA-II). Breakthrough and Comparison students were matched exactly on 6th grade MCA-II reading and math levels.*

[b] *There were no significant differences between the Breakthrough and Comparison groups in mean scale scores in 6th grade MCA-II reading and math.*

Data source: *Saint Paul Public Schools*

Figure 4 provides a profile of the demographic characteristics of the Breakthrough and comparison groups. It indicates the two groups are the same in ELL status, with 42 percent of each group being ELL. The two groups are almost the same in the percentage eligible for free or reduced-price lunch, with 87 percent of Breakthrough students and 83 percent of comparison students being eligible. There are some differences between the groups in gender and race/ethnicity, although they are not large enough to be statistically significant. The comparison group has more females than the Breakthrough group (72% vs. 60%), and the Breakthrough group has more African-Americans (40% vs. 30%) and fewer Asians (37% vs. 48%) than the comparison group.

4. Demographic profile of Breakthrough and Comparison matched pairs

Characteristic[a]		Breakthrough N=113	Comparison N=113
Free or reduced-price lunch	Eligible	87%	83%
	Ineligible	13%	17%
English Language Learner	Yes	42%	42%
	No	58%	58%
Gender	Female	60%	72%
	Male	40%	28%
Race/ethnicity	African-American	40%	30%
	Asian	37%	48%
	Other[b]	23%	22%

[a] *Characteristic as of 6th grade.*

[b] *Includes Hispanic, White, and American Indian.*

Note. *There were no statistically significant differences between the Breakthrough and Comparison groups on any of the characteristics.*

Data source: *Saint Paul Public Schools*

Measurement

Student academic achievement

The indicators of academic achievement listed below were measured in seventh, eighth, and ninth grades for Breakthrough and comparison students. The data for these indicators were made available by the Saint Paul Public Schools and came from the district's centralized student records.

- Number of credits earned in honors classes
- Grades received in honors classes (target: B- or above)
- Grades received in all classes
- Grades received in core classes: English, math, science, social studies (target: B- or above)
- Proficiency in reading and math on state tests (MCA-II), seventh and eighth grades

Student views of the program and its impact

As indicated, telephone interviews and focus groups were conducted by Wilder Research staff with Breakthrough participants in each of the three study cohorts. Questions asked of those who participated in the interviews and focus groups included the following:

- What are some of the things about the program that have been *most helpful* to you so far?
- Are there any aspects of the Breakthrough program that could be improved or changed? Do you have any suggestions for how they could improve those aspects?
- Do you believe being in Breakthrough has affected your attitudes about education in any way so far? If so, how?
- Do you believe being in Breakthrough has affected your success in school in any way so far? If so, how?
- Do you believe being in Breakthrough has affected your future plans in any way so far? If so, how?
- Would you recommend the Breakthrough Saint Paul program to other students? Why or why not?

Program impact analysis

As described above, we did rigorous one-to-one matching of Breakthrough participants with applicants who were not selected for the program to create a comparison group. Our general hypothesis is that participation in Breakthrough will improve academic achievement. Therefore, we expect that Breakthrough students will perform better than comparison students on the academic achievement measures listed above.

We carried out a number of statistical analyses to examine differences between the Breakthrough and comparison groups on these measures, and tested for the statistical significance of the differences that were observed. A statistically significant difference is one that exceeds the amount of variation that could be expected by chance. Statistical significance is noted in this report when $p<.05$, meaning that there is less than a 5 percent probability that the finding occurred by chance. Statistical significance is a function of the magnitude of the difference between the groups being compared, the variability in the outcome data, and the sample size. Several statistical tests were used to determine whether differences between the groups were significant. For numerical data (interval level data) such as number of honors class credits earned, average grades, and achievement test scale scores, paired samples *t*-tests were used to determine whether differences between the groups were statistically significant. For categorical data such as MCA-II level scores and whether students' average grades reached a certain threshold or not (i.e., B- or higher), the McNemar Test and the McNemar-Bowker Test were used.

In addition to one-to-one matching, a statistical procedure called propensity score analysis was used to test for differences in outcomes between the Breakthrough and comparison groups (Rosenbaum & Rubin, 1985; Stuart, 2007). Propensity score analysis uses the whole pool of students who applied for Breakthrough and were not accepted as the comparison group and statistically adjusts for differences in pre-program characteristics (e.g., student reading and math achievement in sixth grade, demographics) between the Breakthrough and comparison groups. By reducing the confounding effects of these characteristics, differences in outcomes can be more accurately attributable to participation in the Breakthrough program. The pattern of results using propensity score analysis was quite similar to those using the comparison group created through one-to-one matching. We decided to report results from the analyses using the one-to-one matching because we achieved better pre-program equivalency in reading and math skills using this technique, and because the results using one-to-one matching are more easily understood.

Results

In this section, results are presented for each of the four evaluation questions.

How well are Breakthrough Saint Paul students doing on the academic outcomes established by the program?

Honors classes

Goals of the Breakthrough program are for participants to take honors courses in middle school and high school and to earn grades of "B-" or higher in these courses. Figure 5 indicates the average number of credits Breakthrough participants earned in honors classes in seventh grade (includes all three cohorts), eighth grade (includes Cohorts 1 & 2), and ninth grade (includes Cohort 1 only). In seventh grade, all participants (active and inactive) earned an average of 6.7 credits, and currently active participants earned an average of 6.9 credits. Passing one class in one quarter earns one credit; for the full school year, four credits. On average, then, Breakthrough seventh graders took the equivalent of about one quarter short of two honors classes for a full school year. For study purposes, honors classes included those classified as honors, Advanced Placement, International Baccalaureate, and College in Schools. Breakthrough eighth graders took the equivalent of slightly more than two honors classes for a full school year (8.7 and 9.0 credits earned for all and currently active program participants, respectively). In 9th grade, all participants earned an average of about seven credits, while currently active participants tended to earn more (an average of 9.5 credits).

The average grades Breakthrough seventh and eighth graders earned in honors classes were slightly higher than a "B." A "B" has a numerical value of 3.00; an "A," 4.00; a "C," 2.00; etc. Honors class grade averages ranged from 3.09 to 3.26 in seventh and eighth grades, with currently active program participants tending to have slightly higher grade averages. Ninth graders had lower grades in honor classes, with an average of about 2.5, or a "C+." The percentage of Breakthrough seventh and eighth graders who averaged a "B-" or higher (2.70+) in honors classes (i.e., reached the program goal) was 72 percent, with a higher percentage of currently active eighth graders doing so (80%). About half of the ninth graders met the "B-" threshold.

