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Analyzing the Reliability of the easyCBM Reading

Comprehension Measures:

Grade 7

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Abstract

In this technical report, we present the results of a reliability study of the seventh-grade multiple choice reading comprehension measures available on the easyCBM learning system conducted in the spring of 2011. Analyses include split-half reliability, alternate form reliability, person and item reliability as derived from Rasch analysis, top / bottom reliability, and repeated measures analysis of variance (ANOVA). Results suggest adequate reliability for the seventh-grade multiple choice reading comprehension measures.

Analyzing the Reliability of the easyCBM Reading Comprehension Measures: Grade 7

Curriculum-based measures (CBMs) are standardized assessments with a rich history of use for screening students at risk for difficulty in reading as well as for tracking the progress students make in gaining essential skills over the course of a school year (Alonzo, Ketterlin-Geller, & Tindal, 2006). In recent years, the widespread adoption of Response to Intervention (RTI) as a model for instructional delivery and school-wide improvement efforts has resulted in renewed attention being given to CBMs and a greater emphasis being placed on their technical adequacy for a variety of uses. One concern expressed by practitioners and researchers alike is the degree to which the brief, individually-administered fluency-based probes most frequently identified with CBM are appropriate for use with older students. As students move from elementary to secondary school, there is some evidence to suggest that more complex CBMs, designed to measure more challenging constructs, such as reading comprehension and vocabulary in context may be more appropriate (Yovanoff, Duesbery, Alonzo, & Tindal, 2005). In this technical report, we describe a study of the reliability of the easyCBM seventh-grade multiple choice reading comprehension measures conducted in 2011.

Methods

In this section, we describe the methods used in conducting a study of the split-half and top-bottom reliability, as well as Rasch analyses of grade 7 multiple-choice reading comprehension (MCRC) measures from the easyCBM[®] assessment system.

Setting and Participants

The study was conducted in elementary and middle schools from two Pacific Northwest public school districts in the spring of 2011. *District A* was diverse, and comprised of approximately 8,900 students, of which approximately 56% were White, 11% Hispanic, 15%

Asian-Pacific Islander, 11% Multiracial, 7% Black, and 1% American Indian-Alaskan Native students. About 26% of students were eligible for free or reduced-priced meals. Students in District A outperformed their peers in the state on the statewide reading assessment. On average, more than 79% of students in grades 3-8 tested proficient on the statewide reading test, compared to about 67% for the state. In all, 27 teachers (six in grade 2, four in grade 3, five in grade 4, six in grade 5, and six in grade 6) and 715 students participated in the study from District A.

District B was a large and diverse school district, of approximately 14,000 students, with a demographic make-up of approximately 56% White, 15% Hispanic, 11% Asian-Pacific Islander, 11% Multiracial, 6% Black, and 2% American Indian-Alaskan Native students. About 34% of students in the district were eligible for free or reduced-priced meals. In 2010, students from District B slightly outperformed their peers in the state on the statewide reading assessment. On average, a little fewer than 69% of students in grades 3-8 tested proficient on the state reading test, compared to about 67% for the state. Fourth grade showed the largest difference between students scoring proficient for the district and state, 72% compared to 67%, respectively. Six teachers (two in grades 3 and 7, one in grades 4 and 8) and 317 students participated in the study from District B.

Because we wanted to investigate the reliability for the full grade range of easyCBM[®] MCRC tests, we recruited participants from grades 2-8, with a goal of recruiting six teachers, with a corresponding six classes of students, from each of these seven grades. We successfully recruited six teachers for grades 2-6. Two teachers were recruited for grade 7 (seven total classes of students), and one for grade 8 (three total classes). The average class size across all grades was 27 students. Teachers were recruited at the district level and were compensated \$150 for participating in the study. The three participating teachers in grades 7 and 8 were given

additional stipend money because they administered comprehension measures to more than one class of students. All students in attendance on the days the MCRC tests were administered participated in the study.

Multiple-choice Reading Comprehension Measures

The reading comprehension measures on easyCBM[®] are designed for group administration and are available for grades 2-8. Students first read an original work of narrative fiction and then answer multiple-choice questions (12 questions on the grade 2 test, 20 questions on each of the grade 3-8 tests) based on the story. Multiple-choice questions are designed to assess literal and inferential comprehension on all grade level tests; evaluative comprehension is also assessed on the grade 3-8 tests. Each question is comprised of the question stem and three possible answer choices: the correct answer and two incorrect but plausible distractors. The comprehension measures have a total of 12 points (grade 2) or 20 points (grades 3-8) possible; students earn one point for every question they answer correctly.

We selected the format of the reading comprehension tests based on prior empirical work with local school districts (Alonzo & Tindal, 2004a, 2004b, 2004c). In this work, teachers had expressed their desire for tests that closely resembled the types of readings students regularly encountered in their classes. At the same time, concerns about increasing the reliability, ease of use, and cost-effectiveness of our measures prompted us to use selected response rather than open-ended question types in our comprehension measures. Accordingly, we developed the MCRC tests in a two-step process. First, we wrote the stories that were used as the basis for each test. Then, we wrote the test items associated with each story. We embedded quality control and content review processes in both these steps throughout instrument development.

Two people, selected for their expertise in instrument development and language arts,

were principally involved with overseeing the creation of the MCRC tests. The first person oversaw the creation and revision of the stories and test items earned her Bachelor of Arts degree in Literature from Carleton College in 1990, worked for twelve years as an English teacher in California public schools, was awarded National Board for Professional Teaching Standards certification in Adolescent and Young Adulthood English Language Arts in 2002, and earned her Ph.D. in the area of Learning Assessments/System Performance at the University of Oregon. The second person hired to write the MCRC items earned his Ph.D. in education psychology, measurement, and methodology from the University of Arizona. He has worked in education at the elementary and middle school levels, as well as in higher education and at the state level. He held a position as associate professor in the distance-learning program for Northern Arizona University and served as director of assessment for a large metropolitan school district in Phoenix, Arizona. In addition, he served as state Director of Assessment and Deputy Associate Superintendent for Standards and Assessment at the Arizona Department of Education. He was a test development manager for Harcourt Assessment and has broad experience in assessment and test development.

Grade 7 test development. The two individuals hired to develop the grade 7 measures worked together to create documentation for story-writers to use while creating their stories. This written documentation was provided to increase the comparability of story structure and reduce the likelihood of construct irrelevant variance related to variation in story type affecting student performance on the different forms of the comprehension measures. Story creation specifications provided information about the length of the stories (approximately 1,500 words), characters, settings, and plots. Stories, which were composed between January 2008 and March 2010, were written by a variety of people who were either elementary and secondary school

educators or graduate students and researchers in the College of Education at the University of Oregon.

The professional item writer we hired created 20 multiple-choice questions, each with three possible answer options, for each form of the grade 7 MCRC test. All seventh-grade questions were written between January 2008 and March of 2010. For each of the seventh-grade MCRC tests, we wrote seven questions targeting literal comprehension, seven questions targeting inferential comprehension, and six questions targeting evaluative comprehension, for a total of 20 items on each form of the test. Within each type of comprehension, item-writing specifications called for a range of difficulty such that each form of each test contained easy, moderate, and difficult items in each of the types of comprehension assessed on that test. Item-writing specifications also guided the ordering of the items on each form of the MCRC test. In all cases, we followed a similar pattern of item ordering, beginning with the easiest literal comprehension item and continuing with items of increasing difficulty, ending with an item designed to be one of the most challenging, pulled from the highest level of comprehension assessed in that grade level (evaluative comprehension in grade 7). Once the multiple-choice items were written, the stories and item lists were formatted into individual tests, each composed of a story and 20 multiple-choice test items. Park, Alonzo & Tindal (2011) provided a detailed description of the development and technical adequacy of the grade 7 MCRC test.

Grade 7 test selection and administration. We selected a subset of MCRC grade 7 forms (roughly 60% of those available through the easyCBM[®] assessment system) to use in this study. We used forms 6, 10, 11, 12, 13, 14, 15, 16, and 17 in this study. We selected the grade 7 forms because higher form numbers are typically used less in the classroom compared to the lower-numbered assessment forms (e.g., forms 1-5); thus, we deemed further understanding form

and item-level reliability statistics of the selected forms a priority.

Each student participated in the testing on three separate testing occasions on three different sessions, roughly one week apart. Each comprehension measure was group administered by the classroom teacher. In the first session, students completed a comprehension form assigned by class. Roughly one week later, students completed an alternate form of the comprehension measure. On the final testing occasion, students completed a third alternate form. To reduce the possibility of the order of the forms completed adversely affecting testing results, we assigned comprehension forms within a given grade at the class level based on a two-group counterbalanced measure design. For instance, the first of the six participating grade 7 classes completed forms 11, 12, and 13, in that order, over the three testing occasions; the second grade 7 class completed forms 13, 12 and 11 (the opposite order for the first). We used the same counterbalanced measure design for all classes and all grades in the study.

Analysis

We used a variety of approaches to study the reliability of the easyCBM comprehension assessments: repeated measures analysis of variance, split half reliability using the Guttman formula, top/bottom reliability, and Rasch analysis. Each of these analytic approaches is explained in more detail in the following section.

One-way repeated measures analysis of variance. To examine whether there was a significant difference in difficulty across the forms, we conducted one-way repeated measures analysis of variance (ANOVA). Each student completed three test forms in each grade. When there was a statistically significant within-subject effect, the mean differences among the three forms were further analyzed to investigate where the significant within-subject difference resided.

Split-half reliability. We conducted form and item-level reliability analyses for all grades in this study. To assess overall reliability of the MCRC measure, we examined the internal consistency among items within each selected test form using split-half reliability coefficients calculated from the Guttman formula using SPSS 19 (SPSS Inc., 2010). We used the Guttman formula to calculate split-half reliability coefficients because the Guttman formula does not assume homogeneity of test halves and will not overestimate the full-form reliability (Kerlinger & Lee, 2000). Thus, we felt the Guttman formula provided a more conservative and reasonable estimate of full test form reliability.

Top-bottom reliability. We computed the total score based on the scored item-level data, with unanswered items scored as incorrect (i.e., “0”). The possible total score for grade 6 forms is 20. Because easyCBM[®] progress monitoring measures were developed to target students who are at-risk for academic failure, items should function differently for students who are at or below the 23rd percentile (i.e., lower percentiles) and those who are at or above the 78th percentile (i.e., higher percentiles). To evaluate the appropriateness of items, item functioning was compared between the two aforementioned groups. The scores corresponding to the 23rd and 78th percentiles were computed for each form. Then, the proportions of correct responses for each item for the two groups were analyzed. Both groups should demonstrate high proportions of correct responses for an easy item that functions appropriately. For a difficult item that is functioning appropriately, the proportion of correct responses for the lower percentile group should be lower than that for the higher percentile group. A higher proportion of correct responses for the lower percentile group indicates that the item may not be functioning appropriately.

