

Comparison of Computer-Delivered CMT and Paper-and-Pencil CMT

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EXECUTIVE SUMMARY

The purpose of this report is to present findings of a comparability study of paper-and-pencil (P&P) and computer-based (CB) forms of the CMT. The study was conducted during the 2012 CMT operational testing window. All eligible students in each grade took the operational form (Form U) under standard conditions. In addition, samples of students in each grade were administered one section of a prior year's operational form on the computer. The prior form used was administered operationally in 2010. Approximately 1300-1400 randomly selected students in each grade took an additional section on the computer on a different day after taking the operational form and with the knowledge that their performance did not count towards their CMT score.

After equating the CB tests to the scale of the P&P tests, item difficulty parameter estimates, expected score functions, and standard error functions for the CB and P&P tests were compared for all grades in all subjects in order to assess the equivalence of the forms. Items were considered non-equivalent if the CB difficulty estimate exceeded the P&P estimate by more than 0.3. The results of the analyses showed that all computer-based tests were more difficult than their paper-and-pencil counterparts. The largest discrepancies between the P&P and CB item parameter estimates (CB items more difficult) were observed for the Reading tests across grades. A major reason for these discrepancies may have been insufficient time limits for the Reading Comprehension sections, leading to large proportions of students not completing items at the end of a section and being scored incorrect, particularly in the lower grades. In Grades 3 through 5, over 90% of the CB Reading Comprehension items were substantially more difficult than their P&P counterparts.

The effect of CB administration was smaller for Mathematics, Writing, and Science. Based on completion rates, time limits did not appear to be a factor in student performance. However, the percentage of Mathematics items that were non-equivalent ranged from 19% in Grade 4 to 52% in Grade 8. For Writing, the proportions ranged from 15% in Grade 4 to 62% in Grade 8. The difficulty of the CB Writing form relative to the P&P form increased across grades. For Science, the percentages of non-equivalent items were 35% in Grade 5 and 29% in Grade 8.

Expected score functions showed that on all tests and in all grades, students would be expected to obtain a lower raw score on the CB test than the P&P test. Thus, use of the Raw to Scale Score tables constructed for the P&P forms would be inappropriate for the CB tests, resulting in substantial proportions of students being classified into lower performance levels than they would have attained on the P&P test.

Conclusions about the equivalence of the CB and P&P forms must take into consideration the possible presence of motivation effects due to the fact that students knew that their performance did not count towards their CMT score. Such effects would be indicated by a low correlation between proficiency estimates for the two forms. However, correlations between proficiency estimates based on the CB and P&P tests were almost all above 0.8 for the DRP (0.79 for Grade 8 DRP), Mathematics, and Science, and around 0.8 for Writing E&R. These correlations are similar to those found for proficiency estimates based on a random split of the operational test, and thus provide partial support for the conclusion that motivation was not a significant factor in student performance and that the CB and P&P tests are measuring the same skills.

Given the size and consistency of the discrepancies between the P&P and CB difficulty estimates for Reading, we do not recommend encouraging schools to administer the Reading test

in computer-based form at this point. Further investigation into the causes of the discrepancies is needed. Substantial effects due to the manner of presentation (e.g., the necessity for scrolling and the inability to see all parts of the item at the same time) may exist and these must be addressed before the Reading test is administered in computer-based form. These presentation issues may have resulted in the high non-completion rates that were observed for items later in the test and hence contributed to the apparent increase in difficulty of the CB Reading test. The complexity of the stimulus material and the difficulty of presenting it in a manner comparable to that possible with the paper-and-pencil form make it essential that presentation issues be addressed and resolved. It is quite possible and indeed likely that the tasks that were presented to students on the Reading Comprehension test as delivered in this pilot were cognitively different from the same tasks presented on the paper-and-pencil test.

The Mathematics, Writing, and Science tests appear to transfer better to the computer-based environment than the Reading test. However, based on the results presented here, the CB tests cannot be considered equivalent to the P&P tests and given the high-stakes nature of these tests, we do not endorse giving schools the option of administering the CMT on the computer in the form used in this pilot study. From a psychometric perspective, it would be better to require all students to take the CB form; however, even were this possible, growth estimates would likely be compromised by the change in instrument.

Purpose of the Study

With the introduction of common core assessments in 2014 under the SBAC consortium, Connecticut's state-wide assessment will move to a computer-adaptive testing environment. To investigate logistical and psychometric problems that may arise as a result of this transition and to begin to prepare schools for it, a pilot computer-based (CB) administration of the CMT was conducted in the Spring of 2012 during the operational testing window. The goal of this administration was to provide data for investigating whether the CB version of the CMT was psychometrically equivalent to the paper-and-pencil (P&P) form so that, if so, schools could be given the option of administering the Spring 2013 CMT via computer. This experience would help to prepare schools for the transition to fully computer-delivered administration.

Numerous prior studies have investigated the comparability of CB and P&P test forms in a variety of contexts. Wang and Shin (2009) provide a concise summary of the research to date. In the area of K-12 education, the research is not conclusive. Three large meta-analytic studies (Wang, Jiao, Young, Brooks, & Olson, 2007, 2008; Kingston, 2009) found no statistically significant effect of delivery mode on mathematics or reading achievement, or only small effects. However, Wang and Shin note that despite the overall consensus, the results are by no means unanimous. This inconsistency may be due to both student and technology factors in a given context. Leeson (2006), in a review of literature, identified student characteristics such as gender and ethnicity, cognitive processing (memory and comprehension), ability, and familiarity with and anxiety about computers. Given the increasing presence of computers in the lives of all students, some of these personal factors may be less influential today than even six years ago. Technology factors that may influence student performance include screen size and resolution,

font, line length, number of lines, spacing and whitespace, scrolling, and number of items per screen. The ability to review items or not may also affect performance.

The body of research to date suggests that comparability of CB and P&P test forms cannot be assumed and must be verified in any testing context. The purpose of this report is to present findings of the analysis of the CB and P&P forms of the CMT and make recommendations regarding the future administration of the CMT in computer-delivered form. These results will also provide valuable information for the construction of the new common core assessments

Design of the Study

Data Collection

All eligible students in each grade took the operational form (Form U) under standard conditions in the Spring of 2012. In addition, samples of students in each grade were administered one section of a prior year's operational form on the computer. The prior form used was Form T, administered operationally in 2010. Approximately 1300-1400 randomly selected students in each grade took an additional section, with all students taking the additional section on a separate day after the operational form and with the knowledge that their performance did not count towards their CMT score. The sampling plan was devised by Measurement Incorporated. The data collection design for each subject area in each grade is depicted in Figure 1.

Figure 1
Data Collection Design for the Comparability Study

Reading		Writing		Math				Science												
N items:	Grade	Grade	Grade	Session 1	Session 2	MA-1	MA-2	Session 1	Session 2											
146	3	2012 CMT RC DRP RC-1 RC-2 DRP 31 42 16 15 42	66	2012 CMT E&R DAW E&R DAW 32 1 32 1	188	2012 CMT Session 1 Session 2 MA-1 MA-2 56 38 56 38	147	2012 CMT RC DRP RC-1 RC-2 DRP 32 42 16 15 42	66	2012 CMT E&R DAW E&R DAW 32 1 32 1	192	2012 CMT Session 1 Session 2 MA-1 MA-2 56 40 56 40	159	2012 CMT RC DRP RC-1 RC-2 DRP 31 49 15 15 49	74	2012 CMT E&R DAW E&R DAW 36 1 36 1	226	2012 CMT Session 1 Session 2 Session 3 MA-1 MA-2 MA-3 50 40 23 50 40 23	78	2012 CMT CB Form Session 1 SC 39 39
158	6	2012 CMT RC DRP RC-1 RC-2 DRP 31 49 15 16 49	74	2012 CMT E&R DAW E&R DAW 36 1 36 1	232	2012 CMT Session 1 Session 2 Session 3 MA-1 MA-2 MA-3 48 41 27 48 41 27	157	2012 CMT RC DRP RC-1 RC-2 DRP 30 49 15 15 49	82	2012 CMT E&R DAW E&R DAW 40 1 40 1	240	2012 CMT Session 1 Session 2 Session 3 MA-1 MA-2 MA-3 50 40 30 50 40 30	96	2012 CMT CB Form Session 1 SC 48 48						
157	8	2012 CMT RC DRP RC-1 RC-2 DRP 30 49 13 16 49	82	2012 CMT E&R DAW E&R DAW 40 1 40 1	234	2012 CMT Session 1 Session 2 Session 3 MA-1 MA-2 MA-3 42 39 36 42 39 36														

Analysis

Prior to beginning the comparability analyses, the characteristics of the samples taking the CB forms were compared to those of the total student population taking the CMT to ensure that the samples were representative.

In carrying out the comparability study, the one-parameter IRT model was fitted to the item response data using WinSteps, as is the current practice for all operational CMT purposes. Using the operational form as an anchor, the item parameters of the computer-based form were estimated and equated to the operational form, which had previously been equated to the bank scale. Two different equating procedures were used. In the first, the operational form item parameters were held fixed during calibration, and the CB form parameters were estimated. The CB form parameters were then automatically on the bank scale. In the second procedure, a free calibration was performed on the combined operational and CB form data, and an equating coefficient computed by the difference in the mean operational form bank item parameter values and the mean free calibration operational form values. The operational form parameters were placed on the bank scale by adding the equating coefficient. The equated operational form item parameters were then examined to determine whether there were any large deviations from the bank values. Following standard equating procedures used by the CSDE and MI, if there were any differences between the bank value and the equated value of more than 0.3, the equating was repeated excluding the item with the largest discrepancy. This procedure was repeated until all discrepancies in the set of equating items were less than 0.3. Once the final equating coefficient was obtained, it was added to the CB form item parameters to adjust the mean difficulty and place the parameters on the bank scale.

The CB form had been previously administered in paper-and-pencil (P&P) form in 2010 and its item parameters had been equated to the bank scale. The equated CB item parameters from the new calibration were then compared to the bank values to investigate the extent to which the CB and P&P forms were psychometrically equivalent in each subject in each grade. Additionally, omit rates were compared for the 2010 P&P and 2012 CB forms.

To examine overall differences in the test forms, expected score functions and standard error functions were computed for each form. The expected score function gives the score that a student at a given proficiency level (on the theta scale) would be expected to receive on each form, given the item parameters for that form. These functions will reveal overall differences in difficulty between the test forms. Standard error functions show the standard error at each theta value and thus provide information about differences in the precision of measurement for the two forms.

Finally, theta estimates obtained for the same student on the 2012 P&P operational test and the CB form were compared to assess the extent to which students were performing in the same way on the two tests. Theta estimates based on the computer-based test are necessarily less accurate than those based on the full operational test, as students took only part of the test on the computer (with the exception of Science). Correlations between P&P and CB theta estimates for tests where students took a sufficient number of CB items (DRP, Mathematics, Writing E&R, and Science) were calculated. High correlations would provide some evidence that the tests are measuring the same skills, but would not rule out the presence of extraneous constructs. As a standard for comparison, correlations between theta estimates obtained on random splits (odd/even) of P&P tests for several grades in each subject were computed. These correlations indicate the largest that the P&P – CB theta correlations could reasonably be expected to be even if they were measuring the same skills.

Results

Distributions of gender, ethnicity, ELL status, special education status, and lunch status, along with mean CMT scores, are provided in Tables A1 to A4. As the tables show, the samples were representative of the full population both demographically and with respect to proficiency distribution.

Item parameter estimates for the fixed anchor and free calibrations were very similar, so only the results for the fixed anchor calibrations are reported here. Tables A5 through A25 in the Appendix contain the banked item parameter values and adjusted CB form item parameter values for each subject in each grade. Figures A1 through A4 provide plots of the equated CB item parameters against the P&P bank values.

Figures 2 through 5 show the discrepancies between the P&P and CB item parameters by item order and section for each subject in each grade. The greatest discrepancies in all grades occurred on the Reading test, which was administered in three sections, with different students taking each section. The first two sections were reading comprehension items, with each containing between 13 and 16 items. The third section was the complete DRP form. Using a discrepancy of 0.3 as a maximum tolerable difference between parameters (consistent with the discrepancy allowed for equating items), the large majority of items in Reading Comprehension Sections 1 and 2 showed unacceptable and often very large differences in the CB and P&P parameters. In almost all cases, the CB items were more difficult than the same P&P items. Discrepancies were generally smaller for DRP items, although overall the CB test was more difficult than the P&P test for all grades except Grade 6, where the CB and P&P tests appeared to be more equivalent. Figure 2 shows a clear pattern of results across the two Reading Comprehension sections. The largest discrepancies occurred for items later in both sections,

Figure 2
 Discrepancy Between 2012 Computer-Based Form T Reading Difficulty Estimates and 2010
 Paper-and-Pencil Form T Bank Values

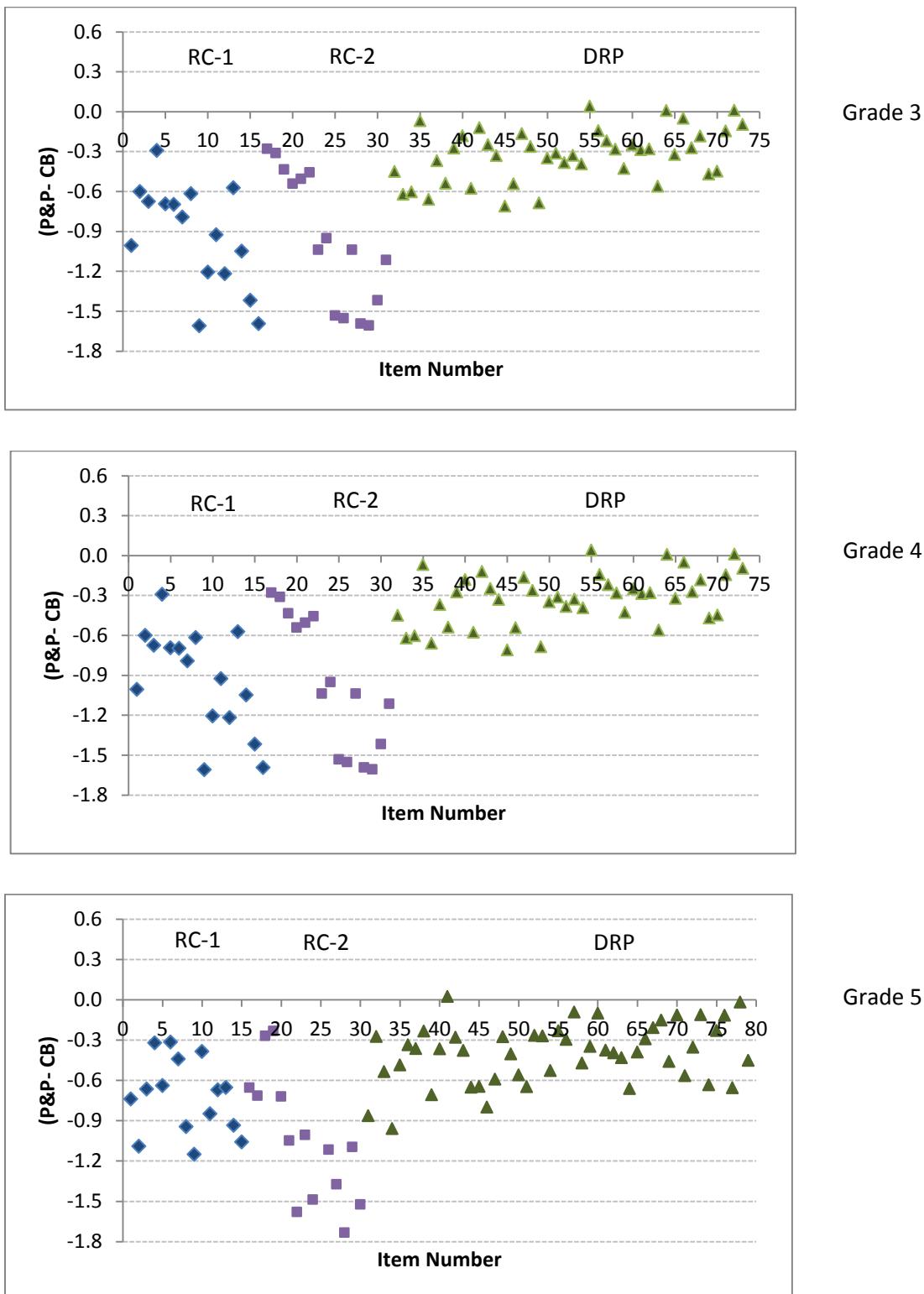


Figure 2 (Continued)

Discrepancy Between 2012 Computer-Based Form T Reading Difficulty Estimates and 2010 Paper-and-Pencil Form T Bank Values

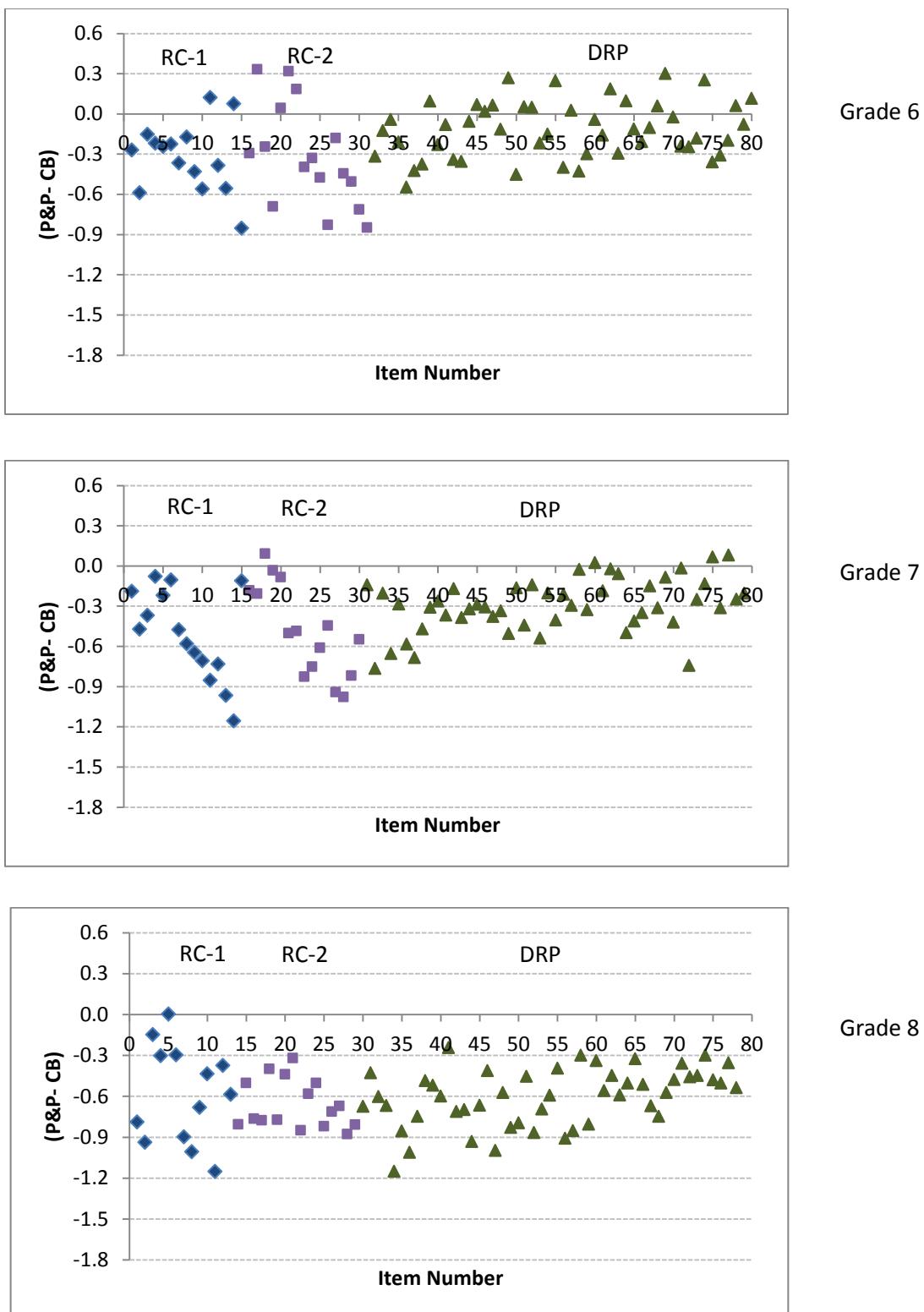


Figure 3
 Discrepancy Between 2012 Computer-Based Form T Mathematics Difficulty Estimates and 2010 Paper-and-Pencil Form T Bank Values

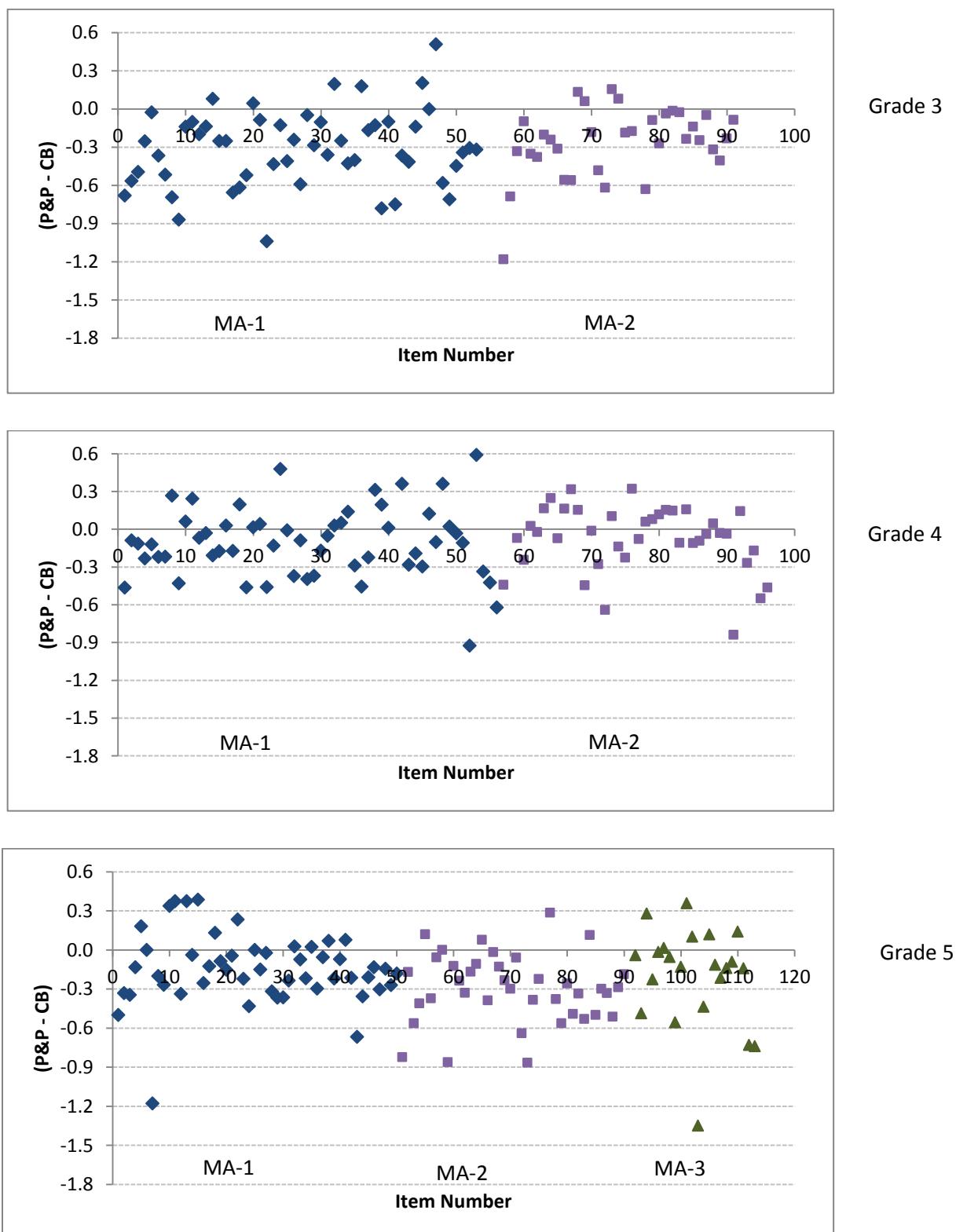


Figure 3 (Continued)

