STEM Pathways Student Academic Achievement Results for the 2014-15 School Year

Summary

A long-term goal of STEM Pathways is to increase student achievement in STEM subjects, especially among underrepresented groups such as those with low incomes, racial/ethnic minorities, and females. To take an initial look at the achievement of STEM Pathways students after the first year of program implementation, we examined results in math, science, and reading from spring 2015 Minnesota Comprehensive Assessments, Series III (MCA-III). Program effects on these test scores are unlikely at this early stage with students having limited program exposure. Program effects could emerge later with multiple years of program exposure.

A quasi-experimental design was used to assess potential program effects on MCA test results of fourth- and fifth-graders attending Minneapolis public schools where STEM Pathways was implemented in 2014-15. This design included a comparison group of fourth- and fifth-graders attending other Minneapolis public schools. Propensity score analysis was conducted to ensure that the treatment and comparison groups were similar on key student characteristics that could influence achievement test performance. This analysis technique was used to statistically equalize the treatment and comparison groups on six characteristics: gender, race/ethnicity, free/reduced-price lunch eligibility, English Language Learner (ELL) status, Special Education status, and spring 2014 MCA-III math scores. Before the propensity score analysis, the treatment group had a higher proportion of ELL and Hispanic students, and a lower proportion of black students, than the comparison group. These differences between the groups essentially disappeared after the propensity score analysis was carried out for both fourth- and fifth-graders, making it more likely that any difference between the treatment and comparison groups in spring 2015 achievement test scores would be a STEM Pathways effect.

Analyses were then conducted to determine whether spring 2015 MCA-III scores differed in math, science (5th grade only), and reading between the treatment and comparison group students. Results indicated that scores were very similar between the two groups for each of the tests in each grade. There was no statistically significant advantage for the treatment group on any of the tests in either grade. In fourth grade, the comparison group scored slightly higher (statistically significant) in reading. These results were confirmed using two additional propensity score analysis methods.

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Potential treatment-comparison group differences on the 2015 MCA tests were examined separately within the following demographic categories: female, male, eligible for free or reduced-price lunch, ineligible for free or reduced-price lunch, ELL, non-ELL, Asian, black, Hispanic, and white. (There were too few students to conduct the analyses within the American Indian group). No strong patterns of differences emerged within any of these demographic categories. Overall, differences in test results tended to be small and most often slightly in favor of the comparison group. A weak but consistent pattern of MCA score differences in favor of the comparison group was found among white students and students ineligible for free or reduced-price lunch (higher-income students). That is, although mostly small and statistically non-significant, differences in favor of the comparison group were consistent across grades and type of test in these two demographic categories.

Introduction

STEM Pathways aims to increase youths' interest, attitudes, learning, and achievement in STEM through a deliberate, interconnected, and comprehensive system of STEM learning opportunities. A key research question of the STEM Pathways project is the following: Does the STEM Pathways model enhance the short-term and long-term outcomes of populations underrepresented in STEM? Underrepresented groups include those with low income, racial/ethnic minorities, and females. Through the results of the pre-post student survey in 2014-15, we observed changes in interests and attitudes of STEM Pathways fourth- and fifth-graders that may be related to their participation in the program. We also examined fourth- and fifth-graders' academic achievement in 2014-15. This was done through examining spring 2015 Minnesota Comprehensive Assessments, Series III (MCA-III), results in math, science (5th grade only), and reading. MCA tests are the academic achievement measures administered to students statewide each spring, and serve as accountability measurement tools in Minnesota for the federal No Child Left Behind law. We consider MCA tests to be long-term indicators of potential effects of the program. Significant program effects may be unlikely in the short term, but could emerge after multiple years of program exposure.

Design

In order to identify potential program effects, we compared fourth- and fifth-graders attending Minneapolis public schools where STEM Pathways was implemented (treatment group) to a comparison group of fourth- and fifth-graders attending other schools within the Minneapolis school district in 2014-15. To be eligible for inclusion in this analysis, students in both groups needed to be continuously enrolled in the same school during the 2014-15 school year, and to be enrolled for at least 160 days during the school year. In addition, students in both groups needed to have taken the MCA-III math test in both spring 2014 and 2015.

Comparison group fourth- and fifth-graders were drawn from all non-STEM Pathways Minneapolis district schools in which more than 45 percent of the students were eligible for free or reduced-price lunch (excluding those schools with a special focus on STEM subjects). The free/reduced-price lunch criterion was set to help make the composition of the schools attended by comparison students more similar to those attended by the treatment group (the proportion of students qualifying for free or reduced-price lunch was over 45% in all six STEM Pathways schools).

