Comparison of Student Performance between Middle School Reform Schools and Middle School Magnet Consortium Schools

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Summary

This research addressed the following objective: are there differences in student performance between the Phase I Middle School Reform (MSR) schools and the Middle School Magnet Consortium (MSMC) schools? The performance of students in the MSR schools and the MSMC schools was comparable overall. The positive results after Year one of MSR implementation and after Year three of MSMC implementation suggest clear benefits of both initiatives. Comparisons between the initiatives are limited by the difference in the amount of time each one has been in the implementation phase. Analyses of all students in MSMC include out-of-consortium students. MSR data include students enrolled in the program for the highly gifted. These aspects of the data should lead to caution in direct comparisons of the results, especially for those based on descriptive analyses.

The first set of findings is based on descriptive analyses of the following measures from the 2007–2008 school year: proficiency rates and scale scores from the Maryland School Assessment (MSA) in reading and mathematics for students in Grades 6, 7, and 8; proficiency rates and scale scores from the Algebra High School Assessment (HSA) for students in Grade 8; and the completion rate for Algebra 1 for students in Grade 8. Phase I MSR students achieved somewhat higher performance on all measures than in-consortium MSMC students. Phase I MSR students performed somewhat higher than all MSMC students on nearly all measures in Grade 8 and Grade 7. Phase I MSR Grade 6 students' performance was slightly lower than all Grade 6 students in the MSMC schools for nearly all measures.

The second set of findings is based on descriptive analyses of differences across years in proficiency rates from the MSA in reading and mathematics for all students in Grades 6–8. For both MSA subjects, each school had an increase in proficiency rates in the 2007–2008 school year compared with the 2006–2007 school year.

The third set of findings is based on advanced analyses that statistically controlled for differences in students' prior performance, demographics, and service receipt measures. Grade-level comparisons of MSA reading scores for students in Grades 6, 7, and 8 and Algebra HSA scores for students in Grade 8 did not find any statistically significant differences between the two groups of students attending MSMC schools (i.e., all students and in-consortium only students) and Phase I MSR. Grade-level comparisons of MSA mathematics scores between the two groups of students attending MSMC schools and Phase I MSR schools indicated very small but statistically significant differences in favor of Phase I MSR for students in Grades 7 and 8. Specifically, for Grades 7 and 8, the mean score for the average student in the MSR schools was found to be at the 54th percentile of the group of all students in the MSMC schools and at the 58th percentile of the group of MSMC in-consortium students. For students in Grade 6, no significant differences were found in MSA mathematics scores between the two groups of students attending MSMC schools (i.e., all students and in-consortium only students) and Phase I MSR.

Section I. Data Summary for Descriptive Analysis

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Research Questions

The following research questions guided the descriptive analyses:

1. How does performance of all students in the three Middle School Magnet Consortium (MSMC) schools compare with performance of all students in the five Phase I Middle School Reform (MSR) schools?

2. How does performance of in-consortium students only in the three MSMC schools compare with performance of all students in the five Phase I MSR schools?

Research Methodology

The following performance measures from the spring 2008 Maryland School Assessment (MSA) reading and mathematics tests for students in Grades 6, 7, and 8 were analyzed:

*   Percentage proficient or above
*   Percentage advanced
*   Mean scale score

The following measures related to Algebra 1 performance during the 2007–2008 year for students in Grade 8 were analyzed:

*   Algebra 1 completion rate, defined as percentage of students earning 2.0 or higher for the year in Algebra 1 or a higher-level mathematics course
*   Percentage passing the Algebra High School Assessment (HSA)
*   Mean scale score on Algebra HSA

Demographic characteristics. There were several demographic differences between the group of students in Phase I MSR schools and the group of students in MSMC schools (Table A1). The sample of Phase I MSR students included in the analyses had a slightly higher percentage of African American (32.8% vs. 31.4%) and a lower percentage of Hispanic (26.4% vs. 37.7%) students compared with all MSMC students. Moreover, the Phase I MSR schools had almost the same percentage of African American (32.8% vs. 32.3%) but a lower percentage of Hispanic (26.4% vs. 46.8%) students than the MSMC in-consortium students The proportion of White students in the MSR group (26.9%) is more than twice the proportion of White students in the MSMC, in-consortium group (10.2%). The analyses of student demographics also reveal that a higher proportion of MSMC all students received Free and Reduced-price Meals System (FARMS) services than their Phase I MSR counterparts (46.1% vs. 35.4%). Likewise, a higher percentage of MSMC in-consortium students were eligible to receive FARMS services than were those in Phase I MSR schools (58.5% vs. 35.4%).