Discrepancy Between 2012 Computer-Based Form T Mathematics Difficulty Estimates and 2010 Paper-and-Pencil Form T Bank Values

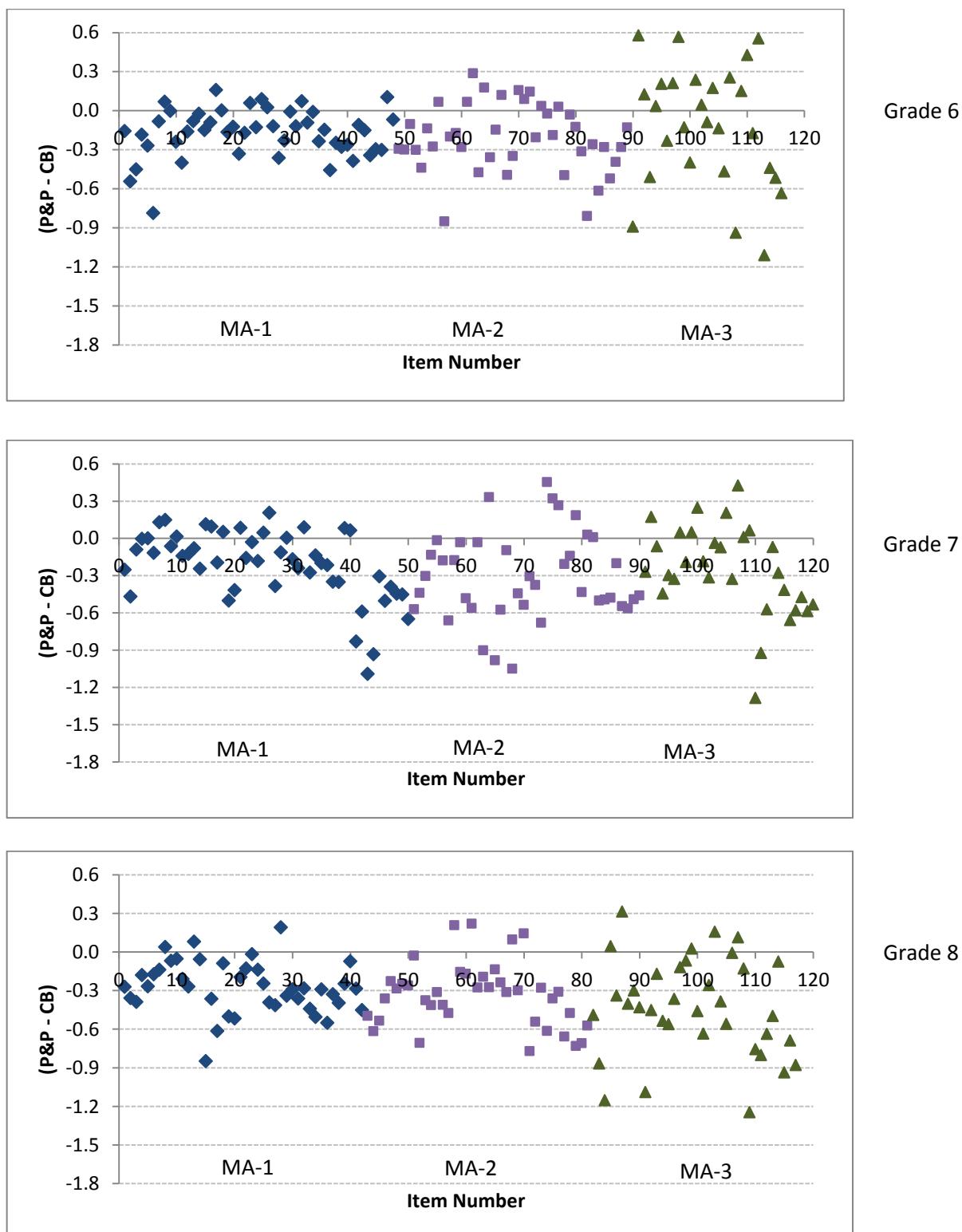


Figure 4

Discrepancy Between 2012 Computer-Based Form Writing Difficulty Estimates and 2010 Paper-and-Pencil Form T Bank Values

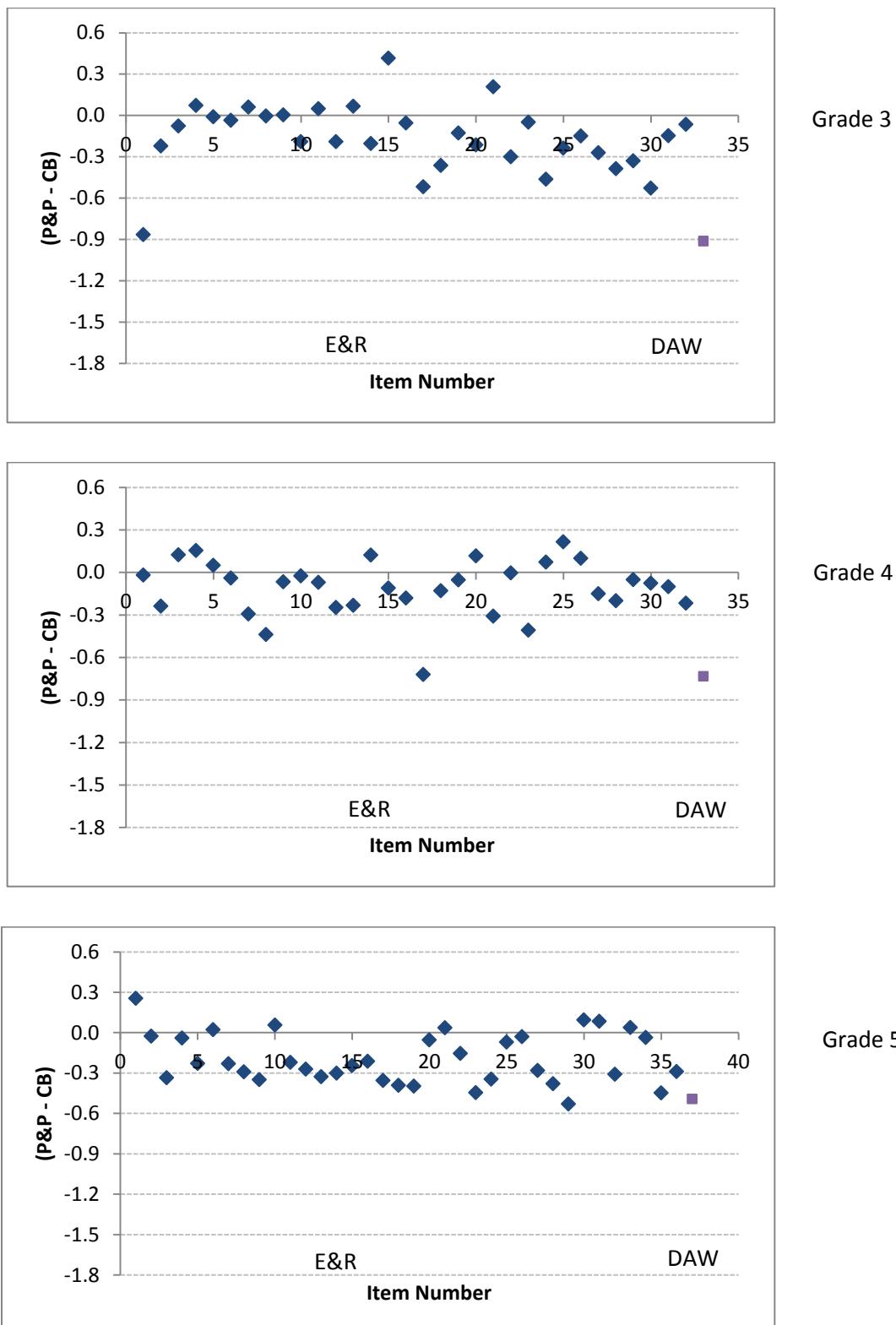


Figure 4 (Continued)

Discrepancy Between 2012 Computer-Based Form Writing Difficulty Estimates and 2010 Paper-and-Pencil Form T Bank Values

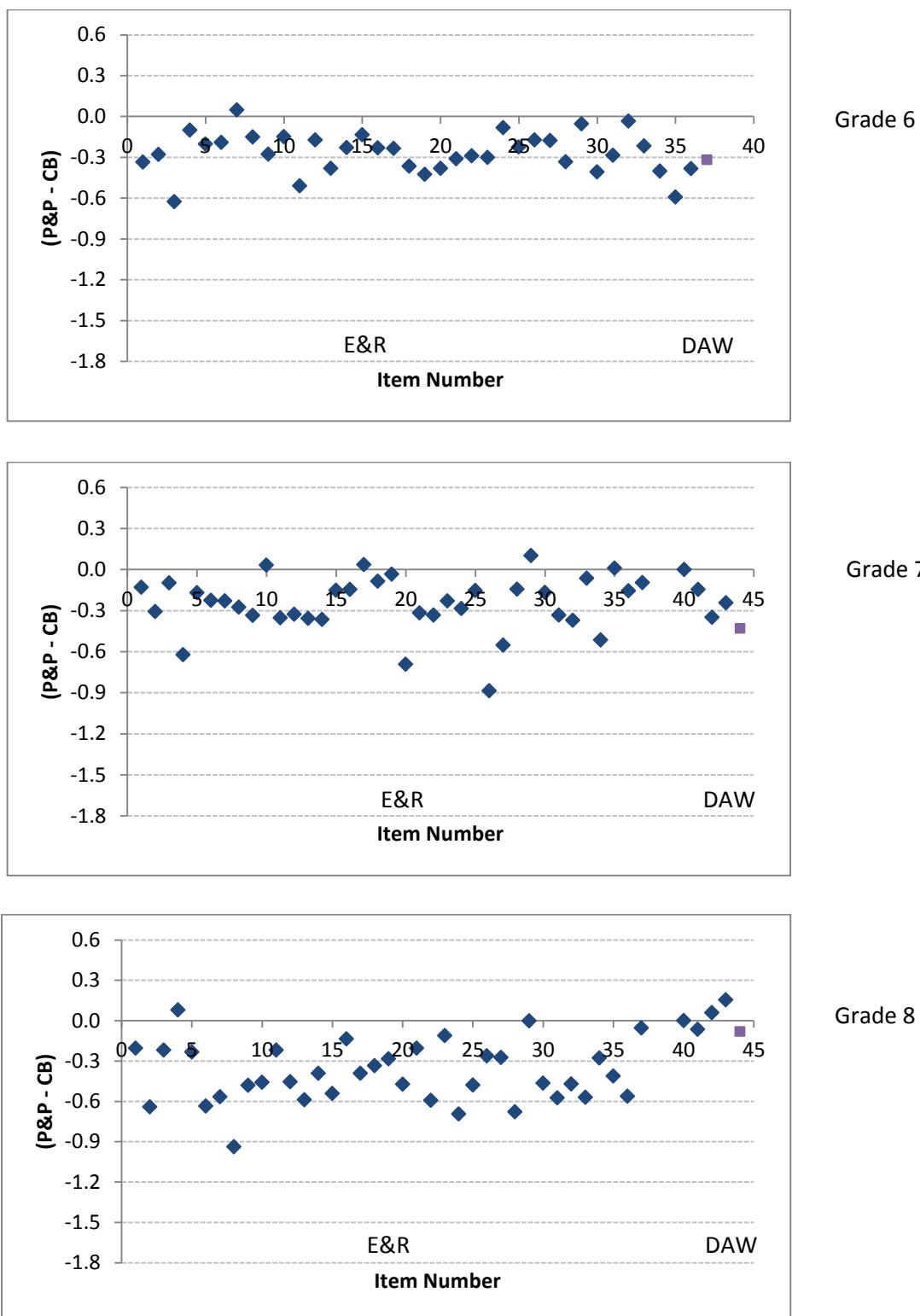
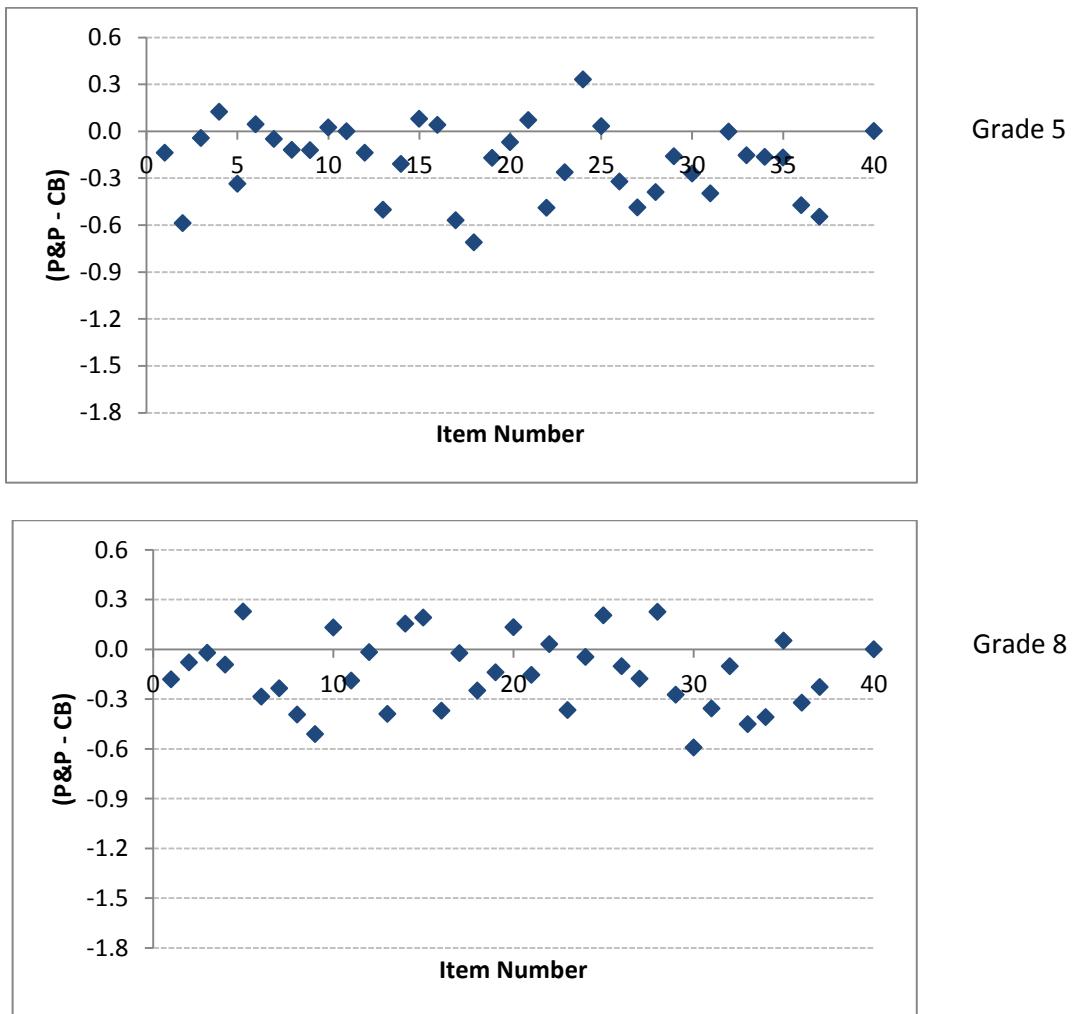


Figure 5
Discrepancy Between 2012 Computer-Based Form Science Difficulty Estimates and 2010 Paper-and-Pencil Form T Bank Values



suggesting that students may have run out of time. Examination of omit rates, provided in Tables A21 through A40, confirmed this hypothesis for the lower grades. The percentage of students omitting the last several items in each section was substantially higher for the CB form than the P&P form in Grades 3 through 5. For Grade 3, omit rates for the last 7 items in CB Reading Comprehension section 1 ranged from 10 to 21% in comparison to rates between 2% and 5% for the P&P form. For CB Reading Comprehension section 2, omit rates ranged from 7% to 15% in comparison to rates between 1% and 3% for the P&P form. Results were similar in Grades 4 and 5. Since omits were scored as incorrect, the difficulties of the later items in the Reading Comprehension sections may be spuriously high. This omit pattern was less pronounced in Grades 6 and 7, and absent in Grade 8.

The pattern of results for the DRP was quite different from that of the two Reading Comprehension sections. While the computer-based DRP was overall more difficult than the P&P test in all grades, the largest differences in difficulty generally occurred on the earlier items in the test and the differences tended to decrease for items later in the test. Omit rates were low and comparable in the P&P and CB forms, indicating that time constraints did not affect performance.

These patterns of results suggested that closer examination of the characteristics of the items was warranted. The ten items with the largest discrepancies in the item parameters and the ten items with the smallest discrepancies were identified and examined closely with respect to characteristics such as whether scrolling was needed to see the entire question, whether scrolling was needed to see all answers, and in particular, the correct answer. Tables A45 to A64 provide the results of these analyses. There were no characteristics that by themselves appeared to be strongly related to the discrepancy between the P&P and CB forms. However, some

combinations of characteristics may have made individual CB items more difficult. Given the lack of clear indicators from this analysis, it may be that students simply became frustrated with the CB Reading Comprehension test as they progressed, and/or that they did not try as hard on the CB test as they would have on the P&P test. The DRP results counter the latter conclusion to some extent, as the discrepancies between the P&P and CB parameters were generally much smaller. The computer-based DRP differed from the Reading Comprehension sections in that no scrolling was required to read either the text of the question or to see all of the answer choices, which were placed to the right-hand side of the text. It appears that the format of the DRP was more amenable to computer-based presentation than the Reading Comprehension test.

The results for Mathematics (Figure 3) showed fewer items with discrepancies between the P&P and CB form item parameter estimates that exceeded 0.3 and smaller discrepancies overall than were found for Reading. The CB Mathematics forms were administered in two or three sections, with different students taking different sections. While the CB test was overall more difficult than the P&P test in all grades, there were many CB items that were within the range of equivalent difficulty (discrepancy less than 0.3) and a few that were easier than their P&P counterparts, particularly in the higher grades. Items in Section 3 showed the largest discrepancies and the greatest variability in the discrepancies. There was no clear pattern of later items in the section having greater discrepancies. Tables 8 through 10 provide an analysis of the characteristics of the 10 items with the largest discrepancies and the 10 items with the smallest discrepancies. Analysis of these characteristics revealed no consistent pattern or explanation for the discrepancies.

Discrepancies between the P&P and CB Writing item parameter estimates (Figure 4) were generally small, especially in the lower grades. In Grades 3 and 4, there were few items

with discrepancies larger than 0.3, although all of these were in favor of the P&P test (CB items were harder). Discrepancies increased with grade, with almost half of the items in Grade 7 showing discrepancies of more than 0.3 and about three-quarters of the items in Grade 8 showing unacceptable discrepancies. Analysis of the characteristics of the items with the largest and smallest discrepancies yielded no insights into the causes.

The Grades 5 and 8 Science tests showed the same trend as other subjects of being more difficult in CB form than P&P form. About a quarter of the Grade 5 items showed discrepancies greater than 0.3, and about 20% of the items in Grade 8 showed discrepancies of this magnitude.

Expected score functions and standard error functions for the P&P and CB forms based on the equated item parameters are presented in Figures 6 to 17. As the figures show, all computer-based forms were overall more difficult than their paper-and-pencil counterparts. This difference in difficulty results in unequal standard errors of the theta estimates and consequently scaled scores. The CB tests yield lower standard errors in the region of the proficiency range where the cut-points occur. However, the difference in expected score functions indicates that the use of the raw-to-scaled score tables based on the paper-and-pencil test for students taking the computer-based test would lead to lower proficiency classifications for many. Separate raw-to-scaled score tables would need to be constructed if the computer-based test were to be used.

Figures A5 through A18 provide plots of theta estimates from the two administrations for each grade and subject. Reading Comprehension sections 1 and 2 contained no more than 16 items, so considerable attenuation of the correlation is expected due to estimation error. This attenuation combined with the problem of inaccurate estimation as a result of omitted items being scored incorrect resulted in relatively low correlations for the reading comprehension sections. Correlations between operational and CB theta estimates ranged from .56 to .73 for

these sections across grades. The DRP section consisted of 42 or 49 items, yielding better theta estimates and correlations with the operational thetas of .80 or better.

For the Mathematics tests, CB sections 1 and 2 were between 38 and 56 items long, while section 3 in Grade 5 through 8 consisted of 23 to 36 items. Correlations between the CB and operational thetas were above .80 in all cases except Grade 3 Math section1 ($r = .76$). For the Editing and Revising (E&R) section of the Writing test, based on 32 to 40 items, the correlations between the CB and operational thetas was lower, around .70 for all grades. This low correlation may be due to the fact that the operational theta is based on both E&R and Direct Assessment of Writing, which is weighted more heavily than the E&R section in the scoring. For Science, students took the full form on the computer. Correlations between operational and CB thetas were around 0.80. The correlations obtained for all test and grades indicate that students would generally be ranked the same way on the CB and P&P tests.

Summary and Recommendations

The results of these analyses show that all computer-based tests were more difficult than their paper-and-pencil counterparts. The largest discrepancies between the P&P and CB item parameter estimates (CB items more difficult) were observed for the Reading tests across grades. A major reason for these discrepancies may have been insufficient time limits for the Reading Comprehension sections, leading to large proportions of students not completing items at the end of a section and being scored incorrect, particularly in the lower grades. In Grades 3 through 5, over 90% of the CB Reading Comprehension items were substantially more difficult than their P&P counterparts.

The effect of CB administration was smaller for Mathematics, Writing, and Science. Based on completion rates, time limits did not appear to be a factor in student performance.

However, the percentage of Mathematics items that were non-equivalent ranged from 19% in Grade 4 to 52% in Grade 8. For Writing, the proportions ranged from 15% in Grade 4 to 62% in Grade 8. The difficulty of the CB Writing form relative to the P&P form increased across grades. For Science, the percentages of non-equivalent items were 35% in Grade 5 and 29% in Grade 8.

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Conclusions about the equivalence of the CB and P&P forms must take into consideration the possible presence of motivation effects due to the fact that students knew that their performance did not count towards their CMT score. Such effects would be indicated by a low correlation between proficiency estimates for the two forms. However, correlations between proficiency estimates based on the CB and P&P tests were almost all above 0.8 for the DRP (0.79 for Grade 8 DRP), Mathematics, and Science, and around 0.8 for Writing E&R. These correlations are similar to those found for proficiency estimates based on a random split of the operational test, and thus provide partial support for the conclusion that motivation was not a significant factor in student performance and that the CB and P&P tests are measuring the same skills.