Rasch analyses. Data from the pilot testing of the MCRC measures were analyzed with a one-parameter logistic Rasch analysis using the software Winsteps 3.68.2 (Linacre, 2009). Unlike classical statistics, Rasch analyses consider patterns of responses across individuals, providing information at a level of specificity in results unattainable with approaches based on classical statistics used in the development of most CBMs. In a complex iterative process, a Rasch analysis concurrently estimates the difficulty of individual test items and the ability level of each individual test taker. The results, relevant to the discussion here, include an estimation of the difficulty (referred to as the ‘measure’) of each item, the standard error of measure associated with each item’s estimated difficulty, and the degree to which each item ‘fits’ the measurement model (referred to as the ‘mean square outfit’). In addition, a Rasch analysis can provide information about the average estimated ability of students who selected each of the possible answer choices. All of this information must be considered when evaluating the technical adequacy of the measures, as described below.

Considering item estimated difficulty. Rasch analyses, which examine each item’s reliability, provide a more precise treatment of reliability than classical statistics, which examine the issue from a global test level. The most reliable estimation of a test-taker’s ability can be gained from tests comprised of items that represent the fullest range of difficulty possible for the population for which the test is intended. Thus, to evaluate the technical adequacy of our MCRC measures, we looked for items representing a range of difficulties. In Rasch analyses, this information is gleaned from examining each item’s *measure*. Easy items will have measures represented with negative numbers; difficult items will have measures represented with positive numbers. A measure of zero indicates an item that a person of average ability would be expected

to have a 50% chance of getting correct. Thus, we sought a full range of *measure* on every MCRC test form.

Examining the standard error of measure. Rasch analyses also provide information about the standard error of measure associated with the estimation of each item's measure. Generally, the smaller the standard error of measure, the more reliable the estimation is. We sought small standard errors of measure for all items on our MCRC tests.

Using the mean square outfit to evaluate goodness of fit. An additional piece of information used to evaluate technical adequacy in a Rasch model is the mean square outfit associated with each item. Values in the range of 0.50 to 1.50 are considered *acceptable fit*. Mean square outfits falling outside this acceptable range indicate the need for further evaluation of item functioning. In general, items with a mean square outfit less than 0.50 are considered less worrisome than items with mean square outfits higher than 1.50 because items falling into the former category perform more *consistently* (e.g., every student regardless of ability gets the item correct or incorrect) compared to items in the latter category that function more *inconsistently* (e.g., students who perform poorly on all other items, always get the item correct) (Linacre, 2002). In all cases, distractor analysis provides useful information to further evaluate the technical adequacy of each item.

Analyzing distractor selection information. A distractor analysis provides information on the average estimated ability of test takers who selected a particular distractor on a test. In evaluating the technical adequacy of an assessment instrument, one hopes to see that the correct answer is selected by test-takers with the highest average estimated ability and the remaining distractors are selected by test-takers with lower estimated abilities. In addition, every distractor

in a well-constructed measure will be selected by at least some test-takers. We considered all of these features in evaluating the technical adequacy of the MCRC measures.

Analyzing person and item reliability. Rasch analyses report both the person and item reliability. The person reliability is equivalent to the traditional test reliability. Low values indicate a narrow range of person measures, or a small number of items. Therefore, testing persons with more extreme abilities (high and low) or lengthening the measure would increase the person reliability. Winsteps' item reliability has no traditional equivalent. Low item reliability values indicate a narrow range of item measures or a small sample. A larger sample of persons would increase item reliability. Low item reliability means that the sample size is too small to precisely locate the items on the latent variable (i.e., ability).

Results

Grade 7 MCRC Equivalence by Form

In this section we report findings concerning the equivalence of MCRC forms. We used one-way repeated measures ANOVA to evaluate equivalence of difficulty across the MCRC forms. Because like groups of students took three MCRC forms, each roughly one week apart, we evaluated the difficulty equivalence of each set of the three forms that were taken by the same group of students. The mean differences between forms of 6, 10, and 17 were not significantly different. On the other hand, the mean differences between forms of 11, 12, and 13 were statistically significant, $F(2, 152) = 44.25, p < .05$. Forms 11 and 12 were significantly more difficult than the form 13. Also, forms 14, 15, and 16 significantly differed in their means, $F(2, 170) = 47.96, p < .05$. Though forms 15 and 16 did not differ significantly in their means, form 16 was significantly more difficult than form 14. Tables 1-8 in Appendix A display descriptive statistics and the complete results of repeated measures ANOVA, as well as post-hoc

analyses conducted to compare mean differences for the grade 7 MCRC measures used in the study.

Grade 7 MCRC Split-half Reliability

In this section we report overall reliability of the MCRC measure based on internal consistency among items within each selected test form using split-half reliability coefficients calculated with the Guttman formula. Split-half reliability coefficients were computed by comparing the results from the first 10 items of the MCRC measure to the second 10 items for all students in the sample taking each form. For grade 7 MCRC forms 6, and 10 through 17, Guttman split-half reliability coefficients ranged from .12 to .63. Specifically, the split-half coefficient for form 6 was .29 ($n = 20$ items); the split-half coefficient for form 10 was .45 ($n = 20$ items); the split-half coefficient for form 11 was .30 ($n = 20$ items); the split-half coefficient for form 12 was .63 ($n = 20$ items); the split-half coefficient for form 13 was .49 ($n = 20$ items); the split-half coefficient for form 14 was .43 ($n = 20$ items); the split-half coefficient for form 15 was .48 ($n = 20$ items); the split-half coefficient for form 16 was .60 ($n = 20$ items); the split-half coefficient for form 17 was .12 ($n = 20$ items). It should be noted that forms 14, 16 and 17 had negative average covariance among items. Form 14 had negative average covariance among the first part (items 1-10); forms 16 and 17 had negative average covariance among the second part (items 11-20). The three forms were checked for data errors (e.g., data entry and coding) and none were found. Although the sample sizes for forms 14 ($n = 83$), 16 ($n = 103$) and 17 ($n = 89$) were not small, it is possible that the true population covariance between items on a each form are positive, and that sampling error has produced a negative covariance within the study sample due to the small number of items on each form ($n = 20$). It could also be the case that the covariance among items is negative and that items are measuring different constructs. Tables 1-

18 in Appendix B display descriptive statistics and complete results of split-half reliability analyses by form for grade 7 MCRC measures used in this study.

Grade 7 Top-bottom Reliability

In this section we report results from top-bottom reliability analysis used to evaluate the appropriateness of items. The proportion of correct responses of each item for low-performing (at or below the 23rd percentile) and high-performing (at or above the 78th percentile) students was evaluated from this analysis to examine the appropriateness of item functioning. For form 6, all students in the low-performing group answered 2 out of 20 items incorrectly; the proportion of correct responses for the remaining 18 items ranged from .06 to .83. Every student in the high-performing group answered 6 out of 20 items correctly, and the proportion of correct responses for the remaining 14 items ranged from .10 to .97. For form 10, all students in the low-performing group answered 1 out of 20 items incorrectly; the proportion of correct responses for the remaining 19 items ranged from .14 to .96. All students in the high-performing group answered 2 out of 20 items correctly, and the proportion of correct responses for the remaining 18 items ranged from .08 to .92. For form 11, all students in the low-performing group answered 1 out of 20 items incorrectly; the proportion of correct responses for the remaining 19 items ranged from .07 to .87. All students in the high-performing group answered 3 out of 20 items correctly, and the proportion of correct responses for the remaining 17 items ranged from .10 to .97. The proportion of correct responses for item 11 was higher for low-performing students (.13) than for high-performing students (.10). For form 12, the proportion of correct responses ranged from .14 to .77 for the low-performing students in this group. All students in the high-performing group answered 5 out of 20 items correctly, and the proportion of correct responses for the remaining 15 items ranged from .74 to .96.

For form 13, the proportion of correct responses ranged from .17 to .83 for the low-performing students in this group. All students in the high-performing group answered 4 out of 20 items correctly, and the proportion of correct responses for the remaining 16 items ranged from .25 to .96. The proportion of correct responses for item 12 was higher for the low-performing students (.44) than the high-performing students (.25). For form 14, the proportion of correct responses ranged from .13 to .91 for the low-performing students in this group. All students in the high-performing group answered 4 out of 20 items correctly, and the proportion of correct responses for the remaining 16 items ranged from .35 to .95. For form 15, the proportion of correct responses ranged from .07 to .93 for the low-performing students in this group. All students in the high-performing group answered 6 out of 20 items correctly, and the proportion of correct responses for the remaining 14 items ranged from .43 to .97. For form 16, the proportion of correct responses ranged from .31 to .81 for the low-performing students in this group. All students in the high-performing group answered 4 out of 20 items correctly, and the proportion of correct responses for the remaining 16 items ranged from .10 to .97. The proportions of correct responses for the items 13 and 20 were higher for the low-performing students (.56 and .38, respectively) than the high-performing students (.37 and .10, respectively). For form 17, the proportion of correct responses ranged from .15 to .96 for the low-performing students in this group. All students in the high-performing group answered 4 out of 20 items correctly, and the proportion of correct responses for the remaining 16 items ranged from .32 to .96. Tables 1-10 in Appendix C display mean and percentile scores and the complete top-bottom reliability results for the grade 7 MCRC forms used in this study.

Grade 7 Item-level Rasch Analyses

Almost all items on the grade 7 MCRC form 6 passed the pre-set adequate model fit selection criteria, falling within the mean square outfit range of 0.50 to 1.50. Items #10 and #14 were over-fit, with mean square outfit values of 1.75 and 1.87, respectively. Item #5 was under-fit, with a mean square outfit of 0.42. Distractor analysis indicated that these items were functioning appropriately, except item #14. Item #13 might also be problematic according to distractor analysis. All items on the grade 7 MCRC form 10 were within the mean square outfit range of 0.50 to 1.50, except for item #9. This item was over-fit, with a mean square outfit of 2.71. Analysis of the distractors also indicated that item #9 was not functioning appropriately. On the grade 7 form 11, items #2 and #16 were over-fit, with mean square outfit values of 0.31 and 0.45, respectively. Distractor analysis also indicated that these items were not functioning appropriately. Almost all items on the grade 7 form 12 were within the mean square outfit range of 0.50 to 1.50. The exception was item #20 that had a mean square outfit of 1.64. Distractor analysis, however, indicated that the item was functioning appropriately.

On the grade 7 form 13, most items were within the pre-set adequate model fit selection criteria, with mean square outfit values between 0.50 and 1.50. The only item that did not meet the criteria was item #12, with a mean square outfit of 1.91. Distractor analysis also indicated that this item may not be functioning appropriately. On the grade 7 form 14, all items were within the pre-set adequate model fit selection criteria, with mean square outfit values between 0.50 to 1.50. Distractor analysis also indicated that all items on this form were functioning appropriately. All but item #15 on the grade 7 form 15 were within mean square outfit values between of 0.50 to 1.50. Item #15 had a mean square outfit of 1.68. Distractor analysis also indicated that this item was not functioning appropriately. Items #10, #11, #19, and #20 on the grade 7 form 16 were not within mean square outfit values of 0.50 and 1.50. Items #10 and #20

were over-fit, both with a mean square outfit of 1.68. Items #11 and #19 were under-fit, with mean square outfit of 0.44 and 0.48, respectively. Distractor analysis, however, indicated that only item #10 was not functioning appropriately. Only item #11 on the grade 7 form 17 was not within mean square outfit values of 0.50 to 1.50. Item #11 was under-fit, with a mean square outfit of 0.44. Distractor analysis also indicated that this item was not functioning appropriately.

