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Interpreting Results on the Fifth Grade *Minnesota Comprehensive Assessments* in Reading and Math: Links to Performance on the *Minnesota Basic Standards Test* Three Years Later

Have you ever wished that there were some way of telling whether 8th grade students are likely to pass the *Minnesota Basic Standards Test*—in time to prepare them to pass on their first attempt?

Minnesota now has longitudinal data that can help to do just that. For the first time since the *MCAs* were given to fifth graders statewide, the eighth grade students who took the *BSTs* in February 2001 also took the *MCAs* in 1998. This longitudinal data makes it possible to compare and correlate the students' scores on both tests. The relationship between students' test scores on the 5th grade *MCAs*, and their level of preparation three years later can be a useful tool for recognizing which students may not succeed on their first attempt at passing the *BSTs* in 8th grade.

This report contains tables and graphs showing how students with various 5th grade *MCA* scores performed three years later on the *BST*. These results should be useful for those who want to use *MCA* scores along with other information to identify students who may be at substantial risk of not meeting the state's high school graduation requirements in reading and mathematics as 8th graders. The data should also enhance the interpretation of *MCA*

scores by adding to the information in the test materials, and by adding to the data linking performance on the *MCA* to national percentile ranks.¹

To develop the tables, we started with files containing the *MCA* scores of all 5th grade public school students taking the reading and mathematics test in 1998. Just over 60,000 students took each test. For each student, we then searched for a record of their 8th grade *BST* reading and mathematics scores in the 2001 public school testing files. Matching records were found for 53,527 students in reading and 53,286 students in mathematics.² (There were approximately 7,000 students who either did not take the *BST* as 8th graders or whose 8th grade record was not located.

RESULTS

Figure 1 and Table 1 (see insert/p. 3) show how the probability of passing the *BST* increases as a function of performance on the *MCA*. For each *MCA* score, Figure 1 and Table 1 show the percentage of 8th graders who passed the *BST* in reading three years later. For the sake of brevity, scores below 900 and above 1710 were deleted from the table.

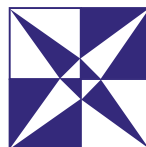
To illustrate how these percentages were

NOTES

1 *Interpreting the Minnesota Comprehensive Assessment Levels: A Link to National Percentile Ranks* (1999).

Minneapolis, MN: Office of Educational Accountability, College of Education and Human Development, University of Minnesota.

2 The Pearson product moment correlation between 5th grade *MCA* reading scores and 8th grade *BST* reading scores was .74. The Pearson product moment correlation in mathematics was .79. The reading or mathematics achievement level attained by 5th grade is a good, but not perfect, predictor of the level attained three years later.



calculated, consider the *MCA* score of 1500. We found 2,417 students with a 1998 5th grade *MCA* reading score of 1500 who had also taken the 8th grade reading *BST* in 2001. Of these 2,417 students, 2,369 passed the *BST*. The 2,369 students who passed the *BST* constitute 98% of all students with an *MCA* score of 1500. Therefore, the table shows that 98% of the students with a 1998 *MCA* score of 1500 went on to pass the 8th grade *BST* test in reading. For all other *MCA* scores, the passing

percentages were calculated in a similar fashion.

The interpretation of these percentages warrants some comment. Again, consider the *MCA* score of 1500. While 98% of the students who received a score of 1500 on the *MCA*s were able to make enough progress in the next three years to pass the *BST* in 8th grade, a 5th grade score of 1500 does not *guarantee* that the student will pass in 8th grade: 2% of those students did **not** pass. Nor do our data suggest that the student with a score of 1500 is capable of passing the *BST* in 5th grade. The data merely indicate that the vast majority of students with an *MCA* score of 1500 were able to make enough *additional* progress by 8th grade to meet the state's minimum high school graduation standard.

As another example, consider the *MCA* score of 1200. Table 1 shows that only 47% of the students scoring 1200 on the *MCA*s subsequently passed the *BST* in eighth grade. For students at this level of reading achievement, it is quite possible to make enough progress between 5th and 8th grade to pass the *BST*—but passing the *BST* requires such a large amount of progress that less than half of the students were able to do so.

The interpretive materials that accompany the *MCA*s contain descriptions of four achievement levels (see sidebar). For the purposes of this analysis and to provide a greater differentiation, Level II was subdivided into two parts, which we have designated Level IIa and Level IIb, for convenience. Level IIa scores range from 1260 to 1419, and Level IIb scores range from 1420 to 1499. A score of 1420 is the cut score used for

Adequate Yearly Progress (AYP) purposes when analyzing school averages. In light of the data in Table 1, it is possible to develop an interpretation for each level based on the likelihood that students will pass the reading *BST* as 8th graders.