Given the size and consistency of the discrepancies between the P&P and CB difficulty estimates for Reading, we do not recommend encouraging schools to administer the Reading test in computer-based form at this point. Further investigation into the causes of the discrepancies is needed. Substantial effects due to the manner of presentation (e.g., the necessity for scrolling and

the inability to see all parts of the item at the same time) may exist and these must be addressed before the Reading test is administered in computer-based form. These presentation issues may have resulted in the high non-completion rates that were observed for items later in the test and hence contributed to the apparent increase in difficulty of the CB Reading test. The complexity of the stimulus material and the difficulty of presenting it in a manner comparable to that possible with the paper-and-pencil form make it essential that presentation issues be addressed and resolved. It is quite possible and indeed likely that the tasks that were presented to students on the Reading Comprehension test as delivered in this pilot were cognitively different from the same tasks presented on the paper-and-pencil test.

The Mathematics, Writing, and Science tests appear to transfer better to the computer-based environment than the Reading test. However, based on the results presented here, the CB tests cannot be considered equivalent to the P&P tests and given the high-stakes nature of these tests, we do not endorse giving schools the option of administering the CMT on the computer in the form used in this pilot study. From a psychometric perspective, it would be better to require all students to take the CB form; however, even were this possible, growth estimates would likely be compromised by the change in instrument.

Figure 6

Expected Score Functions for Reading Using P&P and CB Equated Item Parameter Estimates

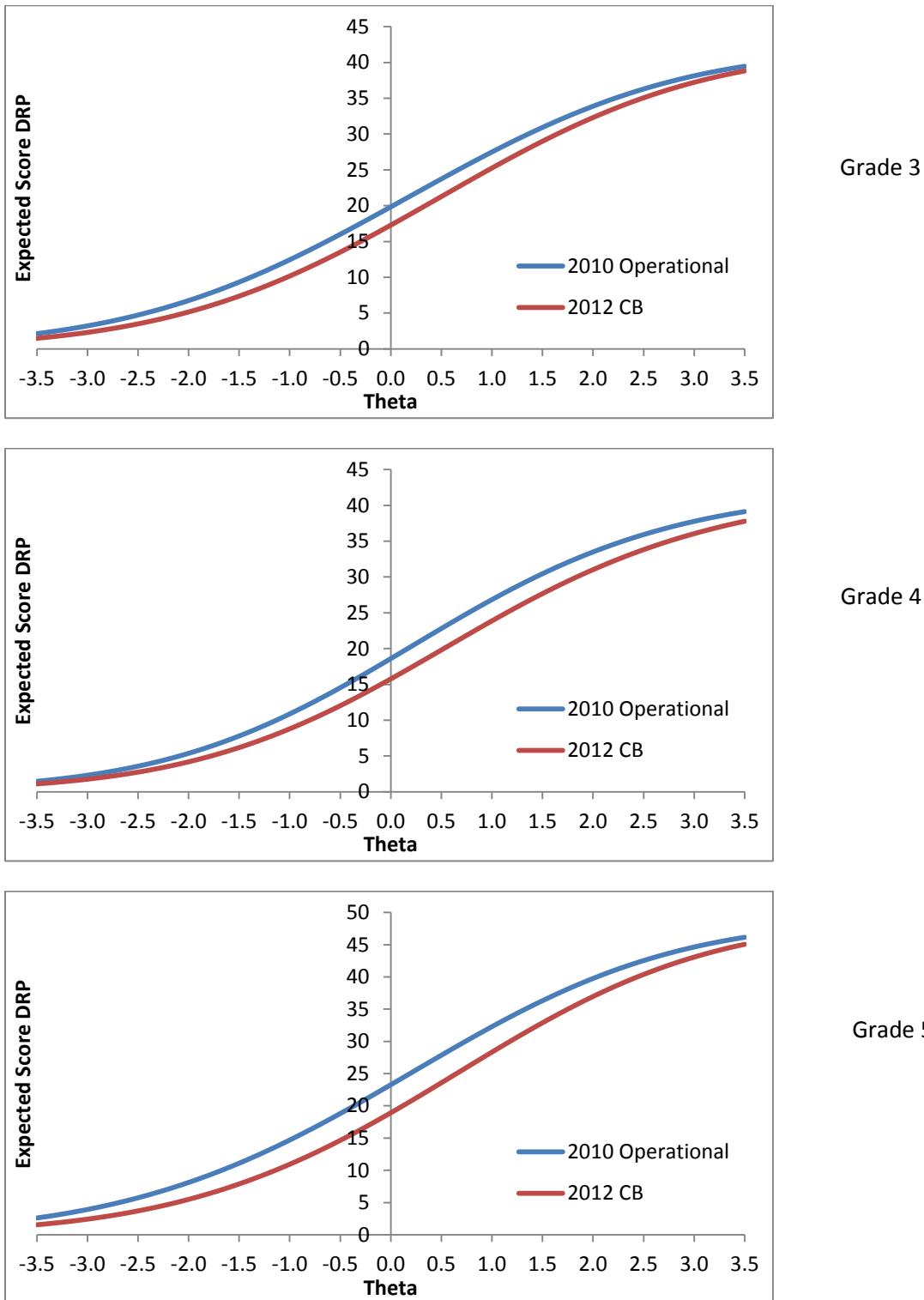
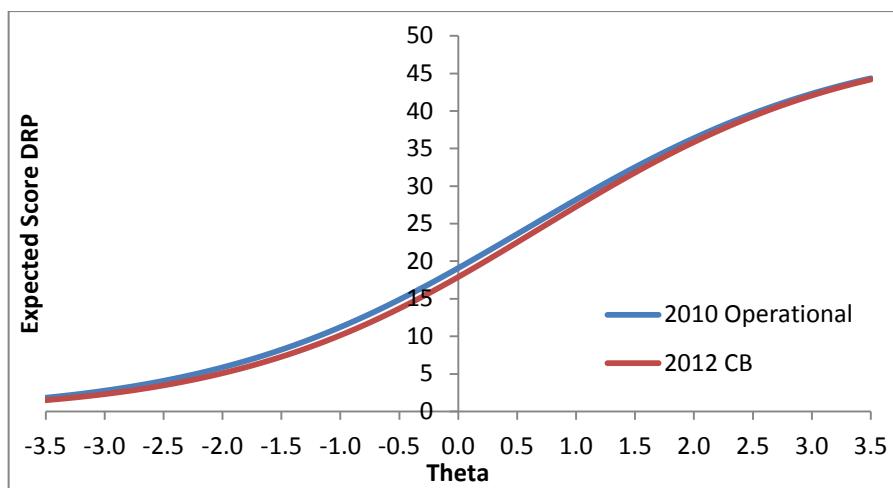
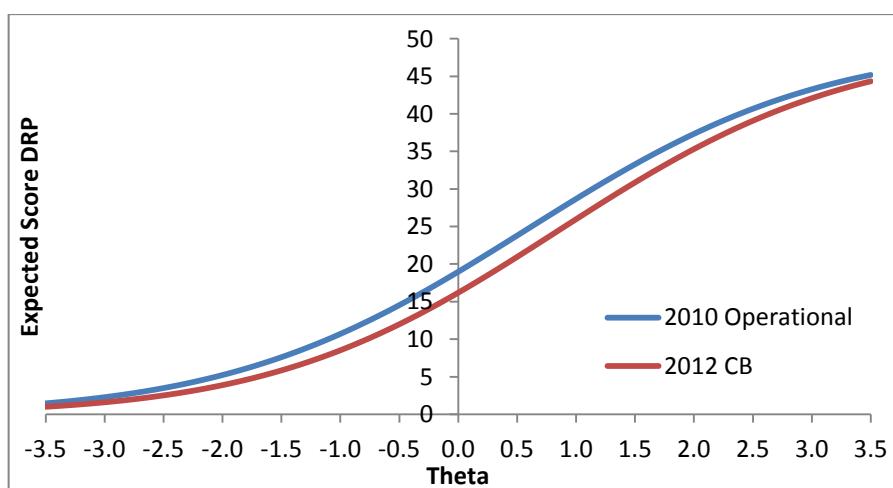


Figure 6 (Continued)

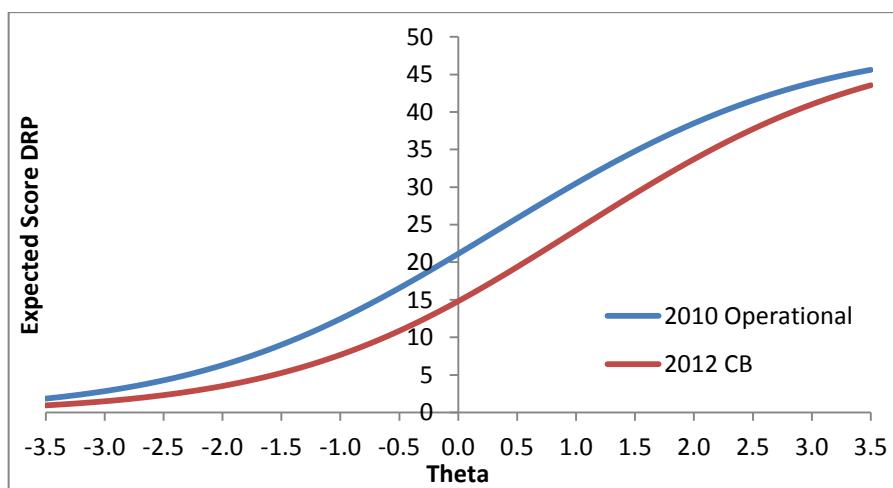
Expected Score Functions for Reading Using P&P and CB Equated Item Parameter Estimates



Grade 6



Grade 7



Grade 8

Figure 7

Standard Error Functions for Reading Using P&P and CB Equated Item Parameter Estimates

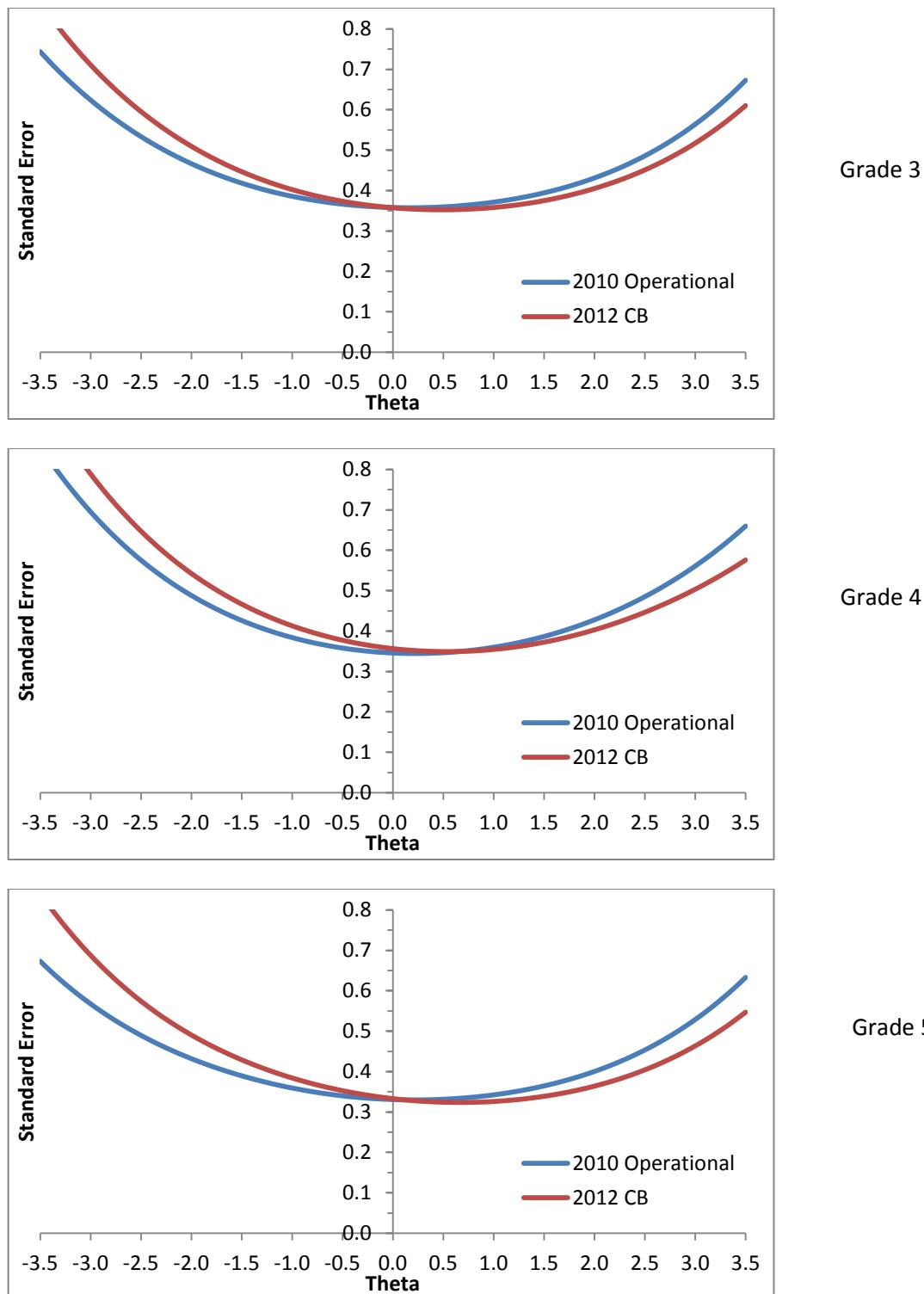


Figure 7 (Continued)

Standard Error Functions for Reading Using P&P and CB Equated Item Parameter Estimates

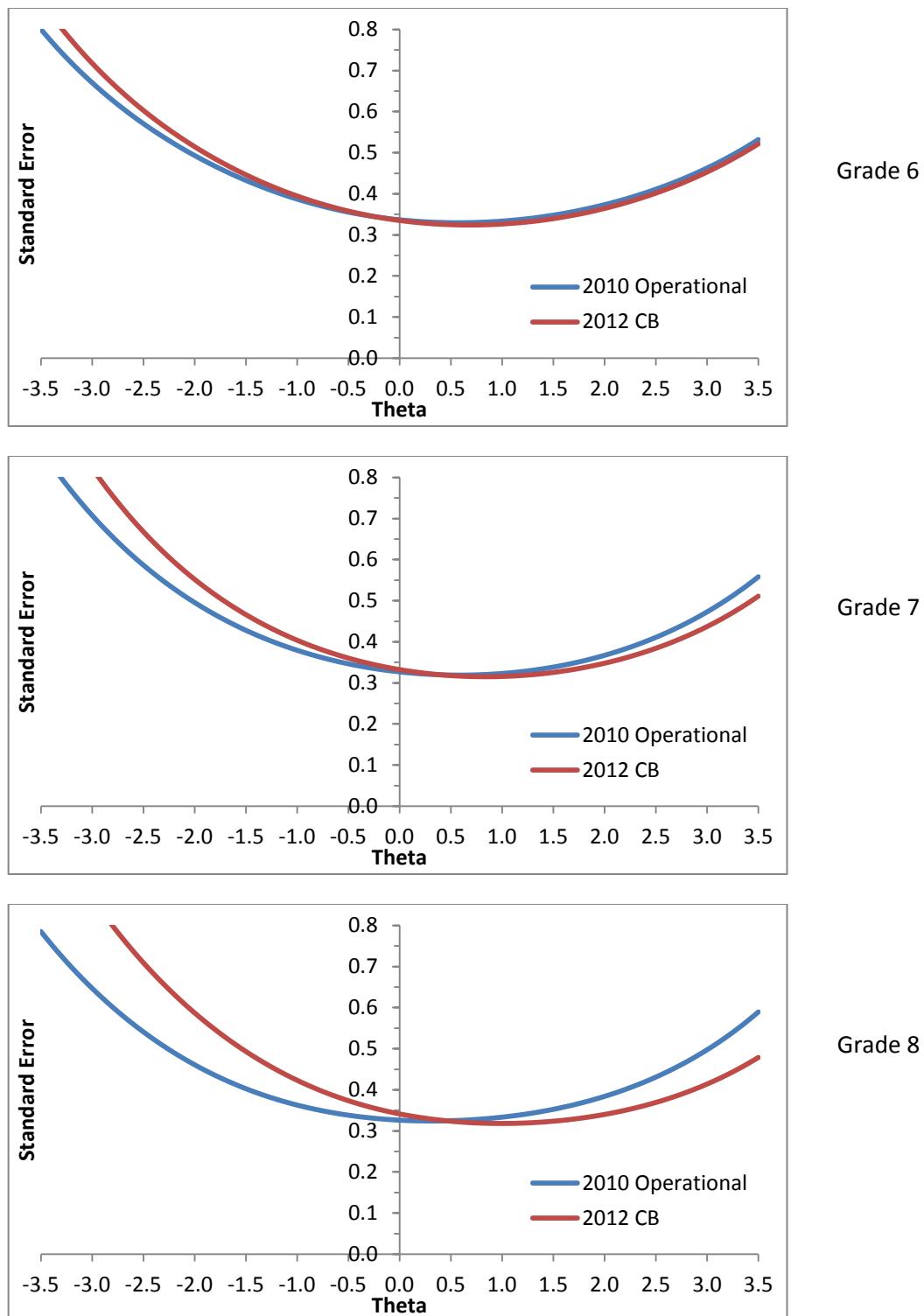


Figure 8

Expected Score Functions for Mathematics Using P&P and CB Equated Item Parameter Estimates

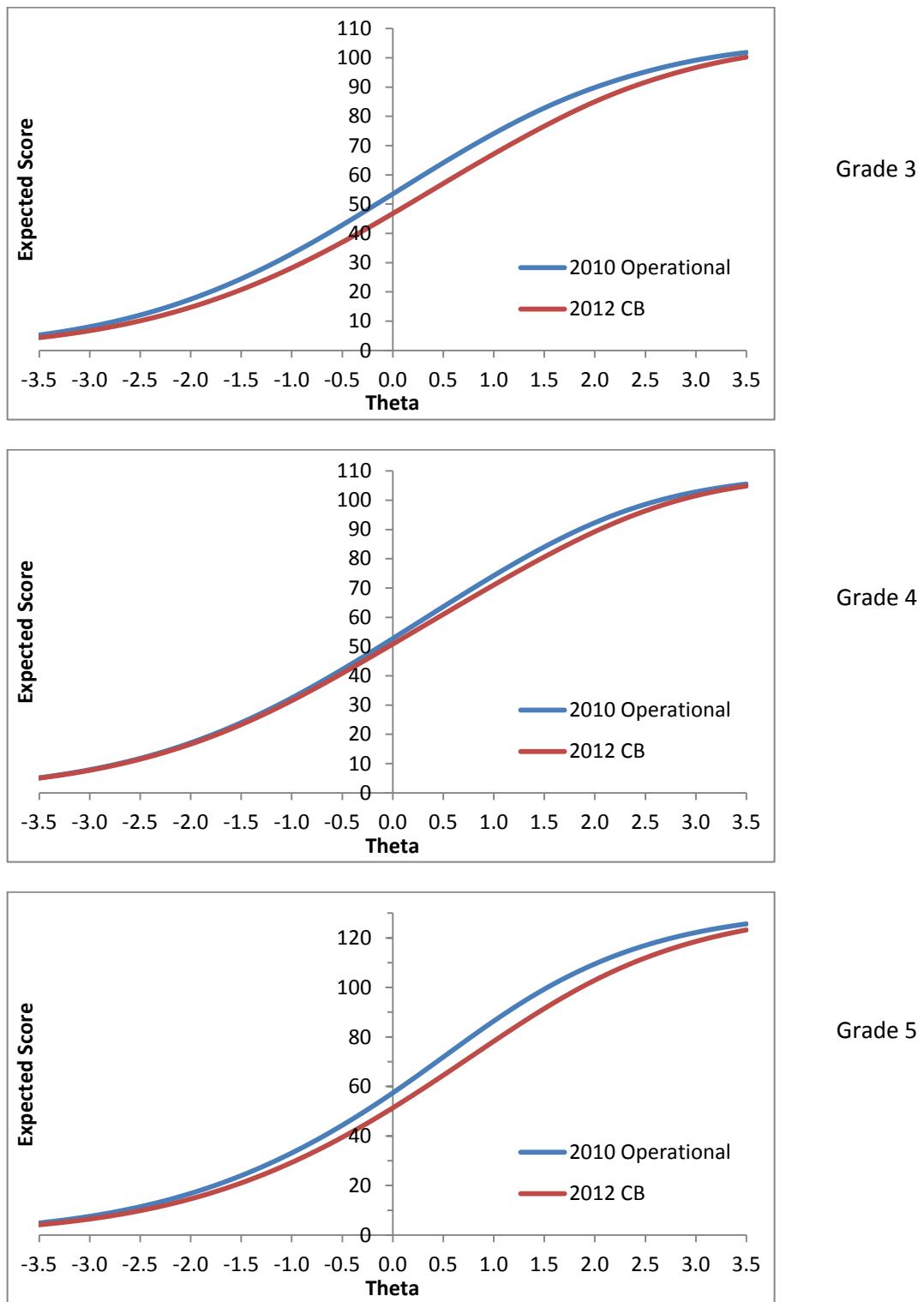


Figure 8 (Continued)

Expected Score Functions for Mathematics Using P&P and CB Equated Item Parameter Estimates

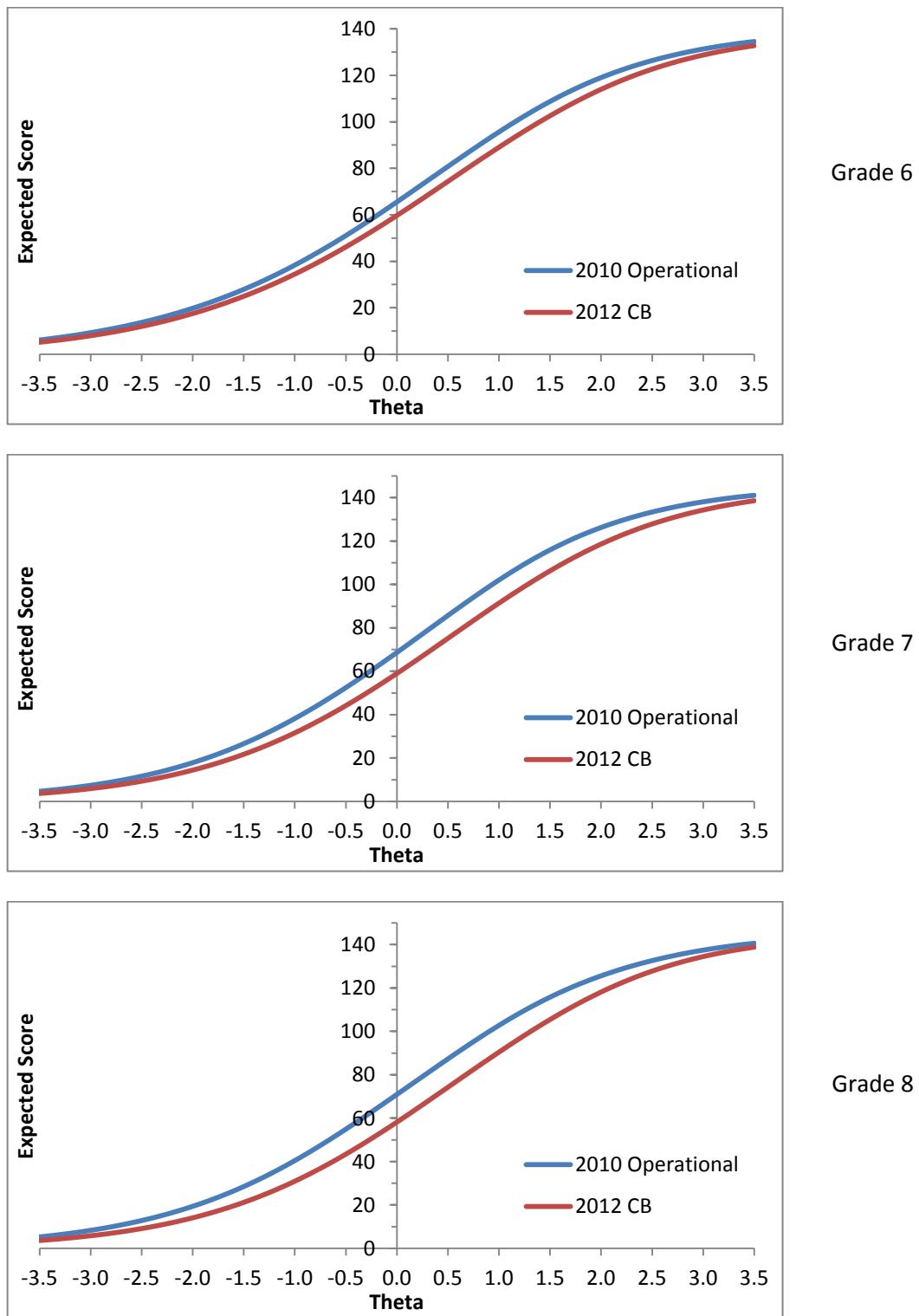


Figure 9

Standard Error Functions for Mathematics Using P&P and CB Equated Item Parameter Estimates