Grades in all classes and core classes

Figure 5 shows average grades in all classes by grade for all Breakthrough participants and for currently active participants. Overall, results indicate that seventh and eighth graders had a "B/B+" average (3.23-3.28), and currently active participants had a slightly

higher average (3.33). The percentage with a "B-" or higher grade average in all classes decreased from seventh to ninth grades – going from 85 percent in seventh grade to 64 percent in 9th grade.

Average grades in core classes (English, math, science, and social studies) were generally in the "B/B+" range in seventh and eighth grades, with average math grades slightly lower (B average). Average grades in ninth grade were primarily about a "B-." The percentage with a "B-" average or higher (program goal) was 71-80 percent in seventh and eighth grades for English, science, and social studies. For math, it was 64-67 percent. In ninth grade, the percentage with a "B-" average or higher was 50-61 percent across the four core classes. The percentages tended to be slightly higher for currently active participants.

State achievement test (MCA-II) results

Most Breakthrough seventh and eighth graders met or exceeded standards in reading and math on the MCA-II administered in the spring of each year (Figure 5). In reading, just over three-quarters (77%) of all Breakthrough seventh and eighth graders met or exceeded standards, while in math 88 percent of all seventh graders and 81 percent of eighth graders did so. The percentages of currently active participants who met or exceeded standards in reading and math were slightly higher than for all participants.

5. Outcome results for all Breakthrough participants and current participants

		All participants		Currently active participants	
Outcome indicator	**Grade**	**Number**	**Mean**	**Number**	**Mean**
Average number of credits earned in Honors classes[a]	7th	127	6.7	97	6.9
	8th	78	8.7	51	9.0
	9th	33	6.9	19	9.5
Grade average in honors classes[b]	7th	114	3.13	86	3.17
	8th	72	3.09	46	3.26
	9th	30	2.48	19	2.51
Grade average in all classes[b]	7th	127	3.28	97	3.33
	8th	78	3.23	51	3.33
	9th	33	2.83	19	2.93
Grade average in English classes[b]	7th	123	3.28	94	3.33
	8th	77	3.14	50	3.31
	9th	32	2.63	19	2.72
Grade average in Math classes[b]	7th	127	3.05	97	3.11
	8th	78	2.89	51	2.99
	9th	32	2.63	18	2.47

5. Outcome results for all Breakthrough participants and current participants (continued)

Outcome indicator	Grade	All participants		Currently active participants	
		Number	Mean	Number	Mean
Grade average in Science classes[b]	7th	127	3.29	97	3.35
	8th	78	3.26	51	3.36
	9th	33	2.78	19	2.90
Grade average in Social Studies classes[b]	7th	123	3.24	95	3.28
	8th	78	3.31	51	3.42
	9th	32	2.70	18	2.81
		Number	Percent	Number	Percent
Average grades of B- or higher in honors classes	7th	114	72%	86	72%
	8th	72	72%	46	80%
	9th	30	50%	19	47%
Average grades of B- or higher in all classes	7th	127	85%	97	85%
	8th	78	78%	51	82%
	9th	33	64%	19	68%
Average grades of B- or higher in English	7th	123	80%	94	80%
	8th	77	71%	50	80%
	9th	32	56%	19	63%
Average grades of B- or higher in Math	7th	127	67%	97	69%
	8th	78	64%	51	69%
	9th	32	50%	18	44%
Average grades of B- or higher in Science	7th	127	80%	97	81%
	8th	78	78%	51	82%
	9th	33	61%	19	63%
Average grades of B- or higher in Social Studies	7th	123	80%	95	81%
	8th	78	77%	51	80%
	9th	32	56%	18	67%
Meets or exceeds standards in Reading (MCA-II[c])	7th	128	77%	98	79%
	8th	77	77%	51	86%
Meets or exceeds standards in Math (MCA-II[c])	7th	128	88%	98	90%
	8th	77	81%	51	84%

[a] *Passing one class in one quarter earns one credit; for a full school year, four credits. For study purposes, honors classes included those classified as honors, advanced placement, international baccalaureate, and college in the schools.*

[b] *Letter grades were assigned the following numerical values: A=4.00, B=3.00, C=2.00, D=1.00, F=0.00.*

[c] *Minnesota Comprehensive Assessments-Series II.*

Data source: *Saint Paul Public Schools*

Differences by participant characteristics

Potential differences in Breakthrough participants' academic achievement were examined by demographic characteristics – gender, race/ethnicity, and ELL status – in seventh and eighth grades. Ninth grade was excluded because the size of the cohort was too small to allow meaningful analysis of demographic differences. Similarly, differences were not examined by free/reduced-price lunch eligibility because there were too few participants in the ineligible category for a useful analysis to be conducted.

Females and males were similar in reading and math achievement as measured by the MCA-II. Females tended to earn more credits in honors courses than males in seventh grade (an average of 7.3 credits vs. 5.8 credits), but the two groups were similar in the average number of honors credits earned in eighth grade. Females tended to earn higher grades than males in seventh and eighth grades for all classes, including honors classes. The average grade of females was a "B+" while the average grade for males was a "B-/B."

Race/ethnicity groups (African-American, Asian, Other) had similar reading achievement based on the MCA-II results. In math, the Asian and Other groups tended to have higher math achievement than African-Americans, although most African-Americans met or exceeded standards in math. The groups did not differ significantly in average honors credits earned. Asians tended to earn higher grades than African-Americans and Others in seventh and eighth grades for all classes, including honors classes.

As expected, the non-ELL group tended to have higher reading achievement (MCA-II) than the ELL group. For example, about 9 out of 10 non-ELL participants met or exceeded standards in reading while about 6/6.5 out of 10 ELL participants did so. The two groups were similar in math achievement. Non-ELL participants tended to earn more honors credits than ELL participants in seventh grade (an average of 7.8 credits vs. 5.6 credits), but the two groups had similar numbers of honors credits earned in eighth grade. ELL and non-ELL participants had similar grades in all classes, including honors classes.

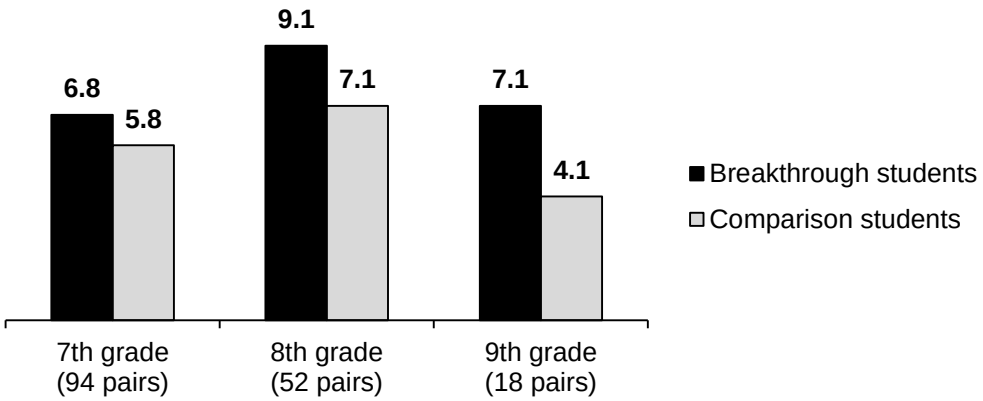
Does Breakthrough Saint Paul have a substantial positive impact on the academic achievement of participating students, and, if so, how large is the impact?