In reading, the lowest score in Level IIa is 1260. Table 1 shows that 62% of the students with a score of 1260 went on to pass the reading *BST* as 8th graders. At Level II or above (i.e., at all scores of 1260 or above), students passed the *BST* at a rate of 60% or better.

The lowest score in Level IIb is 1420. Table 1 shows that 93% of the students with an *MCA* reading score of 1420 subsequently passed the *BST* in reading. At scores in Level IIb or above, students passed at a 90% rate or better.

The lowest score in Level III is 1500. Fully 98% of the students with a score of 1500 went on to pass the *BST*. The lowest score in Level IV is 1710, a score at which all students subsequently passed.

Figure 2 and Table 2 (see insert/p. 4) show the corresponding data for mathematics. In mathematics, the lowest score in Level IIa is 1240. At this score in Table 2, 42% of the students went on to pass the 8th grade mathematics *BST*. For every *MCA* math score in Level II and above, at least 40% went on to meet the state's minimum high school graduation requirement in mathematics by 8th grade.

For students at a score of 1420, the lowest score in Level IIb, 93% of the students subsequently passed the *BST* in math. At a score of 1500, the lowest score in Level III, 97% of the students passed. At the lowest score in Level IV, a score of 1710, all students passed.

Achievement Levels

Achievement levels describe Minnesota student progress toward the state's High Standards in reading, mathematics, and, for 5th graders, writing.

Level IV: Students demonstrate superior performance, well beyond what is expected at the grade level.

Level III: Students are working above grade level. Many are proficient with challenging subject matter.

Level II: Most students in Minnesota fall within this level. This includes a wide range of students, from those with partial knowledge and skills to students who are increasingly proficient with grade level material.

Level I: Students have gaps in the knowledge and skills necessary for satisfactory work.

Figure 1. Percentage of 8th Grade Students Passing the *BST* Reading Test by Students' 5th Grade *MCA* Reading Scores

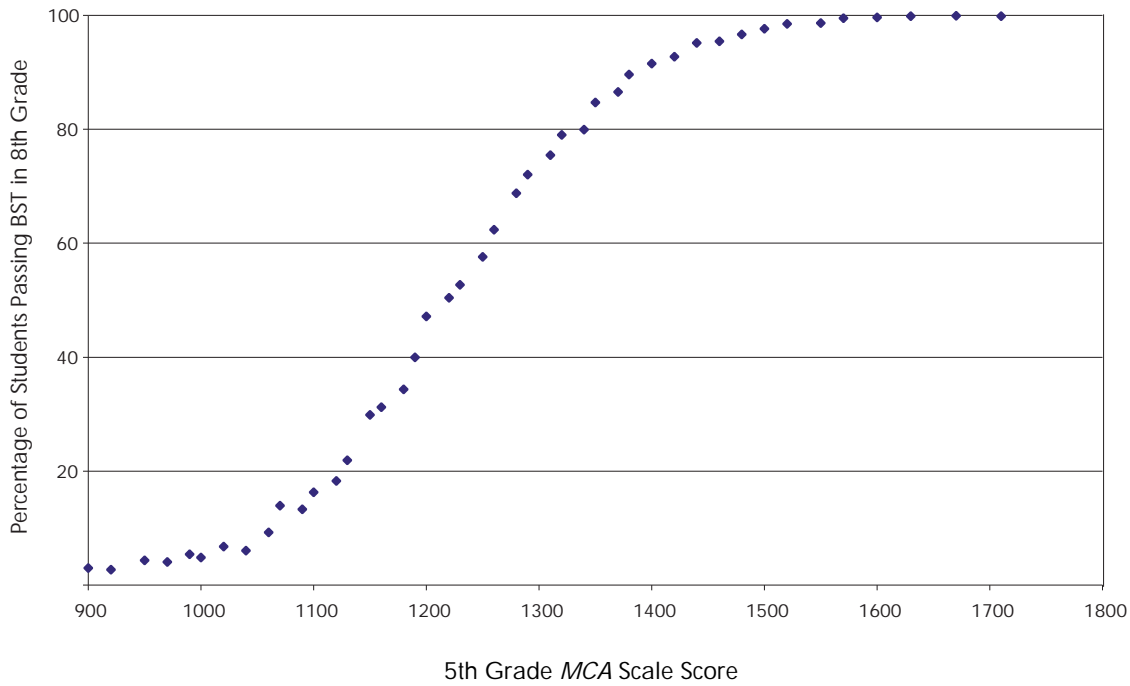


Table 1. Percentage of 8th Grade Students Passing the Reading *BST* for each 5th Grade Reading *MCA* Score