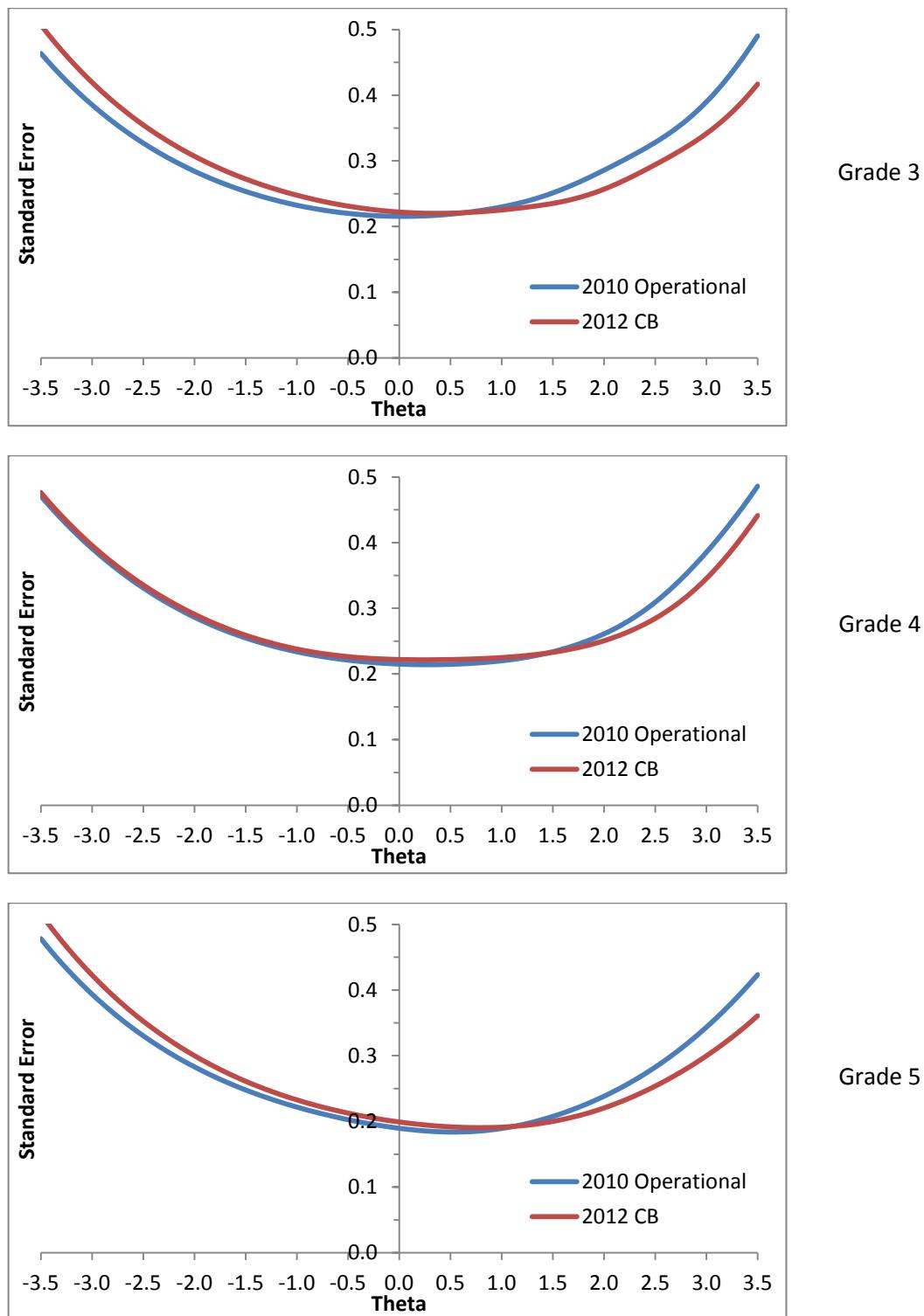


Figure 9 (Continued)

Standard Error Functions for Mathematics Using P&P and CB Equated Item Parameter Estimates

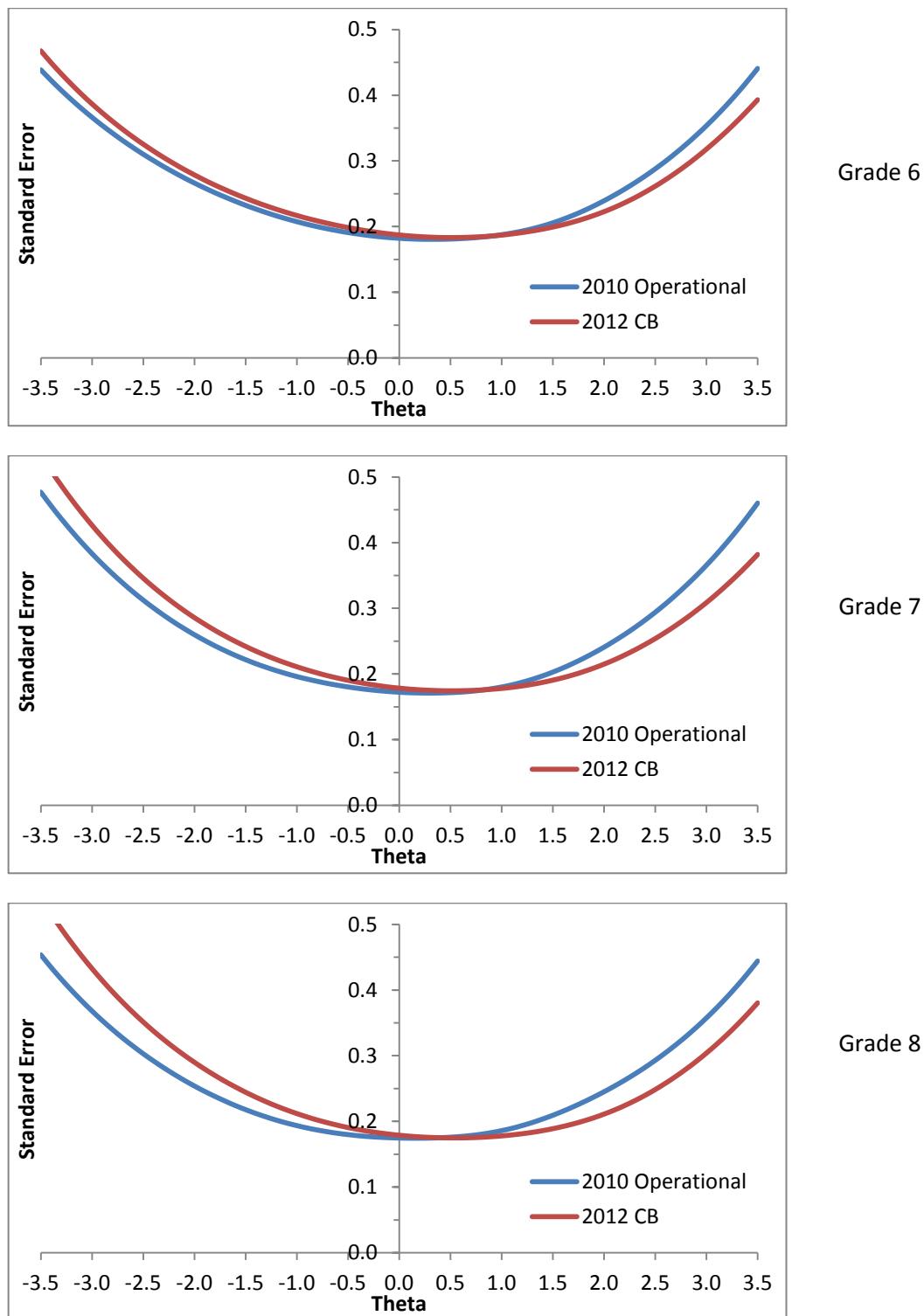
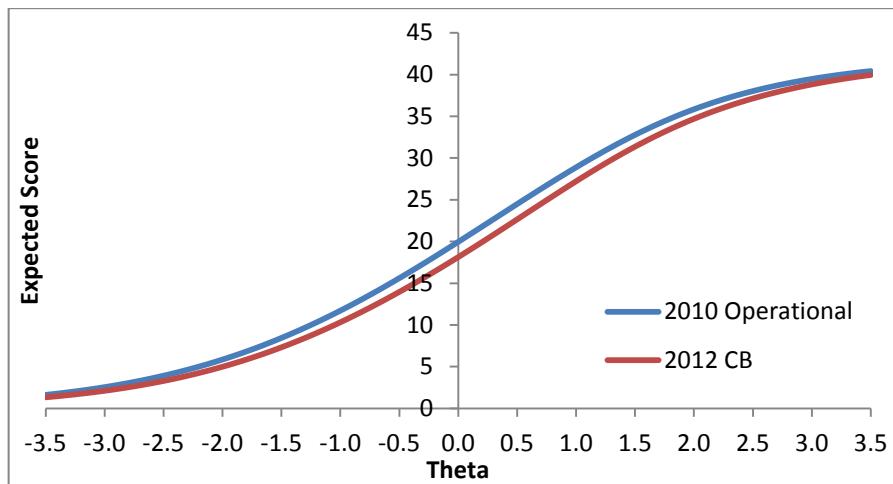
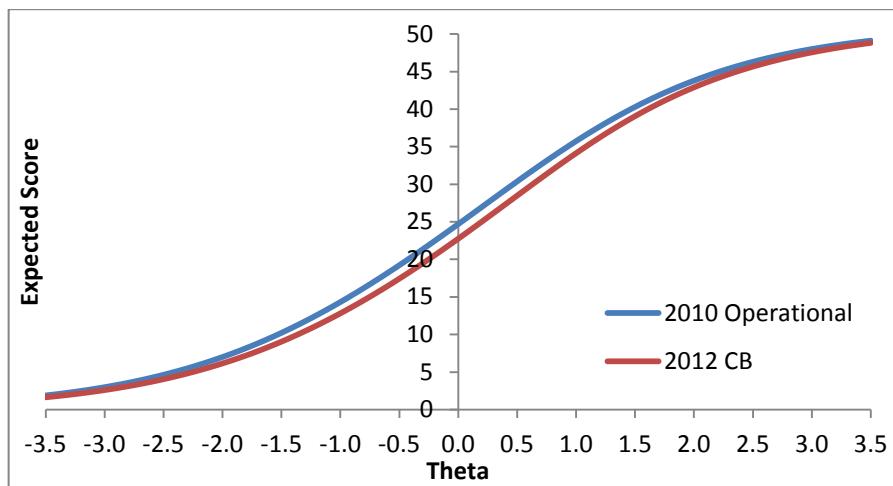


Figure 10

Expected Score Functions for Science Using P&P and CB Equated Item Parameter Estimates



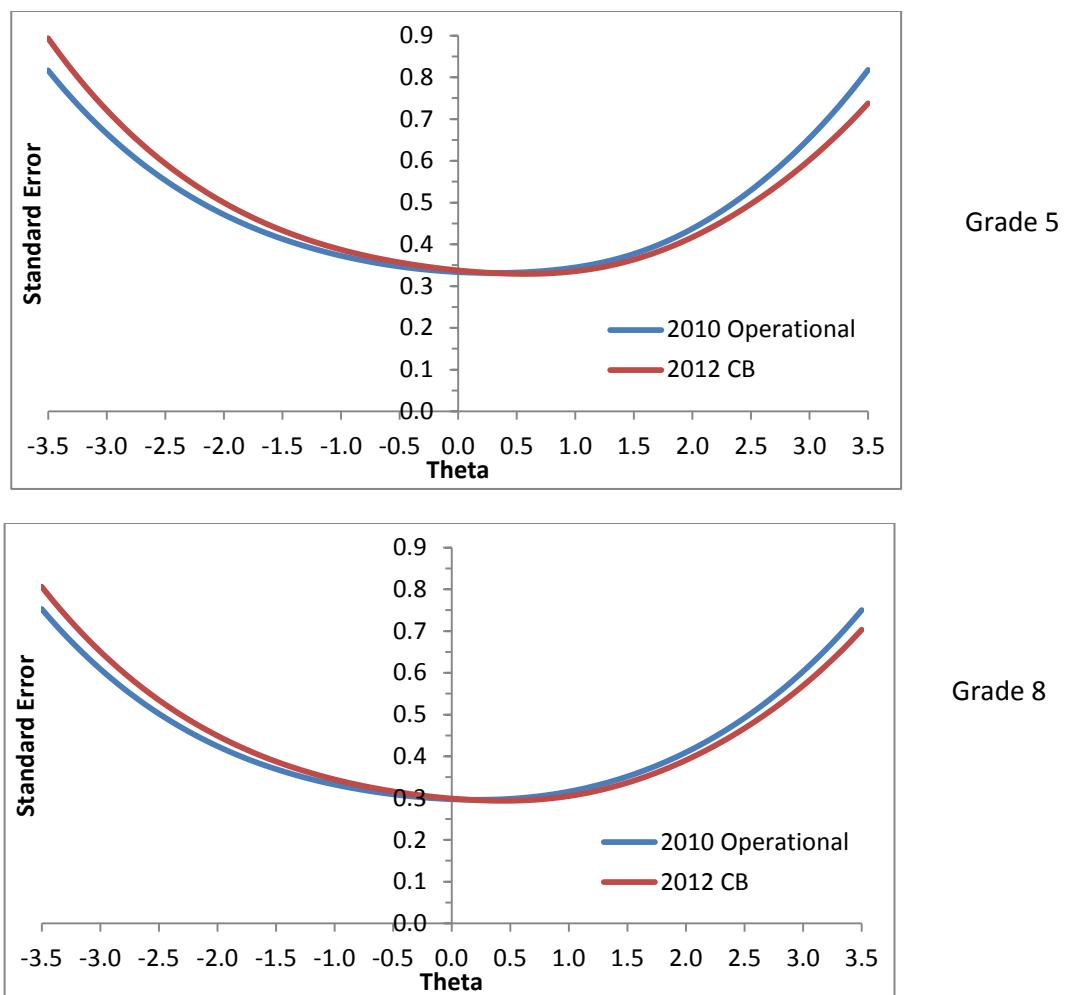
Grade 5



Grade 8

Figure 11

Standard Error Functions for Science Using P&P and CB Equated Item Parameter Estimates



APPENDIX

Table A1
Demographic and Performance Comparison of CMT Population and CB Reading Test Sample

Variable	Value	Grade 3		Grade 4		Grade 5		Grade 6		Grade 7		Grade 8	
		Pop.	Sample										
Gender	F	48.5	49.7	48.5	49.9	48.3	50.5	48.6	50.0	48.4	49.9	48.7	48.5
	M	51.5	50.3	51.5	50.1	51.7	49.5	51.4	50.0	51.6	50.1	51.4	51.5
Ethnicity	H	20.3	21.4	19.9	19.8	19.6	20.6	19.1	17.8	18.6	19.0	18.7	19.6
	B	12.6	13.4	12.9	13.5	12.7	12.8	13.0	12.9	13.3	12.3	13.0	13.7
	W	59.5	57.8	59.8	58.6	60.9	59.5	61.1	63.0	62.0	62.3	62.2	60.4
Lunch	Free	33.1	34.3	32.5	32.5	32.0	32.5	31.2	29.2	30.4	30.6	29.7	30.7
	Reduced	5.1	5.2	5.3	4.7	5.1	5.4	5.6	5.2	5.7	5.7	5.2	5.3
	None	61.9	60.4	62.2	62.8	62.9	62.1	63.2	65.6	63.9	63.7	65.1	64.0
ELL	ELL	6.7	7.2	6.0	5.2	5.4	4.9	5.0	4.0	4.2	4.4	3.9	3.5
	Not ELL	93.3	92.8	94.0	94.8	94.6	95.1	95.0	96.0	95.8	95.5	96.1	96.5
SPED	Enrolled	11.6	7.0	12.6	6.9	13.4	7.4	13.2	8.6	13.2	8.4	12.7	8.9
	Not Enrolled	88.4	93.0	87.4	93.1	86.6	92.8	86.8	91.4	86.8	91.6	87.3	91.1
Reading Form U (Raw)	Mean	53.1	52.2	57.8	57.6	60.9	60.3	65.2	65.1	65	64.2	65.3	64.2
	SD	14.8	15.0	13.0	12.9	14.6	14.7	14.5	14.7	14.4	15.0	15.8	16.3

Table A2
Demographic and Performance Comparison of CMT Population and CB Mathematics Test Sample

Variable	Value	Grade 3		Grade 4		Grade 5		Grade 6		Grade 7		Grade 8	
		Pop.	Sample										
Gender	F	48.5	48.6	48.5	49.6	48.3	50.2	48.6	49.8	48.4	49.4	48.7	48.3
	M	51.5	51.4	51.5	50.4	51.7	49.8	51.4	50.2	51.6	50.6	51.4	51.7
Ethnicity	H	20.3	21.7	19.9	19.8	19.6	21.4	19.1	18.6	18.6	19.2	18.7	19.9
	B	12.6	12.6	12.9	14.1	12.7	12.8	13.0	12.9	13.3	12.2	13.0	13.5
	W	59.5	57.8	59.8	57.4	60.9	58.1	61.1	62.3	62.0	62.2	62.2	60.3
Lunch	Free	33.1	35.4	32.5	33.7	32.0	32.7	31.2	29.9	30.4	30.6	29.7	30.8
	Reduced	5.1	4.9	5.3	4.9	5.1	5.6	5.6	5.2	5.7	5.8	5.2	5.2
	None	61.9	59.7	62.2	61.4	62.9	61.7	63.2	64.9	63.9	63.7	65.1	64.0
ELL	ELL	6.7	7.4	6.0	5.4	5.4	5.2	5.0	4.3	4.2	4.6	3.9	3.7
	Not ELL	93.3	92.6	94.0	94.6	94.6	94.8	95.0	95.7	95.8	95.4	96.1	96.3
SPED	Enrolled	11.6	8.2	12.6	8.6	13.4	8.9	13.2	9.3	13.2	9.3	12.7	9.5
	Not Enrolled	88.4	91.8	87.4	91.4	86.6	91.1	86.8	90.7	86.8	90.7	87.3	90.5
Math Form U (Raw)	Mean	89.4	88.7	89.6	88.8	107.4	106.2	105.7	105.7	104.4	102.5	100.2	98.5
	SD	14.1	14.3	16.4	16.7	20.9	21.4	25.4	25.3	29.3	30.3	30.5	31.3

Table A3
Demographic and Performance Comparison of CMT Population and CB Writing Test Sample

Variable	Value	Grade 3		Grade 4		Grade 5		Grade 6		Grade 7		Grade 8	
		Pop.	Sample										
Gender	F	48.5	48.2	48.5	49.5	48.3	49.5	48.6	49.7	48.4	49.4	48.7	48.3
	M	51.5	51.8	51.5	50.5	51.7	50.5	51.4	50.3	51.6	50.9	51.4	51.7
Ethnicity	H	20.3	21.8	19.9	20.6	19.6	22.8	19.1	19.7	18.6	19.8	18.7	20.0
	B	12.6	13.1	12.9	14.7	12.7	12.8	13.0	13.9	13.3	13.0	13.0	12.9
	W	59.5	57.8	59.8	56.2	60.9	58.0	61.1	60.5	62.0	60.8	62.2	60.9
Lunch	Free	33.1	36.2	32.5	35.4	32.0	34.8	31.2	32.4	30.4	31.5	29.7	30.8
	Reduced	5.1	5.1	5.3	4.9	5.1	5.4	5.6	5.0	5.7	6.7	5.2	5.3
	None	61.9	58.7	62.2	59.7	62.9	59.8	63.2	62.6	63.9	61.8	65.1	63.9
ELL	ELL	6.7	7.5	6.0	5.9	5.4	5.8	5.0	5.1	4.2	5.5	3.9	4.1
	Not ELL	93.3	92.5	94.0	94.1	94.6	94.2	95.0	94.9	95.8	94.5	96.1	95.9
SPED	Enrolled	11.6	11.4	12.6	13.6	13.4	13.6	13.2	14.7	13.2	14.3	12.7	13.8
	Not Enrolled	88.4	88.6	87.4	86.9	86.6	86.4	86.8	85.3	86.8	85.7	87.3	86.2
Writing Form U (Raw)	Mean	31.1	30.5	32.8	32.3	33.9	33.4	35.5	35.1	37.5	36.8	37.9	37.2
	SD	7.1	7.2	6.7	7.0	7.1	7.4	7.6	8.0	7.6	8.1	7.7	8.2

Table A4
Demographic and Performance Comparison of CMT Population and CB Science Test Sample

Variable	Value	Grade 5		Grade 8	
		Pop.	Sample	Pop.	Sample
Gender	F	48.3	50.2	48.7	48.3
	M	51.7	49.8	51.4	51.7
Ethnicity	H	19.6	23.3	18.7	20.0
	B	12.7	12.7	13.0	13.3
	W	60.9	58.5	62.2	60.5
Lunch	Free	32.0	34.8	29.7	29.7
	Reduced	5.1	5.7	5.2	4.6
	None	62.9	59.5	65.1	65.6
ELL	ELL	5.4	6.1	3.9	4.0
	Not ELL	94.6	93.9	96.1	96.0
SPED	Enrolled	13.4	13.8	12.7	14.5
	Not Enrolled	86.6	86.2	87.3	85.5
Science Form U (Raw)	Mean	30.6	29.9	34.6	33.8
	SD	7.4	7.6	9.6	9.8

Table A5
Bank (P&P) and Equated (CB) Item Parameter Values for Grade 3 Reading Form T