Person reliability values were low to moderate overall, ranging from .12 to .66. Item reliability were generally moderate, ranging from .83 to .96. It should be noted that the sample sizes ranged from 77 to 109. Tables 1-18 in Appendix D display the item measure, standard error of measure, mean square outfit, and complete distractor analyses for the nine grade 7 MCRC measures used in this study.

Discussion

Our findings in this study suggest that the grade 7 easyCBM multiple choice reading comprehension measures have acceptable levels of reliability for the two purposes for which they are intended: as one part of a battery of assessments administered in the fall, winter, and spring to screen students at risk for reading difficulty, and as repeated measures over time as used to monitor student progress in developing comprehension skill. Although we would have preferred to have even higher alternate form reliability coefficients, it appears likely that our results are dampened by two factors. First, sample sizes in our study were not as large as we would have liked, due to challenges related to participant recruitment. Second, it appears as though the test forms might have had a ceiling effect, with very little variation in scores for students who were in the top third (reducing the power of the top / bottom reliability analyses). Future research should address both these limitations.

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Appendix A

Table 1
Descriptive Statistics of Grade 7 Measures 6, 10, and 17

	Mean	Std. Deviation	N
total_6	12.7901	2.38598	81
total_10	12.4938	2.58903	81
total_17	13.1975	1.96481	81

Table 2
Tests of Within-Subjects Effects for Grade 7 Measures 6, 10, and 17

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
forms	Sphericity Assumed	20.222	2	10.111	2.743	.067
	Greenhouse-Geisser	20.222	1.965	10.290	2.743	.068
	Huynh-Feldt	20.222	2.000	10.111	2.743	.067
	Lower-bound	20.222	1.000	20.222	2.743	.102
Error(forms)	Sphericity Assumed	589.778	160	3.686		
	Greenhouse-Geisser	589.778	157.225	3.751		
	Huynh-Feldt	589.778	160.000	3.686		
	Lower-bound	589.778	80.000	7.372		

Note. Mauchly's Test of Sphericity: The assumption of sphericity was not violated, Mauchly's W was 0.98, $\chi^2(2) = 1.41, p > .05$.

Table 3
Descriptive Statistics of Grade 7 Measures 11 to 13

	Mean	Std. Deviation	N
total_11	15.1429	2.52208	77
total_12	14.0779	3.69839	77
total_13	11.5584	2.34798	77

Table 4
Tests of Within-Subjects Effects for Grade 7 Measures 11 to 13

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
forms	Sphericity Assumed	521.801	2	260.900	44.250	.000
	Greenhouse-Geisser	521.801	1.787	291.954	44.250	.000
	Huynh-Feldt	521.801	1.827	285.535	44.250	.000
	Lower-bound	521.801	1.000	521.801	44.250	.000
Error(forms)	Sphericity Assumed	896.199	152	5.896		
	Greenhouse-Geisser	896.199	135.833	6.598		
	Huynh-Feldt	896.199	138.886	6.453		
	Lower-bound	896.199	76.000	11.792		

Note. Mauchly's Test of Sphericity: Mauchly's W was 0.88, $\chi^2(2) = 9.05, p < .05$. Thus, for all within-subject effects, the Greenhouse-Geisser *F* was used.

Table 5
Tests of Within-Subjects Contrasts for Grade 7 Measures 11 to 13

Source	forms	Type III Sum of Squares	df	Mean Square	F	Sig.
forms	Level 1 vs. Level 3	989.299	1	989.299	124.337	.000
	Level 2 vs. Level 3	488.779	1	488.779	32.838	.000
Error(forms)	Level 1 vs. Level 3	604.701	76	7.957		
	Level 2 vs. Level 3	1131.221	76	14.884		

Table 6
Descriptive Statistics of Grade 7 Measures 14 to 16

	Mean	Std. Deviation	N
total_14	11.6628	2.37937	86
total_15	14.2791	2.37958	86
total_16	14.3721	2.73989	86

Table 7
Tests of Within-Subjects Effects for Grade 7 Measures 14 to 16

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
forms	Sphericity Assumed	406.891	2	203.446	47.962	.000
	Greenhouse-Geisser	406.891	1.883	216.127	47.962	.000
	Huynh-Feldt	406.891	1.924	211.495	47.962	.000
	Lower-bound	406.891	1.000	406.891	47.962	.000
Error(forms)	Sphericity Assumed	721.109	170	4.242		
	Greenhouse-Geisser	721.109	160.026	4.506		
	Huynh-Feldt	721.109	163.530	4.410		
	Lower-bound	721.109	85.000	8.484		

Note. Mauchly's Test of Sphericity: The assumption of sphericity was not violated, Mauchly's W was 0.94, $\chi^2(2) = 5.41$, $p > .05$.

Table 8
Tests of Within-Subjects Contrasts for Grade 7 Measures 14 to 16

Source	forms	Type III Sum of Squares	df	Mean Square	F	Sig.
forms	Level 1 vs. Level 3	631.267	1	631.267	59.637	.000
	Level 2 vs. Level 3	.744	1	.744	.097	.756
Error(forms)	Level 1 vs. Level 3	899.733	85	10.585		
	Level 2 vs. Level 3	651.256	85	7.662		

Appendix B

Table 1

Grade 7 Split-Half Coefficients for MCRC Form 6 with N = 20 Items

Cronbach's Alpha	Part 1	Value	.410
		N of Items	10 ^a
	Part 2	Value	.115
		N of Items	10 ^b
	Total N of Items		20
Correlation Between Forms			.171
Spearman-Brown Coefficient	Equal Length		.292
	Unequal Length		.292
Guttman Split-Half Coefficient			.285

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 2

Grade 7 Split-Half Scale Statistics for MCRC Form 6 with N = 20 Items

	Mean	Variance	Std. Deviation	N of Items
Part 1	6.81	2.458	1.568	10 ^a
Part 2	6.01	1.531	1.238	10 ^b
Both Parts	12.83	4.653	2.157	20

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 3

Grade 7 Split-Half Coefficients for MCRC Form 10 with N = 20 Items

Cronbach's Alpha	Part 1	Value	.256
		N of Items	10 ^a
	Part 2	Value	.294
		N of Items	10 ^b
	Total N of Items		20
Correlation Between Forms			.299
Spearman-Brown Coefficient	Equal Length		.460
	Unequal Length		.460
Guttman Split-Half Coefficient			.453

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 4

Grade 7 Split-Half Scale Statistics for MCRC Form 10 with N = 20 Items

	Mean	Variance	Std. Deviation	N of Items
Part 1	6.89	1.968	1.403	10 ^a
Part 2	5.75	2.935	1.713	10 ^b
Both Parts	12.64	6.339	2.518	20

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 5

Grade 7 Split-Half Coefficients for MCRC Form 11 with N = 20 Items

Cronbach's Alpha	Part 1	Value	.215
		N of Items	10 ^a
	Part 2	Value	.271
		N of Items	10 ^b
	Total N of Items		20
Correlation Between Forms			.176
Spearman-Brown Coefficient	Equal Length		.299
	Unequal Length		.299
Guttman Split-Half Coefficient			.296

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 6

Grade 7 Split-Half Scale Statistics for MCRC Form 11 with N = 20 Items

	Mean	Variance	Std. Deviation	N of Items
Part 1	7.05	1.839	1.356	10 ^a
Part 2	4.64	2.471	1.572	10 ^b
Both Parts	11.69	5.059	2.249	20

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 7

Grade 7 Split-Half Coefficients for MCRC Form 12 with N = 20 Items

Cronbach's Alpha	Part 1	Value	.609
		N of Items	10 ^a
	Part 2	Value	.468
		N of Items	10 ^b
	Total N of Items		20
Correlation Between Forms			.464
Spearman-Brown Coefficient	Equal Length		.633
	Unequal Length		.633
Guttman Split-Half Coefficient			.633

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 8

Grade 7 Split-Half Scale Statistics for MCRC Form 12 with N = 20 Items

	Mean	Variance	Std. Deviation	N of Items
Part 1	7.65	3.765	1.940	10 ^a
Part 2	6.53	3.842	1.960	10 ^b
Both Parts	14.18	11.133	3.337	20

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 9

Grade 7 Split-Half Coefficients for MCRC Form 13 with N = 20 Items

Cronbach's Alpha	Part 1	Value	.521
		N of Items	10 ^a
	Part 2	Value	.291
		N of Items	10 ^b
	Total N of Items		20
Correlation Between Forms			.328
Spearman-Brown Coefficient	Equal Length		.494
	Unequal Length		.494
Guttman Split-Half Coefficient			.494

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 10

Grade 7 Split-Half Scale Statistics for MCRC Form 13 with N = 20 Items

	Mean	Variance	Std. Deviation	N of Items
Part 1	8.37	2.378	1.542	10 ^a
Part 2	6.76	2.699	1.643	10 ^b
Both Parts	15.13	6.741	2.596	20

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 11

Grade 7 Split-Half Coefficients for MCRC Form 14 with N = 20 Items

Cronbach's Alpha	Part 1	Value	-.066 ^a
		N of Items	10 ^b
	Part 2	Value	.046
		N of Items	10 ^c
	Total N of Items		20
Correlation Between Forms			.276
Spearman-Brown Coefficient	Equal Length		.433
	Unequal Length		.433
Guttman Split-Half Coefficient			.430

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

b. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

c. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 12

Grade 7 Split-Half Scale Statistics for MCRC Form 14 with N = 20 Items

	Mean	Variance	Std. Deviation	N of Items
Part 1	6.24	1.673	1.293	10 ^a
Part 2	5.58	2.198	1.483	10 ^b
Both Parts	11.82	4.930	2.220	20

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 13

Grade 7 Split-Half Coefficients for MCRC Form 15 with N = 20 Items

Cronbach's Alpha	Part 1	Value	.493
		N of Items	10 ^a
	Part 2	Value	.004
N of Items		10 ^b	
	Total N of Items		20
Correlation Between Forms			.319
Spearman-Brown Coefficient	Equal Length		.483
	Unequal Length		.483
Guttman Split-Half Coefficient			.477

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 14

Grade 7 Split-Half Scale Statistics for MCRC Form 15 with N = 20 Items

	Mean	Variance	Std. Deviation	N of Items
Part 1	7.80	2.339	1.529	10 ^a
Part 2	6.73	1.594	1.263	10 ^b
Both Parts	14.52	5.164	2.272	20

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 15

Grade 7 Split-Half Coefficients for MCRC Form 16 with N = 20 Items

Cronbach's Alpha	Part 1	Value	.389
		N of Items	10 ^a
	Part 2	Value	-.055 ^b
		N of Items	10 ^c
	Total N of Items		20
Correlation Between Forms			.438
Spearman-Brown Coefficient	Equal Length		.609
	Unequal Length		.609
Guttman Split-Half Coefficient			.598

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

c. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 16

Grade 7 Split-Half Scale Statistics for MCRC Form 16 with N = 20 Items

	Mean	Variance	Std. Deviation	N of Items
Part 1	7.50	2.625	1.620	10 ^a
Part 2	6.76	1.637	1.279	10 ^b
Both Parts	14.26	6.078	2.465	20

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 17

Grade 7 Split-Half Coefficients for MCRC Form 17 with N = 20 Items

Cronbach's Alpha	Part 1	Value	.182
		N of Items	10 ^a
	Part 2	Value	-.124 ^b
		N of Items	10 ^c
	Total N of Items		20
Correlation Between Forms			.066
Spearman-Brown Coefficient	Equal Length		.124
	Unequal Length		.124
Guttman Split-Half Coefficient			.124

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

c. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Table 18

Grade 7 Split-Half Scale Statistics for MCRC Form 17 with N = 20 Items

	Mean	Variance	Std. Deviation	N of Items
Part 1	7.98	1.727	1.314	10 ^a
Part 2	5.44	1.681	1.296	10 ^b
Both Parts	13.42	3.632	1.906	20

a. The items are: Q1_Corr, Q2_Corr, Q3_Corr, Q4_Corr, Q5_Corr, Q6_Corr, Q7_Corr, Q8_Corr, Q9_Corr, Q10_Corr.

b. The items are: Q11_Corr, Q12_Corr, Q13_Corr, Q14_Corr, Q15_Corr, Q16_Corr, Q17_Corr, Q18_Corr, Q19_Corr, Q20_Corr.