The information presented in Table A1 reveals that there is a lower proportion of students receiving Limited English Proficiency (LEP) services in Phase I MSR but a slightly higher proportion of students who receive special education services than their peers in the MSMC student group or the MSMC in-consortium student group. The gap between the Phase I MSR student group and the MSMC student group was 2.4 percentage points for students receiving LEP services (9.8% vs. 12.4%) and 1.6 percentage points in for students receiving special education services (12.5% vs. 10.9%). The same analyses reveal that the gap between the Phase I MSR students and the MSMC in-consortium students was 6.4 percentage points for students receiving LEP services (9.8% vs. 16.2%) and 0.5 percentage points for students receiving special education services (12.5% vs. 12.0%).

Research Findings

The following findings do not control for the demographic differences described above, nor do they test for statistical or practical significance (i.e., whether the differences are large enough to be of practical significance to educators). The analyses in the second section statistically control for demographic differences and include tests of significance.

Summary

The performance of all students in the MSMC schools was lower than that of students in the Phase I MSR schools on all measures for students in Grade 8, on all MSA mathematics measures for students in Grade 7, and on two of three MSA reading measures for students in Grade 7. For students in Grade 6, when compared with Phase I MSR students, all MSMC students had similar performance on the MSA reading measures and attained higher performance on two of three MSA mathematics measures. However, in-consortium MSMC students' performance was lower than for students in the Phase I MSR schools for all grade levels and all measures studied.

Differences across school years in proficiency rates from the MSA in reading and mathematics for all students in Grades 6–8 also were calculated. Note that these data are after only Year one of MSR implementation and include out-of-consortium students in the MSMC schools. For both MSA reading and mathematics, each school had an increase in proficiency rates in the 2007–2008 school year compared with the 2006–2007 school year. Also, for both MSA subjects, the three-year gain in proficiency rate in the 2007–2008 school year compared with the 2004–2005 school year at each of the MSMC schools was larger than the gains at nearly all the Phase I MSR schools .

Detailed Findings

Reading. Findings for reading varied by grade level for all students in the MSMC schools (Table 1.1). In Grade 6, performance on the MSA reading by all students in the MSMC schools was very similar to performance by the Phase I MSR students. For Grade 7, all MSMC students' performance was lower than their Phase I MSR peers on two of the three MSA reading measures. For Grade 8, all MSMC students performed somewhat lower than Phase I MSR students on nearly all MSA reading measures.

Table 1.1
Descriptive Findings for Spring 2008 MSA Reading by School Group

Outcome measure	Phase I MSR	MSMC all	MSMC in-consortium
Grade 6	*N*=1320	*N*=874	*N*=626
% proficient or above	82.2	84.1	78.6
% advanced	46.4	46.7	35.5
Mean scale score	416.4	416.7	406.0
Standard deviation	39	37	33
Maximum scale score	573.0	573.0	518.0
Minimum scale score	305.0	311.0	311.0
Median scale score	416.0	416.0	407.0
Grade 7	*N*=1250	*N*=733	*N*=540
% proficient or above	84.5	84.6	79.3
% advanced	45.6	40.2	29.4
Mean scale score	420.8	416.1	407.3
Standard deviation	38	36	33
Maximum scale score	567.0	537.0	500.0
Minimum scale score	313.0	277.0	277.0
Median scale score	420.0	416.0	407.0
Grade 8	*N*=1314	*N*=749	*N*=560
% proficient or above	78.1	75.6	69.8
% advanced	39.7	33.9	25.2
Mean scale score	419.8	413.8	407.0
Standard deviation	35	34	32
Maximum scale score	552.0	552.0	552.0
Minimum scale score	318.0	318.0	318.0
Median scale score	419.0	410.0	402.0

Compared with the Phase I MSR students, the in-consortium MSMC students had lower levels of performance on all measures of MSA reading in all three grade levels (Table 1.1).