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
1	-0.825	0.183	-1.007
2	-2.108	-1.508	-0.600
3	-0.406	0.269	-0.675
4	-1.117	-0.825	-0.292
5	-3.279	-2.586	-0.693
6	-2.351	-1.654	-0.697
7	-1.398	-0.605	-0.793
8	-0.762	-0.145	-0.617
9	-0.448	1.162	-1.611
10	-1.441	-0.236	-1.206
11	-1.380	-0.455	-0.925
12	-1.994	-0.776	-1.218
13	-0.598	-0.024	-0.574
14	-1.073	-0.024	-1.049
15	-0.818	0.602	-1.419
16	-0.102	1.492	-1.594
17	-0.383	-0.103	-0.281
18	-1.652	-1.340	-0.313
19	-0.571	-0.137	-0.434
20	-0.837	-0.295	-0.542
21	-0.855	-0.349	-0.506
22	-0.964	-0.507	-0.457
23	-0.186	0.854	-1.040
24	-0.076	0.876	-0.952
25	-2.620	-1.086	-1.534
26	-2.787	-1.232	-1.554
27	0.536	1.576	-1.040
28	-2.515	-0.922	-1.594
29	-2.500	-0.893	-1.607
30	-1.836	-0.417	-1.419
31	0.295	1.411	-1.116

Table A5 (continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
32	-2.224	-1.774	-0.450
33	-0.138	0.482	-0.620
34	-3.111	-2.509	-0.603
35	-0.274	-0.206	-0.068
36	-0.878	-0.218	-0.660
37	-0.965	-0.597	-0.368
38	-1.911	-1.371	-0.539
39	-1.332	-1.060	-0.273
40	0.298	0.479	-0.180
41	-0.394	0.183	-0.577
42	0.037	0.157	-0.120
43	-0.189	0.058	-0.247
44	-0.830	-0.498	-0.331
45	0.250	0.961	-0.711
46	-1.197	-0.655	-0.542
47	-0.641	-0.475	-0.166
48	-0.621	-0.359	-0.261
49	-1.263	-0.578	-0.685
50	-0.497	-0.148	-0.349
51	2.169	2.481	-0.312
52	0.484	0.867	-0.383
53	-1.504	-1.177	-0.328
54	-0.562	-0.169	-0.393
55	1.263	1.221	0.042
56	1.265	1.408	-0.143
57	0.624	0.843	-0.219
58	-1.117	-0.834	-0.282
59	1.406	1.833	-0.427
60	0.940	1.190	-0.249
61	1.059	1.344	-0.285
62	0.519	0.798	-0.279
63	2.209	2.769	-0.560
64	1.680	1.670	0.010
65	0.496	0.819	-0.323
66	2.058	2.109	-0.051
67	0.059	0.331	-0.272

Table A5 (continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
68	2.119	2.302	-0.183
69	0.863	1.334	-0.470
70	1.062	1.509	-0.447
71	0.689	0.833	-0.144
72	1.380	1.369	0.011
73	2.314	2.411	-0.097

Table A6
Bank (P&P) and Equated (CB) Item Parameter Values for Grade 4 Reading Form T

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
1	0.355	0.181	0.173
2	0.512	0.796	-0.284
3	1.512	1.949	-0.437
4	1.302	1.656	-0.354
5	-1.238	-0.722	-0.516
6	-0.412	-0.115	-0.296
7	-0.166	0.276	-0.442
8	-0.694	0.241	-0.935
9	-0.758	0.037	-0.795
10	-1.999	-0.872	-1.127
11	-1.316	-0.463	-0.853
12	-1.629	-0.372	-1.258
13	-2.301	-0.973	-1.328
14	-0.176	0.311	-0.487
15	0.084	0.943	-0.859
16	0.077	1.124	-1.047
17	-0.410	0.375	-0.785
18	0.468	0.983	-0.515
19	0.519	0.957	-0.438
20	-1.626	-0.904	-0.723
21	-0.881	-0.415	-0.466
22	-1.006	-0.507	-0.499
23	-1.653	-0.744	-0.910
24	-0.123	1.056	-1.179
25	-1.397	-0.445	-0.952
26	0.298	0.740	-0.442
27	-0.294	0.740	-1.034
28	0.719	1.520	-0.801
29	1.041	1.404	-0.363
30	0.426	1.700	-1.274
31	0.957	2.545	-1.588

Table A6 (Continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
32	-1.650	-1.631	-0.019
33	-0.650	-0.258	-0.392
34	-0.888	-0.425	-0.464
35	0.224	0.280	-0.056
36	-1.432	-1.266	-0.166
37	-1.102	-0.914	-0.189
38	-1.040	-0.712	-0.328
39	-1.819	-1.420	-0.399
40	-0.602	0.104	-0.706
41	0.387	0.665	-0.278
42	-0.561	-0.243	-0.319
43	-0.698	-0.362	-0.336
44	-0.133	0.189	-0.321
45	-0.165	0.237	-0.402
46	0.157	0.413	-0.256
47	-0.545	-0.448	-0.097
48	0.392	0.877	-0.486
49	0.245	0.498	-0.253
50	0.085	0.413	-0.328
51	1.037	1.404	-0.367
52	0.491	0.767	-0.276
53	-0.804	-0.489	-0.315
54	1.165	1.307	-0.142
55	0.785	1.185	-0.400
56	0.858	1.118	-0.260
57	0.818	0.946	-0.129
58	-0.118	0.081	-0.199
59	2.583	2.876	-0.293
60	1.218	1.456	-0.238
61	0.510	0.729	-0.219
62	-0.034	0.437	-0.471
63	1.615	1.894	-0.279
64	1.250	1.613	-0.362
65	1.005	1.512	-0.507
66	-0.024	0.388	-0.413
67	1.292	1.599	-0.306

Table A6 (Continued)

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
68	2.462	2.728	-0.266
69	3.615	3.752	-0.136
70	0.811	0.972	-0.161
71	2.108	2.706	-0.597
72	0.228	0.458	-0.230
73	3.736	4.010	-0.273

Table A7
Bank (P&P) and Equated (CB) Item Parameter Values for Grade 5 Reading Form T

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
1	-1.723	-0.984	-0.739
2	-3.142	-2.052	-1.090
3	-2.010	-1.346	-0.664
4	0.521	0.842	-0.321
5	-1.546	-0.908	-0.638
6	-0.668	-0.353	-0.316
7	-0.180	0.262	-0.441
8	-0.705	0.239	-0.944
9	-0.784	0.366	-1.150
10	-0.001	0.383	-0.384
11	-2.036	-1.188	-0.848
12	-0.623	0.047	-0.670
13	-0.674	-0.021	-0.653
14	-0.850	0.085	-0.935
15	-0.169	0.890	-1.058
16	-0.789	-0.134	-0.656
17	-2.542	-1.827	-0.714
18	-1.962	-1.694	-0.268
19	-0.154	0.079	-0.233
20	-1.318	-0.597	-0.722
21	-1.028	0.021	-1.048
22	-1.499	0.082	-1.580
23	-1.370	-0.363	-1.007
24	-1.510	-0.021	-1.489
25	-2.114	-0.297	-1.817
26	-1.067	0.049	-1.116
27	-1.252	0.122	-1.374
28	-1.667	0.067	-1.734
29	1.074	2.169	-1.096
30	-0.839	0.685	-1.524

Table A7 (Continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
31	-2.701	-1.839	-0.862
32	-0.256	0.017	-0.273
33	-0.485	0.051	-0.536
34	-2.621	-1.662	-0.959
35	-1.536	-1.052	-0.484
36	-0.354	-0.018	-0.336
37	-2.294	-1.930	-0.364
38	-1.760	-1.526	-0.234
39	-0.796	-0.089	-0.706
40	0.490	0.856	-0.366
41	0.294	0.270	0.024
42	-0.584	-0.306	-0.278
43	0.142	0.518	-0.377
44	-1.126	-0.474	-0.652
45	-2.211	-1.567	-0.645
46	-1.149	-0.350	-0.799
47	0.243	0.834	-0.592
48	0.315	0.590	-0.274
49	-0.209	0.193	-0.402
50	1.832	2.391	-0.558
51	-0.458	0.189	-0.647
52	-0.929	-0.663	-0.266
53	0.853	1.122	-0.268
54	0.926	1.453	-0.527
55	1.201	1.432	-0.231
56	0.547	0.841	-0.294
57	1.260	1.351	-0.090
58	0.729	1.199	-0.470
59	-0.477	-0.130	-0.347
60	2.521	2.619	-0.099
61	1.492	1.868	-0.375
62	-0.092	0.302	-0.395
63	-0.366	0.064	-0.430
64	-0.431	0.230	-0.661
65	1.258	1.647	-0.388
66	0.785	1.076	-0.291
67	-0.562	-0.355	-0.207

Table A7 (Continued)

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
68	1.026	1.178	-0.152
69	0.515	0.973	-0.458
70	1.849	1.962	-0.114
71	1.398	1.962	-0.564
72	2.276	2.629	-0.353
73	1.855	1.966	-0.112
74	-0.268	0.365	-0.633
75	0.837	1.065	-0.229
76	2.124	2.239	-0.116
77	0.291	0.945	-0.654
78	1.361	1.379	-0.017
79	1.687	2.138	-0.451

Table A8
Bank (P&P) and Equated (CB) Item Parameter Values for Grade 6 Reading Form T

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
1	-0.920	-0.650	-0.270
2	0.238	0.827	-0.589
3	-0.129	0.024	-0.153
4	-0.803	-0.584	-0.219
5	0.095	0.339	-0.244
6	0.544	0.770	-0.226
7	-0.437	-0.070	-0.367
8	0.038	0.211	-0.172
9	-1.554	-1.122	-0.431
10	-1.590	-1.029	-0.561
11	1.295	1.175	0.121
12	-0.640	-0.256	-0.384
13	0.013	0.569	-0.556
14	1.811	1.736	0.075
15	-0.163	0.690	-0.853
16	-1.136	-0.841	-0.295
17	1.220	0.889	0.331
18	-2.496	-2.251	-0.246
19	-0.705	-0.014	-0.692
20	0.308	0.266	0.043
21	0.276	-0.042	0.317
22	-0.447	-0.631	0.185
23	-0.045	0.351	-0.396
24	0.975	1.305	-0.330
25	-0.618	-0.143	-0.475
26	-1.198	-0.369	-0.829
27	0.924	1.105	-0.181
28	1.085	1.531	-0.446
29	-0.479	0.028	-0.507
30	0.175	0.889	-0.714
31	0.363	1.212	-0.849

Table A8(Continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
32	-2.674	-2.358	-0.316
33	-2.502	-2.378	-0.124
34	0.536	0.577	-0.041
35	0.039	0.249	-0.210
36	-2.335	-1.789	-0.547
37	-0.963	-0.540	-0.424
38	0.191	0.565	-0.374
39	-0.175	-0.270	0.095
40	0.067	0.296	-0.229
41	0.792	0.872	-0.080
42	-0.568	-0.229	-0.340
43	-1.060	-0.705	-0.355
44	-0.788	-0.731	-0.057
45	-0.475	-0.546	0.070
46	0.101	0.082	0.019
47	2.263	2.199	0.065
48	0.148	0.262	-0.114
49	1.882	1.613	0.269
50	-0.845	-0.392	-0.452
51	0.002	-0.052	0.054
52	1.382	1.333	0.048
53	0.846	1.062	-0.216
54	3.460	3.611	-0.151
55	0.905	0.659	0.247
56	-0.385	0.014	-0.399
57	1.070	1.044	0.027
58	0.180	0.608	-0.428
59	0.604	0.902	-0.298
60	1.916	1.957	-0.041
61	0.626	0.785	-0.160
62	1.829	1.643	0.186
63	0.199	0.493	-0.294
64	1.772	1.676	0.097
65	-0.040	0.073	-0.113
66	1.612	1.819	-0.207
67	2.588	2.690	-0.102

Table A8 (Continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
68	0.600	0.541	0.059
69	3.626	3.325	0.301
70	1.296	1.319	-0.023
71	-0.505	-0.265	-0.241
72	0.347	0.592	-0.246
73	1.057	1.238	-0.181
74	1.494	1.242	0.252
75	1.335	1.695	-0.359
76	2.846	3.154	-0.308
77	-0.184	0.014	-0.198
78	1.008	0.947	0.061
79	1.113	1.191	-0.077
80	2.815	2.700	0.115

Table A9
Bank (P&P) and Equated (CB) Item Parameter Values for Grade 7 Reading Form T

Item	2010 Bank Value	2012 Equaled CB Value	Discrepancy
1	-0.943	-0.754	-0.189
2	-0.270	0.202	-0.472
3	-0.922	-0.552	-0.370
4	-1.436	-1.357	-0.079
5	-0.584	-0.365	-0.220
6	0.092	0.197	-0.105
7	-0.507	-0.031	-0.476
8	-0.257	0.324	-0.581
9	0.130	0.775	-0.645
10	-1.629	-0.920	-0.709
11	-1.048	-0.195	-0.853
12	0.231	0.963	-0.732
13	-0.838	0.128	-0.966
14	-0.458	0.697	-1.156
15	0.689	0.799	-0.111
16	-0.858	-0.676	-0.182
17	-1.192	-0.985	-0.207
18	0.023	-0.068	0.091
19	-0.277	-0.244	-0.034
20	-1.153	-1.068	-0.085
21	-0.011	0.491	-0.502
22	-0.031	0.456	-0.487
23	-1.171	-0.344	-0.827
24	-0.397	0.355	-0.752
25	-0.191	0.420	-0.611
26	-0.749	-0.303	-0.446
27	-0.915	0.026	-0.941
28	-0.992	-0.015	-0.977
29	-0.122	0.696	-0.819
30	0.398	0.946	-0.548

Table A9 (Continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
31	0.486	0.627	-0.140
32	-2.411	-1.647	-0.764
33	-0.239	-0.035	-0.204
34	-1.486	-0.833	-0.653
35	-0.088	0.196	-0.284
36	-0.520	0.064	-0.583
37	-0.803	-0.119	-0.683
38	0.015	0.485	-0.470
39	-0.064	0.244	-0.307
40	-1.336	-1.073	-0.263
41	-0.701	-0.334	-0.367
42	-0.601	-0.433	-0.168
43	-1.111	-0.726	-0.385
44	2.580	2.901	-0.321
45	-0.600	-0.314	-0.286
46	-0.015	0.291	-0.306
47	-0.134	0.244	-0.377
48	0.123	0.456	-0.334
49	-0.309	0.196	-0.505
50	0.303	0.466	-0.163
51	1.467	1.908	-0.441
52	1.141	1.282	-0.141
53	-0.006	0.533	-0.539
54	0.494	0.695	-0.201
55	0.047	0.451	-0.404
56	0.657	0.868	-0.211
57	0.428	0.722	-0.295
58	0.616	0.640	-0.025
59	0.476	0.802	-0.326
60	1.021	0.997	0.024
61	0.627	0.811	-0.184
62	1.215	1.237	-0.021
63	1.547	1.606	-0.059
64	1.081	1.578	-0.497
65	1.234	1.645	-0.412
66	1.603	1.952	-0.349
67	1.153	1.302	-0.149

Table A10 (Continued)

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
68	0.756	1.068	-0.312
69	1.141	1.225	-0.084
70	1.214	1.633	-0.420
71	2.945	2.960	-0.015
72	1.641	2.384	-0.743
73	2.317	2.567	-0.250
74	2.803	2.935	-0.132
75	1.860	1.792	0.068
76	0.949	1.261	-0.312
77	1.949	1.868	0.081
78	0.986	1.233	-0.247
79	1.195	1.398	-0.204

Table A10
Bank (P&P) and Equated (CB) Item Parameter Values for Grade 8 Reading Form T

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
1	-0.949	-0.161	-0.788
2	-0.477	0.462	-0.938
3	0.043	0.191	-0.148
4	-0.303	0.000	-0.303
5	0.496	0.492	0.004
6	0.178	0.474	-0.296
7	-0.571	0.328	-0.898
8	0.169	1.175	-1.007
9	-0.557	0.124	-0.681
10	-0.008	0.428	-0.436
11	-1.241	-0.090	-1.151
12	1.128	1.502	-0.373
13	0.014	0.601	-0.587
14	-0.414	0.393	-0.807
15	-0.259	0.244	-0.502
16	-0.217	0.548	-0.765
17	-1.764	-0.987	-0.777
18	-0.718	-0.318	-0.400
19	-0.413	0.359	-0.772
20	-0.231	0.208	-0.439
21	-0.679	-0.359	-0.320
22	1.280	2.131	-0.851
23	0.355	0.936	-0.582
24	-0.162	0.341	-0.504
25	-0.466	0.354	-0.821
26	-0.661	0.052	-0.713
27	-0.302	0.369	-0.671
28	-0.092	0.786	-0.878
29	0.433	1.241	-0.809

Table A10 (Continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
30	-2.969	-2.296	-0.673
31	-0.261	0.166	-0.427
32	-0.215	0.387	-0.602
33	0.614	1.282	-0.668
34	-1.139	0.011	-1.150
35	-0.988	-0.133	-0.855
36	-1.415	-0.404	-1.011
37	-0.898	-0.151	-0.747
38	0.234	0.718	-0.484
39	1.044	1.563	-0.520
40	-0.856	-0.258	-0.599
41	0.450	0.693	-0.243
42	-0.408	0.303	-0.711
43	-0.347	0.350	-0.697
44	-0.567	0.364	-0.931
45	1.171	1.837	-0.666
46	0.885	1.297	-0.412
47	-1.292	-0.295	-0.997
48	0.283	0.856	-0.573
49	-0.525	0.303	-0.828
50	0.010	0.804	-0.794
51	0.139	0.591	-0.453
52	-0.525	0.341	-0.865
53	1.502	2.196	-0.694
54	-0.869	-0.276	-0.593
55	-0.645	-0.252	-0.394
56	1.362	2.270	-0.908
57	0.123	0.975	-0.851
58	0.477	0.776	-0.299
59	0.201	1.006	-0.805
60	2.384	2.722	-0.338
61	-0.525	0.032	-0.558
62	1.275	1.722	-0.447
63	1.453	2.043	-0.590
64	1.374	1.876	-0.502
65	1.737	2.061	-0.324
66	1.813	2.326	-0.514

Table A10 (Continued)

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
67	0.056	0.726	-0.670
68	-0.046	0.701	-0.748
69	0.619	1.192	-0.573
70	2.377	2.853	-0.476
71	1.791	2.149	-0.357
72	1.553	2.010	-0.457
73	1.328	1.776	-0.448
74	2.217	2.516	-0.299
75	0.932	1.411	-0.479
76	0.652	1.155	-0.503
77	2.960	3.315	-0.355
78	1.872	2.409	-0.537

Table A11

Bank (P&P) and Equated (CB) Item Parameter Values for Grade 3 Mathematics Form T

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
1	-1.248	-0.569	-0.680
2	-1.219	-0.654	-0.566
3	-0.164	0.331	-0.495
4	-1.905	-1.651	-0.255
5	-0.247	-0.220	-0.027
6	-0.129	0.238	-0.367
7	-1.170	-0.654	-0.516
8	-2.450	-1.755	-0.695
9	-2.456	-1.586	-0.870
10	-0.736	-0.597	-0.140
11	0.373	0.476	-0.103
12	0.284	0.483	-0.199
13	0.281	0.419	-0.138
14	-0.943	-1.023	0.080
15	-0.462	-0.209	-0.253
16	-1.145	-0.894	-0.252
17	-1.309	-0.654	-0.656
18	-1.080	-0.464	-0.617
19	-2.392	-1.870	-0.521
20	-1.452	-1.495	0.043
21	-0.441	-0.354	-0.087
22	-1.069	-0.030	-1.039
23	-0.550	-0.117	-0.433
24	0.710	0.837	-0.128
25	1.350	1.761	-0.411
26	0.691	0.934	-0.243
27	-1.006	-0.414	-0.592
28	0.706	0.754	-0.049
29	0.598	0.883	-0.285
30	0.044	0.148	-0.104
31	0.058	0.419	-0.361
32	0.089	-0.107	0.196
33	0.947	1.198	-0.251
34	-1.053	-0.625	-0.428
35	0.943	1.344	-0.402
36	-0.274	-0.451	0.177
37	-0.850	-0.683	-0.166

Table A11 (Continued)

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
38	0.946	1.074	-0.128
39	0.670	1.452	-0.782
40	1.420	1.520	-0.100
41	1.687	2.437	-0.750
42	1.561	1.928	-0.367
43	1.674	2.090	-0.415
44	-0.286	-0.147	-0.139
45	0.300	0.097	0.204
46	-1.261	-1.259	-0.002
47	-1.323	-1.831	0.508
48	-2.453	-1.870	-0.582
49	0.701	1.410	-0.709
50	-2.278	-1.831	-0.447
51	-0.078	0.265	-0.343
52	0.045	0.352	-0.307
53	0.303	0.622	-0.320
54	0.551	1.732	-1.181
55	0.008	0.696	-0.688
56	1.577	1.909	-0.332
57	-0.167	-0.068	-0.099
58	0.001	0.354	-0.353
59	-0.908	-0.529	-0.379
60	-0.101	0.102	-0.203
61	-0.090	0.152	-0.242
62	-0.178	0.136	-0.314
63	-0.049	0.509	-0.558
64	-2.536	-1.977	-0.559
65	-1.212	-1.344	0.132
66	-1.441	-1.500	0.059
67	-0.125	0.059	-0.183
68	0.130	0.614	-0.483
69	-0.857	-0.238	-0.619
70	-1.215	-1.368	0.153
71	-0.007	-0.087	0.080
72	-0.677	-0.490	-0.186
73	0.180	0.354	-0.174
74	-0.330	1.932	-2.262

Table A11 (Continued)

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
75	0.070	0.701	-0.632
76	-0.873	-0.784	-0.089
77	-0.521	-0.248	-0.273
78	0.187	0.225	-0.038
79	-0.913	-0.898	-0.015
80	0.741	0.768	-0.027
81	0.358	0.594	-0.237
82	0.805	0.945	-0.140
83	0.041	0.287	-0.246
84	1.751	1.799	-0.048
85	0.382	0.701	-0.320
86	1.079	1.485	-0.406
87	2.369	2.601	-0.232
88	-0.921	-0.834	-0.087
89	-0.328	-0.766	0.438
90	0.526	0.529	-0.003
91	0.572	0.419	0.154
92	0.552	0.562	-0.010
93	2.632	2.991	-0.359
94	1.293	1.744	-0.451

Table A12

Bank (P&P) and Equated (CB) Item Parameter Values for Grade 4 Mathematics Form T

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
1	-0.375	0.088	-0.463
2	-0.058	0.031	-0.089
3	-0.358	-0.243	-0.115
4	-0.035	0.198	-0.233
5	-0.046	0.074	-0.120
6	1.231	1.451	-0.220
7	0.832	1.050	-0.219
8	-2.540	-2.807	0.267
9	-2.507	-2.077	-0.430
10	-1.200	-1.262	0.062
11	1.260	1.017	0.243
12	0.959	1.026	-0.068
13	-0.653	-0.622	-0.030
14	2.035	2.243	-0.209
15	0.184	0.358	-0.174
16	0.811	0.781	0.030
17	1.222	1.394	-0.172
18	2.011	1.813	0.198
19	-0.960	-0.499	-0.462
20	-1.717	-1.732	0.015
21	0.567	0.525	0.042
22	0.445	0.904	-0.459
23	-0.710	-0.580	-0.131
24	-0.101	-0.580	0.479
25	0.889	0.899	-0.010
26	0.035	0.407	-0.372
27	0.966	1.055	-0.089
28	2.057	2.452	-0.395
29	1.703	2.074	-0.371
30	2.286	2.456	-0.170
31	-0.417	-0.366	-0.052
32	-0.728	-0.757	0.029
33	-0.150	-0.201	0.051
34	0.043	-0.097	0.140
35	-0.618	-0.330	-0.289
36	0.210	0.664	-0.455
37	-0.901	-0.677	-0.224

Table A12 (Continued)