This question was addressed through the use of a carefully matched comparison group as described in the evaluation methods section earlier. Statistically significant differences on the academic achievement indicators in favor of the Breakthrough group over the comparison group are taken as likely evidence of a positive program impact.

Credits earned in honors classes

Breakthrough students tended to earn more credits in honors classes than comparison students. In seventh grade they earned an average of one credit more than comparison students; in eighth grade, an average of two credits more; and in ninth grade, an average of three credits more (Figure 6). The differences in average credits earned were statistically significant in seventh and eighth grades. The lack of statistical significance of the difference in ninth grade is likely due to the small sample size. See Figure A1 in the Appendix for further details of the analysis.

6. Number of credits earned in honors classes



Data source: *Saint Paul Public Schools*

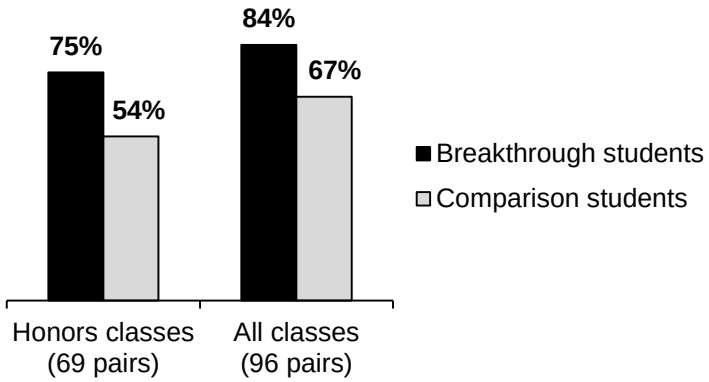
Overall grades and grades in honors classes

A higher percentage of Breakthrough seventh graders earned average grades of "B-" or higher in all classes combined than comparison seventh graders. This was also the case when honors classes were examined separately (Figure 7). A "B-" grade average in honors classes is a program goal for Breakthrough students. Among eighth and ninth graders, differences between the percentage of Breakthrough and comparison students with a "B-" average or higher were small and not statistically significant for both all classes and honors classes separately (Figures A2 & A3).

In addition, differences in average grades between the Breakthrough and comparison groups were examined. Grade averages were calculated by assigning an "A," a numerical value of 4.00; "B," a value of 3.00; "C," a value of 2.00; etc. Results in seventh grade indicated that Breakthrough students had higher average grades in all classes combined than comparison students (3.27 vs. 2.98, or B+ vs. B). Similarly, for honors classes, Breakthrough seventh graders had higher average grades than comparison seventh graders (3.14 vs. 2.75). Differences between the two groups in grade averages in all

classes, and honors classes separately, were smaller in eighth and ninth grades and not statistically significant (Figures A4 & A5).

7. Percentage with average grades of B- or higher: 7th grade



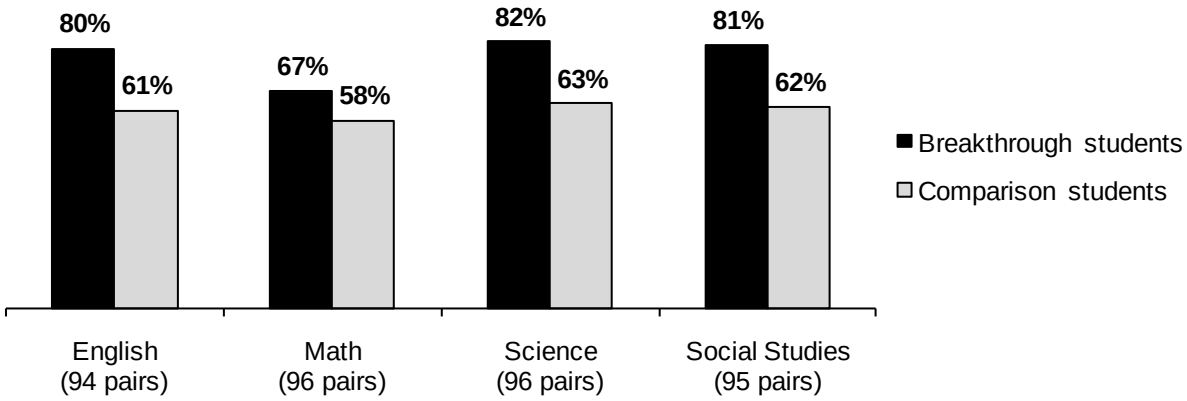
Data source: *Saint Paul Public Schools*

Grades in core classes

Breakthrough seventh graders tended to earn higher grades in core classes (English, math, science, and social studies) than comparison seventh graders. Figure 8 indicates that about 8 out of 10 Breakthrough seventh graders had grades of "B-" or higher in English, science, and social studies while about 6 out of 10 comparison seventh graders did so. (Earning grades of "B-" or higher is a goal of the program.) These differences were statistically significant. The difference in the percentage having grades of "B-" or higher in math was smaller between the two groups and not statistically significant. Also, the percentages were lower in math for both groups than in the other core subjects. Among eighth and ninth graders, differences between the percentage of Breakthrough and comparison students with a "B-" or higher in the core classes were smaller and not statistically significant (Figure A6).

Turning to average grades in core classes, we found the pattern of differences between Breakthrough and comparison students was similar to that just described for the percentages having grades of "B-" or higher, but somewhat more in favor of Breakthrough students. In seventh grade, Breakthrough students had significantly higher grade averages in all four core subjects than comparison students. In eighth and ninth grades, grade averages were higher for Breakthrough than comparison students in all four core classes. However, the differences were often quite small and were not statistically significant except in one instance (eighth grade science). Results of these analyses are presented in Figures A7-A10.

8. Percentage with average grades of B- or higher in core classes: 7th grade



Data source: *Saint Paul Public Schools*

State achievement test (MCA-II) results

Recall that Breakthrough and comparison students were matched exactly by MCA-II level in reading and math in spring of sixth grade, just before the Breakthrough students entered the program. Also, the average MCA-II scale scores for the two groups were exactly the same for math and almost exactly the same for reading. Hence, higher MCA-II scores among Breakthrough students than comparison students in seventh and eighth grades could be quite strong evidence for a positive program impact on academic achievement.