Mathematics. As with reading, findings for MSA mathematics varied by grade level for all students in the MSMC schools (Table 1.2). Performance of all Grade 6 MSMC students was higher than performance of all Grade 6 Phase I MSR students on two measures, percentage proficient or above and mean scale score, but lower on the third measure, percentage advanced. Performance of all MSMC students in Grade 7 and Grade 8 was lower than performance of all Grade 7 and 8 Phase I MSR students on all MSA mathematics measures.

Table 1.2
Descriptive Findings for Spring 2008 MSA Mathematics by School Group

Outcome measure	Phase I MSR	MSMC all	MSMC in-consortium
Grade 6	*N*=1315	*N*=873	*N*=625
% proficient or above	72.7	78.8	72.0
% advanced	28.2	26.9	15.5
Mean scale score	423.6	425.6	414.9
Standard deviation	40	37	32
Maximum scale score	545.0	545.0	523.0
Minimum scale score	331.0	331.0	331.0
Median scale score	418.0	422.0	414.0
Grade 7	*N*=1248	*N*=733	*N*=540
% proficient or above	70.7	66.9	59.8
% advanced	26.4	16.1	7.4
Mean scale score	422.3	413.9	404.7
Standard deviation	42	36	31
Maximum scale score	577.0	547.0	547.0
Minimum scale score	324.0	326.0	326.0
Median scale score	418.0	409.0	404.0
Grade 8	*N*=1312	*N*=749	*N*=560
% proficient or above	68.4	60.6	53.6
% advanced	33.2	20.7	12.7
Mean scale score	428.7	419.2	412.1
Standard deviation	37	33	29
Maximum scale score	559.0	559.0	514.0
Minimum scale score	343.0	330.0	330.0
Median scale score	426.0	416.0	410.0

Compared with the Phase I MSR students, the MSMC in-consortium students' performance was lower on all MSA mathematics measures in all three grade levels (Table 1.2).

Algebra. For all measures related to Algebra 1, performance of all students in the MSMC schools and of in-consortium MSMC students was lower than performance of students in the Phase I MSR schools (Table 1.3).

Table 1.3
Descriptive Findings for Algebra 1 During 2007–2008 by School Group

Outcome measure for Grade 8	Phase I MSR	MSMC all	MSMC in-consortium
Algebra HSA	*N*=551	*N*=370	*N*=284
Pass rate	89.8%	81.9%	80.6%
Mean scale score	436.0	430.1	428.6
Standard deviation	21	20	21
Maximum scale score	525.0	505.0	505.0
Minimum scale score	388.0	367.0	367.0
Median scale score	433.0	430.0	428.0
Algebra 1 or higher	*N*=1355	*N*=747	*N*=558
Completion rate[a]	51.0%	47.3%	41.0%

[a] Defined as percentage of students earning 2.0 or higher in Algebra 1 or a higher-level mathematics course.

Changes over time. This analysis compared differences across years in proficiency rates from the MSA tests in reading and mathematics for all students in Grades 6–8; for the MSMC schools, out-of-consortium students are included in the analysis. For MSA reading, students at each of the MSMC schools and at each of the Phase I MSR schools showed increases in the proficiency rate for fiscal year 2008 compared with fiscal year 2007 (Table 1.4). Likewise, for MSA mathematics, students at each of the MSMC schools and at each of the Phase I MSR schools showed increases in the proficiency rate for fiscal year 2008 compared with fiscal year 2007 (Table 1.5). Note that fiscal year 2008 was Year one of implementation for MSR and Year three of implementation for MSMC.

The three-year changes in proficiency rates from fiscal year 2008 compared with fiscal year 2005 also were calculated. Again, for MSA reading, students at each of the MSMC schools and at each of the Phase I MSR schools showed increases (Table 1.4). However, the three-year gains on the MSA reading tests were higher at the MSMC schools than at the Phase I MSR schools. For MSA mathematics, the three-year change in proficiency rate was positive at each of the MSMC schools and at each of the Phase I MSR schools (Table 1.5). However, the three-year gains on the MSA mathematics tests were higher at each of the MSMC schools than at each of the Phase I MSR schools, with the exception of Earle B. Wood Middle School.