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
38	-0.287	-0.601	0.314
39	-0.107	-0.303	0.196
40	-0.688	-0.699	0.012
41	-1.239	-1.921	0.682
42	-0.712	-1.072	0.360
43	-0.124	0.157	-0.281
44	-0.773	-0.580	-0.193
45	-0.755	-0.459	-0.296
46	-1.227	-1.351	0.124
47	-0.957	-0.854	-0.103
48	-1.009	-1.369	0.360
49	-0.800	-0.820	0.021
50	-0.807	-0.775	-0.033
51	0.805	0.913	-0.108
52	0.308	1.233	-0.925
53	-0.077	-0.666	0.589
54	-0.552	-0.216	-0.335
55	0.671	1.094	-0.423
56	0.979	1.599	-0.621
57	-3.211	-2.770	-0.442
58	-1.121	-1.767	0.647
59	-1.483	-1.412	-0.070
60	0.553	0.797	-0.244
61	0.889	0.863	0.026
62	1.230	1.253	-0.023
63	-2.486	-2.652	0.165
64	-0.537	-0.783	0.246
65	-1.565	-1.492	-0.073
66	-0.506	-0.668	0.162
67	-1.401	-1.717	0.316
68	-0.968	-1.121	0.153
69	-1.028	-0.582	-0.446
70	0.979	0.991	-0.013
71	0.571	0.848	-0.277
72	-0.043	0.599	-0.642
73	-1.348	-1.452	0.104
74	-0.534	-0.396	-0.138

Table A12 (Continued)

Item	2010	2012 Equated	
	Bank Value	CB Value	Discrepancy
75	-1.122	-0.896	-0.226
76	-0.241	-0.561	0.321
77	1.414	1.492	-0.078
78	-1.109	-1.168	0.059
79	-0.982	-1.061	0.079
80	0.984	0.868	0.116
81	-0.583	-0.736	0.153
82	0.341	0.194	0.147
83	0.974	1.082	-0.108
84	-0.568	-0.725	0.157
85	1.679	1.789	-0.110
86	1.272	1.365	-0.093
87	1.044	1.082	-0.039
88	2.022	1.976	0.046
89	-1.722	-1.692	-0.030
90	-0.932	-0.896	-0.036
91	0.211	1.049	-0.838
92	0.371	0.227	0.144
93	1.343	1.612	-0.268
94	0.624	0.795	-0.171
95	1.410	1.960	-0.550
96	2.121	2.584	-0.463

Table A13

Bank (P&P) and Equated (CB) Item Parameter Values for Grade 5 Mathematics Form T

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
1	-1.658	-1.158	-0.500
2	-2.053	-1.720	-0.332
3	-1.941	-1.595	-0.345
4	0.110	0.243	-0.132
5	-0.745	-0.926	0.181
6	0.320	0.319	0.000
7	-2.048	-0.870	-1.179
8	-1.749	-1.549	-0.200
9	1.230	1.497	-0.267
10	-0.305	-0.641	0.337
11	-0.965	-1.339	0.374
12	0.487	0.824	-0.337
13	-1.198	-1.572	0.374
14	0.336	0.374	-0.038
15	-1.012	-1.398	0.386
16	-0.932	-0.677	-0.255
17	0.234	0.360	-0.126
18	0.373	0.243	0.131
19	1.499	1.585	-0.086
20	0.295	0.446	-0.151
21	0.834	0.879	-0.045
22	-0.091	-0.323	0.233
23	-1.050	-0.829	-0.221
24	0.103	0.535	-0.432
25	-0.539	-0.539	0.000
26	-0.149	0.001	-0.150
27	1.126	1.148	-0.022
28	-0.104	0.214	-0.318
29	-0.103	0.264	-0.367
30	-0.446	-0.081	-0.365
31	0.091	0.326	-0.235
32	0.851	0.824	0.027
33	0.972	1.045	-0.073
34	1.417	1.635	-0.218
35	1.181	1.158	0.024
36	1.247	1.543	-0.296
37	-0.733	-0.677	-0.055

Table A13 (Continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
38	-0.733	-0.803	0.070
39	-0.325	-0.106	-0.219
40	-0.239	-0.167	-0.072
41	-0.564	-0.641	0.078
42	-0.381	-0.167	-0.214
43	-0.144	0.522	-0.667
44	1.950	2.307	-0.357
45	1.490	1.699	-0.209
46	1.075	1.208	-0.133
47	-0.505	-0.202	-0.303
48	1.079	1.223	-0.144
49	0.491	0.760	-0.269
50	0.978	1.160	-0.181
51	-0.195	0.627	-0.822
52	-0.161	0.007	-0.169
53	-0.485	0.078	-0.563
54	0.127	0.537	-0.410
55	-1.244	-1.365	0.121
56	-0.550	-0.178	-0.372
57	0.286	0.344	-0.058
58	1.322	1.321	0.001
59	-1.278	-0.416	-0.862
60	0.873	0.997	-0.124
61	-2.184	-1.948	-0.236
62	-1.169	-0.839	-0.330
63	0.465	0.633	-0.168
64	1.708	1.815	-0.108
65	1.226	1.148	0.078
66	-0.023	0.364	-0.387
67	1.451	1.469	-0.018
68	0.884	1.012	-0.128
69	0.978	1.212	-0.234
70	0.739	1.038	-0.299
71	0.409	0.468	-0.059
72	2.157	2.798	-0.641
73	1.021	1.887	-0.866
74	-1.633	-1.249	-0.384

Table A13 (Continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
75	-0.100	0.124	-0.224
76	-1.168	-1.824	0.656
77	0.236	-0.050	0.285
78	-0.723	-0.346	-0.377
79	-0.140	0.423	-0.563
80	0.933	1.192	-0.259
81	0.015	0.506	-0.491
82	1.019	1.354	-0.335
83	1.344	1.875	-0.531
84	0.437	0.324	0.114
85	0.618	1.116	-0.498
86	1.053	1.351	-0.298
87	1.130	1.461	-0.331
88	2.054	2.566	-0.512
89	0.326	0.612	-0.286
90	2.734	2.920	-0.186
91	-1.324	1.307	-2.631
92	0.116	0.155	-0.040
93	1.944	2.429	-0.485
94	-0.044	-0.324	0.280
95	-1.135	-0.910	-0.225
96	0.296	0.311	-0.015
97	-2.811	-2.826	0.015
98	-1.987	-1.933	-0.054
99	-0.212	0.343	-0.555
100	0.019	0.148	-0.129
101	-0.872	-1.231	0.359
102	0.564	0.462	0.102
103	0.027	1.375	-1.348
104	2.005	2.442	-0.436
105	-0.733	-0.852	0.119
106	-0.119	-0.006	-0.113
107	0.559	0.773	-0.214
108	0.580	0.719	-0.139
109	0.381	0.471	-0.090
110	1.307	1.166	0.141
111	1.091	1.232	-0.141

Table A13 (Continued)

Item	2010 Bank Value	2012 Equated		Discrepancy
		CB Value		
112	0.620	1.348		-0.729
113	1.105	1.843		-0.739

Table A14

Bank (P&P) and Equated (CB) Item Parameter Values for Grade 6 Mathematics Form T

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
1	-2.421	-2.265	-0.156
2	-2.203	-1.660	-0.543
3	-2.979	-2.527	-0.452
4	-2.399	-2.214	-0.185
5	-0.189	0.080	-0.269
6	-0.506	0.282	-0.787
7	-2.609	-2.527	-0.082
8	-0.608	-0.677	0.068
9	-1.146	-1.144	-0.003
10	0.486	0.725	-0.239
11	0.054	0.455	-0.401
12	0.681	0.842	-0.161
13	0.717	0.797	-0.080
14	1.586	1.609	-0.023
15	-0.104	0.046	-0.149
16	1.442	1.533	-0.091
17	-0.985	-1.144	0.158
18	-0.282	-0.283	0.001
19	1.331	1.497	-0.166
20	0.000	0.125	-0.125
21	-0.357	-0.025	-0.332
22	0.649	0.819	-0.171
23	-0.651	-0.710	0.059
24	-0.424	-0.297	-0.128
25	-0.907	-0.996	0.089
26	-0.090	-0.116	0.026
27	1.281	1.400	-0.119
28	0.861	1.225	-0.364
29	-0.395	-0.166	-0.229
30	-0.534	-0.526	-0.008
31	-1.320	-1.200	-0.120
32	-1.038	-1.111	0.072
33	-0.925	-0.833	-0.092
34	-1.153	-1.144	-0.010
35	0.392	0.628	-0.236
36	0.751	0.899	-0.148
37	-0.372	0.086	-0.457

Table A14 (Continued)

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
38	0.432	0.679	-0.247
39	0.541	0.819	-0.278
40	0.628	0.890	-0.262
41	0.193	0.581	-0.387
42	-0.171	-0.061	-0.110
43	0.931	1.081	-0.150
44	1.205	1.548	-0.343
45	2.169	2.466	-0.296
46	0.732	1.033	-0.301
47	-0.319	-0.422	0.103
48	0.886	0.955	-0.069
49	-1.127	-0.833	-0.294
50	0.150	0.450	-0.300
51	-2.583	-2.479	-0.104
52	-0.528	-0.226	-0.302
53	-0.039	0.401	-0.440
54	-0.734	-0.596	-0.138
55	-0.496	-0.220	-0.276
56	1.381	1.314	0.067
57	-1.788	-0.936	-0.851
58	-0.819	-0.620	-0.199
59	0.570	0.742	-0.173
60	0.413	0.693	-0.280
61	0.382	0.316	0.066
62	0.693	0.406	0.287
63	0.219	0.693	-0.474
64	-0.198	-0.374	0.176
65	-0.060	0.300	-0.360
66	-0.218	-0.070	-0.148
67	-0.446	-0.565	0.119
68	-0.542	-0.046	-0.495
69	-1.903	-1.554	-0.349
70	0.169	0.012	0.156
71	-0.531	-0.620	0.089
72	0.080	-0.064	0.145
73	-0.795	-0.588	-0.207
74	0.467	0.431	0.036

Table A14 (Continued)

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
75	0.723	0.747	-0.024
76	1.280	1.468	-0.189
77	0.968	0.938	0.030
78	1.377	1.874	-0.497
79	0.707	0.738	-0.031
80	0.289	0.416	-0.127
81	0.204	0.517	-0.314
82	0.302	1.113	-0.811
83	0.592	0.852	-0.260
84	0.060	0.676	-0.616
85	0.657	0.938	-0.280
86	-0.010	0.511	-0.521
87	0.648	1.042	-0.394
88	0.094	0.375	-0.281
89	2.186	2.316	-0.130
90	-3.454	-2.563	-0.890
91	-1.475	-2.054	0.579
92	-0.305	-0.430	0.125
93	-0.095	0.417	-0.511
94	-0.386	-0.422	0.036
95	-1.029	-1.235	0.206
96	-0.540	-0.307	-0.232
97	0.327	0.114	0.212
98	-0.865	-1.432	0.567
99	-0.020	0.109	-0.128
100	1.190	1.589	-0.399
101	-0.148	-0.386	0.238
102	0.384	0.339	0.045
103	0.286	0.375	-0.089
104	-0.410	-0.585	0.175
105	0.615	0.750	-0.135
106	2.218	2.685	-0.467
107	0.133	-0.121	0.254
108	-0.762	0.176	-0.938
109	-0.967	-1.117	0.150
110	0.890	0.463	0.427
111	0.227	0.401	-0.174

Table A14 (Continued)

Item	2010		Discrepancy
	Bank Value	2012 Equated CB Value	
112	0.555	0.001	0.554
113	0.798	1.908	-1.110
114	0.102	0.542	-0.440
115	1.246	1.762	-0.517
116	1.204	1.837	-0.634

Table A15

Bank (P&P) and Equated (CB) Item Parameter Values for Grade 7 Form T Mathematics

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
1	-0.223	0.030	-0.253
2	-1.500	-1.031	-0.469
3	-0.158	-0.067	-0.091
4	-0.184	-0.180	-0.005
5	0.592	0.591	0.000
6	0.235	0.351	-0.117
7	-1.197	-1.326	0.129
8	0.626	0.478	0.148
9	-0.237	-0.174	-0.063
10	0.007	-0.007	0.014
11	-1.219	-1.077	-0.143
12	-1.328	-1.201	-0.126
13	-0.765	-0.684	-0.081
14	-1.396	-1.152	-0.244
15	-0.563	-0.676	0.113
16	0.233	0.140	0.094
17	0.093	0.289	-0.196
18	-0.223	-0.274	0.051
19	-0.357	0.145	-0.502
20	0.037	0.455	-0.418
21	-0.056	-0.140	0.084
22	0.278	0.436	-0.158
23	0.359	0.389	-0.030
24	0.740	0.924	-0.184
25	0.211	0.165	0.046
26	0.002	-0.203	0.205
27	-1.508	-1.123	-0.385
28	-0.641	-0.529	-0.113
29	0.877	0.874	0.004
30	1.587	1.755	-0.169
31	-1.101	-0.861	-0.240
32	0.803	0.715	0.088
33	-0.797	-0.522	-0.275
34	-1.195	-1.058	-0.137
35	-0.175	0.025	-0.200
36	0.451	0.667	-0.216
37	0.624	0.974	-0.350

Table A15 (Continued)

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
38	-0.172	0.180	-0.352
39	0.867	0.784	0.083
40	0.659	0.596	0.063
41	-1.128	-0.298	-0.830
42	0.569	1.160	-0.591
43	0.113	1.204	-1.092
44	-0.757	0.175	-0.932
45	-0.300	0.005	-0.305
46	0.029	0.532	-0.503
47	0.754	1.145	-0.391
48	1.710	2.157	-0.446
49	0.171	0.624	-0.453
50	0.758	1.408	-0.649
51	-0.951	-0.380	-0.571
52	-0.168	0.272	-0.439
53	-0.716	-0.413	-0.304
54	0.032	0.166	-0.134
55	0.656	0.673	-0.017
56	0.453	0.633	-0.180
57	-1.188	-0.527	-0.661
58	-0.332	-0.155	-0.178
59	0.148	0.182	-0.034
60	-0.061	0.422	-0.482
61	-2.321	-1.760	-0.561
62	2.057	2.090	-0.033
63	-0.106	0.795	-0.902
64	-0.195	-0.527	0.331
65	0.629	1.612	-0.983
66	0.229	0.804	-0.575
67	0.798	0.894	-0.096
68	0.889	1.939	-1.051
69	-0.201	0.242	-0.443
70	-0.300	0.237	-0.537
71	-0.421	-0.114	-0.306
72	-0.655	-0.280	-0.375
73	-0.211	0.468	-0.680
74	0.560	0.109	0.451
75	-0.976	-1.296	0.321
76	1.185	0.920	0.266

Table A15 (Continued)

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
77	0.818	1.025	-0.207
78	0.761	0.903	-0.141
79	0.932	0.748	0.184
80	-0.272	0.161	-0.433
81	1.406	1.377	0.028
82	1.783	1.775	0.009
83	-0.470	0.031	-0.502
84	0.367	0.861	-0.494
85	0.773	1.253	-0.479
86	1.784	1.985	-0.201
87	0.060	0.606	-0.546
88	0.879	1.445	-0.566
89	0.835	1.326	-0.491
90	0.414	0.874	-0.460
91	-0.540	-0.271	-0.268
92	-0.098	-0.271	0.174
93	1.454	1.518	-0.064
94	-1.756	-1.313	-0.443
95	-1.000	-0.705	-0.295
96	-1.046	-0.719	-0.327
97	-0.339	-0.387	0.047
98	-0.185	0.006	-0.191
99	-0.730	-0.780	0.050
100	-0.184	-0.431	0.247
101	-0.421	-0.236	-0.185
102	-0.857	-0.542	-0.315
103	-0.713	-0.675	-0.038
104	0.594	0.666	-0.072
105	0.043	-0.162	0.205
106	1.794	2.120	-0.326
107	1.599	1.173	0.426
108	0.337	0.327	0.010
109	0.179	0.114	0.065
110	0.066	1.350	-1.284
111	-0.927	-0.005	-0.922
112	-0.933	-0.362	-0.571
113	-1.117	-1.048	-0.069

Table A15 (Continued)

Item	2010		Discrepancy
	Bank Value	2012 Equated CB Value	
114	-0.322	-0.045	-0.278
115	0.424	0.840	-0.415
116	0.484	1.142	-0.658
117	0.201	0.781	-0.580
118	-0.052	0.421	-0.473
119	1.073	1.659	-0.586
120	0.911	1.443	-0.532

Table A16

Bank (P&P) and Equated (CB) Item Parameter Values for Grade 8 Form T Mathematics

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
1	-1.082	-0.813	-0.270
2	-0.641	-0.282	-0.359
3	-0.878	-0.491	-0.387
4	-0.413	-0.233	-0.180
5	-0.477	-0.211	-0.266
6	0.038	0.211	-0.173
7	-0.026	0.112	-0.138
8	0.399	0.360	0.039
9	-0.626	-0.559	-0.068
10	0.073	0.126	-0.053
11	1.046	1.256	-0.209
12	0.583	0.851	-0.268
13	-0.791	-0.871	0.080
14	-0.634	-0.577	-0.057
15	-0.218	0.630	-0.848
16	0.965	1.329	-0.364
17	0.626	1.240	-0.614
18	0.415	0.504	-0.089
19	1.501	2.003	-0.502
20	0.918	1.434	-0.516
21	-0.429	-0.233	-0.196
22	-0.266	-0.137	-0.129
23	-0.436	-0.419	-0.018
24	-0.392	-0.255	-0.137
25	-2.366	-2.121	-0.245
26	0.324	0.717	-0.393
27	-0.152	0.261	-0.413
28	0.187	-0.005	0.191
29	1.222	1.562	-0.340
30	0.277	0.567	-0.290
31	0.667	1.029	-0.362
32	1.803	2.085	-0.283
33	-0.564	-0.121	-0.442
34	0.282	0.786	-0.504
35	-1.096	-0.806	-0.290
36	-0.020	0.529	-0.550
37	-0.049	0.279	-0.328

Table A16 (Continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
38	0.318	0.714	-0.396
39	1.137	1.384	-0.247
40	0.779	0.850	-0.072
41	-0.569	-0.283	-0.286
42	-0.160	0.292	-0.452
43	-0.441	0.056	-0.497
44	1.856	2.472	-0.616
45	-1.322	-0.787	-0.536
46	-0.787	-0.425	-0.362
47	0.201	0.428	-0.227
48	-0.195	0.091	-0.285
49	-0.898	-0.648	-0.250
50	-0.501	-0.239	-0.261
51	0.462	0.491	-0.029
52	0.194	0.901	-0.708
53	-0.626	-0.251	-0.376
54	0.561	0.975	-0.414
55	-1.976	-1.664	-0.312
56	1.464	1.876	-0.413
57	-0.101	0.374	-0.475
58	-0.523	-0.730	0.207
59	0.313	0.468	-0.156
60	0.531	0.702	-0.171
61	-0.519	-0.737	0.218
62	0.454	0.731	-0.277
63	0.256	0.451	-0.194
64	0.260	0.534	-0.274
65	0.329	0.464	-0.135
66	0.262	0.499	-0.238
67	0.772	1.084	-0.312
68	0.415	0.319	0.096
69	-0.101	0.197	-0.298
70	1.074	0.930	0.144
71	-0.721	0.050	-0.771
72	-0.621	-0.078	-0.543
73	-0.997	-0.718	-0.279
74	0.558	1.172	-0.614

Table A16 (Continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
75	-0.707	-0.345	-0.362
76	2.216	2.527	-0.311
77	0.357	1.015	-0.658
78	0.873	1.348	-0.475
79	0.665	1.397	-0.732
80	0.665	1.374	-0.709
81	0.237	0.809	-0.572
82	-1.941	-1.453	-0.488
83	-1.633	-0.767	-0.867
84	-1.123	0.030	-1.152
85	0.464	0.420	0.044
86	-1.227	-0.890	-0.337
87	0.489	0.175	0.315
88	-0.024	0.378	-0.401
89	-0.608	-0.309	-0.299
90	-0.377	0.053	-0.430
91	0.041	1.129	-1.088
92	-0.196	0.256	-0.452
93	-1.023	-0.853	-0.170
94	-0.298	0.238	-0.535
95	0.682	1.242	-0.559
96	1.376	1.741	-0.364
97	-1.807	-1.689	-0.118
98	-1.089	-1.023	-0.066
99	-1.374	-1.400	0.026
100	0.015	0.475	-0.460
101	-0.117	0.516	-0.634
102	1.167	1.424	-0.257
103	-0.494	-0.652	0.157
104	0.688	1.073	-0.385
105	-0.583	-0.024	-0.559
106	-0.890	-0.882	-0.008
107	0.984	0.871	0.113
108	-0.634	-0.507	-0.127
109	-0.773	0.471	-1.244
110	-0.707	0.048	-0.755
111	0.768	1.568	-0.800

Table A16 (Continued)

Item	2010	2012 Equated	Discrepancy
	Bank Value	CB Value	
112	1.316	1.951	-0.635
113	0.599	1.095	-0.496
114	-0.677	-0.603	-0.074
115	0.064	0.998	-0.934
116	0.875	1.562	-0.688
117	1.110	1.987	-0.877

Table A17
Bank (P&P) and Equated (CB) Item Parameter Values for Grade 3 Writing Form T

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
1	-1.214	-0.348	-0.866
2	0.254	0.476	-0.221
3	0.117	0.193	-0.076
4	-1.224	-1.296	0.072
5	-0.659	-0.648	-0.010
6	-0.595	-0.560	-0.035
7	0.819	0.758	0.061
8	-2.309	-2.305	-0.004
9	-0.551	-0.554	0.003
10	-0.289	-0.099	-0.191
11	-0.663	-0.711	0.049
12	-0.372	-0.181	-0.191
13	-0.398	-0.465	0.066
14	-2.225	-2.021	-0.204
15	-0.591	-1.007	0.415
16	1.476	1.531	-0.055
17	-0.049	0.468	-0.517
18	0.850	1.212	-0.362
19	-0.929	-0.801	-0.128
20	1.196	1.411	-0.214
21	-1.145	-1.353	0.208
22	-1.487	-1.186	-0.301
23	0.241	0.291	-0.050
24	0.107	0.571	-0.464
25	-0.004	0.234	-0.238
26	-0.339	-0.190	-0.149
27	1.151	1.421	-0.271
28	-0.504	-0.117	-0.387
29	0.738	1.068	-0.329
30	-0.221	0.307	-0.528
31	-1.348	-1.201	-0.147
32	-0.007	0.059	-0.066
33	0.374	1.285	-0.911

Table A18
Bank (P&P) and Equated (CB) Item Parameter Values for Grade 4 Writing Form T

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
1	0.527	0.548	-0.020
2	-0.701	-0.463	-0.238
3	0.776	0.654	0.123
4	0.307	0.152	0.155
5	-0.990	-1.038	0.048
6	0.139	0.179	-0.040
7	0.234	0.528	-0.294
8	-0.172	0.266	-0.439
9	-0.351	-0.283	-0.068
10	-0.420	-0.393	-0.026
11	-1.395	-1.324	-0.070
12	-0.876	-0.628	-0.248
13	-0.548	-0.316	-0.233
14	1.665	1.544	0.121
15	-1.341	-1.229	-0.112
16	-1.507	-1.324	-0.182
17	-0.600	0.120	-0.720
18	-0.318	-0.188	-0.130
19	0.268	0.322	-0.054
20	-0.262	-0.377	0.115
21	-0.240	0.070	-0.310
22	-0.498	-0.492	-0.005
23	-0.045	0.364	-0.409
24	1.627	1.554	0.072
25	-0.873	-1.088	0.215
26	0.246	0.148	0.099
27	0.128	0.279	-0.152
28	0.018	0.219	-0.201
29	1.541	1.594	-0.052
30	2.009	2.086	-0.077
31	-0.336	-0.235	-0.101
32	0.847	1.065	-0.218
33	0.430	1.163	-0.732