Appendix C

Table 1
Grade 7 Mean and the Percentile Scores by Form

Form	Mean (<i>n</i>)	23 rd Percentile (<i>n</i>)	78 th Percentile (<i>n</i>)
6	12.80 (85)	11 (18)	14 (31)
10	12.57 (103)	11 (28)	15 (25)
11	11.52 (83)	9 (15)	13 (29)
12	14.05 (82)	12 (22)	17 (23)
13	15.14 (77)	13 (18)	17 (24)
14	11.56 (93)	10 (23)	14 (20)
15	14.27 (90)	12 (15)	16 (30)
16	14.14 (109)	13 (32)	16 (30)
17	13.23 (103)	12 (27)	15 (28)

Table 2
Item Statistics for Students for Grade 7 Form 6

	23 rd Percentile or Below			78 th Percentile or Above		
	Mean	Std. Deviation	N	Mean	Std. Deviation	N
Q1_Corr	.78	.428	18	1.00	.000	31
Q2_Corr	.56	.511	18	.97	.180	31
Q3_Corr	.50	.514	18	.81	.402	31
Q4_Corr	.72	.461	18	1.00	.000	31
Q5_Corr	.78	.428	18	1.00	.000	31
Q6_Corr	.78	.428	18	1.00	.000	31
Q7_Corr	.33	.485	18	.77	.425	31
Q8_Corr	.00	.000	18	.61	.495	31
Q9_Corr	.39	.502	18	.65	.486	31
Q10_Corr	.06	.236	18	.19	.402	31
Q11_Corr	.50	.514	18	.71	.461	31
Q12_Corr	.11	.323	18	.58	.502	31
Q13_Corr	.78	.428	18	.84	.374	31
Q14_Corr	.94	.236	18	.97	.180	31
Q15_Corr	.00	.000	18	.16	.374	31
Q16_Corr	.33	.485	18	.65	.486	31
Q17_Corr	.44	.511	18	.81	.402	31
Q18_Corr	.06	.236	18	.10	.301	31
Q19_Corr	.89	.323	18	1.00	.000	31
Q20_Corr	.83	.383	18	1.00	.000	31

Table 3
Item Statistics for Students for Grade 7 Form 10

	23 rd Percentile or Below			78 th Percentile or Above		
	Mean	Std. Deviation	N	Mean	Std. Deviation	N
Q1_Corr	.89	.315	28	1.00	.000	25
Q2_Corr	.96	.189	28	1.00	.000	25
Q3_Corr	.50	.509	28	.88	.332	25
Q4_Corr	.14	.356	28	.92	.277	25
Q5_Corr	.57	.504	28	.88	.332	25
Q6_Corr	.50	.509	28	.84	.374	25
Q7_Corr	.68	.476	28	.92	.277	25
Q8_Corr	.71	.460	28	.92	.277	25
Q9_Corr	.00	.000	28	.08	.277	25
Q10_Corr	.68	.476	28	.88	.332	25
Q11_Corr	.29	.460	28	.88	.332	25
Q12_Corr	.32	.476	28	.80	.408	25
Q13_Corr	.43	.504	28	.92	.277	25
Q14_Corr	.86	.356	28	.88	.332	25
Q15_Corr	.18	.390	28	.40	.500	25
Q16_Corr	.14	.356	28	.64	.490	25
Q17_Corr	.82	.390	28	.96	.200	25
Q18_Corr	.46	.508	28	.60	.500	25
Q19_Corr	.25	.441	28	.72	.458	25
Q20_Corr	.32	.476	28	.60	.500	25

Table 4
Item Statistics for Students for Grade 7 Form 11

	23 rd Percentile or Below			78 th Percentile or Above		
	Mean	Std. Deviation	N	Mean	Std. Deviation	N
Q1_Corr	.60	.507	15	.97	.186	29
Q2_Corr	.87	.352	15	1.00	.000	29
Q3_Corr	.27	.458	15	.45	.506	29
Q4_Corr	.87	.352	15	.90	.310	29
Q5_Corr	.87	.352	15	1.00	.000	29
Q6_Corr	.40	.507	15	.72	.455	29
Q7_Corr	.20	.414	15	.69	.471	29
Q8_Corr	.60	.507	15	.97	.186	29
Q9_Corr	.13	.352	15	.24	.435	29
Q10_Corr	.47	.516	15	.93	.258	29
Q11_Corr	.13	.352	15	.10	.310	29
Q12_Corr	.07	.258	15	.38	.494	29
Q13_Corr	.33	.488	15	.52	.509	29
Q14_Corr	.33	.488	15	.76	.435	29
Q15_Corr	.47	.516	15	.97	.186	29
Q16_Corr	.93	.258	15	1.00	.000	29
Q17_Corr	.33	.488	15	.83	.384	29
Q18_Corr	.07	.258	15	.21	.412	29
Q19_Corr	.00	.000	15	.69	.471	29
Q20_Corr	.33	.488	15	.62	.494	29

Table 5
Item Statistics for Students for Grade 7 Form 12

	23 rd Percentile or Below			78 th Percentile or Above		
	Mean	Std. Deviation	N	Mean	Std. Deviation	N
Q1_Corr	.73	.456	22	1.00	.000	23
Q2_Corr	.50	.512	22	1.00	.000	23
Q3_Corr	.23	.429	22	.74	.449	23
Q4_Corr	.68	.477	22	.87	.344	23
Q5_Corr	.50	.512	22	1.00	.000	23
Q6_Corr	.55	.510	22	1.00	.000	23
Q7_Corr	.45	.510	22	.78	.422	23
Q8_Corr	.45	.510	22	.96	.209	23
Q9_Corr	.59	.503	22	.87	.344	23
Q10_Corr	.77	.429	22	1.00	.000	23
Q11_Corr	.36	.492	22	.74	.449	23
Q12_Corr	.41	.503	22	.91	.288	23
Q13_Corr	.41	.503	22	.74	.449	23
Q14_Corr	.64	.492	22	.96	.209	23
Q15_Corr	.14	.351	22	.96	.209	23
Q16_Corr	.68	.477	22	.83	.388	23
Q17_Corr	.36	.492	22	.91	.288	23
Q18_Corr	.59	.503	22	.96	.209	23
Q19_Corr	.32	.477	22	.87	.344	23
Q20_Corr	.64	.492	22	.74	.449	23

Table 6
Item Statistics for Students for Grade 7 Form 13

	23 rd Percentile or Below			78 th Percentile or Above		
	Mean	Std. Deviation	N	Mean	Std. Deviation	N
Q1_Corr	.83	.383	18	.96	.204	24
Q2_Corr	.39	.502	18	.83	.381	24
Q3_Corr	.67	.485	18	.96	.204	24
Q4_Corr	.61	.502	18	.96	.204	24
Q5_Corr	.83	.383	18	1.00	.000	24
Q6_Corr	.72	.461	18	1.00	.000	24
Q7_Corr	.78	.428	18	.96	.204	24
Q8_Corr	.61	.502	18	.79	.415	24
Q9_Corr	.50	.514	18	.83	.381	24
Q10_Corr	.83	.383	18	1.00	.000	24
Q11_Corr	.56	.511	18	1.00	.000	24
Q12_Corr	.44	.511	18	.25	.442	24
Q13_Corr	.56	.511	18	.88	.338	24
Q14_Corr	.61	.502	18	.88	.338	24
Q15_Corr	.39	.502	18	.88	.338	24
Q16_Corr	.17	.383	18	.88	.338	24
Q17_Corr	.44	.511	18	.92	.282	24
Q18_Corr	.50	.514	18	.88	.338	24
Q19_Corr	.50	.514	18	.83	.381	24
Q20_Corr	.72	.461	18	.96	.204	24

Table 7
Item Statistics for Students for Grade 7 Form 14

	23 rd Percentile or Below			78 th Percentile or Above		
	Mean	Std. Deviation	N	Mean	Std. Deviation	N
Q1_Corr	.91	.288	23	1.00	.000	20
Q2_Corr	.65	.487	23	.95	.224	20
Q3_Corr	.17	.388	23	.40	.503	20
Q4_Corr	.30	.470	23	.40	.503	20
Q5_Corr	.70	.470	23	1.00	.000	20
Q6_Corr	.30	.470	23	.60	.503	20
Q7_Corr	.26	.449	23	.70	.470	20
Q8_Corr	.83	.388	23	1.00	.000	20
Q9_Corr	.35	.487	23	.80	.410	20
Q10_Corr	.43	.507	23	.70	.470	20
Q11_Corr	.43	.507	23	.60	.503	20
Q12_Corr	.48	.511	23	.75	.444	20
Q13_Corr	.43	.507	23	.55	.510	20
Q14_Corr	.26	.449	23	.55	.510	20
Q15_Corr	.52	.511	23	.90	.308	20
Q16_Corr	.35	.487	23	.65	.489	20
Q17_Corr	.52	.511	23	.95	.224	20
Q18_Corr	.65	.487	23	1.00	.000	20
Q19_Corr	.35	.487	23	.70	.470	20
Q20_Corr	.13	.344	23	.35	.489	20

Table 8
Item Statistics for Students for Grade 7 Form 15

	23 rd Percentile or Below			78 th Percentile or Above		
	Mean	Std. Deviation	N	Mean	Std. Deviation	N
Q1_Corr	.67	.488	15	1.00	.000	30
Q2_Corr	.60	.507	15	.90	.305	30
Q3_Corr	.73	.458	15	1.00	.000	30
Q4_Corr	.07	.258	15	.43	.504	30
Q5_Corr	.73	.458	15	1.00	.000	30
Q6_Corr	.60	.507	15	1.00	.000	30
Q7_Corr	.73	.458	15	.90	.305	30
Q8_Corr	.73	.458	15	.93	.254	30
Q9_Corr	.33	.488	15	.90	.305	30
Q10_Corr	.40	.507	15	.93	.254	30
Q11_Corr	.93	.258	15	1.00	.000	30
Q12_Corr	.40	.507	15	.97	.183	30
Q13_Corr	.47	.516	15	.90	.305	30
Q14_Corr	.73	.458	15	.97	.183	30
Q15_Corr	.47	.516	15	.33	.479	30
Q16_Corr	.13	.352	15	.27	.450	30
Q17_Corr	.80	.414	15	.87	.346	30
Q18_Corr	.40	.507	15	.63	.490	30
Q19_Corr	.67	.488	15	1.00	.000	30
Q20_Corr	.33	.488	15	.70	.466	30