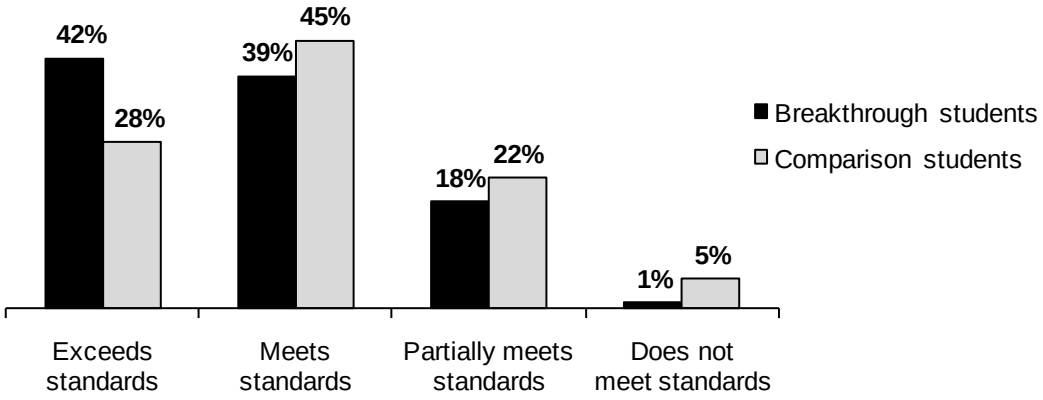
Results show that, on average, Breakthrough students had higher MCA-II scale scores than comparison students in both reading and math in seventh and eighth grades. All comparisons were statistically significant. These results are presented in Figure A11.

Figures 9 and 10 show the percentages of Breakthrough and comparison students scoring at each of the four levels (exceeds standards, meets standards, partially meets standards, and does not meet standards) for reading and math, respectively. Results are presented for seventh and eighth grades. The general pattern across grades and subjects suggests higher reading and math skills among Breakthrough students – i.e., more Breakthrough students exceeded standards and fewer partially met or did not meet the standards. See Figures A12 and A13 for further details.

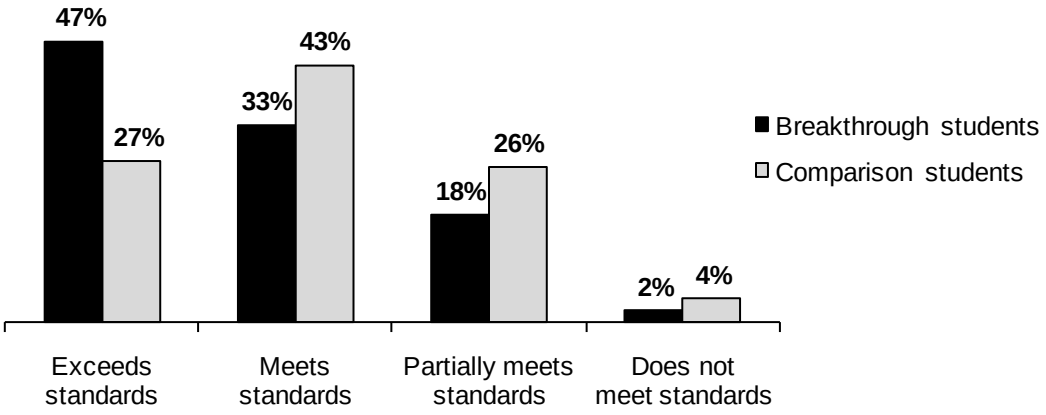
Overall, the MCA-II results, combined with honors credits and grades, suggest a substantial program impact. This impact may be stronger in middle school than in high school, although the high school data available to this study were limited (small sample and only for ninth grade).

9. Reading achievement (MCA-II) results

7th grade (94 pairs)



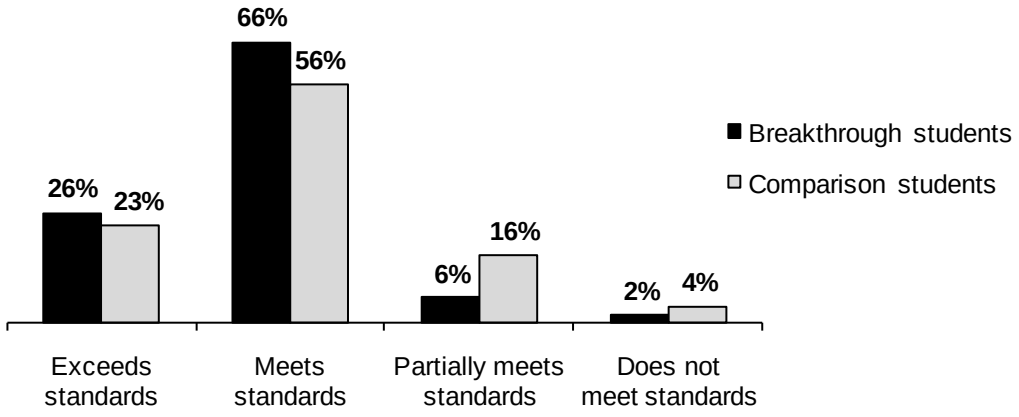
8th grade (51 pairs)



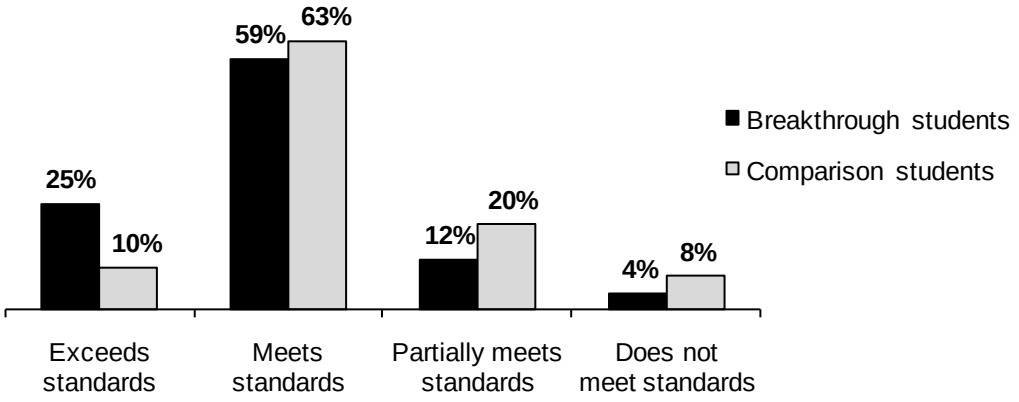
Data source: *Saint Paul Public Schools*

10. Math achievement (MCA-II) results

7th grade (94 pairs)



8th grade (51 pairs)



Data source: *Saint Paul Public Schools*

Do potential program impacts vary by the characteristics of program participants (e.g., gender, race, English proficiency)?