5th Grade <i>MCA</i> Scale Score	Percentage Passing <i>BST</i> In 8th Grade	5th Grade <i>MCA</i> Scale Score	Percentage Passing <i>BST</i> In 8th Grade	5th Grade <i>MCA</i> Scale Score	Percentage Passing <i>BST</i> In 8th Grade
Achievement Level I		Achievement Level IIa		Achievement Level III	
900 or below	3	1260	62	1500	98
920	3	1280	69	1520	99
950	4	1290	72	1550	99
970	4	1310	75	1570	99
990	5	1320	79	1600	100
1000	5	1340	80	1630	100
1020	7	1350	85	1670	100
1040	6	1370	87	Achievement Level IV	
1060	9	1380	90	1710 or above	100
1070	14	1400	92		
1090	13	Achievement Level IIb			
1100	16	1420	93		
1120	18	1440	95		
1130	22	1460	95		
1150	30	1480	97		
1160	31				
1180	34				
1190	40				
1200	47				
1220	50				
1230	53				
1250	58				

Figure 2. Percentage of 8th Grade Students Passing the *BST* Math Test by Students' 5th Grade *MCA* Math Scores

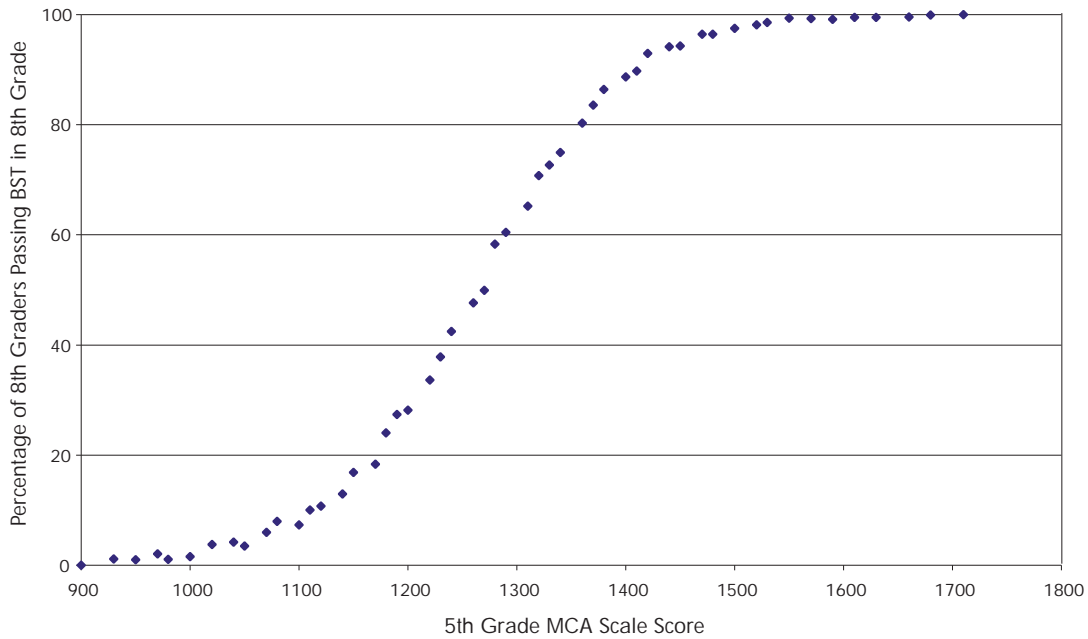


Table 2. Percentage of 8th Grade Students Passing the Math *BST* for each 5th Grade Math *MCA* Score