As part of the quasi-experimental design for assessing potential treatment effects, propensity score analysis was used. This is a statistical technique used to equalize the treatment and comparison groups on key characteristics (other than the treatment) thought to influence student performance on the outcome indicators. If successful, propensity score analysis increases the likelihood that any differences found between the treatment and comparison groups can be attributed to the treatment.

Using this technique, treatment and comparison group students were equalized or "balanced" on the following six characteristics:

- Gender
- Race/ethnicity
- Free or reduced-price lunch eligibility
- English Language Learner (ELL) status
- Special Education status
- MCA-III math scale score in 2014

As a first step in equalizing the two groups, a propensity score was calculated for each member of the treatment and comparison groups based on their profile on the six characteristics. A propensity score has a value between 0 and 1 based on how closely the profile of each member of both the treatment and comparison groups matches the overall profile of the treatment group on the six characteristics. The closer a member's profile matches the overall treatment group profile, the higher the propensity score. (A logistic regression is used to generate the propensity scores with the six characteristics as the independent variables and group membership as the dependent variable, treatment=1 and control=0.)

Students in the treatment group and the comparison group with extreme propensity scores ("outliers") were excluded for purposes of the student achievement analysis. These students had profiles on the six characteristics very different from most of the students and would have made it more difficult to equalize the two groups statistically if they stayed in the analysis. In the fourth-grade cohort, 48 comparison group students and one treatment student were excluded. In the fifth-grade

cohort, five comparison group students and three treatment group students were excluded. After these exclusions and a few others due to missing test scores, 355 fourth-graders remained in the treatment group and 1,067 fourth-graders remained in the comparison group. Among fifth-graders, 331 remained in the treatment group and 1,059 remained in the comparison group.

For the next step, we used the Inverse Probability of Treatment Weights (IPTW) method to provide weights to each member of the treatment and comparison groups as a way to equalize the two groups on the six characteristics listed above. In the IPTW weighting method, individual weights are assigned based on each study group member's propensity score. The formula used to determine the weights is *1/p* for treatment group members and *1/1-p* for comparison group members, where p is the propensity score. The results of using this weighting method is that treatment group members with higher propensity scores receive lower weights while treatment group members with lower propensity scores receive higher weights. For comparison group members, those with higher propensity scores receive higher weights while those with lower propensity scores receive lower weights. Assigning the weights in this way serves to balance or equalize the two groups on the six characteristics. Once these weights were determined, weighted regression analyses were performed to estimate the potential effects of STEM Pathways on students' achievement test performance.

Measurement of academic outcomes

To assess potential treatment effects on academic achievement, the treatment and comparison group students were compared on the spring 2015 MCA-III math, science (5^{th} grade only), and reading tests. MCA scale scores were used for this analysis. In fourth grade, scale scores range from 409 through 499 in math and from 411 through 490 in reading. In fifth grade, scale scores range from 515 through 586 in math, from 517 through 591 in reading, and from 501 through 599 in science. We also compared the two groups on the proportion of students who reached the proficiency level on these tests (i.e., met or exceeded standards for their grade).

Exposure to STEM Pathways programming

About 29 hours of STEM Pathways programming was provided to both fourth- and fifth-graders attending STEM Pathways schools during the 2014-15 school year. Each grade received programming from three STEM Pathways partners. Fourth-graders received programming from The Bakken (6.25 hours), STARBASE Minnesota (20 hours), and The Works (3 hours). Fifth-graders received programming from the Minnesota Zoo (4 hours), STARBASE Minnesota (20 hours), and The Bell Museum (5 hours). Some students likely received fewer than 29 hours of programming due to absences on program days. Some of the programming occurred late in the school year at some schools with little chance to affect students' performance on MCA-III tests (administered in April and May). For example, fourth-grade students at four STEM Pathways

schools attended STARBASE in April or May, and students at one school attended The Works in late May. Fifth-graders at all six STEM Pathways schools attended The Bell Museum in April or May.

Many comparison students had a small amount of exposure to STEM Pathways programming during the 2014-15 school year. The four-hour Minnesota Zoo program was provided to fifth-graders at most schools that comparison group students attended (18 of the 21 MPS schools comparison group students attended). Part of The Bakken program was provided to fourth-graders at three schools that comparison group students attended. The Works program was provided at one school that fourth-grade comparison group students attended and two schools that fifth-grade comparison group students attended.

