

Evaluation of Smarter Balanced Test Results at MicroSociety Academy Charter School

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Summary

In the fall of 2015 *MicroSociety*® Academy Charter School (MACS) opened as a *MicroSociety* school serving grades K-5. In the fall of 2016, the school added sixth graders, and MACS plans eventually to serve students in grades K-8.

In the spring of 2016, MACS students in Grades 3-5 completed New Hampshire's Smarter Balanced Assessment Consortium exams in reading and mathematics. In the spring of 2017, MACS students in Grades 3-6 completed the Smarter Balanced exams. MACS school personnel compared test performance at their school to test performance state-wide and district-wide in Nashua, New Hampshire—reporting wide differences favoring MicroSociety Academy students in most grades and subjects tested (MACS, 2016; Lowell Sun, 2018).

This report was commissioned by MicroSociety, Inc. with two goals: to have an independent analyst confirm the positive results reported by school personnel; and to provide additional context for interpreting testing results at MACS.

This report confirms that in the spring of 2016 and 2017 for both reading and mathematics at all grade levels there was a larger percentage of MACS students scoring Level 3 or Level 4 on the Smarter Balanced Assessment than was typical statewide. Given the apparent economic advantage of MACS students vs. the rest of the state, this higher performance was to be expected. In fact, were it not the case there would be cause for concern.

More tellingly, MACS students were also more likely to score at Level 3 or Level 4 on the Smarter Balanced Assessment than were students at demographically similar New Hampshire schools. For reading, this pattern of higher achievement held at all three grade levels tested in 2016 and for all four grade levels tested in 2017. For mathematics, this pattern of higher achievement held at two of the three grade levels tested in 2016 and at three of the four grade levels tested in 2017.

Overall Strategy

This report compares achievement on the Smarter Balanced exam at MACS to achievement by two comparison groups:

1. Students statewide, and
2. Students at a set of demographically similar New Hampshire schools.

This report does NOT compare achievement at MACS to achievement district-wide in Nashua, because the groups are not comparable. According to the National Center for Education Statistics (NCES)

Elementary and Secondary Information (ELSI) system, in 2016 43% of Nashua students received free or reduced lunch, compared to 34% statewide and 16% at MACS. Socio-economic status, as reflected in the percent of students receiving free and reduced lunch, is a good predictor of student achievement. In fact, students' average test scores in Nashua have been consistently below test scores statewide, whereas test-scores at MAC S and at three other schools in Nashua school district that are demographically similar to MACS have been consistently above test scores statewide¹.

MACS is a very small school, with only 11 or 12 students tested at each grade level in the spring of 2016, and either 19 or 20 students tested at each grade level in the spring of 2017. Consequently, even moderately large changes in percent of students meeting or exceeding state standards should be interpreted cautiously. A single student having a good (or bad) testing day can change the percentage of MACS students meeting standards for an entire grade level by 5% to 10%.