Table 9
Item Statistics for Students for Grade 7 Form 16

	23 rd Percentile or Below			78 th Percentile or Above		
	Mean	Std. Deviation	N	Mean	Std. Deviation	N
Q1_Corr	.78	.420	32	.90	.305	30
Q2_Corr	.81	.397	32	.93	.254	30
Q3_Corr	.69	.471	32	1.00	.000	30
Q4_Corr	.47	.507	32	.90	.305	30
Q5_Corr	.66	.483	32	.97	.183	30
Q6_Corr	.81	.397	32	.93	.254	30
Q7_Corr	.50	.508	32	1.00	.000	30
Q8_Corr	.47	.507	32	.93	.254	30
Q9_Corr	.31	.471	32	.87	.346	30
Q10_Corr	.34	.483	32	.67	.479	30
Q11_Corr	.66	.483	32	1.00	.000	30
Q12_Corr	.47	.507	32	.80	.407	30
Q13_Corr	.56	.504	32	.37	.490	30
Q14_Corr	.78	.420	32	.97	.183	30
Q15_Corr	.38	.492	32	.93	.254	30
Q16_Corr	.56	.504	32	.83	.379	30
Q17_Corr	.56	.504	32	.97	.183	30
Q18_Corr	.41	.499	32	.87	.346	30
Q19_Corr	.78	.420	32	1.00	.000	30
Q20_Corr	.38	.492	32	.10	.305	30

Table 10
Item Statistics for Students for Grade 7 Form 17

	23 rd Percentile or Below			78 th Percentile or Above		
	Mean	Std. Deviation	N	Mean	Std. Deviation	N
Q1_Corr	.48	.509	27	.86	.356	28
Q2_Corr	.93	.267	27	1.00	.000	28
Q3_Corr	.70	.465	27	1.00	.000	28
Q4_Corr	.81	.396	27	1.00	.000	28
Q5_Corr	.81	.396	27	.96	.189	28
Q6_Corr	.52	.509	27	.82	.390	28
Q7_Corr	.89	.320	27	.89	.315	28
Q8_Corr	.37	.492	27	.68	.476	28
Q9_Corr	.52	.509	27	.89	.315	28
Q10_Corr	.59	.501	27	.86	.356	28
Q11_Corr	.96	.192	27	1.00	.000	28
Q12_Corr	.41	.501	27	.54	.508	28
Q13_Corr	.26	.447	27	.64	.488	28
Q14_Corr	.96	.192	27	.89	.315	28
Q15_Corr	.22	.424	27	.46	.508	28
Q16_Corr	.15	.362	27	.32	.476	28
Q17_Corr	.26	.447	27	.46	.508	28
Q18_Corr	.48	.509	27	.79	.418	28
Q19_Corr	.44	.506	27	.79	.418	28
Q20_Corr	.41	.501	27	.75	.441	28

Appendix D

Table 1
Item Statistics, Entry Order, Grade 7 MCRC Form 6

Item Number	Raw Score	Count	Measure	Model Standard Error	Mean Square Outfit
1	79	85	-1.99	-0.61	0.64
2	69	85	-0.74	-0.69	0.81
3	49	85	0.59	1.03	1.12
4	78	85	-1.80	-0.79	0.61
5	79	85	-1.99	-1.24	0.42
6	77	85	-1.64	-0.62	0.70
7	49	85	0.59	0.57	1.06
8	34	85	1.41	-2.13	0.74
9	50	85	0.53	2.08	1.26
10	14	85	2.77	2.07	1.75
11	52	85	0.42	0.88	1.11
12	33	85	1.46	-1.13	0.85
13	67	85	-0.57	1.51	1.37
14	82	85	-2.77	1.13	1.87
15	8	85	3.46	-0.22	0.84
16	44	85	0.86	-0.14	0.98
17	58	85	0.06	0.65	1.09
18	5	85	3.99	0.38	1.11
19	80	85	-2.20	-0.06	0.85
20	81	85	-2.45	-0.29	0.69

Table 2
Distractor Analysis, Grade 7 MCRC Form 6

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
1	A	0	2	2	-0.95	0.17
	B	0	4	5	0.07	0.54
	C	1	79	93	1.02	0.09
	Missing	**				
2	B	0	6	7	0.25	0.28
	A	0	10	12	0.15	0.29
	C	1	69	81	1.10	0.10
	Missing	**				
3	A	0	1	1	0.95	0.00
	C	0	34	40	0.63	0.13
	B	1	49	58	1.14	0.13
	Missing	**	1	1	0.59	0.00
4	C	0	1	1	-1.13	0.00
	B	0	6	7	0.02	0.26
	A	1	78	92	1.02	0.09
	Missing	**				
5	C	0	2	2	-0.09	0.68
	A	0	3	4	-0.79	0.53
	B	1	79	93	1.05	0.08
	Missing	**	1	1	-1.86	0.00
6	B	0	2	2	-1.13	0.35
	A	0	5	6	0.39	0.40
	C	1	77	91	1.05	0.09
	Missing	**	1	1	-1.86	0.00
7	B	0	2	2	0.07	0.17
	C	0	32	38	0.66	0.15
	A	1	49	58	1.16	0.11
	Missing	**	2	2	0.19	2.04
8	B	0	18	21	0.64	0.15
	C	0	32	38	0.54	0.14
	A	1	34	40	1.52	0.11
	Missing	**	1	1	-1.86	0.00
9	A	0	2	2	0.6	0.35
	C	0	31	36	0.77	0.16
	B	1	50	59	1.05	0.11
	Missing	**	2	2	0.47	2.33
10	A	0	14	16	0.74	0.25
	C	1	14	16	1.17	0.27
	B	0	56	66	0.96	0.10
	Missing	**	1	1	-1.86	0.00

Table 2
Distractor Analysis, Grade 7 MCRC Form 6 (Continued)

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
11	A	0	15	18	0.34	0.20
	C	0	17	20	1.05	0.16
	B	1	52	61	1.10	0.11
	Missing	**	1	1	-1.86	0.00
12	A	0	14	16	0.56	0.23
	C	1	33	39	1.42	0.12
	B	0	37	44	0.70	0.12
	Missing	**	1	1	-1.86	0.00
13	A	0	8	9	0.55	0.16
	C	0	9	11	1.21	0.24
	B	1	67	79	0.97	0.11
	Missing	**	1	1	-1.86	0.00
14	C	0	0	0	0.00	0.00
	A	0	2	2	0.55	1.68
	B	1	82	96	0.97	0.09
	Missing	**	1	1	-1.86	0.00
15	A	1	8	9	1.66	0.28
	C	0	34	40	0.73	0.15
	B	0	42	49	1.01	0.11
	Missing	**	1	1	-1.86	0.00
16	A	0	18	21	0.63	0.19
	B	0	22	26	0.69	0.16
	C	1	44	52	1.22	0.12
	Missing	**	1	1	-1.86	0.00
17	B	0	3	4	0.14	0.64
	A	0	23	27	0.65	0.21
	C	1	58	68	1.12	0.09
	Missing	**	1	1	-1.86	0.00
18	A	1	5	6	1.40	0.38
	C	0	8	9	0.25	0.40
	B	0	71	84	0.97	0.10
	Missing	**	1	1	0.59	0.00
19	A	0	1	1	-1.48	0.00
	C	0	3	4	0.26	0.69
	B	1	80	94	0.98	0.09
	Missing	**	1	1	0.59	0.00
20	B	0	0	0	0.00	0.00
	C	0	3	4	-0.21	0.46
	A	1	81	95	0.97	0.10
	Missing	**	1	1	0.59	0.00

Table 3
Item Statistics, Entry Order, Grade 7 MCRC Form 10

Item Number	Raw Score	Count	Measure	Model Standard Error	Mean Square Outfit
1	97	103	-2.33	0.00	0.92
2	100	103	-3.08	-0.13	0.74
3	66	103	0.07	-0.86	0.90
4	56	103	0.53	-2.34	0.81
5	71	103	-0.18	0.46	1.06
6	66	103	0.07	0.26	1.03
7	80	103	-0.68	0.64	1.12
8	84	103	-0.94	0.73	1.16
9	4	103	4.21	2.04	2.71
10	80	103	-0.68	0.65	1.12
11	57	103	0.48	-2.04	0.83
12	58	103	0.44	-0.53	0.95
13	75	103	-0.39	-0.97	0.85
14	89	103	-1.34	0.71	1.19
15	35	103	1.47	0.78	1.09
16	46	103	0.97	-0.19	0.98
17	88	103	-1.25	0.08	1.00
18	47	103	0.92	1.56	1.14
19	52	103	0.70	-0.52	0.95
20	45	103	1.01	1.40	1.13

Table 4
Distractor Analysis, Grade 7 MCRC Form 10

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
1	B	0	0	0	0.00	0.00
	C	0	5	5	-0.36	0.34
	A	1	97	94	0.77	0.08
	Missing	**	1	1	1.41	0.00
2	C	0	0	0	0.00	0.00
	A	0	2	2	0.37	0.13
	B	1	100	97	0.75	0.08
	Missing	**	1	1	-0.85	0.00
3	B	0	5	5	0.10	0.37
	C	0	31	30	0.35	0.14
	A	1	66	64	0.97	0.08
	Missing	**	1	1	-0.85	0.00
4	C	0	0	0	0.00	0.00
	B	0	44	43	0.23	0.11
	A	1	56	54	1.12	0.08
	Missing	**	3	3	0.55	0.70
5	A	0	7	7	-0.18	0.18
	B	0	23	22	0.54	0.18
	C	1	71	69	0.88	0.08
	Missing	**	2	2	0.28	1.13
6	C	0	5	5	0.24	0.24
	A	0	31	30	0.49	0.11
	B	1	66	64	0.89	0.10
	Missing	**	1	1	-0.85	0.00
7	B	0	1	1	1.09	0.00
	A	0	22	21	0.41	0.15
	C	1	80	78	0.80	0.09
	Missing	**				
8	B	0	1	1	-1.15	0.00
	C	0	18	17	0.46	0.19
	A	1	84	82	0.80	0.08
	Missing	**				
9	A	0	3	3	0.76	0.6
	C	1	4	4	0.74	0.7
	B	0	96	93	0.72	0.08
	Missing	**				
10	A	0	3	3	0.94	0.43
	C	0	20	19	0.35	0.18
	B	1	80	78	0.81	0.09
	Missing	**				

Table 4
Distractor Analysis, Grade 7 MCRC Form 10 (Continued)