Treatment and comparison group characteristics before propensity score analysis

Figures 1 and 2 indicate the profiles of the treatment and comparison groups on the six characteristics listed above prior to the propensity score analysis. Figure 1 shows the similarities and differences between these two groups for fourth-graders. Note that there is very little difference in the proportions of boys and girls, or in the proportions of Special Education students, in the two groups. The differences between the treatment and comparison groups is slightly larger for the percent eligible for free or reduced-price lunch, but the difference is not statistically significant. There are statistically significant differences between the groups in ELL students, racial/ethnic composition, and 2014 MCA-III math scores. The treatment group has a higher percentage of ELL students than the comparison group. With regard to race/ethnicity, the treatment group has a higher percentage of Hispanic students than the comparison group and a somewhat lower percentage of black students. Average 2014 MCA-III math scores are slightly higher in the treatment group than in the comparison group (testing occurred in the spring of third grade, scores could range from 315 through 399).

For fifth-graders, differences between the two groups follow a very similar pattern (Figure 2). There is little difference between the groups in gender and Special Education. The difference between groups in eligibility for free/reduced-price lunch is not statistically significant. Again, statistically significant differences occur between the groups in ELL students, racial/ethnic composition, and 2014 MCA-III math scores. The differences follow the same pattern as with fourth-graders. In contrast to the comparison group, the treatment group has a higher percentage of ELL students, a higher percentage of Hispanic students, and a lower percentage of black students. Average 2014 MCA-III math scores are slightly higher in the treatment group than in the comparison group (testing occurred in the spring of fourth grade, scores could range from 409 through 499).

1. Characteristics of treatment and comparison groups before propensity score analysis: 4th grade

Student characteristics		Group: Treatment (N=357)	Group: Comparison (N=1,117)	Difference[a]
Gender	Male	49%	50%	-1
	Female	51%	50%	1
Race/ethnicity[b]	American Indian	2%	6%	-4
	Asian	7%	6%	1
	Black	31%	37%	-6
	Hispanic	36%	26%	10
	White	24%	24%	0
Eligible for free or reduced-price lunch		79%	75%	4
English Language Learner[c]		40%	30%	10
Receives Special Education services		10%	11%	-1
MCA-III Math 2014 scale score: Mean[d]		350	347	3

[a] *Difference in percentage points (treatment minus control group).*

[b] *The difference between the treatment and comparison groups on the student characteristic is statistically significant (p<.05) using the Pearson Chi-Square Test (2-sided).*

[c] *The difference between the treatment and comparison groups on the student characteristic is statistically significant (p<.05) using Fisher's Exact Test (2-sided).*

[d] *The difference between the treatment and comparison groups in MCA-III math scale score means is statistically significant (p<.05) using the t-test (2-tailed).*

2. Characteristics of treatment and comparison groups before propensity score analysis: 5th grade

Student characteristics		Group: Treatment (N=338)	Group: Comparison (N=1,074)	Difference[a]
Gender	Male	50%	49%	1
	Female	50%	51%	-1
Race/ethnicity[b]	American Indian	5%	5%	0
	Asian	10%	7%	3
	Black	33%	43%	-10
	Hispanic	35%	24%	11
	White	17%	21%	-4
Eligible for free or reduced-price lunch		82%	77%	5
English Language Learner[c]		40%	32%	8
Receives Special Education services		10%	12%	-2
MCA-III Math 2014 scale score: Mean[d]		449	445	4

[a] *Difference in percentage points (treatment minus control group).*

[b] *The difference between the treatment and comparison groups on the student characteristic is statistically significant (p<.05) using the Pearson Chi-Square Test (2-sided).*

[c] *The difference between the treatment and comparison groups on the student characteristic is statistically significant (p<.05) using Fisher's Exact Test (2-sided).*

[d] *The difference between the treatment and comparison groups in MCA-III math scale score means is statistically significant (p<.05) using the t-test (2-tailed).*

Treatment and comparison group characteristics after propensity score analysis

Figures 3 indicates the profiles of the fourth grade treatment and comparison groups on the six student characteristics after equalizing the two groups through the propensity score analysis described earlier. Note that the differences between the groups in ELL status, race/ethnicity, and 2014 MCA-III math scores we observed prior to the propensity score analysis have disappeared or become very small. The treatment and comparison groups have been successfully equalized on the six student characteristics; there are no statistically significant differences between the two groups on these characteristics.