Table 1.4
Changes in Proficiency Rates for MSA Reading by MSMC Schools and MSR Schools

	FY 2005	FY 2006	Annual change FY 2006 vs. FY 2005	FY 2007	Annual change FY 2007 vs. FY 2006	FY 2008	Annual change FY 2008 vs. FY 2007	Three year change FY 2008 vs. FY 2005
Grade 6–8 Reading (% Proficient or advanced)								
MSMC schools, all students								
Argyle	58.0	66.7	+ 8.7	71.7	+ 5.0	83.0	+11.3	+ 25.0
Loiederman[a]	54.2	60.4	+ 6.2	69.8	+ 9.4	80.8	+11.0	+ 26.6
Parkland	54.2	57.4	+ 3.2	72.3	+14.9	80.9	+ 8.6	+ 26.7
MSR schools, all students								
Banneker	68.0	64.7	- 3.3	73.4	+ 8.7	84.9	+11.5	+16.9
Clemente	74.4	75.3	+ 0.9	75.5	+ 0.2	85.0	+ 9.5	+10.6
Montgomery Village	61.6	66.3	+ 4.7	68.8	+ 2.5	76.0	+ 7.2	+14.4
Sligo	60.8	61.1	+ 0.3	68.9	+ 7.8	76.5	+ 7.6	+15.7
Wood	75.9	70.9	- 5.0	76.2	+ 5.3	81.2	+ 5.0	+ 5.3

Note. Change is difference in number of percentage points between time periods being compared.
[a]Parkland data used for FY 2005.

Table 1.5
Changes in Proficiency Rates for MSA Mathematics by MSMC Schools and MSR Schools

	FY 2005	FY 2006	Annual change FY 2006 vs. FY 2005	FY 2007	Annual change FY 2007 vs. FY 2006	FY 2008	Annual change FY 2008 vs. FY 2007	Three year change FY 2008 vs. FY 2005
Grade 6–8 Mathematics (% Proficient or advanced)								
MSMC schools, all students								
Argyle	43.7	55.3	+11.6	57.7	+ 2.4	63.6	+ 5.9	+19.9
Loiederman[a]	53.2	54.9	+ 1.7	63.0	+ 8.1	71.0	+ 8.0	+17.8
Parkland	53.2	50.0	- 3.2	64.6	+14.6	67.2	+ 2.6	+14.0
MSR schools, all students								
Banneker	52.3	49.7	- 2.6	54.3	+ 4.6	65.9	+11.6	+13.6
Clemente	64.4	69.1	+ 4.7	67.8	- 1.3	69.9	+ 2.1	+ 5.5
Montgomery Village	52.6	55.3	+ 2.7	51.9	- 3.4	61.4	+ 9.5	+ 8.8
Sligo	58.7	66.8	+ 8.1	68.6	+ 1.8	70.7	+ 2.1	+12.0
Wood	63.0	65.1	+ 2.1	66.7	+ 1.6	80.9	+14.2	+17.9

Note. Change is difference in number of percentage points between time periods being compared.
[a]Parkland data used for FY 2005.

Section II. Data Summary for Advanced Analyses

Shahpar Modarresi, Ph.D.

Research Questions

The following research questions guided the advanced analyses:

1. Are there differences in student performance between the group of students in the five Phase I Middle School Reform (MSR) schools and the group of students in the three Middle School Magnet Consortium (MSMC) schools after controlling for students' prior performance, demographics, and service receipt measures?

2. Are there differences in student performance between the group of students at the five Phase I MSR schools and between the groups of in-consortium students in the three MSMC schools after controlling for students' prior performance, demographics, and service receipt measures?