We examined whether the differences between Breakthrough and comparison students in academic achievement varied by demographic characteristics. To do this we examined differences on the academic indicators (honors class credits earned, grades in honors classes, grades in all classes, MCA-II scores results in reading and math) within the following demographic groups:

- Females
- Males

- African-Americans
- Asians
- Asian females
- ELL
- Non-ELL
- Currently active Breakthrough participants

Generally, results indicated that the patterns observed overall occurred within each of these demographic groups. That is, Breakthrough students within each demographic group tended to earn more honors class credits, have higher grades in honors classes and overall, and score higher in MCA-II reading and math than comparison students. Because of low numbers, ninth grade results were often unreliable within the demographic groups, and sometimes this was the case for eighth grade results as well.

Within the currently active participant group, differences between Breakthrough students and their matched pairs were often slightly larger than what we observed in our overall analyses. We could have chosen to conduct our main analyses only for these active participants and their matched pairs. We chose not to because, by excluding Breakthrough students who discontinued their participation in the program, we might bias this group toward more academically motivated students relative to the comparison group. This could potentially make student motivation more of a factor in differences observed between the groups, making it more difficult to know what impact the program may have had on the differences.

How do participating students view the program, and in what ways do they think it has influenced or helped them?

This section describes results of two focus groups with eighth grade participants and telephone interviews with ninth and tenth grade participants. Major points emerging from the discussions are categorized into 14 themes. Results indicate participants' overall experience with the program and perceptions of the program's effectiveness. Ideas and suggestions for program improvement were also provided by participants and may be useful for future programming decisions.

Overall program impressions

Participants provided very positive feedback about their overall experience with Breakthrough Saint Paul. Themes in participants' comments are illustrated by selected quotes.

Theme 1: Participants feel that the program positively influences their success in school and in life.

> It's a great help for students that want to succeed in life. Have fun and learn at the same time. It's a great environment.
>
> It is a life changing experience. It has positively impacted my life.

Theme 2: Participants are encouraged to set high expectations in school and for their future after high school.

> The expectations are so high, and they challenge you to do stuff. So when I got to school and they tried to challenge me, I already had it because I did this before.
>
> When I was in 5th grade, I did not know that college was good for your future. After I joined Breakthrough, it is a big part of my life. In order to reach my dreams, I need to go to college to achieve that. I never knew much about college but I am learning about college at Breakthrough.

Theme 3: Participants have acculturated and utilize the language and concepts learned in Breakthrough.

> The program is fun and you get to learn a lot of new things. They make it a lot fun. Instead of homework – they call homework boo-yah. So instead of getting homework assignments, we get boo-yah.
>
> Bookshakalaka means test or quiz; it's not as intimidating.
>
> Detour is like detention. They switch the words so we don't think about their typical meaning in school.

Theme 4: Participants would recommend Breakthrough to other students.

> Definitely and totally in all respects – it is a great opportunity. It's the best thing that ever happened to me.
>
> It's good for people whose families are struggling, like scholarships and other opportunities to get into college and other things past high school.

> Yes, I would strongly recommend Breakthrough to other students. Most kids are on the couch with the TV or maybe live in a tough neighborhood, which was the case for me, and Breakthrough got me away from that and into education, learning, and having fun.
>
> Sixth graders would be missing out on a lot if they didn't get this experience.

Attitudes about education

The participants stated that Breakthrough reinforced or positively influenced their attitudes towards education.

Theme 5: Confidence building

Participating in Breakthrough and practicing public speaking skills has built the confidence of program participants.

> When I entered [Breakthrough], I had no confidence. I started and, as the program progressed, I had more confidence and comfort with myself at home and in the classroom.
>
> I am shy and Breakthrough helped me get over my fear and I participate much more often. It's challenging; I challenge myself to take risks, don't be scared to go far.
>
> At the beginning of the year, I was doing bad. They gave me a personal tutor, and they helped me with all my classes and made me feel like I have a future and that I am not going to fail.
>
> Now I actually do talk; I didn't used to talk. I feel like a leader when I talk, and I feel confident about everything I say. I speak up in class and feel confident.
>
> It's provided comfort inside of me. It has helped me in school, and I can now talk to other students, talk louder and not be afraid to talk or be shy.

Theme 6: Increased motivation

Some participants discovered a sense of motivation that they did not possess prior to their participation in the program, such as the drive to learn in class and secure good grades.

> … it just pushed me and gave me some more motivation to accomplish my academic goals.
>
> It made me make sure that I was self-motivated to perform better and study better. I spoke better in class and wrote longer essays because I had more to say. Assignments were turned in earlier than necessary. Breakthrough helps to motivate my performance.

Theme 7: Reinforced trajectory

Some students stated they have always been focused on their education, but the program provided a support structure to excel academically.

> My attitude didn't change because I always liked learning, but it just encourage[d] me [to] like it more and keep on the path to college and do my best.
>
> It is not changed but surely makes me believe in myself – that I can do this and see that I can get to where I want to go. I always wanted to go to college, but now I can actually see the reality because Breakthrough introduced me to scholarships, tutors, research the schools that you want.
>
> Although Breakthrough has not changed my idea about education, the program really opened my mind, makes my dream clear, my passion more passionate, sets a high standard for you to achieve, makes you reach higher.

Success in school

Breakthrough positively influenced students' success in school.

Theme 8: Enrollment in honors classes

Students enrolled in challenging honors courses to increase their likelihood of being able to do advanced coursework when they enter high school.

> Breakthrough pushed me to do honors classes, and every time I got a bad grade, I realized I can't get lower than a B-. It motivated me to do better.
>
> I took my education very seriously. I was thinking about my education at an earlier age than other people. I applied for the PSEO (Post-Secondary Enrollment Option) because of Breakthrough.
>
> Breakthrough helped me become more grounded because they set standards where you have to be enrolled in honors classes. I've been in all honors classes.

Theme 9: Better prepared for school work

Summer classes prepared students for the subjects taught during the following school year. Learning the material during the summer helped increase their understanding of each topic and excel.

> …I learned a lot here, so when I got to school, I already knew a lot of the stuff. So in school I don't have to worry about catching up or getting lost.

> I remember when we had boo-yah (homework) in the summer. I think that helped me with high school, as it got me ready for what high school was going to be like and to be ready for all the homework that was going to come in high school.

Theme 10: Improved grades

Needing to earn a B- grade average or higher motivated students to perform well in school. For those who experienced difficulty in certain subject areas, tutoring and academic support helped to raise or maintain grades.