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
11	C	0	17	17	0.37	0.17
	A	0	29	28	0.23	0.13
	B	1	57	55	1.08	0.09
	Missing	**				
12	B	0	4	4	0.24	0.37
	A	0	41	40	0.39	0.12
	C	1	58	56	0.99	0.09
	Missing	**				
13	A	0	5	5	-0.19	0.22
	B	0	23	22	0.24	0.16
	C	1	75	73	0.93	0.08
	Missing	**				
14	B	0	4	4	1.03	0.23
	C	0	10	10	0.16	0.30
	A	1	89	86	0.77	0.08
	Missing	**				
15	B	0	18	17	0.60	0.18
	A	1	35	34	0.98	0.13
	C	0	50	49	0.58	0.11
	Missing	**				
16	C	0	18	17	0.34	0.17
	A	0	39	38	0.50	0.11
	B	1	46	45	1.06	0.11
	Missing	**				
17	B	0	4	4	0.47	0.48
	C	0	10	10	0.21	0.24
	A	1	88	85	0.81	0.08
	Missing	**	1	1	-1.15	0.00
18	A	0	10	10	0.20	0.21
	B	0	45	44	0.67	0.12
	C	1	47	46	0.9	0.11
	Missing	**	1	1	-0.02	0.00
19	A	0	13	13	0.43	0.20
	C	0	37	36	0.41	0.13
	B	1	52	50	1.02	0.10
	Missing	**	1	1	0.51	0.00
20	A	0	1	1	-0.85	0.00
	C	1	45	44	0.91	0.12
	B	0	56	54	0.60	0.10
	Missing	**	1	1	0.51	0.00

Table 5
Item Statistics, Entry Order, Grade 7 MCRC Form 11

Item Number	Raw Score	Count	Measure	Model Standard Error	Mean Square Outfit
1	70	84	-1.26	-0.87	0.75
2	81	84	-3.36	-0.79	0.31
3	33	84	1.07	1.20	1.13
4	69	84	-1.17	0.56	1.13
5	79	84	-2.63	-0.49	0.63
6	50	84	0.13	1.45	1.15
7	43	84	0.52	-0.39	0.96
8	70	84	-1.26	0.09	1.00
9	17	84	2.10	0.86	1.19
10	67	84	-0.99	-1.00	0.77
11	12	84	2.56	1.35	1.42
12	16	84	2.19	-0.38	0.89
13	36	84	0.90	0.87	1.08
14	41	84	0.63	-0.06	0.99
15	62	84	-0.61	-0.98	0.82
16	81	84	-3.36	-0.49	0.45
17	50	84	0.13	-0.94	0.90
18	17	84	2.10	0.84	1.18
19	34	84	1.01	-1.43	0.86
20	29	84	1.30	0.64	1.08

Table 6
Distractor Analysis, Grade 7 MCRC Form 11

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
1	B	0	5	6	0.05	0.19
	C	0	8	10	-0.14	0.23
	A	1	70	83	0.72	0.08
	Missing	**	1	1	-5.64	0.00
2	A	0	0	0	0.00	0.00
	B	0	2	2	-0.88	0.00
	C	1	81	96	0.63	0.08
	Missing	**	1	1	-5.64	0.00
3	C	0	4	5	0.74	0.34
	A	1	33	39	0.76	0.13
	B	0	46	55	0.46	0.11
	Missing	**	1	1	-5.64	0.00
4	A	0	2	2	1.08	0.65
	C	0	9	11	0.35	0.23
	B	1	69	82	0.66	0.09
	Missing	**	4	5	-1.73	1.31
5	A	0	0	0	0.00	0.00
	B	0	3	4	-0.21	0.32
	C	1	79	94	0.64	0.08
	Missing	**	2	2	-2.92	2.72
6	B	0	12	14	0.21	0.18
	C	0	21	25	0.57	0.16
	A	1	50	60	0.7	0.11
	Missing	**	1	1	-5.64	0.00
7	A	0	17	20	0.24	0.20
	C	0	23	27	0.34	0.15
	B	1	43	51	0.87	0.10
	Missing	**	1	1	-5.64	0.00
8	A	0	4	5	0.66	0.08
	B	0	9	11	0.04	0.22
	C	1	70	83	0.66	0.09
	Missing	**	1	1	-5.64	0.00
9	C	0	2	2	0.9	0.16
	B	1	17	20	0.81	0.19
	A	0	63	75	0.55	0.09
	Missing	**	2	2	-3.26	2.38
10	C	0	3	4	-0.65	0.12
	A	0	12	14	-0.06	0.23
	B	1	67	80	0.77	0.08
	Missing	**	2	2	-2.61	3.03

Table 6
Distractor Analysis, Grade 7 MCRC Form 11 (Continued)

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
11	C	0	11	13	-0.07	0.20
	A	1	12	14	0.59	0.21
	B	0	60	71	0.72	0.09
	Missing	**	1	1	-5.64	0.00
12	A	1	16	19	1.14	0.18
	B	0	18	21	0.44	0.17
	C	0	48	57	0.46	0.10
	Missing	**	2	2	-2.29	3.35
13	A	0	3	4	0.43	0.18
	B	1	36	43	0.80	0.13
	C	0	44	52	0.44	0.11
	Missing	**	1	1	-5.64	0.00
14	A	0	7	8	0.06	0.24
	B	0	34	40	0.42	0.11
	C	1	41	49	0.85	0.12
	Missing	**	2	2	-2.92	2.72
15	B	0	9	11	0.00	0.20
	C	0	11	13	0.16	0.17
	A	1	62	74	0.77	0.09
	Missing	**	2	2	-2.92	2.72
16	B	0	0	0	0.00	0.00
	A	0	1	1	-0.88	0.00
	C	1	81	96	0.62	0.08
	Missing	**	2	2	-2.92	2.72
17	C	0	3	4	-0.44	0.44
	B	0	29	35	0.28	0.12
	A	1	50	60	0.86	0.1
	Missing	**	2	2	-2.92	2.72
18	C	0	0	0	0.00	0.00
	B	1	17	20	0.74	0.15
	A	0	65	77	0.57	0.10
	Missing	**	2	2	-2.92	2.72
19	B	0	20	24	0.43	0.20
	A	0	28	33	0.24	0.13
	C	1	34	40	1.01	0.08
	Missing	**	2	2	-2.92	2.72
20	C	0	16	19	0.53	0.17
	B	1	29	35	0.90	0.15
	A	0	37	44	0.40	0.10
	Missing	**	2	2	-2.92	2.72

Table 7
Item Statistics, Entry Order, Grade 7 MCRC Form 12

Item Number	Raw Score	Count	Measure	Model Standard Error	Mean Square Outfit
1	75	83	-1.69	-0.50	0.67
2	61	83	-0.18	-1.11	0.75
3	39	83	1.25	1.20	1.17
4	61	83	-0.18	1.25	1.30
5	67	83	-0.69	-1.86	0.50
6	62	83	-0.25	-1.43	0.67
7	57	83	0.12	0.69	1.13
8	63	83	-0.33	-0.97	0.75
9	60	83	-0.10	-0.03	0.98
10	71	83	-1.11	-0.80	0.67
11	46	83	0.83	0.22	1.02
12	55	83	0.25	-0.50	0.90
13	51	83	0.52	0.43	1.06
14	69	83	-0.89	0.76	1.25
15	51	83	0.52	-0.87	0.86
16	54	83	0.32	0.78	1.13
17	51	83	0.52	-1.00	0.84
18	61	83	-0.18	-0.05	0.97
19	47	83	0.77	-0.90	0.87
20	51	83	0.52	3.45	1.64

Table 8
Distractor Analysis, Grade 7 MCRC Form 12

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
1	B	0	2	2	-0.10	0.11
	C	0	5	6	0.02	0.35
	A	1	75	90	1.24	0.13
	Missing	**	1	1	-4.4	0.00
2	C	0	3	4	-0.14	0.42
	B	0	18	22	0.23	0.23
	A	1	61	73	1.46	0.13
	Missing	**	1	1	-4.40	0.00
3	A	0	19	23	0.71	0.27
	B	0	22	27	0.70	0.19
	C	1	39	47	1.52	0.17
	Missing	**	3	4	0.11	2.26
4	B	0	5	6	0.17	0.38
	C	0	16	19	0.86	0.22
	A	1	61	73	1.29	0.15
	Missing	**	1	1	-4.40	0.00
5	A	0	3	4	-0.22	0.23
	B	0	12	14	-0.25	0.24
	C	1	67	81	1.44	0.11
	Missing	**	1	1	-4.40	0.00
6	C	0	7	8	0.05	0.21
	A	0	11	13	0.30	0.24
	B	1	62	75	1.47	0.12
	Missing	**	3	4	-2.11	1.41
7	B	0	7	8	0.36	0.43
	C	0	16	19	0.84	0.24
	A	1	57	69	1.40	0.13
	Missing	**	3	4	-2.49	1.08
8	C	0	8	10	0.40	0.22
	A	0	10	12	0.18	0.26
	B	1	63	76	1.43	0.12
	Missing	**	2	2	-3.4	1.00
9	A	0	6	7	0.68	0.44
	B	0	14	17	0.49	0.20
	C	1	60	72	1.40	0.13
	Missing	**	3	4	-2.11	1.41
10	A	0	3	4	0.03	0.59
	B	0	7	8	0.18	0.26
	C	1	71	86	1.32	0.12
	Missing	**	2	2	-3.40	1.00

Table 8
Distractor Analysis, Grade 7 MCRC Form 12 (Continued)

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
11	C	0	10	12	0.47	0.28
	A	0	24	29	0.81	0.17
	B	1	46	55	1.52	0.16
	Missing	**	3	4	-1.86	1.64
12	C	0	11	13	0.33	0.19
	B	0	15	18	0.73	0.21
	A	1	55	66	1.47	0.14
	Missing	**	2	2	-3.40	1.00
13	C	0	10	12	0.36	0.23
	A	0	20	24	0.85	0.22
	B	1	51	61	1.47	0.14
	Missing	**	2	2	-3.40	1.00
14	B	0	4	5	-0.16	0.25
	C	0	8	10	0.57	0.41
	A	1	69	83	1.32	0.12
	Missing	**	2	2	-3.40	1.00
15	A	0	1	1	-0.67	0.00
	B	0	27	33	0.46	0.13
	C	1	51	61	1.57	0.14
	Missing	**	4	5	-0.8	1.57
16	C	0	1	1	0.69	0.00
	B	0	26	31	0.82	0.15
	A	1	54	65	1.36	0.15
	Missing	**	2	2	-3.40	1.00
17	C	0	11	13	0.31	0.19
	A	0	19	23	0.62	0.19
	B	1	51	61	1.57	0.14
	Missing	**	2	2	-3.40	1.00
18	A	0	2	2	-0.11	0.57
	C	0	18	22	0.68	0.16
	B	1	61	73	1.37	0.14
	Missing	**	2	2	-3.40	1.00
19	B	0	7	8	0.39	0.27
	C	0	27	33	0.64	0.15
	A	1	47	57	1.60	0.15
	Missing	**	2	2	-3.40	1.00
20	C	0	14	17	0.75	0.17
	B	0	15	18	1.31	0.28
	A	1	51	61	1.21	0.15
	Missing	**	3	4	-1.22	2.26

Table 9
Item Statistics, Entry Order, Grade 7 MCRC Form 13

Item Number	Raw Score	Count	Measure	Model Standard Error	Mean Square Outfit
1	73	77	-1.72	-0.04	0.84
2	48	77	0.93	-0.50	0.93
3	69	77	-0.91	-0.63	0.71
4	61	77	-0.01	-0.32	0.90
5	72	77	-1.47	-0.47	0.66
6	70	77	-1.07	-0.27	0.81
7	67	77	-0.64	0.05	0.97
8	58	77	0.24	0.80	1.16
9	55	77	0.46	0.00	0.99
10	73	77	-1.72	-0.33	0.68
11	64	77	-0.30	-1.19	0.66
12	29	77	2.09	5.26	1.91
13	49	77	0.87	0.87	1.12
14	61	77	-0.01	-0.32	0.90
15	53	77	0.60	-0.51	0.91
16	39	77	1.48	0.81	1.09
17	60	77	0.07	-0.75	0.82
18	50	77	0.80	0.15	1.01
19	48	77	0.93	0.41	1.05
20	67	77	-0.64	-0.13	0.91