3. Characteristics of treatment and comparison groups after propensity score analysis: 4th grade

Student characteristics		Group: Treatment (N=355)	Group: Comparison (N=1,067)	Difference[a]
Gender	Male	50%	50%	0
	Female	50%	50%	0
Race/ethnicity	American Indian	4%	2%	2
	Asian	7%	7%	0
	Black	37%	37%	0
	Hispanic	28%	30%	-2
	White	24%	24%	0
Eligible for free or reduced-price lunch		76%	76%	0
English Language Learner		32%	34%	-2
Receives Special Education services		11%	11%	0
MCA-III Math 2014 scale score: Mean		347	348	-1

[a] *Difference in percentage points (treatment minus control group).*

Note: *There were no statistically significant differences between the treatment and comparison groups on any of the student characteristics.*

Figure 4 shows the same information for fifth-graders. Again, the differences we observed on the student characteristics prior to propensity score analysis are largely gone, and the profiles of the treatment and comparison groups are almost identical. There are no statistically significant differences between the two groups on any of the six characteristics.

4. Characteristics of treatment and control groups after propensity score analysis: 5th grade

Student characteristics		Group: Treatment (N=331)	Group: Comparison (N=1,059)	Difference[a]
Gender	Male	51%	50%	1
	Female	49%	50%	-1
Race/ethnicity	American Indian	5%	5%	0
	Asian	8%	8%	0
	Black	41%	40%	1
	Hispanic	27%	27%	0
	White	20%	20%	0
Eligible for free or reduced-price lunch		77%	78%	-1
English Language Learner		34%	34%	0
Receives Special Education services		12%	11%	1
MCA-III Math 2014 scale score: Mean		446	446	0

[a] *Difference in percentage points (treatment minus control group).*

Note: *There were no statistically significant differences between the treatment and comparison groups on any of the student characteristics.*

This equalization between the groups makes it more likely that any treatment group difference that might be found in student achievement in spring 2015 could be a STEM Pathways effect.

Achievement test results

Analyses were conducted to test whether STEM Pathways had an effect on spring 2015 MCA-III results. A series of regression analyses were carried out to determine whether MCA math, reading, and science scores differed significantly between the treatment and comparison groups, using the IPTW weighting described earlier to neutralize any effects differences in the six student characteristics between the two groups might have on these scores. Findings from this analysis are reported in Figure 5, with fourth and fifth grade findings shown separately. For the most part, there is very little difference in MCA scores between the treatment and comparison groups.

Average (mean) scale scores are reported for each MCA test by group as well as the percentage that reached the proficiency level on the test (i.e., met or exceeded grade-level standards).

5. Achievement tests (MCA-III) results in spring 2015: Treatment and comparison groups

		Group	
4th Grade		**Treatment (N=355)**	**Comparison (N=1,067)**
Math	Scale score mean[a]	446	448
	Percent proficient[b]	45%	50%
Reading	Scale score mean[a, c]	441	444
	Percent proficient[b, c]	31%	37%
5th Grade		**Treatment (N=331)**	**Comparison (N=1,059)**
Math	Scale score mean[d]	543	543
	Percent proficient[b]	36%	37%
Reading	Scale score mean[d]	544	545
	Percent proficient[b]	40%	39%
Science	Scale score mean[d]	539	540
	Percent proficient[b]	28%	30%

[a] *In 4th grade, scale scores range from 409 through 499 in math and 411 through 490 in reading.*

[b] *Percent meeting or exceeding standards.*

[c] *The difference between the treatment and comparison group is statistically significant (p<.05).*

[d] *In 5th grade, scale scores range from 515 through 586 in math, 517 through 591 in reading, and 501 through 599 in science. MCA science is only administered to fifth-grade students.*

In fourth grade, average scale scores and proficiency percentages are somewhat higher in the comparison group than the treatment group for both math and reading. These differences between groups on these measures are statistically significant for reading but not for math. In fifth grade, the average scale scores for math, reading, and science are identical or almost identical for the treatment and comparison groups. Proficiency percentages are also very similar between the two groups for all three tests. None of the differences between groups for fifth-graders is statistically significant. Note that half or fewer of the fourth-graders are proficient across subjects and study groups (ranging from 31% to 50%). Among fifth-graders, 40 percent or fewer are proficient across subjects and study groups (ranging from 28% to 40%). In science, 28 and 30 percent, respectively, are proficient in the treatment and comparison groups.