Table A19
Bank (P&P) and Equated (CB) Item Parameter Values for Grade 5 Writing Form T

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
1	-2.346	-2.601	0.255
2	0.144	0.169	-0.025
3	-0.550	-0.215	-0.335
4	-1.163	-1.123	-0.040
5	-0.879	-0.650	-0.229
6	-1.553	-1.575	0.021
7	-0.109	0.122	-0.231
8	-1.222	-0.931	-0.291
9	1.567	1.917	-0.350
10	1.625	1.570	0.056
11	-0.424	-0.204	-0.220
12	-0.107	0.164	-0.271
13	-0.113	0.215	-0.328
14	0.870	1.170	-0.300
15	-0.849	-0.604	-0.245
16	0.314	0.527	-0.213
17	-0.011	0.346	-0.356
18	0.449	0.841	-0.392
19	-0.554	-0.157	-0.398
20	0.698	0.753	-0.055
21	-1.526	-1.563	0.037
22	-0.609	-0.454	-0.155
23	0.751	1.197	-0.446
24	0.216	0.560	-0.344
25	-0.059	0.011	-0.070
26	-0.240	-0.210	-0.030
27	-0.290	-0.009	-0.282
28	0.201	0.581	-0.380
29	1.082	1.613	-0.531
30	-1.073	-1.167	0.094
31	0.430	0.346	0.084
32	0.260	0.568	-0.309
33	0.995	0.956	0.039
34	0.872	0.909	-0.036
35	0.002	0.450	-0.448
36	0.387	0.676	-0.289
37	0.361	0.853	-0.492

Table A20
Bank (P&P) and Equated (CB) Item Parameter Values for Grade 6 Writing Form T

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
1	-0.709	-0.374	-0.336
2	-0.848	-0.568	-0.280
3	-1.220	-0.594	-0.626
4	0.954	1.054	-0.101
5	-0.080	0.124	-0.203
6	0.545	0.737	-0.192
7	0.672	0.624	0.048
8	1.402	1.552	-0.150
9	-0.616	-0.339	-0.277
10	0.342	0.492	-0.150
11	-1.711	-1.201	-0.510
12	0.016	0.188	-0.172
13	-0.421	-0.039	-0.382
14	0.410	0.640	-0.229
15	-0.213	-0.078	-0.135
16	-0.034	0.197	-0.231
17	0.208	0.442	-0.234
18	0.084	0.450	-0.366
19	0.331	0.756	-0.425
20	0.343	0.725	-0.382
21	-0.605	-0.294	-0.311
22	-0.383	-0.093	-0.290
23	-1.031	-0.729	-0.302
24	0.041	0.124	-0.083
25	0.185	0.409	-0.224
26	0.331	0.504	-0.173
27	0.014	0.192	-0.178
28	0.067	0.400	-0.333
29	-1.397	-1.342	-0.055
30	0.672	1.080	-0.408
31	-0.295	-0.009	-0.285
32	0.898	0.933	-0.035
33	1.645	1.861	-0.216
34	-0.255	0.147	-0.402
35	1.210	1.803	-0.593
36	-0.392	-0.009	-0.383
37	0.828	1.145	-0.318

Table A21
Bank (P&P) and Equated (CB) Item Parameter Values for Grade 7 Writing Form T

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
1	-0.994	-0.864	-0.130
2	-0.715	-0.407	-0.308
3	-1.446	-1.349	-0.097
4	-0.050	0.574	-0.624
5	-1.200	-1.030	-0.170
6	-2.561	-2.335	-0.226
7	-0.891	-0.662	-0.229
8	-0.317	-0.041	-0.276
9	-0.804	-0.469	-0.335
10	0.678	0.647	0.031
11	0.380	0.733	-0.354
12	-1.391	-1.063	-0.328
13	-0.520	-0.161	-0.359
14	-1.478	-1.112	-0.366
15	-1.739	-1.586	-0.153
16	-0.288	-0.142	-0.147
17	-1.700	-1.735	0.035
18	0.281	0.368	-0.087
19	1.811	1.845	-0.034
20	-1.202	-0.510	-0.692
21	-0.816	-0.498	-0.318
22	-0.043	0.290	-0.333
23	0.394	0.624	-0.229
24	-2.131	-1.846	-0.285
25	0.239	0.392	-0.154
26	-0.407	0.480	-0.887
27	0.153	0.707	-0.554
28	-0.719	-0.575	-0.144
29	-1.028	-1.129	0.101
30	0.359	0.527	-0.169
31	1.112	1.445	-0.333
32	-0.307	0.065	-0.372
33	-0.573	-0.510	-0.064
34	-0.036	0.480	-0.516
35	0.645	0.635	0.010
36	0.237	0.392	-0.155
37	0.752	0.848	-0.096

Table A21 (Continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
38	0.610	0.756	-0.146
39	-0.457	-0.108	-0.349
40	-1.088	-0.843	-0.245
41	0.447	0.875	-0.429

Table A22
Bank (P&P) and Equated (CB) Item Parameter Values for Grade 8 Writing Form T

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
1	-0.863	-0.657	-0.206
2	1.376	2.018	-0.643
3	0.111	0.331	-0.220
4	0.516	0.438	0.078
5	-1.557	-1.323	-0.234
6	0.563	1.200	-0.636
7	-1.203	-0.636	-0.567
8	-0.659	0.280	-0.939
9	-0.909	-0.427	-0.482
10	0.003	0.464	-0.461
11	0.626	0.845	-0.220
12	1.641	2.096	-0.456
13	-1.344	-0.754	-0.590
14	0.090	0.482	-0.392
15	-0.776	-0.233	-0.543
16	-0.095	0.042	-0.137
17	-1.072	-0.679	-0.393
18	-0.038	0.298	-0.337
19	0.884	1.169	-0.285
20	-0.921	-0.446	-0.475
21	0.800	1.005	-0.206
22	-2.217	-1.622	-0.594
23	-1.180	-1.067	-0.113
24	0.707	1.402	-0.695
25	-0.895	-0.414	-0.481
26	-0.628	-0.364	-0.264
27	0.633	0.908	-0.275
28	-0.366	0.312	-0.678
29	0.025	0.027	-0.003
30	-0.016	0.451	-0.467
31	-0.898	-0.322	-0.576
32	-0.576	-0.105	-0.472
33	-1.017	-0.446	-0.571
34	0.925	1.203	-0.279
35	-0.046	0.367	-0.413
36	-0.933	-0.370	-0.562
37	0.657	0.713	-0.056

Table A22 (Continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
38	-1.914	-1.847	-0.066
39	0.127	0.068	0.058
40	-0.443	-0.597	0.154
41	0.389	0.470	-0.081

Table A23
Bank (P&P) and Equated (CB) Item Parameter Values for Grade 5 Science Form T

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
1	0.314	0.454	-0.139
2	2.151	2.739	-0.588
3	-0.138	-0.094	-0.045
4	1.041	0.917	0.124
5	-0.996	-0.658	-0.338
6	-0.468	-0.511	0.043
7	-0.141	-0.089	-0.051
8	-1.706	-1.586	-0.120
9	-0.809	-0.688	-0.122
10	0.578	0.555	0.022
11	-1.146	-1.146	-0.001
12	-0.022	0.116	-0.138
13	-0.383	0.120	-0.503
14	-0.610	-0.400	-0.210
15	0.450	0.372	0.078
16	-0.948	-0.988	0.040
17	0.436	1.006	-0.570
18	1.706	2.417	-0.711
19	0.535	0.707	-0.172
20	1.373	1.444	-0.071
21	1.138	1.068	0.070
22	0.203	0.693	-0.490
23	1.309	1.573	-0.264
24	-1.065	-1.395	0.331
25	-0.196	-0.227	0.031
26	0.102	0.424	-0.322
27	-0.181	0.307	-0.488
28	-1.328	-0.939	-0.389
29	-1.142	-0.981	-0.162
30	0.449	0.721	-0.272
31	-0.011	0.387	-0.397
32	-0.650	-0.646	-0.003
33	-0.475	-0.319	-0.156
34	0.092	0.256	-0.165
35	1.510	1.679	-0.169
36	-0.016	0.457	-0.474
37	0.198	0.745	-0.547

Table A23 (Continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
38	-2.041	-0.793	-1.248
39	0.805	0.566	0.238

Table A24
Bank (P&P) and Equated (CB) Item Parameter Values for Grade 8 Science Form T

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
1	-1.714	-1.534	-0.180
2	0.858	0.938	-0.079
3	0.776	0.798	-0.021
4	-0.353	-0.260	-0.093
5	-1.576	-1.803	0.227
6	0.463	0.748	-0.285
7	-0.110	0.125	-0.236
8	0.863	1.256	-0.392
9	-0.049	0.462	-0.510
10	-0.547	-0.678	0.132
11	1.681	1.870	-0.189
12	0.530	0.548	-0.017
13	-0.313	0.076	-0.389
14	-0.446	-0.600	0.154
15	1.109	0.918	0.191
16	-0.099	0.270	-0.370
17	-0.669	-0.647	-0.022
18	2.279	2.527	-0.248
19	-0.068	0.072	-0.140
20	-0.984	-1.118	0.134
21	-0.619	-0.466	-0.153
22	-1.231	-1.262	0.031
23	0.413	0.779	-0.366
24	0.741	0.786	-0.045
25	1.370	1.165	0.205
26	0.016	0.118	-0.102
27	-0.905	-0.727	-0.178
28	1.199	0.973	0.226
29	-0.764	-0.490	-0.273
30	-0.667	-0.075	-0.593
31	-0.643	-0.286	-0.357
32	0.712	0.814	-0.103
33	-0.116	0.335	-0.451
34	-1.231	-0.823	-0.409
35	0.810	0.758	0.052
36	0.497	0.817	-0.321
37	-0.125	0.103	-0.228

Table A24 (Continued)

Item	2010 Bank Value	2012 Equated CB Value	Discrepancy
38	-0.214	-0.345	0.131
39	0.091	0.639	-0.548
40	-0.619	-0.251	-0.367
41	0.735	0.834	-0.099
42	0.065	0.335	-0.270
43	-0.265	-0.286	0.021
44	-1.091	-0.636	-0.455
45	0.281	0.479	-0.198
46	-0.645	-0.574	-0.070
47	-0.857	-0.349	-0.507
48	0.876	1.111	-0.235

Table A25

Comparison of Omit Rates on 2010 Grade 3 Paper-and-Pencil Form T and 2012 Computer-Based Reading Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
RC-1	1	0.01	0.01	DRP	38	0.01	0.00
	2	0.01	0.01		39	0.01	0.01
	3	0.01	0.01		40	0.03	0.01
	4	0.01	0.01		41	0.01	0.01
	5	0.01	0.01		42	0.01	0.01
	6	0.01	0.01		43	0.01	0.01
	7	0.01	0.01		44	0.01	0.01
	8	0.02	0.04		45	0.01	0.01
	9	0.02	0.06		46	0.01	0.01
	10	0.01	0.10		47	0.01	0.01
	11	0.01	0.10		48	0.01	0.02
	12	0.02	0.11		49	0.01	0.02
	13	0.02	0.11		50	0.01	0.02
	14	0.02	0.12		51	0.01	0.02
	15	0.04	0.16		52	0.01	0.02
	16	0.05	0.21		53	0.01	0.01
RC-2	17	0.01	0.01	DRP	54	0.02	0.02
	18	0.01	0.01		55	0.02	0.03
	19	0.01	0.01		56	0.02	0.02
	20	0.01	0.01		57	0.02	0.02
	21	0.01	0.01		58	0.02	0.03
	22	0.01	0.01		59	0.02	0.03
	23	0.01	0.04		60	0.03	0.03
	24	0.02	0.07		61	0.03	0.04
	25	0.01	0.10		62	0.04	0.04
	26	0.01	0.10		63	0.04	0.05
	27	0.02	0.10		64	0.05	0.05
	28	0.01	0.11		65	0.05	0.05
	29	0.02	0.11		66	0.05	0.05
	30	0.02	0.12		67	0.06	0.05
DRP	31	0.03	0.15		68	0.07	0.06
	32	0.01	0.00		69	0.07	0.06
	33	0.01	0.01		70	0.07	0.07
	34	0.01	0.01		71	0.08	0.07
	35	0.01	0.00		72	0.08	0.08
	36	0.01	0.00		73	0.08	0.08
	37	0.01	0.00				

Table A26

Comparison of Omit Rates on 2010 Grade 4 Paper-and-Pencil Form T and 2012 Computer-Based Reading Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
RC-1	1	0.01	0.01	DRP	38	0.01	0.00
	2	0.01	0.00		39	0.01	0.00
	3	0.01	0.01		40	0.01	0.00
	4	0.01	0.01		41	0.01	0.00
	5	0.01	0.01		42	0.01	0.00
	6	0.01	0.01		43	0.01	0.00
	7	0.01	0.02		44	0.01	0.01
	8	0.01	0.04		45	0.01	0.00
	9	0.01	0.05		46	0.01	0.00
	10	0.01	0.06		47	0.01	0.01
	11	0.01	0.06		48	0.01	0.00
	12	0.01	0.07		49	0.01	0.00
	13	0.01	0.07		50	0.01	0.01
	14	0.01	0.07		51	0.01	0.00
	15	0.02	0.09		52	0.01	0.01
	16	0.05	0.15		53	0.01	0.01
RC-2	17	0.01	0.02	DRP	54	0.01	0.01
	18	0.01	0.02		55	0.02	0.01
	19	0.01	0.02		56	0.01	0.01
	20	0.01	0.02		57	0.02	0.02
	21	0.01	0.02		58	0.02	0.02
	22	0.01	0.02		59	0.02	0.02
	23	0.01	0.02		60	0.02	0.02
	24	0.01	0.05		61	0.02	0.02
	25	0.01	0.08		62	0.02	0.02
	26	0.01	0.09		63	0.03	0.03
	27	0.01	0.09		64	0.03	0.03
	28	0.01	0.10		65	0.03	0.04
	29	0.01	0.10		66	0.03	0.04
	30	0.02	0.13		67	0.04	0.04
DRP	31	0.04	0.22		68	0.04	0.05
	32	0.01	0.00		69	0.06	0.05
	33	0.01	0.00		70	0.06	0.06
	34	0.01	0.00		71	0.06	0.06
	35	0.01	0.00		72	0.05	0.06
	36	0.01	0.00		73	0.06	0.06
	37	0.01	0.00				

Table A27

Comparison of Omit Rates on 2010 Grade 5 Paper-and-Pencil Form T and 2012 Computer-Based Reading Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	CB
RC-1	1	0.01	0.00		38	0.01	0.00
	2	0.01	0.00		39	0.01	0.01
	3	0.01	0.00		40	0.01	0.00
	4	0.01	0.00		41	0.01	0.00
	5	0.01	0.00		42	0.01	0.00
	6	0.01	0.00		43	0.01	0.01
	7	0.01	0.02		44	0.01	0.00
	8	0.01	0.02		45	0.01	0.00
	9	0.01	0.04		46	0.01	0.00
	10	0.01	0.06		47	0.01	0.00
	11	0.01	0.06		48	0.01	0.00
	12	0.01	0.07		49	0.01	0.01
	13	0.01	0.07		50	0.01	0.01
	14	0.01	0.08		51	0.01	0.01
	15	0.02	0.09		52	0.01	0.01
RC-2	16	0.01	0.00		53	0.01	0.01
	17	0.01	0.00		54	0.01	0.01
	18	0.01	0.01		55	0.01	0.01
	19	0.01	0.01		56	0.02	0.02
	20	0.01	0.02		57	0.02	0.01
	21	0.01	0.03		58	0.01	0.01
	22	0.01	0.08		59	0.01	0.01
	23	0.01	0.09		60	0.02	0.02
	24	0.01	0.09		61	0.02	0.02
	25	0.01	0.11		62	0.02	0.02
	26	0.01	0.12		63	0.02	0.03
	27	0.01	0.13		64	0.02	0.03
	28	0.01	0.13		65	0.02	0.03
	29	0.01	0.14		66	0.03	0.03
DRP	30	0.02	0.17		67	0.03	0.04
	31	0.01	0.00		68	0.03	0.04
	32	0.01	0.00		69	0.04	0.04
	33	0.01	0.00		70	0.04	0.04
	34	0.01	0.00		71	0.04	0.05
	35	0.01	0.00		72	0.04	0.05
	36	0.01	0.00		73	0.05	0.06
	37	0.01	0.00		74	0.05	0.07

Table A27 (Continued)

Section	Item	Operational	CB
DRP	75	0.06	0.07
	76	0.07	0.07
	77	0.07	0.08
	78	0.07	0.08
	79	0.07	0.09

Table A28

Comparison of Omit Rates on 2010 Grade 6 Paper-and-Pencil Form T and 2012 Computer-Based Reading Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
RC-1	1	0.01	0.00	DRP	38	0.01	0.00
	2	0.01	0.00		39	0.01	0.00
	3	0.01	0.00		40	0.01	0.01
	4	0.01	0.00		41	0.01	0.01
	5	0.01	0.01		42	0.01	0.00
	6	0.01	0.01		43	0.01	0.00
	7	0.02	0.03		44	0.01	0.01
	8	0.01	0.02		45	0.01	0.01
	9	0.01	0.02		46	0.01	0.00
	10	0.01	0.02		47	0.01	0.00
	11	0.01	0.03		48	0.01	0.01
	12	0.01	0.03		49	0.01	0.01
	13	0.01	0.03		50	0.01	0.01
	14	0.01	0.03		51	0.01	0.01
	15	0.02	0.04		52	0.01	0.00
RC-2	16	0.01	0.01	DRP	53	0.01	0.01
	17	0.01	0.00		54	0.01	0.01
	18	0.01	0.00		55	0.01	0.01
	19	0.01	0.00		56	0.01	0.01
	20	0.01	0.01		57	0.02	0.02
	21	0.01	0.00		58	0.01	0.01
	22	0.01	0.01		59	0.01	0.01
	23	0.01	0.03		60	0.01	0.01
	24	0.02	0.07		61	0.02	0.02
	25	0.01	0.07		62	0.02	0.02
	26	0.01	0.07		63	0.02	0.02
	27	0.01	0.08		64	0.02	0.02
	28	0.01	0.09		65	0.02	0.03
	29	0.01	0.09		66	0.02	0.03
DRP	30	0.01	0.10		67	0.02	0.03
	31	0.03	0.13		68	0.03	0.03
	32	0.01	0.00		69	0.03	0.03
	33	0.01	0.00		70	0.03	0.04
	34	0.01	0.00		71	0.03	0.04
	35	0.01	0.00		72	0.03	0.04
	36	0.01	0.01		73	0.03	0.04
	37	0.01	0.00		74	0.04	0.04

Table A28 (Continued)

Section	Item	2010 Operational	2012 CB
DRP	75	0.05	0.05
	76	0.05	0.05
	77	0.05	0.05
	78	0.05	0.05
	79	0.06	0.05
	80	0.06	0.05

Table A29

Comparison of Omit Rates on 2010 Grade 7 Paper-and-Pencil Form T and 2012 Computer-Based Reading Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
RC-1	1	0.01	0.01	DRP	38	0.01	0.01
	2	0.01	0.01		39	0.01	0.01
	3	0.01	0.00		40	0.01	0.01
	4	0.01	0.00		41	0.01	0.01
	5	0.01	0.00		42	0.01	0.01
	6	0.01	0.00		43	0.01	0.01
	7	0.03	0.02		44	0.01	0.01
	8	0.02	0.03		45	0.01	0.00
	9	0.01	0.02		46	0.01	0.01
	10	0.01	0.03		47	0.01	0.01
	11	0.01	0.03		48	0.01	0.01
	12	0.01	0.03		49	0.01	0.01
	13	0.01	0.03		50	0.01	0.01
	14	0.03	0.05		51	0.01	0.01
	15	0.13	0.09		52	0.01	0.00
RC-2	16	0.02	0.01	DRP	53	0.01	0.01
	17	0.01	0.00		54	0.02	0.01
	18	0.01	0.00		55	0.02	0.01
	19	0.01	0.01		56	0.02	0.01
	20	0.01	0.00		57	0.01	0.01
	21	0.02	0.01		58	0.01	0.01
	22	0.02	0.03		59	0.01	0.01
	23	0.01	0.02		60	0.01	0.01
	24	0.01	0.03		61	0.02	0.01
	25	0.01	0.03		62	0.02	0.01
	26	0.01	0.03		63	0.02	0.02
	27	0.01	0.03		64	0.02	0.02
	28	0.01	0.03		65	0.02	0.02
	29	0.03	0.06		66	0.02	0.01
	30	0.09	0.07		67	0.02	0.02
DRP	31	0.01	0.00	DRP	68	0.03	0.03
	32	0.01	0.01		69	0.03	0.02
	33	0.01	0.00		70	0.03	0.02
	34	0.01	0.00		71	0.03	0.03
	35	0.01	0.01		72	0.03	0.03
	36	0.01	0.01		73	0.04	0.03
	37	0.01	0.01		74	0.05	0.03

Table A29 (Continued)

Section	Item	2010 Operational	2012 CB
DRP	75	0.05	0.03
	76	0.05	0.03
	77	0.05	0.04
	78	0.06	0.04
	79	0.05	0.04

Table A30

Comparison of Omit Rates on 2010 Grade 8 Paper-and-Pencil Form T and 2012 Computer-Based Reading Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
RC-1	1	0.01	0.00	DRP	38	0.01	0.00
	2	0.02	0.01		39	0.01	0.00
	3	0.01	0.00		40	0.01	0.00
	4	0.01	0.00		41	0.01	0.00
	5	0.01	0.00		42	0.01	0.01
	6	0.01	0.00		43	0.01	0.01
	7	0.01	0.01		44	0.01	0.00
	8	0.03	0.03		45	0.01	0.00
	9	0.01	0.02		46	0.01	0.01
	10	0.01	0.02		47	0.01	0.00
	11	0.01	0.02		48	0.01	0.00
	12	0.01	0.02		49	0.01	0.01
	13	0.05	0.05		50	0.01	0.00
RC-2	14	0.01	0.01	DRP	51	0.01	0.00
	15	0.02	0.01		52	0.01	0.01
	16	0.01	0.00		53	0.01	0.01
	17	0.01	0.00		54	0.02	0.01
	18	0.01	0.01		55	0.01	0.00
	19	0.01	0.01		56	0.01	0.01
	20	0.01	0.00		57	0.01	0.01
	21	0.01	0.00		58	0.01	0.01
	22	0.01	0.00		59	0.01	0.01
	23	0.02	0.02		60	0.01	0.01
	24	0.03	0.03		61	0.02	0.01
	25	0.01	0.02		62	0.02	0.01
	26	0.01	0.02		63	0.02	0.01
	27	0.01	0.02		64	0.02	0.01
	28	0.02	0.04		65	0.02	0.01
	29	0.04	0.06		66	0.02	0.01
DRP	30	0.01	0.00		67	0.02	0.01
	31	0.01	0.00		68	0.03	0.01
	32	0.01	0.00		69	0.03	0.01
	33	0.01	0.00		70	0.03	0.02
	34	0.01	0.01		71	0.03	0.01
	35	0.01	0.01		72	0.03	0.02
	36	0.01	0.00		73	0.03	0.02
	37	0.01	0.00		74	0.04	0.02