Results by Year

2016 Results

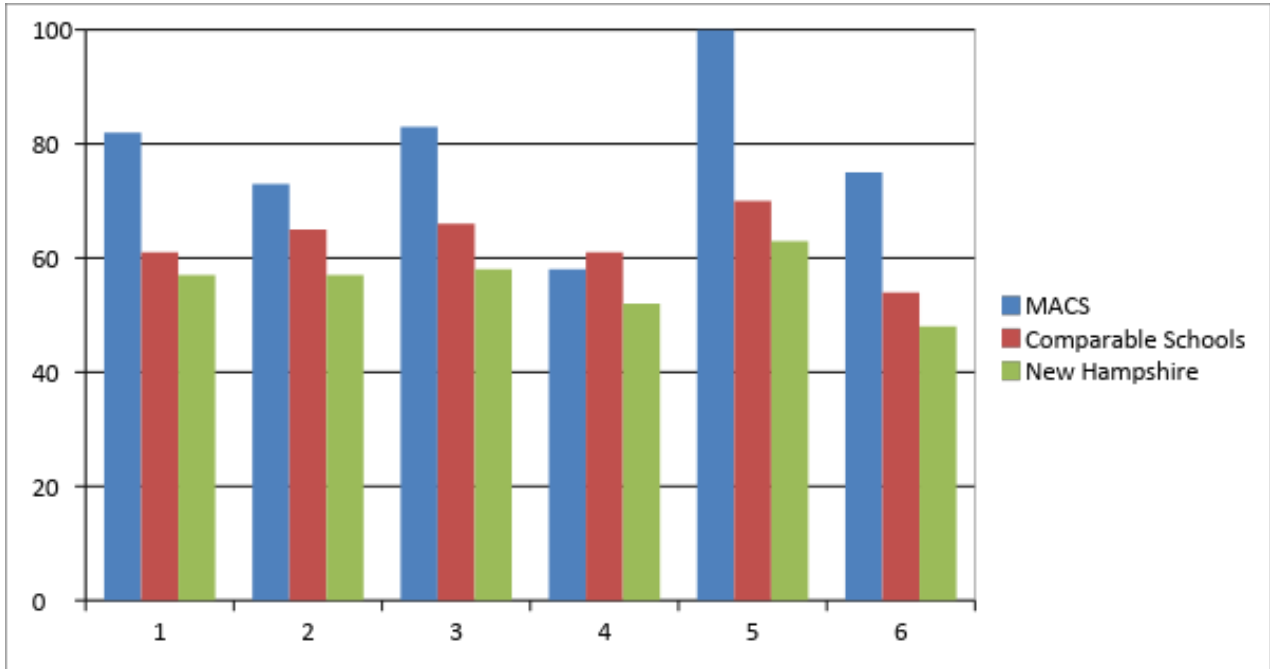
Table 1 and Figure 1 compare the 2016 Smarter Balanced test scores at MACS to scores statewide and scores at a set of demographically similar schools

Table 1: 2016 Comparisons of Smarter Balanced Assessment Results

Grade	Content Area	MACS (%) at level 3 or above	Comparable Schools (%) at level 3 or above	NH (%) at level 3 or above
3	Reading	82	61	57
	Mathematics	73	65	57
4	Reading	83	66	58
	Mathematics	58	61	52
5	Reading	100	70	63
	Mathematics	75	54	48
6	Reading	MACS not tested	MACS not tested	MACS not tested
	Mathematics	MACS not tested	MACS not tested	MACS not tested

Figure 1. 2016: % Students achieving Level 3 or Above on Smarter Balanced Assessment, by Grade level

¹ See the Technical Appendix for details about how the demographically similar schools were selected.