Two additional propensity score analysis methods were used to examine potential treatment effects on the MCA tests. One was the Average Treatment Effect (ATE) method which matched

each treatment group member with up to three comparison group members using propensity scores based on the same six student characteristics. The other was a regression analysis method that used propensity scores based on the six characteristics as covariates, but without weighting. The results using these two methods were essentially the same as those using the IPTW method.

Treatment vs. comparison group achievement results within student demographic categories

Potential treatment-comparison group differences on the 2015 MCA tests were explored within student demographic categories using the IPTW regression method. These analyses were conducted separately within the following demographic categories: female, male, eligible for free/reduced-price lunch, ineligible for free/reduced-price lunch, ELL, non-ELL, Asian, black, Hispanic, and white. (There were too few students to conduct the analyses within the American Indian group).

Results from these analyses are reported in Figures 6 and 7 for fourth- and fifth-graders, respectively, indicating average 2015 MCA-III scale scores in the treatment and comparison groups. Some statistically significant differences between the treatment and comparison groups emerged in several demographic categories. The strongest pattern is in the white subgroup. Average scale scores are significantly higher in the comparison group than the treatment group for all the MCA tests in both grades among white students. A similar but weaker pattern of differences in favor of the comparison group occurred for the subgroup ineligible for free/reduced-price lunch (i.e., higher-income subgroup). The only statistically significant differences for this subgroup are for fifth-grade reading and science.

There are several other weak patterns within demographic subgroups in one grade. Differences in favor of the comparison group are quite small (3-4 scale points), but statistically significant. Among fourth-grade boys, average MCA scale scores in math and reading are significantly higher in the comparison group than in the treatment group. Similarly, among non-ELL fourth-grade students, average MCA scale scores in math and reading are significantly higher in the comparison group than in the treatment group. Finally, among fifth-grade Hispanic students, average MCA scale scores in reading and science are significantly higher in the comparison group than in the treatment group.

6. Achievement tests (MCA-III) results in spring 2015 for 4th-graders within student characteristics categories: Scale scores

Student characteristics		Test	MCA-III scale score mean[a] Treatment group	MCA-III scale score mean[a] Comparison group	Difference[b]
Gender	Female (N=709)	Math	448	448	0
		Reading	444	445	-1
	Male (N=713)	Math*	445	449	-4
		Reading*	438	442	-4
Free or reduced-price lunch	Eligible (N=1,076)	Math	442	443	-1
		Reading*	436	439	-3
	Ineligible (N=346)	Math	461	464	-3
		Reading	455	458	-3
ELL status	ELL (N=477)	Math	440	439	1
		Reading	434	434	0
	Non-ELL (N=945)	Math*	450	453	-3
		Reading*	445	449	-4
Race/ethnicity	Asian (N=97)	Math	451	449	2
		Reading	447	443	4
	Black (N=522)	Math	438	440	-2
		Reading*	434	438	-4
	Hispanic (N=422)	Math	445	445	0
		Reading	439	439	0
	White (N=347)	Math*	458	464	-6
		Reading*	452	458	-6

[a] In 4th grade, scale scores range from 409 through 499 in math and 411 through 490 in reading.

[b] Treatment group score minus comparison group score.

** The difference between the treatment and comparison group is statistically significant (p<.05).*

7. Achievement tests (MCA-III) results in spring 2015 for 5th-graders within student characteristics categories: Scale scores

Student characteristics		Test	MCA-III scale score mean[a] Treatment group	MCA-III scale score mean[a] Comparison group	Difference[b]
Gender	Female (N=691)	Math	544	544	0
		Reading	546	547	-1
		Science	540	541	-1
	Male (N=699)	Math	543	543	0
		Reading	542	544	-2
		Science	539	540	-1
Free or reduced-price lunch	Eligible (N=1,089)	Math	540	539	1
		Reading	540	541	-1
		Science	536	535	1
	Ineligible (N=301)	Math	554	557	-3
		Reading*	556	561	-5
		Science*	551	559	-8
ELL status	ELL (N=471)	Math	538	537	1
		Reading	535	536	-1
		Science	530	531	-1
	Non-ELL (N=919)	Math	546	546	0
		Reading	549	550	-1
		Science	544	545	-1
Race/ethnicity	Asian (N=108)	Math	544	547	-3
		Reading	546	545	1
		Science	542	543	-1
	Black (N=561)	Math	540	538	2
		Reading	542	540	2
		Science	537	534	3
	Hispanic (N=372)	Math	541	541	0
		Reading*	539	542	-3
		Science*	534	538	-4
	White (N=275)	Math*	552	557	-5
		Reading*	555	562	-7
		Science*	551	560	-9

[a] In 5th grade, scale scores range from 515 through 586 in math, 517 through 591 in reading, and 501 through 599 in science.