> I never like when [Breakthrough staff] calls me when I get a D. I don't like that, so it helped me keep my grades up.
>
> Breakthrough makes sure you get good grades. If you perform badly, they message you and help you do better.
>
> My performance before [Breakthrough] was not as good as it is now. I got some D's and F's, and now I get A's and B's and high grades in class.
>
> …I used to be in the bottom of the class, but now I am in the top 5 percent of my class because Breakthrough staff keeps pushing me.

Theme 11: Learning becomes fun

The program is very positive and encouraging in its practices, which transforms learning into a fun experience.

> Before Breakthrough, I just thought you had to study all the time to get to college, now I know you have to enjoy learning.
>
> I have gained skills through Breakthrough and perform well [in school]. I take things away from that experience – I learn while having fun.
>
> Breakthrough helps you view education as not work but learning and more fun. They make education more fun.

Influence on future plans

Overall, participants felt that Breakthrough has influenced their future plans, whether inspiring a change in career or prompting them to think about college for the first time.

Theme 12: College as a goal

Attending college was not a goal for some students before participating in the program, but their involvement in the program encouraged them to set goals and plan for college. The program also provided support and advice that encouraged college planning.

> Breakthrough takes things seriously. Even in 6th grade, you start thinking of college – they teach you that you're never too young to think about college. I had the plan to go to college in 6th grade because of Breakthrough.
>
> Prior to going to Breakthrough I didn't know anything about a college campus. It was a mystery to me and no one in my family would have ever gone or taken me. So once I got to visit, I found that it was less weird and that I could fit in, and that's when I made it my goal to go to college.
>
> At first I didn't think college was possible because I come from a family that doesn't have a lot education, but I came to Breakthrough and have the motivation.
>
> Before [I started] Breakthrough, I always thought about going to college, but I didn't think about how hard all the steps would be. Now I am more aware than most of my friends. I am knowledgeable and know that I need to start preparing for college.
>
> I thought college was a real far off thing. Breakthrough has shown me so many different ways to be able to go to college. It motivates me to get good grades so that I can go to a good college and have it paid for me.
>
> I see me going to Columbia and majoring in law. Breakthrough helped me realize I'm not going to get there with sports or slacking off. There are links to help you sign up for scholarships you can get.

Theme 13: Backup plans

Participants believed that they needed to have multiple plans for the future in case one route did not happen.

> I see myself going to a DI college with a scholarship in sports. I'm going to keep on working hard to get where I want to be as a pro athlete. But to fall back on, I want to major in science and go to school to be a doctor.
>
> I want to become a professional baseball player, but Breakthrough makes me think about a backup plan – to study sports medicine or become a sports trainer.

Theme 14: Self-discovery

The program provided a space for students to explore new subject areas and discover previously hidden talents. Many participants experienced a "reality check" about future plans after attending college seminars.

> I'm really good at public speaking, and I didn't know that until I came [to Breakthrough]. It exposes you to different elements. Now I want to be a lawyer or politician because I like to speak to people.
>
> …Breakthrough has helped me find hidden talents. I have a good memory. I learn in different ways from other people.

Program aspects: Strengths and areas for improvement

Program participants identified key aspects of the Breakthrough program that they believed were most helpful while also offering suggestions for improvement.

Class difficulty

Participants appreciated the difficulty level of the Breakthrough classes. They feel prepared for the school year and motivated to enroll in challenging courses, such as honors, Advanced Placement, and PSEO.

College visits

Participants identified college visits as one of the most helpful aspects of the program. They began to look forward to college, learned more about the college experience, and thought about the schools to which they might apply in the future.

Day length

Differing opinions existed about the length of the day (seven hours) in the summer program. Some participants thought longer days would be beneficial because it would permit more time for learning and other experiences. However, these participants noted that, if the days were extended, the program should end earlier in the summer. This would allow for more outdoor activities and provide time for their family to take vacations that are otherwise hard to schedule. Other participants believed that the day should be shorter (about five hours). While understanding the needed rigor of the program, they noted the desire to have more time for social activities and hobbies outside of Breakthrough during the summer.

Electives

Elective courses were fun, and students enjoyed exploring topic areas outside of their core courses. Electives were a good place to meet people with similar interests. Several participants suggested that electives could be improved by soliciting student opinions on potential topics, allowing students to take more than one elective, or offering a variety of topics.

Yo-Time (recreational time)

Participants enjoyed Yo-Time but would like a greater variety of activities to be offered, including more non-athletic activities.

Boo-yah (homework)

Participants identified homework load as a key area for improvement. It is challenging for students to complete their assigned Boo-yah and still have time to pursue other non-Breakthrough activities. Some suggested an extended day or a study period separate from Detour (detention) that would allow them to stay and discuss homework problems with their teachers.

Detour (detention)

Participants viewed Detour as an important aspect of the program that pushes them to complete their homework each day. However, the current structure encourages students to rush through their homework to avoid Detour rather than taking the time to correctly complete it. They suggested that students be allowed to finish their homework in Detour, have it reviewed by a tutor, and then join Yo-time rather than remain in detention, which makes Detour feel like a punishment.

All-School Meeting (ASM)

Participants enjoyed getting together with their peers to display what they have learned in the program. Some suggested that ASM could be improved further by encouraging more participation from all students in the program.

Food

The majority of participants mentioned that lunch and snacks need significant improvements. Specifically, they expressed the desire for a greater variety of food offered and higher quality food.

The following program aspects surfaced in the responses provided by the ninth and tenth grade cohorts, but not the eighth grade cohort:

Laptop program

The laptop program has been a tremendously useful resource for the participants because it allows the students to complete their homework and easily seek tutoring help. However, the participants noted that they began to feel disconnected from Breakthrough once the laptop program started because their cohort did not meet as often in-person.

Meeting more with the cohort during the school year

The participants wish the cohort could meet more frequently than two or three times during the school year. Several participants stated that Breakthrough has shifted from "building relationships to solely academic." This shift has created a bad impression of their Breakthrough experience, and they mentioned that their interest in Breakthrough is declining as a result. They hoped that Breakthrough would consider monthly gatherings once the participants enter high school because important relationships built through Breakthrough were beginning to dissolve given that they rarely met with their cohort. This has created the perception that Breakthrough places too much emphasis on academics while disregarding the relationships built since the participants started the program.

Providing a summer program for high school participants

Participants voiced a strong desire for an optional summer program for high school-aged students. Many participants found the summer programs very beneficial during middle school because it was not simply "summer school." It was a place where they could gain skills, find friends, and prepare for the next school year. Several participants expressed that they were "bummed" when there were not any summer Breakthrough programs during high school. While realizing the importance of providing flexibility for the Breakthrough students who want to participate in other summer programs (such as sports camps, etc.), they hoped that a summer Breakthrough program would still remain an option.