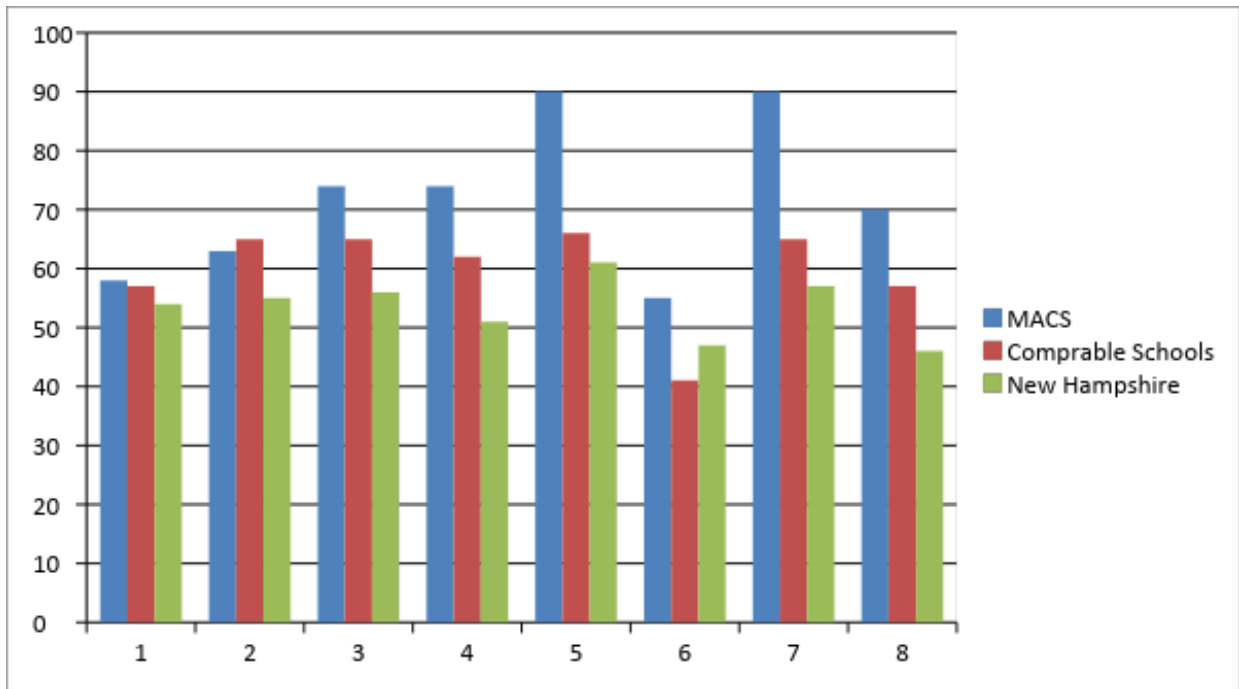
2017 Results

Table 2 and Figure 2 compare the 2017 Smarter Balanced test scores at MACS to scores statewide and scores at a set of demographically similar schools.

Table 2. 2017 Comparisons of Smarter Balanced Assessment Results

Grade	Content Area	MACS (%) at level 3 or above	Comparable Schools (%) at level 3 or above	NH (%) at level 3 or above
3	Reading	58	57	54
	Mathematics	63	65	55
4	Reading	74	65	56
	Mathematics	74	62	51
5	Reading	90	66	61
	Mathematics	55	41	47
6	Reading	90	65	57
	Mathematics	70	57	46

Figure 2. 2017: % Students achieving Level 3 or Above on Smarter Balanced Assessment, by Grade level



Significance of Smarter Balanced Results

As can be seen in Tables 1 and 2, MACS students scored higher than statewide averages in both reading and mathematics at all grade levels in both 2016 and 2017. While encouraging, these results are not surprising given the relative socio-economic advantage of MACS students.

More importantly, MACS students out-performed students at demographically matched comparison schools. In 2016, MACS students scored higher than demographically matched schools in all grades and subject areas except Grade 4 mathematics. In 2017, MACS students scored higher than demographically matched schools in all grades and subject areas except Grade 3 mathematics. Overall, MACS out-scored demographically matched schools on 12 out of 14 possible comparisons. The probability of scoring higher on at least 12 out of 14 comparisons by chance is only 0.6%. Thus, despite the small number of students tested each year at MACS, we can conclude that students at MACS were outscoring their peers at similar schools to a degree that cannot easily be explained by chance.

Changes between Spring of 2016 and Spring of 2017

Table 3 and Figure 3 report changes at MACS between the spring of 2016 and the spring of 2017 in percent of students scoring Level 3 or above on the Smarter Balanced Reading assessment, compared to changes at demographically comparable schools and changes statewide. As can be seen in the table and figure, for each group reading scores dropped at all three grade levels tested. The drop-off in reading achievement was steeper at MACS than statewide or at demographically comparable schools.

Table 4 and Figure 4 report changes at MACS between the spring of 2016 and the spring of 2017 in percent of students scoring Level 3 or above on the Smarter Balanced Mathematics assessment, compared to changes at demographically comparable schools and changes statewide. As can be seen in the table and figure, there was a slight decrease statewide in the percent of students achieving proficient or better in mathematics. In contrast, there was no consistent trend in how mathematics achievement changed at MACS or at demographically comparable schools.

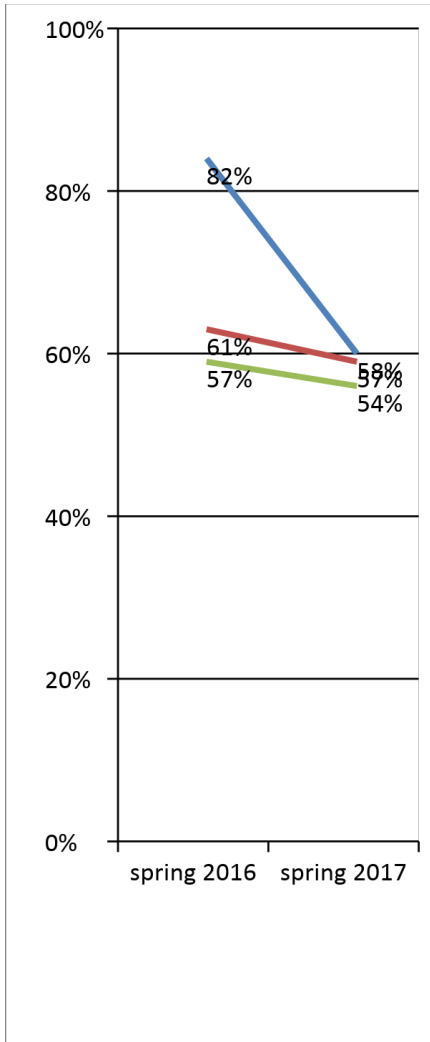
The relatively large changes in proficiency levels at MACS are likely due to the small size of grade level cohorts at the school. With small sample sizes, there are likely to be large random swings in the percent of students who are proficient or advanced. Nonetheless, school personnel at MACS might be well advised to monitor reading achievement, because if the downward trend were to continue in the future there would be cause for concern.