Research Methodology

Both statistical significance tests and effect sizes are used in this study to address the research questions. The former examines the likelihood that observed differences among the groups of students (Phase I MSR compared to MSMC or Phase I MSR compared to in-consortium MSMC) occurred by chance. However, statistical significance is influenced by sample sizes such that with a large sample, even small differences may be significant. Therefore, effect sizes (ES) were used to judge whether the observed differences among groups are large enough to be of practical significance to educators (American Psychological Association, 2001). Based on the Cohen's convention (1988), an effect size of 0.2 is considered small, an effect size of 0.5 is considered medium, and an effect size of 0.8 or greater may be considered large.

The outcome measures included scale scores[1] from the following: a) the spring 2008 Maryland School Assessment (MSA) in reading and mathematics for Grades 6, 7, and 8; and b) Grade 8 Algebra High School Assessment (HSA). The analysis of covariance (ANCOVA) was used to test for significant differences among students' mean scale scores on MSA and Algebra HSA tests. Only students who had complete data for both these outcome measures and prior performance measures were included in the analyses.

Although the findings obtained from this part of study were based on sound evaluation design, as well as appropriate analyses, it should be noted that causality should not be inferred from the current study. (For more detailed methodology, see Appendix A.)

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[1] Scale scores are units of a single, equal-interval scale and are expressed as numbers that may range from 0 through 999. The equal-interval property of the scale makes scale scores especially appropriate for various statistical purposes.

Research Findings

Summary of Findings for Question 1

1. Are there differences in student performance between the group of students in the five Phase I Middle School Reform (MSR) schools and the group of students in the three Middle School Magnet Consortium (MSMC) schools after controlling for students' prior performance, demographics, and service receipt measures?

Reading. Grade level comparisons of the two groups of students revealed that on average, there were no significant differences between the performance of the two groups of students (Phase I MSR vs. MSMC), as measured by their MSA reading scores, after factoring out the effects of students' prior performance, demographics, and service receipt measures in all of the three grade levels analyzed (Grades 6, 7, and 8).

Mathematics. Similar analyses revealed relatively small patterns of academic benefits in mathematics for Grade 7 and 8 students attending Phase I MSR. The comparisons of MSA mathematics scores between the two groups of students from Phase I MSR and those from the MSMC schools indicated that after adjusting for the effects of students' prior performance and background characteristics, there were small differences between the two groups of students in favor of the Phase I MSR students for Grades 7 and 8 and no differences for students in   Grade 6.

Algebra. An examination of Algebra HSA scores revealed no significant differences between Grade 8 students from Phase I MSR schools and those from the MSMC schools.

Detailed Findings for Question 1

Reading. Analysis of Grade 6 and Grade 7 MSA reading scores (Table 2.1) revealed no significant differences between the two groups of students (Phase I MSR schools vs. MSMC all students).

Table 2.1
Adjusted Means and Effect Size for 2008 MSA Reading Scores for
Phase I MSR Students Versus MSMC All Students

Grade	Phase I MSR N (Adjusted mean scale score)	MSMC all N (Adjusted mean scale score)	Mean difference	Effect size
6	1211 (409.05)	816 (409.54)	-0.50	-0.01
7	1151 (414.92)	690 (413.70)	1.22	0.03
8	1226 (417.64)	706 (415.65)	1.99[a]	0.06

[a]The mean difference is significant at 0.05 level.

In Grade 8, the Phase I MSR students scored significantly higher in MSA reading (Table 2.1) than their MSMC peers.   However, the calculated effect size reveals that the difference was not

large enough to be useful in an educational setting (ES=0.06). This negligible effect size indicates that the mean reading scores for MSR students is at the 50th percentile for the MSMC students. Practically, one cannot detect consistent meaningful differences in the performances of students in MSR and MSMC schools.

Mathematics. Analysis of Grade 6 MSA mathematics scores (Table 2.2) revealed no significant differences between the two groups of students (Phase I MSR vs. MSMC all students).

Table 2.2
Adjusted Means and Effect Size for 2008 MSA Mathematics Scores for
Phase I MSR Students Versus MSMC All Students

Grade	Phase I MSR N (Adjusted mean scale score)	MSMC all N (Adjusted mean scale score)	Mean difference	Effect size
6	1226 (421.76)	830 (422.39)	-0.63	-0.02
7	1152 (423.58)	705 (418.05)	5.52[a]	0.14
8	1231 (427.76)	718 (423.33)	4.44[a]	0.12

[a]The mean difference is significant at 0.05 level.