5th Grade <i>MCA</i> Scale Score	Percentage of 8th Grade Students Passing <i>BST</i>	5th Grade <i>MCA</i> Scale Score	Percentage of 8th Grade Students Passing <i>BST</i>	5th Grade <i>MCA</i> Scale Score	Percentage of 8th Grade Students Passing <i>BST</i>
Achievement Level I		Achievement Level IIa		Achievement Level III	
900 or below	0	1240	42	1500	97
930	1	1260	48	1520	98
950	1	1270	50	1530	99
970	2	1280	58	1550	99
980	1	1290	60	1570	99
1000	2	1310	65	1590	99
1020	4	1320	71	1610	99
1040	4	1330	73	1630	99
1050	4	1340	75	1660	100
1070	6	1360	80	1680	100
1080	8	1370	84	Achievement Level IV	
1100	7	1380	86	1710 or above	100
1110	10	1400	89		
1120	11	1410	90		
1140	13	Achievement Level IIb			
1150	17	1420	93		
1170	18	1440	94		
1180	24	1450	94		
1190	27	1470	96		
1200	28	1480	96		
1220	34				
1230	38				

CONCLUSIONS

The percentages in Tables 1 and 2 should be interpreted carefully. First, these percentages refer to passing in 8th grade, on the student's **first** attempt at the test. Students do have other opportunities to pass in grades 9–12.

Second, the percentages convey *nothing* about how well 5th grade students might do if they took the *BST* as 5th graders. Rather, the percentages reflect how the 1998 5th graders performed in 8th grade *after three more years of learning and development*.

When the *MCA* score corresponds to a high *BST* pass rate, it means that by 5th grade, the students had progressed to the point where most were able to pass the *BST* after three more years of schooling. When the *MCA* score corresponds to a low pass rate (but not zero), it means that some students at that achievement level can attain the state's minimum standard in 8th grade. But the low percentage also means that to pass by 8th grade, the necessary gains are larger than those that are actually achieved by most students.

Finally, no score on the *MCA* *guarantees* that a particular student will pass or fail three years later.

These results convey information about the meaning of the *MCA* score levels. At every score in Level IIb and above, more than 90% of the students successfully passed the *BST* in 8th grade. Pass rates were lower toward the bottom scores in Level IIa and in Level I. At the lowest score in *MCA* Level II, about 60% of students subsequently passed the *BST* in reading and about 40% passed the *BST* in mathematics.

Along with other information, the 5th grade *MCAs* could potentially be used to identify students substantially at risk of failing to meet the state's minimum high school graduation standard as 8th graders.

To use the results in this manner, however, parents and educators must decide how much risk is "substantial." Does a 30% probability of failing constitute a "substantial risk," or does the risk of failing have to reach 50% or 70% before it constitutes a substantial risk? The decision must take into account many factors, including the size of the achievement "gap" facing students at the lower achievement levels; the fact that passing the *BSTs* is required for high school graduation; and the fact that students have multiple opportunities to pass the *BSTs* in 9th–12th grades.

At *MCA* scale scores of 1310 in reading and 1340 in math, 75% of the students went on to meet the state's minimum high school graduation requirement on their first attempt three years later. In other words, 25% of all the students at this achievement level were **not** able to pass the *BSTs* on their first try.

In our view, such students, whose scale scores predict that they have a less than 75% chance of passing the *BSTs* on their first attempt (students with *MCA* scale scores up to 1309 in reading and 1339 in math), are at substantial risk.

Given the size of the academic "gap" facing students at this level, and the need for students to be able to work at the high school level in order to profit by their academic coursework in the upper grades, it makes sense to ensure that students

receive the help they need as early as possible, rather than waiting until they fail a *Basic Standards Test* to offer extra support.

At *MCA* scores of 1220 in reading and 1270 in mathematics, only 50% of the students went on to pass the *BST* three years later. Based on the fact that students have opportunities to pass the *BSTs* between 9th and 12th grades, some might argue that in fact, scores that predict a 50% chance (rather than a 25% chance) of failing the *BSTs* should be the "cutoff point" below which students are considered at substantial risk. On balance, however, we believe that students whose scores fall below 1310 in reading or below 1340 in math should be considered at substantial risk and should receive additional support in these subject areas.

At 5th grade *MCA* scale scores of 1380 in reading and 1410 in mathematics, 90% of the students passed the *BSTs* on their first attempt in 8th grade. It could be argued that some students at this level are still at risk, and that they should receive help in weak areas if they need it.

In our view, however, once the probability of passing reaches 90%, the risk is still real, but no longer substantial. Students at achievement levels III and IV should certainly receive academic help if they need it in a particular area of study; but as a *group*, they have a very high probability of passing the *BSTs* on their first attempt and cannot be considered "at substantial risk."

About the OEA . . .

The Office of Educational Accountability is an independent office whose mission is to analyze and publicly report on the needs of students and the condition of education in Minnesota as reflected in a comprehensive set of indicators. OEA reports are designed to inform and facilitate the improvement of education statewide.

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