Table 10
Distractor Analysis, Grade 7 MCRC Form 13

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
1	A	0	2	3	1.42	0.65
	C	0	2	3	-0.92	0.42
	B	1	73	95	1.57	0.09
	Missing	**				
2	A	0	3	4	0.17	0.33
	C	0	26	34	1.20	0.14
	B	1	48	62	1.75	0.12
	Missing	**				
3	B	0	1	1	0.00	0.00
	C	0	7	9	0.48	0.42
	A	1	69	90	1.63	0.09
	Missing	**				
4	B	0	6	8	1.38	0.22
	C	0	9	12	0.61	0.29
	A	1	61	79	1.65	0.10
	Missing	**	1	1	1.67	0.00
5	A	0	1	1	-1.34	0.00
	C	0	4	5	0.91	0.18
	B	1	72	94	1.58	0.09
	Missing	**				
6	B	0	1	1	-1.34	0.00
	A	0	5	6	0.72	0.18
	C	1	70	91	1.59	0.09
	Missing	**	1	1	2.07	0.00
7	C	0	2	3	0.76	0.00
	A	0	7	9	0.98	0.32
	B	1	67	87	1.58	0.10
	Missing	**	1	1	1.67	0.00
8	C	0	2	3	1.50	0.17
	B	0	17	22	1.12	0.26
	A	1	58	75	1.62	0.10
	Missing	**				
9	A	0	6	8	0.40	0.46
	B	0	16	21	1.30	0.18
	C	1	55	71	1.68	0.1
	Missing	**				
10	B	0	2	3	1.22	0.45
	C	0	2	3	-0.67	0.67
	A	1	73	95	1.57	0.09
	Missing	**				

Table 10
Distractor Analysis, Grade 7 MCRC Form 13 (Continued)

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
11	B	0	1	1	0.76	0.00
	A	0	11	14	0.53	0.26
	C	1	64	83	1.69	0.09
	Missing	**	1	1	1.04	0.00
12	A	0	0	0	0.00	0.00
	C	1	29	38	1.32	0.17
	B	0	48	62	1.62	0.12
	Missing	**	1	1	1.04	0.00
13	C	0	2	3	1.05	0.29
	A	0	25	32	1.22	0.13
	B	1	49	64	1.66	0.13
	Missing	**	1	1	2.07	0.00
14	B	0	1	1	-1.34	0.00
	A	0	15	19	1.04	0.19
	C	1	61	79	1.66	0.10
	Missing	**				
15	C	0	6	8	0.25	0.35
	A	0	18	23	1.24	0.15
	B	1	53	69	1.74	0.11
	Missing	**				
16	B	0	14	18	1.00	0.11
	C	0	23	30	1.23	0.18
	A	1	39	51	1.85	0.14
	Missing	**	1	1	1.67	0.00
17	A	0	6	8	0.86	0.52
	B	0	10	13	0.70	0.22
	C	1	60	78	1.72	0.09
	Missing	**	1	1	0.76	0.00
18	C	0	12	16	1.34	0.13
	B	0	14	18	1.04	0.26
	A	1	50	65	1.69	0.12
	Missing	**	1	1	0.76	0.00
19	A	0	7	9	0.94	0.32
	B	0	21	27	1.27	0.13
	C	1	48	62	1.7	0.13
	Missing	**	1	1	0.76	0.00
20	C	0	4	5	1.11	0.56
	A	0	5	6	0.41	0.47
	B	1	67	87	1.62	0.09
	Missing	**	1	1	0.76	0.00

Table 11
Item Statistics, Entry Order, Grade 7 MCRC Form 14

Item Number	Raw Score	Count	Measure	Model Standard Error	Mean Square Outfit
1	88	93	-2.60	-0.75	0.60
2	80	93	-1.50	-0.69	0.80
3	26	93	1.51	-0.10	0.98
4	35	93	1.03	1.41	1.15
5	76	93	-1.16	-0.43	0.89
6	35	93	1.03	2.36	1.26
7	51	93	0.27	1.02	1.08
8	86	93	-2.23	-0.31	0.82
9	52	93	0.22	-1.18	0.91
10	47	93	0.46	0.01	1.00
11	49	93	0.36	1.37	1.10
12	61	93	-0.23	-0.60	0.93
13	35	93	1.03	2.88	1.32
14	36	93	0.98	-0.17	0.98
15	68	93	-0.62	-0.51	0.92
16	39	93	0.84	-0.27	0.97
17	67	93	-0.56	-0.77	0.89
18	77	93	-1.24	-1.61	0.66
19	49	93	0.36	-0.46	0.96
20	18	93	2.03	-0.31	0.92

Table 12
Distractor Analysis, Grade 7 MCRC Form 14

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
1	A	0	0	0	0.00	0.00
	B	0	5	5	-0.69	0.41
	C	1	88	95	0.54	0.06
	Missing	**				
2	B	0	2	2	-0.62	0.14
	C	0	11	12	0.01	0.15
	A	1	80	86	0.56	0.07
	Missing	**				
3	A	1	26	28	0.74	0.10
	B	0	26	28	0.66	0.13
	C	0	37	40	0.23	0.11
	Missing	**	4	4	-0.29	0.31
4	A	0	3	3	-0.04	0.94
	C	1	35	38	0.57	0.10
	B	0	54	58	0.44	0.09
	Missing	**	1	1	0.32	0.00
5	A	0	8	9	0.00	0.27
	C	0	8	9	0.18	0.19
	B	1	76	82	0.58	0.07
	Missing	**	1	1	-1.40	0.00
6	C	0	28	30	0.59	0.09
	B	0	29	31	0.35	0.11
	A	1	35	38	0.54	0.13
	Missing	**	1	1	-1.40	0.00
7	A	0	8	9	0.30	0.23
	C	0	33	35	0.27	0.11
	B	1	51	55	0.61	0.10
	Missing	**	1	1	1.43	0.00
8	B	0	2	2	-0.34	0.14
	C	0	4	4	-0.24	0.47
	A	1	86	92	0.52	0.07
	Missing	**	1	1	0.58	0.00
9	C	0	12	13	0.14	0.18
	A	0	28	30	0.22	0.13
	B	1	52	56	0.72	0.08
	Missing	**	1	1	-1.06	0.00
10	C	0	21	23	0.17	0.14
	B	0	25	27	0.36	0.13
	A	1	47	51	0.67	0.09
	Missing	**				

Table 12
Distractor Analysis, Grade 7 MCRC Form 14 (Continued)

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
11	A	0	5	5	0.11	0.31
	B	0	39	42	0.37	0.10
	C	1	49	53	0.59	0.10
	Missing	**				
12	C	0	6	6	-0.57	0.40
	A	0	26	28	0.28	0.11
	B	1	61	66	0.66	0.07
	Missing	**				
13	A	0	5	5	-0.61	0.25
	C	1	35	38	0.47	0.13
	B	0	52	56	0.61	0.07
	Missing	**	1	1	-1.06	0.00
14	B	0	5	5	-0.19	0.46
	C	1	36	39	0.71	0.09
	A	0	51	55	0.4	0.09
	Missing	**	1	1	-1.06	0.00
15	C	0	7	8	-0.06	0.16
	A	0	15	16	0.27	0.16
	B	1	68	73	0.62	0.08
	Missing	**	3	3	-0.63	0.61
16	C	0	8	9	0.52	0.17
	B	1	39	42	0.71	0.10
	A	0	43	46	0.35	0.10
	Missing	**	3	3	-0.98	0.27
17	B	0	6	6	0.23	0.19
	A	0	16	17	0.18	0.14
	C	1	67	72	0.63	0.08
	Missing	**	4	4	-0.72	0.32
18	A	0	6	6	-0.12	0.13
	C	0	6	6	-0.28	0.32
	B	1	77	83	0.64	0.06
	Missing	**	4	4	-0.72	0.32
19	C	0	15	16	0.32	0.17
	B	0	25	27	0.30	0.12
	A	1	49	53	0.70	0.09
	Missing	**	4	4	-0.72	0.32
20	C	1	18	19	0.84	0.13
	A	0	27	29	0.23	0.15
	B	0	46	49	0.54	0.07
	Missing	**	2	2	-1.23	0.17

Table 13
Item Statistics, Entry Order, Grade 7 MCRC Form 15

Item Number	Raw Score	Count	Measure	Model Standard Error	Mean Square Outfit
1	79	90	-0.93	-1.04	0.65
2	67	90	0.06	0.21	1.03
3	77	90	-0.72	-0.94	0.71
4	19	90	2.78	-0.47	0.88
5	84	90	-1.65	-1.1	0.47
6	82	90	-1.32	-1.31	0.49
7	74	90	-0.45	0.29	1.05
8	82	90	-1.32	0.02	0.94
9	58	90	0.60	0.32	1.04
10	65	90	0.19	-0.25	0.95
11	86	90	-2.10	-0.44	0.62
12	67	90	0.06	-0.80	0.85
13	70	90	-0.14	-0.34	0.91
14	79	90	-0.93	-0.19	0.90
15	33	90	1.91	4.47	1.68
16	17	90	2.94	0.51	1.11
17	76	90	-0.63	1.56	1.49
18	47	90	1.18	1.46	1.15
19	79	90	-0.93	-1.50	0.53
20	43	90	1.39	0.76	1.07

Table 14
Distractor Analysis, Grade 7 MCRC Form 15

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
1	C	0	0	0	0.00	0.00
	B	0	8	9	0.38	0.22
	A	1	79	88	1.42	0.09
	Missing	**	3	3	0.21	0.45
2	A	0	8	9	0.55	0.28
	B	0	12	13	1.10	0.20
	C	1	67	74	1.45	0.10
	Missing	**	3	3	0.21	0.45
3	C	0	6	7	0.05	0.31
	B	0	7	8	0.76	0.24
	A	1	77	86	1.43	0.09
	Missing	**				
4	A	0	18	20	0.66	0.23
	B	1	19	21	1.88	0.16
	C	0	53	59	1.28	0.10
	Missing	**				
5	A	0	2	2	0.04	0.42
	C	0	3	3	-0.56	0.33
	B	1	84	93	1.38	0.08
	Missing	**	1	1	1.09	0.00
6	A	0	3	3	-0.10	0.16
	B	0	5	6	0.09	0.40
	C	1	82	91	1.41	0.08
	Missing	**				
7	B	0	3	3	0.37	0.25
	C	0	13	14	0.98	0.20
	A	1	74	82	1.37	0.10
	Missing	**				
8	B	0	0	0	0.00	0.00
	A	0	8	9	0.47	0.39
	C	1	82	91	1.36	0.09
	Missing	**				
9	A	0	16	18	0.86	0.10
	B	0	16	18	1.00	0.24
	C	1	58	64	1.48	0.11
	Missing	**				
10	C	0	7	8	0.71	0.34
	A	0	18	20	0.88	0.16
	B	1	65	72	1.46	0.10
	Missing	**				