Breakthrough Leaders Program

The Breakthrough Leaders Program (summer before entering ninth grade) helped participants to cultivate skills and values, such as leadership, responsibility, organization, and teamwork. The participants reported that the leadership program shaped their desire to become leaders in school and extracurricular activities in their high schools. BLP sparked the interest in some participants to become teachers.

Conclusion

The impact analysis carried out in this evaluation study provides promising evidence of positive program impacts on student achievement, especially in middle school. Breakthrough Saint Paul participants' views of program influences provide support for the results of the impact analysis. However, caution should be exercised in attributing all of the Breakthrough-comparison group difference in academic outcomes to the program. The quasi-experimental study design employed careful one-to-one matching of Breakthrough students with comparison students on academic, need-related, and demographic factors. Nevertheless, the two groups may differ on other factors that influence academic outcomes that we were unable to take into account. An experimental design with random assignment of students to Breakthrough and a control group could be a stronger design if well executed. However, that was not feasible for the current study.

We identified two other evaluation studies of Breakthrough (formerly "Summerbridge") that assessed program impact on student academic performance using comparison groups – one was an evaluation of a local program (Harlow & Baenen, 2001) and the other was a national evaluation involving multiple program sites (Bitter & Feldman, 2003). The national evaluation also used applicants to the program who were not accepted as the comparison group. The local program evaluation found that program participants were less likely to drop out of school than comparison students, but the two groups did not differ significantly on reading and math test scores in eighth grade (in contrast to Breakthrough Saint Paul results) or on grades and test scores in high school. The national study, which relied on surveys of students, found that program participants tended to be doing more advanced coursework in middle school and high school than comparison students (similar to the finding that Breakthrough Saint Paul participants were more likely to be taking honors courses).

Future studies of the Breakthrough program using experimental or quasi-experimental designs would be useful in providing additional evidence on the impact of the program. With regard to the current study, it would be valuable to extend it by continuing to follow the study cohorts through high school and into college to assess longer-term outcomes of the program.

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Appendix

A1. Credits earned in honors classes[a]

		Number of honors class credits earned[b]		Significance tests
		Breakthrough	Comparison	
7th grade	Mean	6.8	5.8	p<.05
	(Standard deviation)	(3.9)	(4.5)	
	Number	96	96	
8th grade	Mean	9.1	7.1	p<.01
	(Standard deviation)	(3.6)	(4.5)	
	Number	52	52	
9th grade	Mean	7.1	4.1	ns[c]
	(Standard deviation)	(5.8)	(4.6)	
	Number	18	18	

[a] *For study purposes, honors classes included those classified as honors, advanced placement, international baccalaureate, and college in the schools.*

[b] *Passing one class for one quarter earns one credit; for a full school year, four credits.*

[c] *Not statistically significant.*

Note: *Effect sizes for seventh and eighth grades are .23 and .49, respectively.*

Data source: *Saint Paul Public Schools*

A2. Average grades of "B-" or higher in all classes

		Average grades[a] in all classes				
		Breakthrough		Comparison		
Grade	Number of pairs	2.70+	0-2.69	2.70+	0-2.69	Significance tests
7th grade	96	84%	16%	67%	33%	p<.01
8th grade	52	77%	23%	75%	25%	ns[b]
9th grade	18	50%	50%	44%	56%	ns[b]

[a] *Letter grades were assigned the following numerical values: A=4.00, B=3.00, C=2.00, D=1.00, and F=0.00. A grade average of 2.70 or higher is considered a grade average of B- or higher.*

[b] *Not statistically significant.*

Data source: *Saint Paul Public Schools*

A3. Average grades of "B-" or higher in honors classes[a]

Grade	Number of pairs	Average grades[b] in honors classes: Breakthrough 2.70+	Breakthrough 0-2.69	Comparison 2.70+	Comparison 0-2.69	Significance tests
7th grade	69	75%	25%	54%	46%	p<.05
8th grade	43	70%	30%	63%	37%	ns[c]
9th grade	12	42%	58%	58%	42%	ns[c]

[a] *For study purposes, honors classes included those classified as honors, advanced placement, international baccalaureate, and college in the schools.*

[b] *Letter grades were assigned the following numerical values: A=4.00, B=3.00, C=2.00, D=1.00, and F=0.00. A grade average of 2.70 or higher is considered a grade average of B- or higher.*

[c] *Not statistically significant.*

Data source: *Saint Paul Public Schools*

A4. Grade average in all classes

		Grades[a] in all classes: Breakthrough	Comparison	Significance tests
7th grade	Mean	3.27	2.98	
	(Standard deviation)	(0.59)	(0.82)	p<.01
	Number	96	96	
8th grade	Mean	3.18	3.00	
	(Standard deviation)	(0.65)	(0.92)	ns[b]
	Number	52	52	
9th grade	Mean	2.70	2.56	
	(Standard deviation)	(0.89)	(0.94)	ns[b]
	Number	18	18	

[a] *Letter grades were assigned the following numerical values: A=4.00, B=3.00, C=2.00, D=1.00, and F=0.00.*

[b] *Not statistically significant.*

Note: *Effect size for seventh grade is .40.*

Data source: *Saint Paul Public Schools*

A5. Grade average in honors classes[a]

		Grades[b] in honors classes		Significance tests
		Breakthrough	Comparison	
7th grade	Mean	3.14	2.75	p<.05
	(Standard deviation)	(0.76)	(1.04)	
	Number	69	69	
8th grade	Mean	3.09	2.93	ns[c]
	(Standard deviation)	(0.79)	(0.96)	
	Number	43	43	
9th grade	Mean	2.43	2.46	ns[c]
	(Standard deviation)	(1.23)	(0.83)	
	Number	12	12	

[a] *For study purposes, honors classes included those classified as honors, advanced placement, international baccalaureate, and college in the schools.*

[b] *Letter grades were assigned the following numerical values: A=4.00, B=3.00, C=2.00, D=1.00, and F=0.00.*

[c] *Not statistically significant*

Note: *Effect size for seventh grade is .42.*

Data source: *Saint Paul Public Schools.*

A6. Average grades of "B-" or higher in English, Math, Science and Social Studies

Subject	Grade	Number of pairs	Average grades[a] in subject: Breakthrough 2.70+	Breakthrough 0-2.69	Comparison 2.70+	Comparison 0-2.69	Significance tests
English	7th	94	80%	20%	61%	39%	p<.01
	8th	50	68%	32%	62%	38%	ns[b]
	9th	18	50%	50%	56%	44%	ns[b]
Math	7th	96	67%	33%	58%	42%	ns[b]
	8th	52	63%	37%	58%	42%	ns[b]
	9th	17	35%	65%	53%	47%	ns[b]
Science	7th	96	82%	18%	63%	37%	p<.01
	8th	52	77%	23%	62%	38%	ns[b]
	9th	18	56%	44%	61%	39%	ns[b]
Social Studies	7th	95	81%	19%	62%	38%	p<.01
	8th	52	79%	21%	71%	29%	ns[b]
	9th	17	47%	53%	35%	65%	ns[b]