[b] Treatment group score minus comparison group score.

** The difference between the treatment and comparison group is statistically significant (p<.05).*

Note that the equalization of the treatment and comparison groups on the six student characteristics using weightings, as described earlier, was conducted with the full treatment and comparison groups being intact. When analyses are performed on subgroups within the two study groups (such as with white or non-ELL student subgroups) the equalization is compromised. For example, it cannot be assumed that the subgroup of white students in the treatment and comparison groups are equalized on the other demographic characteristics when analyses are carried out on this racial subgroup separately.

To help address this issue, additional analyses were conducted on several student subgroups to statistically control for demographic differences between the two groups. This was accomplished using regression analysis and adding free/reduced-price lunch eligibility and sometimes ELL status as covariates plus interaction terms for each (i.e., the interaction of each with the study group variable), when appropriate and when sample sizes were large enough. These analyses were carried out for the following subgroups: white students (4^{th} and 5^{th} grades), Hispanic students (5^{th} grade), boys (4^{th} grade), and non-ELL students (4^{th} grade).

For the white subgroup, differences in MCA test results between the treatment and comparison groups are reduced when controlling for free/reduced-price lunch differences between the two groups, and are no longer statistically significant except for fifth-grade science. The interaction term in this analysis is not statistically significant. ELL status was not controlled because there were too few ELL students among whites. Results of this analysis presented in Figure 8 indicate the difference in average scale score between the treatment and comparison groups (average treatment group score minus average comparison group score). All of the differences shown for the white subgroup are negative indicating somewhat higher average scores in the comparison group than the treatment group. These results suggest that part of the differences in white students' test results in favor of the comparison group that we saw in Figures 6 and 7 may be due to a lower proportion of white students eligible for free/reduced-price lunch in the comparison group than the treatment group. By controlling for eligibility for free/reduced-price lunch, the pattern of comparison group white students scoring higher on MCA tests than their counterparts in the treatment group is weakened substantially.

Turning to the fifth-grade Hispanic subgroup, we controlled for differences in eligibility for free/reduced-price lunch and ELL status between the treatment and comparison groups. This results in changes in the average difference in MCA math, reading, and science scores between the treatment and comparison groups, but now none are statistically significant. For fourth-grade boys, differences between the treatment and comparison groups change slightly after controlling for free/reduced-price lunch eligibility and ELL status. The difference in math is no longer statistically significant, while the difference in reading remains statistically significant. For fourth-grade non-ELL students, differences between the treatment and comparison groups also change slightly after controlling for free/reduced-price lunch eligibility, and the differences for

math and reading remain statistically significant. The interaction terms in all of these analyses are not statistically significant.

8. Results of additional analyses of treatment-comparison group MCA-III differences within selected student characteristics categories

Subgroup	Grade	Test	Difference in 2015 MCA-III scale scores between treatment and comparison groups (treatment group mean minus comparison group mean)
White students	4 (N=347)	Math	-4
		Reading	-3
	5 (N=275)	Math	-3
		Reading	-5
		Science	-7*
Hispanic students	5 (N=372)	Math	8
		Reading	-6
		Science	-2
Male students	4 (N=713)	Math	-6
		Reading	-5*
Non-ELL students	4 (N=945)	Math	-5*
		Reading	-4*

** The difference between the treatment and comparison group is statistically significant (p<.05).*

In sum, no strong patterns of differences between the treatment and comparison groups emerged across grades and MCA tests within any of the demographic categories examined. Overall, differences in test results tended to be small and most often slightly in favor of the comparison group. A weak but consistent pattern of MCA score differences in favor of the comparison group was found among white students and students ineligible for free or reduced-price lunch (higher-income students). That is, differences in favor of the comparison group were consistent across grades and type of test in these two demographic categories, but the differences were generally small and most often not statistically significant.

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Information. Insight. Impact.

451 Lexington Parkway North
Saint Paul, Minnesota 55104
651-280-2700
www.wilderresearch.org

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For more information

For more information about this report, contact Dan Mueller at Wilder Research, 651-280-2711.

Author: Dan Mueller

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