In Grades 7 and 8, Phase I MSR students significantly outperformed their MSMC peers as measured by their MSA mathematics test scores (Table 2.2). However, the effect size for each grade level indicates that the difference in MSA mathematics scores between the two groups of students are very small in an educational setting (ES<0.20). Specifically, the mean score for the average student in the MSR schools is at the 54th percentile of the students in the MSMC schools.

Algebra. For Algebra HSA scores, the difference between the two groups of students (Phase I MSR schools vs. MSMC all students) was not statistically significant and was too small to be meaningful in an educational setting (Table 2.3).

Table 2.3
Adjusted Means and Effect Size for the 2008 Algebra HSA Scores for
Phase I MSR Students Versus MSMC All Students

Grade	Phase I MSR N (Adjusted mean scale score)	MSMC all N (Adjusted mean scale score)	Mean difference	Effect size
8	521 (428.81)	350 (429.02)	-0.21	-0.01

Summary of Findings for Question 2

2. Are there differences in student performance between the group of students at the five Phase I MSR schools and between the groups of in-consortium students in the three MSMC schools after controlling for students' prior performance, demographics, and service receipt measures?

Reading. Grade level comparisons of the two groups of students revealed that on average, there were no significant differences between the performances of the Phase I MSR students and their peers attending the in-consortium MSMC as measured by MSA reading scores, after factoring out the effects of students' prior performance, their demographics, and service receipt measures.

Mathematics. The comparisons of MSA mathematics scores between the group of students from Phase I MSR and the group of in-consortium students from MSMC schools indicated that after adjusting for the effects of students' prior performance and background characteristics, there were small differences between the two groups of students in favor of the Phase I MSR students for Grades 7 and 8 and no differences for students in Grade 6.

Algebra. The analysis of the Algebra HSA scores for Grade 8 students did not find any significant differences between the group of students from the Phase I MSR schools and their in-consortium MSMC peers.

Detailed Findings for Question 2

Reading. For Grades 6 and 8, the analysis of MSA reading scores between a group of students attending Phase I MSR schools and their MSMC in-consortium peers did not reveal any significant differences (Table 2.4).

Table 2.4
Adjusted Means and Effect Size for 2008 MSA Reading Scores for
Phase I MSR Students Versus MSMC In-consortium Students

Grade	Phase I MSR N (Adjusted mean scale score)	MSMC in-consortium N (Adjusted mean scale score)	Mean difference	Effect size
6	1211 (406.13)	582 (404.46)	1.67	0.03
7	1151 (413.31)	501 (410.58)	2.74[a]	0.07
8	1226 (413.55)	520 (411.59)	1.96	0.06

[a]The mean difference is significant at 0.05 level.

For Grade 7, students from the Phase I MSR schools significantly outperformed their MSMC in-consortium peers as measured by their MSA reading scores. However, the difference was too small (ES=0.07), indicating that the distribution of the scores for MSR and MSMC students is similar. Specifically, the average score for the students in MSR schools is around the 50th percentile of the scores for MSMC in-consortium students.

Mathematics. For Grade 6, the difference in MSA mathematics scores between the group of Phase I MSR students and their MSMC in-consortium peers was too small to be statistically significant or of practical significance to educators (Table 2.5).

Table 2.5
Adjusted Means and Effect Size for 2008 MSA Mathematics Scores for
Phase I MSR Students Versus MSMC In-consortium Students

Grade	Phase I MSR N (Adjusted mean scale score)	MSMC in-consortium N (Adjusted mean scale score)	Mean difference	Effect size
6	1211 (419.18)	596 (417.81)	1.37	0.04
7	1152 (422.91)	516 (416.37)	6.54[a]	0.16
8	1231 (425.46)	531 (419.72)	5.73 [a]	0.16

[a]The mean difference is significant at 0.05 level.

For Grades 7 and 8, students from the Phase I MSR schools significantly outperformed their MSMC in-consortium peers as measured by MSA scores in mathematics (Table 2.5). However, the effect sizes for both grade levels indicate that the difference between the two groups of students was small for an educational setting (ES=.16). This small effect size indicates that the mean score for the average student in the MSR schools is at the 58th percentile of the scores for MSMC in-consortium students.