Table 3: Change in Reading Achievement, by Grade Level

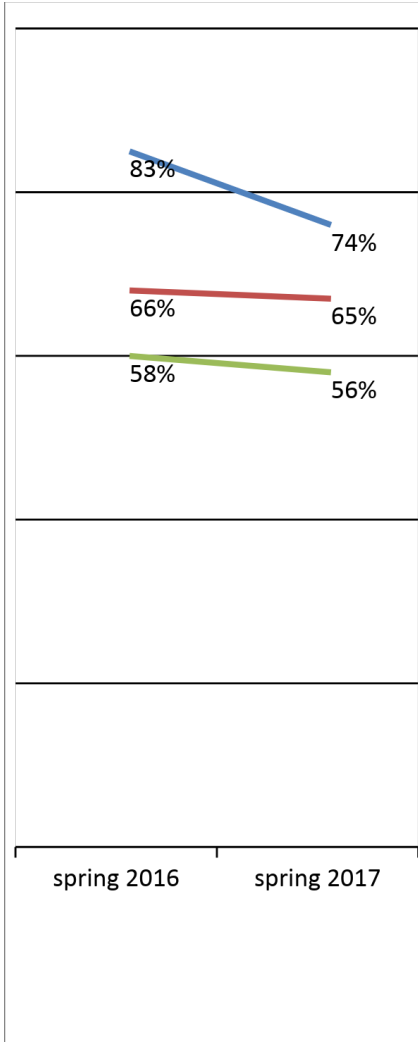
Grade	Year (spring)	MACS (%) at level 3 or above	Comparable Schools (%) at level 3 or above	NH (%) at level 3 or above
3	2016	82	61	57
	2017	58	57	54
4	2016	83	66	58
	2017	74	65	56
5	2016	100	70	63
	2017	90	66	61