[a] *Letter grades were assigned the following numerical values: A=4.00, B=3.00, C=2.00, D=1.00, and F=0.00. A grade average of 2.70 or higher is considered a grade average of B- or higher.*

[b] *Not statistically significant.*

Data source: *Saint Paul Public Schools*

A7. Grade average in English classes

		Grades[a] in English classes		Significance tests
		Breakthrough	Comparison	
7th grade	Mean	3.27	2.85	p<.01
	(Standard deviation)	(0.76)	(1.11)	
	Number	94	94	
8th grade	Mean	3.00	2.81	ns[b]
	(Standard deviation)	(0.96)	(1.12)	
	Number	50	50	
9th grade	Mean	2.57	2.52	ns[b]
	(Standard deviation)	(1.25)	(1.02)	
	Number	18	18	

[a] *Letter grades were assigned the following numerical values: A=4.00, B=3.00, C=2.00, D=1.00, and F=0.00.*

[b] *Not statistically significant.*

Note: *Effect size for seventh grade is .44.*

Data source: *Saint Paul Public Schools*

A8. Grade average in Math classes

		Grades[a] in Math classes		Significance tests
		Breakthrough	Comparison	
7th grade	Mean	3.05	2.76	p<.05
	(Standard deviation)	(0.88)	(1.06)	
	Number	96	96	
8th grade	Mean	2.80	2.73	ns[b]
	(Standard deviation)	(0.94)	(1.16)	
	Number	52	52	
9th grade	Mean	2.38	2.18	ns[b]
	(Standard deviation)	(1.08)	(1.39)	
	Number	17	17	

[a] *Letter grades were assigned the following numerical values: A=4.00, B=3.00, C=2.00, D=1.00, and F=0.00.*

[b] *Not statistically significant.*

Note: *Effect size for seventh grade is .29.*

Data source: *Saint Paul Public Schools*

A9. Grade average in Science classes

		Grades[a] in Science classes		Significance tests
		Breakthrough	Comparison	
7th grade	Mean	3.29	2.94	p<.01
	(Standard deviation)	(0.70)	(1.02)	
	Number	96	96	
8th grade	Mean	3.27	2.85	p<.05
	(Standard deviation)	(0.72)	(1.16)	
	Number	52	52	
9th grade	Mean	2.74	2.34	ns[b]
	(Standard deviation)	(0.98)	(1.12)	
	Number	18	18	

[a] *Letter grades were assigned the following numerical values: A=4.00, B=3.00, C=2.00, D=1.00, and F=0.00.*

[b] *Not statistically significant.*

Note: *Effect sizes for seventh and eighth grades are .40 and .43, respectively.*

Data source: *Saint Paul Public Schools*

A10. Grade average in Social Studies classes

		Grades[a] in Social Studies classes		Significance tests
		Breakthrough	Comparison	
7th grade	Mean	3.24	2.90	p<.01
	(Standard deviation)	(0.73)	(1.04)	
	Number	95	95	
8th grade	Mean	3.30	3.09	ns[b]
	(Standard deviation)	(0.74)	(0.95)	
	Number	52	52	
9th grade	Mean	2.55	2.02	ns[b]
	(Standard deviation)	(1.19)	(1.26)	
	Number	17	17	

[a] *Letter grades were assigned the following numerical values: A=4.00, B=3.00, C=2.00, D=1.00, and F=0.00.*

[b] *Not statistically significant.*

Note: *Effect size for seventh grade is .38.*

Data source: *Saint Paul Public Schools*

A11. MCA-II results: Scale scores

		Reading and math scale scores		Significance tests
READING		**Breakthrough**	**Comparison**	
7th grade	Mean	759.2	755.0	
	(Standard deviation)	(11.2)	(10.5)	p<.01
	Number	94	94	
8th grade	Mean	859.8	854.3	
	(Standard deviation)	(12.4)	(11.2)	p<.01
	Number	51	51	
MATH				
7th grade	Mean	760.2	757.0	
	(Standard deviation)	(9.1)	(11.2)	p<.01
	Number	94	94	
8th grade	Mean	858.0	852.7	
	(Standard deviation)	(12.5)	(11.6)	p<.01
	Number	51	51	

Note: *Effect sizes for seventh and eighth grade reading are .39 and .46, respectively. Effect sizes for seventh and eighth grade math are .32 and .44, respectively.*

Data source: *Saint Paul Public Schools*

A12. MCA-II Reading level results

	7th grade		8th grade	
MCA-II level	**Breakthrough (N=94)**	**Comparison (N=94)**	**Breakthrough (N=51)**	**Comparison (N=51)**
Exceeds standards	42%	28%	47%	27%
Meets standards	39%	45%	33%	43%
Partially meets standards	18%	22%	18%	26%
Does not meet standards	1%	5%	2%	4%
Total	100%	100%	100%	100%
Meets/exceeds standards	81%	72%	80%	71%
Does not/partially meets standards	19%	28%	20%	29%
Total	100%	100%	100%	100%

Note. *The results shown in the figure suggest that Breakthrough students tend to have stronger reading skills than comparison students. Differences between the groups for eighth graders using the four levels were statistically significant (McNemar-Bowker Test, p<.05, one-sided). Although a similar pattern was observed for seventh graders, it did not reach statistical significance.*

Data source: *Saint Paul Public Schools*

A13. MCA-II Math level results

MCA-II level	7th grade Breakthrough (N=94)	7th grade Comparison (N=94)	8th grade Breakthrough (N=51)	8th grade Comparison (N=51)
Exceeds standards	26%	23%	25%	10%
Meets standards	66%	56%	59%	63%
Partially meets standards	6%	16%	12%	20%
Does not meet standards	2%	4%	4%	8%
Total	100%	100%	100%	100%
Meets/exceeds standards	91%	80%	84%	73%
Does not/partially meets standards	9%	20%	16%	27%
Total	100%	100%	100%	100%

Note. *The results shown in the figure suggest that Breakthrough students tend to have stronger math skills than comparison students. The difference between the groups for seventh graders using the two categories (meets/exceeds standards vs. does not/partially meets standards) were statistically significant (McNemar Test, p<.05). Although a similar pattern was observed for other comparisons, these differences did not reach statistical significance.*

Data source: *Saint Paul Public Schools*