Algebra. The analysis of Algebra HSA test scores from Grade 8 students did not reveal any significant differences between the group of Phase I MSR students and the group of in-consortium MSMC students (Table 2.6).

Table 2.6
Adjusted Means and Effect Size for 2008 Algebra HSA Scores for
Phase I MSR Students Versus MSMC In-consortium Students

Grade	Phase I MSR N (Adjusted mean scale score)	MSMC in-consortium N (Adjusted mean scale score)	Mean difference	Effect size
8	521 (427.08)	266 (426.28)	0.80	0.04

Conclusion for Sections I and II

The performance of students in MSR schools and MSMC schools were comparable overall. Advanced analysis showed no significant differences between the two groups studied. Based on the descriptive analyses, each school in this study showed progress after one year of MSR implementation, as well as over three years of MSMC implementation. The positive results after one year of MSR implementation and after three years of implementation of MSMC suggest clear benefits of both initiatives. However, results of the descriptive analyses were limited by the difficulty isolating each sample; MSMC data is impacted by out-of-consortium students and MSR data is impacted by students in programs for the highly gifted. These aspects of the data should lead to caution in direct comparisons of the results, especially for those based on descriptive analyses.

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Appendix A

Detailed Methodology for Advanced Analyses

Due to the lack of random assignment of students to either Phase I MSR schools or MSMC schools, this study used a quasi-experimental design to address the research questions. When using this design, it is important to recognize that the two groups of students may have important preexisting differences that may influence their achievement after exposure to an intervention (Gay & Airasian, 2000). To improve the internal validity of the findings, information on measured covariates is incorporated into estimation of the treatment effect through the use of propensity score method. Propensity scores (based on students' pretest scores, demographics, and service receipt measures) were computed using a logistic regression model as recommended by previous researchers (Luellen, et. al., 2005).

To balance the nonequivalent groups, the propensity score was divided into five categories and used as a categorical covariate in each of the statistical models (Rosenbaum & Rubin, 1983, 1984, 1985). The students' characteristics and service receipt measures also were included in the ANCOVA models to reduce the residual variability of the outcome measures. To test for non-parallelism or interaction (homogeneity of regression slopes), the product term between pretest scores and group variable was included in each of the ANCOVA models. The grade-level analyses controlled for students' prior performance (i.e., MSA scores from previous year); demographics; eligibility for Free and Reduced-price Meals System services, special education, and/or English Language Learner services plus the calculated propensity. The following formula was used to calculate the effect size in this evaluation: effect size $= (M_t - M_c)/SD$. The M_t and M_c are adjusted group means for students who participated in Phase I MSR and those two groups of students who attended the MSMC Schools, respectively, and SD is the standard deviation of the pooled outcome scores.

Table A1
Demographic Profile of Students in MSR, MSMC, and MSMC In-consortium Students

Demographic subgroup	MSR		MSMC, all students		MSR		MSMC, in- consortium only	
	N	%	N	%	N	%	N	%
Race								
African American	1276	32.82	740	31.41	1276	32.82	558	32.33
American Indian	9	0.23	8	0.34	9	0.23	5	0.29
Asian American	532	13.68	283	12.01	532	13.68	179	10.37
Hispanic	1026	26.39	889	37.73	1026	26.39	808	46.81
White	1045	26.88	436	18.51	1045	26.88	176	10.20
Gender								
Male	2019	51.93	1194	50.68	2019	51.93	873	50.58
Female	1869	48.07	1162	49.32	1869	48.07	853	49.42
Special services								
Not FARMS	2511	64.58	1270	53.90	2511	64.58	716	41.48
FARMS	1377	35.42	1086	46.10	1377	35.42	1010	58.52
Not special education	3403	87.53	2099	89.09	3403	87.53	1519	88.01
Special education	485	12.47	257	10.91	485	12.47	207	11.99
Not LEP	3508	90.23	2064	87.61	3508	90.23	1447	83.84
LEP	380	9.77	292	12.39	380	9.77	279	16.16