Figure 3: Change in Reading Percent Proficient or Better, by Grade Level

Grade 3



Grade 4



Grade 5

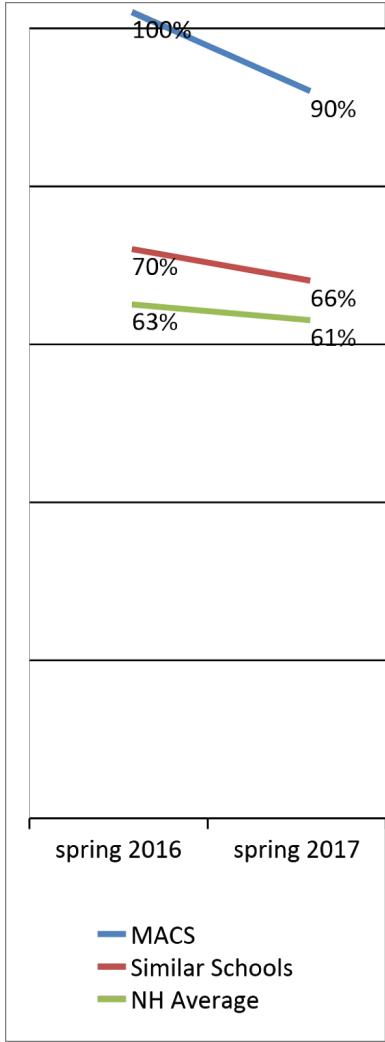


Table 4: Change in Mathematics Achievement, by Grade Level

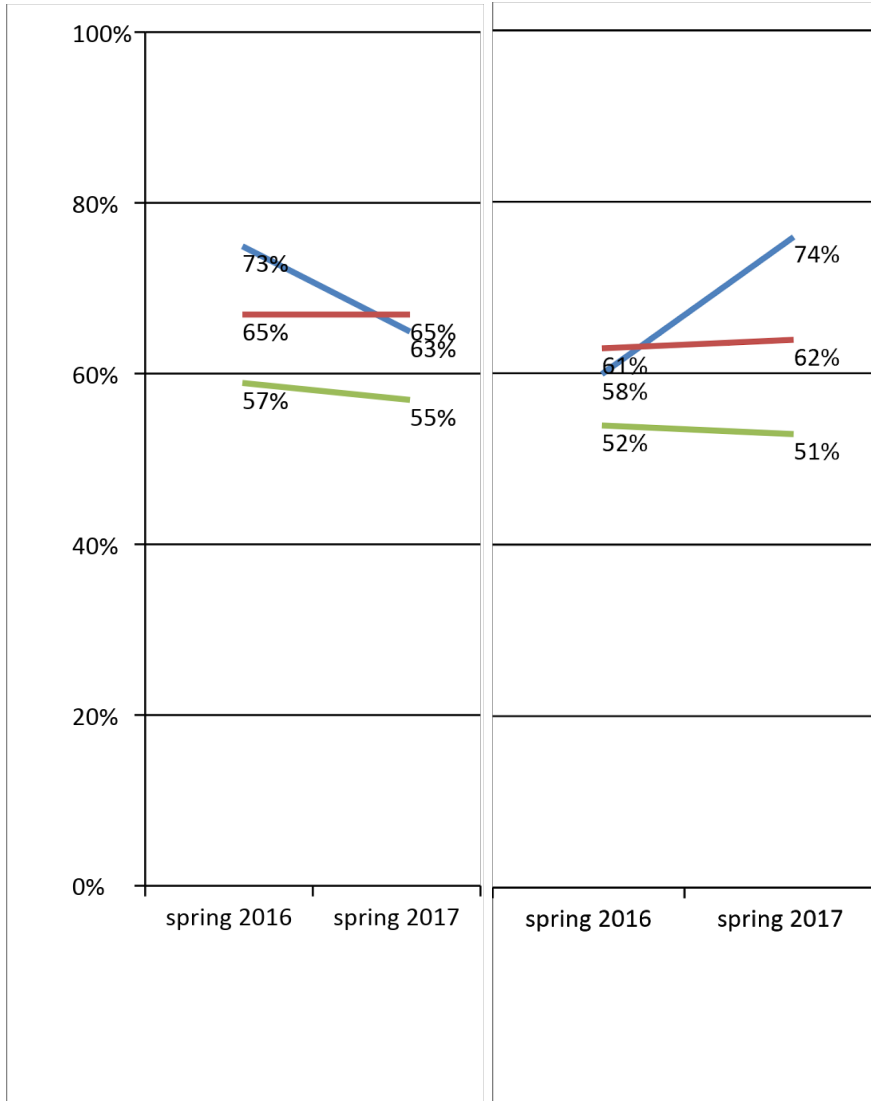
Grade	Year (spring)	MACS (%) at level 3 or above	Comparable Schools (%) at level 3 or above	NH (%) at level 3 or above
3	2016	73	65	57
	2017	63	65	55
4	2016	58	61	52
	2017	74	62	51
5	2016	75	54	48
	2017	55	41	47

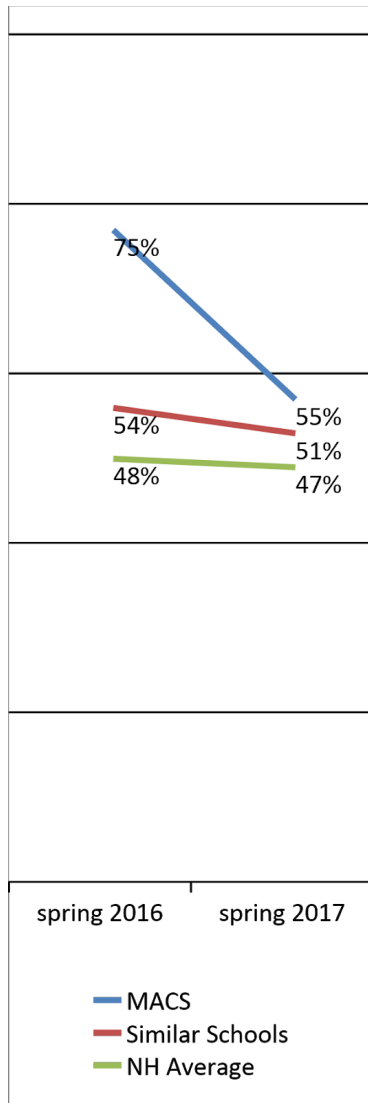
Figure 4: Change in Mathematics Percent Proficient or Better, by Grade Level