Table 14
Distractor Analysis, Grade 7 MCRC Form 15 (Continued)

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
11	C	0	0	0	0.00	0.00
	B	0	3	3	0.09	0.19
	A	1	86	96	1.33	0.09
	Missing	**	1	1	1.09	0.00
12	C	0	4	4	0.59	0.42
	B	0	18	20	0.69	0.19
	A	1	67	74	1.50	0.09
	Missing	**	1	1	0.46	0.00
13	C	0	9	10	0.76	0.27
	A	0	10	11	0.55	0.33
	B	1	70	78	1.46	0.09
	Missing	**	1	1	0.76	0.00
14	C	0	2	2	0.18	0.28
	A	0	8	9	0.58	0.38
	B	1	79	88	1.39	0.09
	Missing	**	1	1	0.76	0.00
15	A	0	20	22	1.31	0.10
	C	1	33	37	1.10	0.16
	B	0	36	40	1.44	0.16
	Missing	**	1	1	1.09	0.00
16	B	0	7	8	0.34	0.45
	C	1	17	19	1.73	0.23
	A	0	66	73	1.27	0.08
	Missing	**				
17	B	0	3	3	1.00	0.29
	C	0	9	10	1.43	0.28
	A	1	76	84	1.31	0.10
	Missing	**	2	2	0.18	0.28
18	A	0	11	12	0.74	0.26
	C	0	32	36	1.23	0.12
	B	1	47	52	1.45	0.13
	Missing	**				
19	B	0	4	4	0.55	0.25
	A	0	6	7	-0.19	0.27
	C	1	79	88	1.44	0.08
	Missing	**	1	1	0.46	0.00
20	C	0	21	23	0.95	0.16
	B	0	25	28	1.08	0.13
	A	1	43	48	1.59	0.14
	Missing	**	1	1	0.46	0.00

Table 15
Item Statistics, Entry Order, Grade 7 MCRC Form 16

Item Number	Raw Score	Count	Measure	Model Standard Error	Mean Square Outfit
1	79	109	-0.29	-0.6	0.87
2	78	109	-0.24	-0.52	0.89
3	93	109	-1.24	-1.39	0.55
4	76	109	-0.13	1.44	1.28
5	88	109	-0.86	0.52	1.13
6	75	109	-0.07	-1.40	0.76
7	80	109	-0.35	-1.63	0.68
8	79	109	-0.29	-0.61	0.87
9	56	109	0.85	0.61	1.07
10	69	109	0.23	3.55	1.63
11	90	109	-1.00	-1.99	0.48
12	47	109	1.26	0.09	1.01
13	37	109	1.74	1.36	1.23
14	77	109	-0.18	-1.96	0.66
15	79	109	-0.29	-0.99	0.80
16	79	109	-0.29	0.58	1.11
17	86	109	-0.72	-1.54	0.63
18	88	109	-0.86	0.76	1.20
19	100	109	-1.97	-1.22	0.44
20	4	109	4.70	1.66	2.61

Table 16
Distractor Analysis, Grade 7 MCRC Form 16

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
1	A	0	13	12	0.78	0.23
	C	0	17	16	-0.56	0.10
	B	1	79	72	1.24	0.11
	Missing	**				
2	A	0	9	8	0.33	0.47
	C	0	22	20	-0.20	0.18
	B	1	78	72	1.29	0.10
	Missing	**				
3	A	0	5	5	-0.13	0.40
	B	0	11	10	-0.61	0.17
	C	1	93	85	1.14	0.10
	Missing	**				
4	B	0	11	10	0.09	0.25
	C	0	22	20	0.78	0.17
	A	1	76	70	1.06	0.13
	Missing	**				
5	C	0	3	3	0.62	0.62
	A	0	18	17	0.35	0.19
	B	1	88	81	1.03	0.12
	Missing	**				
6	B	0	14	13	0.96	0.15
	C	0	20	18	-0.74	0.08
	A	1	75	69	1.34	0.10
	Missing	**				
7	B	0	11	10	0.22	0.19
	A	0	17	16	-0.24	0.17
	C	1	80	73	1.28	0.11
	Missing	**	1	1	-1.75	0.00
8	B	0	6	6	-0.32	0.40
	C	0	22	20	0.28	0.19
	A	1	79	72	1.22	0.11
	Missing	**	2	2	-0.82	0.92
9	C	0	13	12	-0.55	0.15
	A	0	39	36	0.89	0.10
	B	1	56	51	1.31	0.15
	Missing	**	1	1	-1.75	0.00
10	C	0	4	4	0.22	0.54
	A	0	35	32	1.03	0.14
	B	1	69	63	0.93	0.14
	Missing	**	1	1	-1.75	0.00

Table 16
Distractor Analysis, Grade 7 MCRC Form 16 (Continued)

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
11	C	0	8	7	-0.48	0.11
	B	0	10	9	-0.41	0.19
	A	1	90	83	1.21	0.10
	Missing	**	1	1	-1.75	0.00
12	C	0	12	11	-0.43	0.13
	A	1	47	43	1.44	0.15
	B	0	49	45	0.78	0.13
	Missing	**	1	1	-1.75	0.00
13	B	0	27	25	-0.04	0.18
	C	1	37	34	1.26	0.16
	A	0	44	40	1.26	0.13
	Missing	**	1	1	-1.75	0.00
14	C	0	11	10	0.71	0.21
	B	0	20	18	-0.53	0.10
	A	1	77	71	1.34	0.10
	Missing	**	1	1	-1.75	0.00
15	A	0	7	6	-0.28	0.24
	B	0	22	20	0.18	0.20
	C	1	79	72	1.25	0.11
	Missing	**	1	1	-1.75	0.00
16	A	0	10	9	0.41	0.31
	B	0	18	17	0.5	0.23
	C	1	79	72	1.12	0.12
	Missing	**	2	2	-1.31	0.43
17	B	0	6	6	0.00	0.25
	C	0	16	15	-0.35	0.21
	A	1	86	79	1.24	0.10
	Missing	**	1	1	-1.75	0.00
18	A	0	6	6	-0.21	0.29
	C	0	14	13	0.79	0.19
	B	1	88	81	1.03	0.12
	Missing	**	1	1	-1.75	0.00
19	A	0	3	3	-0.22	0.29
	C	0	5	5	-0.63	0.14
	B	1	100	92	1.04	0.10
	Missing	**	1	1	-1.75	0.00
20	C	1	4	4	0.97	0.54
	B	0	23	21	0.88	0.21
	A	0	78	72	0.93	0.13
	Missing	**	4	4	0.67	0.95

Table 17
Item Statistics, Entry Order, Grade 7 MCRC Form 17

Item Number	Raw Score	Count	Measure	Model Standard Error	Mean Square Outfit
1	69	103	0.23	-0.04	0.99
2	98	103	-2.14	-0.61	0.65
3	90	103	-1.07	-1.34	0.65
4	92	103	-1.27	-0.75	0.75
5	93	103	-1.38	-0.04	0.95
6	72	103	0.09	0.44	1.05
7	95	103	-1.63	1.00	1.38
8	56	103	0.81	-0.46	0.97
9	70	103	0.18	0.44	1.05
10	75	103	-0.07	-0.30	0.95
11	101	103	-3.10	-0.58	0.44
12	46	103	1.24	0.83	1.06
13	48	103	1.15	0.42	1.03
14	93	103	-1.38	0.89	1.29
15	25	103	2.24	-0.32	0.94
16	18	103	2.68	1.08	1.23
17	33	103	1.82	0.64	1.07
18	67	103	0.32	0.59	1.06
19	64	103	0.46	-0.76	0.93
20	56	103	0.81	0.72	1.05

Table 18
Distractor Analysis, Grade 7 MCRC Form 17

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
1	A	0	7	7	0.45	0.18
	C	0	27	26	0.88	0.08
	B	1	69	67	1.11	0.08
	Missing	**				
2	A	0	1	1	-0.55	0.00
	B	0	4	4	0.46	0.19
	C	1	98	95	1.04	0.06
	Missing	**				
3	C	0	5	5	0.20	0.24
	B	0	6	6	0.22	0.10
	A	1	90	87	1.11	0.06
	Missing	**	2	2	0.76	0.15
4	B	0	2	2	0.03	0.00
	C	0	7	7	0.44	0.14
	A	1	92	89	1.08	0.06
	Missing	**	2	2	0.5	1.05
5	A	0	2	2	0.32	0.29
	C	0	7	7	0.8	0.24
	B	1	93	90	1.05	0.06
	Missing	**	1	1	-0.55	0.00
6	A	0	1	1	0.32	0.00
	B	0	29	28	0.81	0.10
	C	1	72	70	1.09	0.08
	Missing	**	1	1	1.21	0.00
7	C	0	2	2	0.62	0.59
	B	0	6	6	0.87	0.41
	A	1	95	92	1.02	0.06
	Missing	**				
8	A	0	11	11	0.80	0.11
	C	0	34	33	0.80	0.12
	B	1	56	54	1.20	0.08
	Missing	**	2	2	0.03	0.00
9	A	0	15	15	0.48	0.14
	C	0	18	17	1.02	0.14
	B	1	70	68	1.11	0.07
	Missing	**				
10	A	0	1	1	0.32	0.00
	B	0	26	25	0.69	0.11
	C	1	75	73	1.12	0.07
	Missing	**	1	1	1.55	0.00

Table 18
Distractor Analysis, Grade 7 MCRC Form 17 (Continued)

Entry #	Data Code	Score Value	Count	%	Average Measure	S.E. Mean
11	B	0	0	0	0.00	0.00
	C	0	2	2	-0.12	0.44
	A	1	101	98	1.03	0.06
	Missing	**				
12	C	0	11	11	0.54	0.15
	A	0	45	44	0.98	0.09
	B	1	46	45	1.15	0.10
	Missing	**	1	1	0.61	0.00
13	A	0	26	25	0.85	0.13
	B	0	28	27	0.81	0.08
	C	1	48	47	1.19	0.10
	Missing	**	1	1	1.55	0.00
14	B	0	2	2	1.23	0.32
	A	0	6	6	1.13	0.20
	C	1	93	90	1.01	0.07
	Missing	**	2	2	0.32	0.00
15	A	1	25	24	1.38	0.14
	B	0	32	31	0.78	0.10
	C	0	43	42	1.01	0.09
	Missing	**	3	3	0.22	0.10
16	C	0	0	0	0.00	0.00
	B	1	18	17	1.24	0.20
	A	0	83	81	0.97	0.06
	Missing	**	2	2	0.32	0.00
17	A	0	2	2	-0.26	0.29
	C	1	33	32	1.20	0.12
	B	0	66	64	0.97	0.07
	Missing	**	2	2	0.32	0.00
18	B	0	6	6	0.77	0.25
	C	0	27	26	0.87	0.10
	A	1	67	65	1.09	0.08
	Missing	**	3	3	0.73	0.41
19	B	0	11	11	0.35	0.14
	C	0	25	24	0.89	0.11
	A	1	64	62	1.19	0.08
	Missing	**	3	3	0.51	0.20
20	B	0	18	17	0.97	0.17
	A	0	28	27	0.74	0.12
	C	1	56	54	1.16	0.08
	Missing	**	1	1	0.61	0.00