Grade 3

Grade 4

Grade 5





Discussion

During the 2015-16 school year and 2016-17 school year, the *MicroSociety* Academy Charter School achieved better results on 3rd, 4th, 5th, and 6th grade Smarter Balanced math and reading than did demographically similar schools or statewide averages. While the advantage over state scores can probably be explained by Socio-economic status, a different explanation is needed for the achievement advantage over demographically similar schools. This study could not evaluate what this explanation might be. Possible explanations include school leadership and staff, school curriculum, self-selection of unusually motivated or talented students to attend the school, the unusually high percentage of Asian students at MACS, or the implementation of *MicroSociety*.

Technical Appendix

Identifying Matched Comparison Schools

Because MACS opened as a *MicroSociety* campus, there is no test data prior to implementation that can be used to match the school to similar Comparison schools. Consequently, this analysis matched the school to Comparison schools based on demographic characteristics. Specifically, the study identified appropriate comparison schools based on percent of students receiving free or reduced lunch, and racial composition.

Data for matching were drawn from the National Center for Education Statistics (NCES) Elementary and Secondary Information (ELSI) system. The ELSI system provided demographic data for the 2015-16 school year.

Because many schools in New Hampshire teach Grade 3-5 or Grade 6, but not both, the study of necessity used two sets of “demographically matched” schools: one set for Grades 3-5, and a different set for Grade 6. Schools considered as candidate matches were all New Hampshire public schools in the database that taught the appropriate grade levels in 2015-16². Matching variables were percent of students receiving free/reduced lunch, and percent enrollment for each of the three races making up most of the student body at MACS: percent White, percent Hispanic, and percent Asian.

A school was selected as a demographic match if it was in the 25% of all New Hampshire schools in the data set who were closest to MACS for EACH of the four selection variables: percent free or reduced lunch, percent White, percent Hispanic, and percent Asian. This process yielded a set of seven demographically matched schools for Grades 3-5, and a set of three demographically matched schools for Grade 6.

The racial composition of MACS is somewhat unusual: Of the 217 New Hampshire schools teaching Grades 3-5 in the Grades 3-5 database, MACS had the second-highest proportion of Asian students and the twenty-fourth highest proportion of Hispanic students. Of the 177 New Hampshire schools in the Grade 6 data base, MACS had the second-highest proportion of Asian students and the eighth-highest proportion of Hispanic students. Overall, the matching process yielded schools whose average profile was quite close to that of MACS in Socio-Economic status, but somewhat more White and less Asian. Tables A1 and A2 compare the demographics at MACS to the across-school-average (i.e., the mean of the school means) demographics at the matched comparison schools.

Table A1: Demographic Variables, *MicroSociety* Academy Charter School vs. Average at 7 Matched-Comparison Schools used for Grades 3-5

	% FRL	% Black	% White	% Hispanic	% Asian
Comparisons	14.9%	1.7%	71.9%	9.4%	12.4%

² The NCES ELSI database was only able to provide demographic data through the spring of 2016. Although MACS did not offer Grade 6 until the 2016-2017 school year, school demographics were available for grades K-5 from the spring of 2016. Consequently, matches for Grade 6 were determined by comparing schoolwide demographics at MACS to schoolwide demographics of the 176 New Hampshire schools that taught sixth grade in 2015-16.

MACS	16.0%	1.1%	55.3%	11.7%	29.8%
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Table A2: Demographic Variables, *MicroSociety Academy Charter School* vs. Average at 3 Matched-Comparison Schools used for Grade 6

	% FRL	% Black	% White	% Hispanic	% Asian
Comparisons	17.6%	1.1%	85.8%	5.3%	3.8%
MACS	16.0%	1.1%	55.3%	11.7%	29.8%

Dependent Variables

Data describing the percent of students meeting or exceeding expectations each year were obtained from New Hampshire state websites. These included excel spreadsheets providing school-level results each year and pdf files describing state-level results each year.