Table A30 (Continued)

Section	Item	2010 Operational	2012 CB
DRP	75	0.04	0.02
	76	0.04	0.02
	77	0.04	0.02
	78	0.04	0.02

Table A31

Comparison of Omit Rates on 2010 Grade 3 Paper-and-Pencil Form T and 2012 Computer-Based Mathematics Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
MA-1	1	0.00	0.00	MA-2	38	0.00	0.00
	2	0.00	0.00		39	0.00	0.00
	3	0.00	0.00		40	0.00	0.00
	4	0.00	0.00		41	0.00	0.00
	5	0.00	0.00		42	0.00	0.00
	6	0.00	0.00		43	0.00	0.00
	7	0.00	0.00		44	0.00	0.00
	8	0.00	0.00		45	0.00	0.00
	9	0.00	0.00		46	0.00	0.00
	10	0.00	0.00		47	0.00	0.00
	11	0.00	0.00		48	0.00	0.00
	12	0.00	0.00		49	0.01	0.00
	13	0.01	0.01		50	0.00	0.00
	14	0.01	0.00		51	0.00	0.00
	15	0.00	0.00		52	0.01	0.01
	16	0.00	0.00		53	0.01	0.01
	17	0.00	0.00		54	0.02	0.02
	18	0.00	0.00		55	0.03	0.03
	19	0.00	0.00		56	0.05	0.05
	20	0.00	0.00		57	0.00	0.00
	21	0.00	0.00		58	0.00	0.00
	22	0.00	0.00		59	0.00	0.00
	23	0.00	0.00		60	0.00	0.00
	24	0.01	0.00		61	0.00	0.00
	25	0.01	0.00		62	0.00	0.00
	26	0.00	0.00		63	0.00	0.00
	27	0.00	0.00		64	0.00	0.00
	28	0.01	0.00		65	0.00	0.00
	29	0.01	0.00		66	0.00	0.00
	30	0.00	0.00		67	0.00	0.00
	31	0.01	0.01		68	0.00	0.00
	32	0.00	0.00		69	0.00	0.00
	33	0.00	0.00		70	0.00	0.00
	34	0.01	0.00		71	0.00	0.00
	35	0.01	0.00		72	0.00	0.00
	36	0.00	0.00		73	0.00	0.00
	37	0.00	0.00		74	0.02	0.02

Table A31 (Continued)

Section	Item	2010 Operational	2012 CB
MA-3	75	0.00	0.00
	76	0.00	0.00
	77	0.00	0.00
	78	0.00	0.00
	79	0.01	0.01
	80	0.01	0.01
	81	0.01	0.01
	82	0.01	0.01
	83	0.01	0.01
	84	0.01	0.01
	85	0.00	0.00
	86	0.01	0.01
	87	0.01	0.01
	88	0.01	0.01
	89	0.00	0.00
	90	0.01	0.01
	91	0.01	0.00
	92	0.01	0.00
	93	0.01	0.01
	94	0.01	0.01

Table A32

Comparison of Omit Rates on 2010 Grade 4 Paper-and-Pencil Form T and 2012 Computer-Based Mathematics Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
MA-1	1	0.00	0.00	MA-2	38	0.00	0.00
	2	0.00	0.00		39	0.00	0.00
	3	0.01	0.01		40	0.01	0.01
	4	0.00	0.00		41	0.00	0.00
	5	0.00	0.00		42	0.00	0.00
	6	0.01	0.01		43	0.00	0.00
	7	0.01	0.01		44	0.00	0.00
	8	0.00	0.00		45	0.00	0.00
	9	0.00	0.00		46	0.00	0.00
	10	0.00	0.00		47	0.00	0.00
	11	0.01	0.01		48	0.00	0.00
	12	0.00	0.00		49	0.00	0.00
	13	0.00	0.00		50	0.01	0.01
	14	0.01	0.01		51	0.01	0.01
	15	0.00	0.00		52	0.01	0.01
	16	0.00	0.00		53	0.01	0.01
	17	0.00	0.00		54	0.01	0.01
	18	0.00	0.00		55	0.02	0.02
	19	0.01	0.01		56	0.04	0.04
	20	0.00	0.00		57	0.00	0.00
	21	0.01	0.01		58	0.00	0.00
	22	0.00	0.00		59	0.00	0.00
	23	0.00	0.00		60	0.00	0.00
	24	0.00	0.00		61	0.00	0.00
	25	0.00	0.00		62	0.00	0.00
	26	0.00	0.00		63	0.00	0.00
	27	0.00	0.00		64	0.00	0.00
	28	0.00	0.00		65	0.00	0.00
	29	0.00	0.00		66	0.00	0.00
	30	0.01	0.01		67	0.00	0.00
	31	0.00	0.00		68	0.00	0.00
	32	0.00	0.00		69	0.00	0.00
	33	0.00	0.00		70	0.01	0.01
	34	0.00	0.00		71	0.00	0.00
	35	0.00	0.00		72	0.00	0.00
	36	0.00	0.00		73	0.00	0.00
	37	0.00	0.00		74	0.00	0.00

Table A32 (Continued)

Section	Item	2010 Operational	2012 CB
	75	0.00	0.00
	76	0.00	0.00
	77	0.00	0.00
	78	0.00	0.00
	79	0.00	0.00
	80	0.00	0.00
	81	0.00	0.00
	82	0.00	0.00
	83	0.00	0.00
	84	0.00	0.00
	85	0.00	0.00
	86	0.00	0.00
	87	0.00	0.00
	88	0.00	0.00
	89	0.00	0.00
	90	0.00	0.00
	91	0.00	0.00
	92	0.00	0.00
	93	0.00	0.00
	94	0.00	0.00
	95	0.01	0.01
	96	0.03	0.03

Table A33

Comparison of Omit Rates on 2010 Grade 5 Paper-and-Pencil Form T and 2012 Computer-Based Mathematics Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
MA-1	1	0.00	0.00	MA-2	38	0.01	0.00
	2	0.00	0.00		39	0.01	0.00
	3	0.00	0.00		40	0.01	0.00
	4	0.00	0.00		41	0.01	0.00
	5	0.01	0.00		42	0.01	0.00
	6	0.00	0.00		43	0.01	0.01
	7	0.00	0.00		44	0.03	0.02
	8	0.00	0.00		45	0.01	0.01
	9	0.00	0.01		46	0.04	0.01
	10	0.00	0.00		47	0.01	0.00
	11	0.01	0.01		48	0.01	0.00
	12	0.00	0.00		49	0.01	0.01
	13	0.01	0.00		50	0.02	0.01
	14	0.01	0.00		51	0.00	0.01
	15	0.01	0.00		52	0.00	0.00
	16	0.00	0.00		53	0.01	0.00
	17	0.01	0.01		54	0.01	0.00
	18	0.00	0.00		55	0.00	0.00
	19	0.01	0.01		56	0.00	0.00
	20	0.00	0.01		57	0.00	0.01
	21	0.00	0.00		58	0.00	0.00
	22	0.01	0.00		59	0.00	0.00
	23	0.01	0.00		60	0.00	0.00
	24	0.01	0.01		61	0.00	0.00
	25	0.00	0.00		62	0.01	0.00
	26	0.01	0.00		63	0.01	0.00
	27	0.01	0.00		64	0.01	0.01
	28	0.01	0.00		65	0.01	0.00
	29	0.00	0.00		66	0.01	0.00
	30	0.00	0.01		67	0.01	0.01
	31	0.01	0.00		68	0.00	0.01
	32	0.01	0.00		69	0.00	0.00
	33	0.00	0.01		70	0.01	0.00
	34	0.01	0.01		71	0.01	0.00
	35	0.01	0.00		72	0.01	0.01
	36	0.01	0.00		73	0.00	0.00
	37	0.01	0.00		74	0.00	0.01

Table A33 (Continued)

Section	Item	Operational	CB	Section	Item	Operational	CB
	75	0.00	0.01		112	0.00	0.00
	76	0.01	0.01		113	0.01	0.03
	77	0.04	0.01				
	78	0.00	0.00				
	79	0.01	0.01				
	80	0.01	0.01				
	81	0.01	0.01				
	82	0.01	0.01				
	83	0.01	0.01				
	84	0.05	0.01				
	85	0.01	0.01				
	86	0.01	0.01				
	87	0.02	0.02				
	88	0.03	0.02				
	89	0.03	0.03				
	90	0.04	0.04				
MA-3	91	0.00	0.00				
	92	0.00	0.00				
	93	0.00	0.00				
	94	0.00	0.00				
	95	0.01	0.00				
	96	0.01	0.00				
	97	0.00	0.00				
	98	0.00	0.00				
	99	0.00	0.00				
	100	0.00	0.00				
	101	0.00	0.00				
	102	0.00	0.00				
	103	0.00	0.00				
	104	0.02	0.02				
	105	0.00	0.00				
	106	0.00	0.00				
	107	0.02	0.00				
	108	0.01	0.00				
	109	0.02	0.01				
	110	0.01	0.00				
	111	0.00	0.00				

Table A34

Comparison of Omit Rates on 2010 Grade 6 Paper-and-Pencil Form T and 2012 Computer-Based Mathematics Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
MA-1	1	0.00	0.00	MA-2	38	0.01	0.01
	2	0.00	0.00		39	0.01	0.01
	3	0.00	0.00		40	0.03	0.03
	4	0.00	0.00		41	0.00	0.00
	5	0.00	0.00		42	0.00	0.00
	6	0.00	0.00		43	0.02	0.02
	7	0.00	0.00		44	0.03	0.03
	8	0.00	0.00		45	0.04	0.04
	9	0.00	0.00		46	0.04	0.04
	10	0.01	0.01		47	0.02	0.02
	11	0.00	0.00		48	0.04	0.04
	12	0.00	0.00		49	0.00	0.00
	13	0.00	0.00		50	0.01	0.01
	14	0.01	0.01		51	0.00	0.00
	15	0.00	0.00		52	0.01	0.01
	16	0.01	0.01		53	0.00	0.00
	17	0.00	0.00		54	0.00	0.00
	18	0.01	0.01		55	0.00	0.00
	19	0.01	0.01		56	0.00	0.00
	20	0.00	0.00		57	0.00	0.00
	21	0.01	0.01		58	0.00	0.00
	22	0.01	0.01		59	0.00	0.00
	23	0.00	0.00		60	0.00	0.00
	24	0.00	0.00		61	0.00	0.00
	25	0.00	0.00		62	0.00	0.00
	26	0.00	0.00		63	0.00	0.00
	27	0.00	0.00		64	0.00	0.00
	28	0.01	0.01		65	0.00	0.00
	29	0.00	0.00		66	0.00	0.00
	30	0.00	0.00		67	0.00	0.00
	31	0.00	0.00		68	0.00	0.00
	32	0.00	0.00		69	0.00	0.00
	33	0.00	0.00		70	0.00	0.00
	34	0.00	0.00		71	0.00	0.00
	35	0.01	0.01		72	0.00	0.00
	36	0.01	0.01		73	0.00	0.00
	37	0.00	0.00		74	0.01	0.00

Table A34 (Continued)

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
	75	0.00	0.00		112	0.00	0.00
	76	0.00	0.00		113	0.01	0.01
	77	0.02	0.02		114	0.00	0.00
	78	0.01	0.01		115	0.02	0.02
	79	0.01	0.01		116	0.03	0.03
	80	0.00	0.00				
	81	0.00	0.00				
	82	0.00	0.00				
	83	0.01	0.01				
	84	0.00	0.00				
	85	0.01	0.01				
	86	0.01	0.01				
	87	0.03	0.03				
	88	0.02	0.02				
	89	0.02	0.02				
MA-3	90	0.00	0.00				
	91	0.00	0.00				
	92	0.00	0.00				
	93	0.01	0.01				
	94	0.01	0.00				
	95	0.00	0.00				
	96	0.00	0.00				
	97	0.00	0.00				
	98	0.00	0.00				
	99	0.00	0.00				
	100	0.00	0.00				
	101	0.00	0.00				
	102	0.00	0.00				
	103	0.00	0.00				
	104	0.00	0.00				
	105	0.01	0.01				
	106	0.02	0.02				
	107	0.00	0.00				
	108	0.00	0.00				
	109	0.00	0.00				
	110	0.01	0.01				
	111	0.00	0.00				

Table A35

Comparison of Omit Rates on 2010 Grade 7 Paper-and-Pencil Form T and 2012 Computer-Based Mathematics Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
MA-1	1	0.00	0.00	MA-2	38	0.01	0.01
	2	0.00	0.00		39	0.01	0.01
	3	0.01	0.01		40	0.02	0.02
	4	0.01	0.01		41	0.02	0.02
	5	0.00	0.00		42	0.00	0.00
	6	0.01	0.01		43	0.01	0.01
	7	0.00	0.00		44	0.01	0.01
	8	0.00	0.00		45	0.02	0.02
	9	0.01	0.01		46	0.03	0.03
	10	0.00	0.00		47	0.03	0.03
	11	0.00	0.00		48	0.07	0.07
	12	0.00	0.00		49	0.04	0.04
	13	0.00	0.00		50	0.08	0.08
	14	0.00	0.00		51	0.00	0.00
	15	0.01	0.01		52	0.00	0.00
	16	0.00	0.00		53	0.00	0.00
	17	0.01	0.01		54	0.01	0.01
	18	0.01	0.01		55	0.01	0.01
	19	0.01	0.01		56	0.01	0.01
	20	0.00	0.00		57	0.01	0.01
	21	0.00	0.00		58	0.01	0.01
	22	0.01	0.01		59	0.01	0.01
	23	0.01	0.01		60	0.00	0.00
	24	0.01	0.01		61	0.00	0.00
	25	0.00	0.00		62	0.02	0.02
	26	0.01	0.01		63	0.01	0.01
	27	0.00	0.00		64	0.01	0.01
	28	0.00	0.00		65	0.01	0.01
	29	0.00	0.00		66	0.00	0.00
	30	0.00	0.00		67	0.01	0.01
	31	0.01	0.01		68	0.01	0.01
	32	0.00	0.00		69	0.01	0.01
	33	0.01	0.01		70	0.01	0.01
	34	0.01	0.01		71	0.00	0.00
	35	0.01	0.01		72	0.01	0.01
	36	0.02	0.02		73	0.00	0.00
	37	0.03	0.03		74	0.01	0.01

Table A35 (Continued)

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
	75	0.00	0.00		112	0.00	0.00
	76	0.02	0.02		113	0.01	0.01
	77	0.01	0.01		114	0.03	0.03
	78	0.02	0.02		115	0.02	0.02
	79	0.01	0.01		116	0.01	0.01
	80	0.01	0.01		117	0.01	0.01
	81	0.04	0.04		118	0.02	0.02
	82	0.02	0.02		119	0.01	0.01
	83	0.01	0.01		120	0.06	0.06
	84	0.06	0.06				
	85	0.04	0.04				
	86	0.04	0.04				
	87	0.04	0.04				
	88	0.06	0.06				
	89	0.05	0.05				
	90	0.05	0.05				
MA-3	91	0.00	0.00				
	92	0.00	0.00				
	93	0.00	0.00				
	94	0.00	0.00				
	95	0.00	0.00				
	96	0.01	0.01				
	97	0.00	0.00				
	98	0.01	0.01				
	99	0.00	0.00				
	100	0.01	0.01				
	101	0.00	0.00				
	102	0.00	0.00				
	103	0.00	0.00				
	104	0.00	0.00				
	105	0.00	0.00				
	106	0.00	0.00				
	107	0.01	0.01				
	108	0.01	0.01				
	109	0.02	0.02				
	110	0.01	0.01				
	111	0.00	0.00				

Table A36

Comparison of Omit Rates on 2010 Grade 8 Paper-and-Pencil Form T and 2012 Computer-Based Mathematics Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
MA-1	1	0.00	0.00	MA-2	38	0.03	0.03
	2	0.00	0.00		39	0.04	0.04
	3	0.00	0.00		40	0.06	0.06
	4	0.00	0.00		41	0.02	0.02
	5	0.00	0.00		42	0.03	0.03
	6	0.00	0.00		43	0.02	0.02
	7	0.00	0.00		44	0.00	0.00
	8	0.00	0.00		45	0.00	0.00
	9	0.00	0.00		46	0.01	0.00
	10	0.00	0.00		47	0.00	0.00
	11	0.00	0.00		48	0.01	0.01
	12	0.01	0.01		49	0.00	0.00
	13	0.01	0.00		50	0.01	0.01
	14	0.00	0.00		51	0.00	0.00
	15	0.00	0.00		52	0.01	0.01
	16	0.00	0.00		53	0.00	0.00
	17	0.00	0.00		54	0.01	0.01
	18	0.00	0.00		55	0.00	0.00
	19	0.01	0.01		56	0.01	0.01
	20	0.01	0.01		57	0.01	0.01
	21	0.00	0.00		58	0.00	0.00
	22	0.00	0.00		59	0.01	0.01
	23	0.00	0.00		60	0.01	0.01
	24	0.00	0.00		61	0.00	0.00
	25	0.00	0.00		62	0.04	0.04
	26	0.01	0.01		63	0.01	0.01
	27	0.00	0.00		64	0.02	0.02
	28	0.01	0.01		65	0.02	0.02
	29	0.01	0.01		66	0.01	0.01
	30	0.00	0.00		67	0.01	0.01
	31	0.01	0.01		68	0.01	0.01
	32	0.05	0.05		69	0.02	0.02
	33	0.01	0.01		70	0.02	0.02
	34	0.00	0.00		71	0.02	0.02
	35	0.00	0.00		72	0.03	0.03
	36	0.00	0.00		73	0.02	0.02
	37	0.01	0.01		74	0.06	0.06

Table A36 (Continued)

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
	75	0.03	0.03		112	0.06	0.06
	76	0.05	0.05		113	0.01	0.01
	77	0.06	0.05		114	0.02	0.02
	78	0.05	0.05		115	0.02	0.02
	79	0.04	0.04		116	0.03	0.03
	80	0.08	0.08		117	0.08	0.08
	81	0.09	0.09				
MA-3	82	0.00	0.00				
	83	0.00	0.00				
	84	0.00	0.00				
	85	0.01	0.00				
	86	0.01	0.01				
	87	0.00	0.00				
	88	0.00	0.00				
	89	0.01	0.01				
	90	0.01	0.01				
	91	0.01	0.01				
	92	0.00	0.00				
	93	0.01	0.01				
	94	0.01	0.01				
	95	0.01	0.01				
	96	0.01	0.01				
	97	0.00	0.00				
	98	0.00	0.00				
	99	0.01	0.01				
	100	0.01	0.01				
	101	0.00	0.00				
	102	0.00	0.00				
	103	0.01	0.01				
	104	0.01	0.01				
	105	0.00	0.00				
	106	0.00	0.00				
	107	0.00	0.00				
	108	0.00	0.00				
	109	0.01	0.01				
	110	0.00	0.00				
	111	0.04	0.04				

Table A37

Comparison of Omit Rates on 2010 Grade 3 Paper-and-Pencil Form T and 2012 Computer-Based Writing Items

Section	Item	2010 Operational	2012 CB
WR-1	1	0.00	0.00
	2	0.00	0.00
	3	0.00	0.00
	4	0.00	0.00
	5	0.00	0.00
	6	0.00	0.00
	7	0.00	0.00
	8	0.00	0.00
	9	0.00	0.00
	10	0.00	0.00
	11	0.00	0.00
	12	0.00	0.00
	13	0.00	0.00
	14	0.00	0.00
	15	0.00	0.00
	16	0.00	0.01
	17	0.01	0.01
	18	0.01	0.00
	19	0.00	0.00
	20	0.00	0.00
	21	0.00	0.01
	22	0.01	0.01
	23	0.01	0.01
	24	0.01	0.01
	25	0.01	0.01
	26	0.01	0.00
	27	0.00	0.01
	28	0.01	0.01
	29	0.01	0.01
	30	0.01	0.01
	31	0.01	0.01
	32	0.01	0.00

Table A38

Comparison of Omit Rates on 2010 Grade 4 Paper-and-Pencil Form T and 2012 Computer-Based Writing Items

Section	Item	2010 Operational	2012 CB
WR-1	1	0.00	0.00
	2	0.00	0.00
	3	0.00	0.00
	4	0.00	0.00
	5	0.00	0.00
	6	0.00	0.00
	7	0.00	0.00
	8	0.00	0.00
	9	0.00	0.00
	10	0.00	0.00
	11	0.00	0.00
	12	0.00	0.00
	13	0.00	0.00
	14	0.00	0.00
	15	0.00	0.00
	16	0.00	0.00
	17	0.00	0.00
	18	0.00	0.00
	19	0.00	0.00
	20	0.00	0.01
	21	0.00	0.00
	22	0.00	0.01
	23	0.01	0.00
	24	0.00	0.00
	25	0.00	0.00
	26	0.00	0.01
	27	0.01	0.01
	28	0.01	0.00
	29	0.00	0.00
	30	0.00	0.01
	31	0.00	0.01
	32	0.01	0.00

Table A39

Comparison of Omit Rates on 2010 Grade 5 Paper-and-Pencil Form T and 2012 Computer-Based Writing Items

Section	Item	2010 Operational	2012 CB
WR-1	1	0.01	0.00
	2	0.01	0.00
	3	0.01	0.00
	4	0.01	0.00
	5	0.01	0.00
	6	0.01	0.00
	7	0.01	0.00
	8	0.01	0.00
	9	0.02	0.00
	10	0.01	0.00
	11	0.01	0.00
	12	0.01	0.00
	13	0.01	0.00
	14	0.01	0.00
	15	0.01	0.00
	16	0.01	0.00
	17	0.01	0.00
	18	0.01	0.00
	19	0.01	0.00
	20	0.01	0.00
	21	0.01	0.00
	22	0.01	0.00
	23	0.01	0.00
	24	0.02	0.00
	25	0.02	0.01
	26	0.01	0.00
	27	0.01	0.00
	28	0.01	0.00
	29	0.01	0.00
	30	0.01	0.00
	31	0.01	0.00
	32	0.02	0.00
	33	0.01	0.00
	34	0.01	0.00
	35	0.01	0.00
	36	0.01	0.00

Table A40

Comparison of Omit Rates on 2010 Grade 6 Paper-and-Pencil Form T and 2012 Computer-Based Writing Items

Section	Item	2010 Operational	2012 CB
WR-1	1	0.00	0.00
	2	0.00	0.00
	3	0.00	0.00
	4	0.00	0.00
	5	0.00	0.00
	6	0.00	0.00
	7	0.00	0.00
	8	0.00	0.00
	9	0.00	0.00
	10	0.00	0.00
	11	0.00	0.00
	12	0.00	0.00
	13	0.00	0.00
	14	0.00	0.00
	15	0.00	0.00
	16	0.00	0.00
	17	0.00	0.00
	18	0.00	0.00
	19	0.00	0.00
	20	0.00	0.00
	21	0.00	0.00
	22	0.00	0.00
	23	0.00	0.00
	24	0.00	0.00
	25	0.00	0.00
	26	0.00	0.00
	27	0.00	0.00
	28	0.00	0.00
	29	0.00	0.00
	30	0.00	0.00
	31	0.00	0.00
	32	0.00	0.00
	33	0.00	0.00
	34	0.00	0.01
	35	0.01	0.01
	36	0.01	0.00

Table A41

Comparison of Omit Rates on 2010 Grade 7 Paper-and-Pencil Form T and 2012 Computer-Based Writing Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
WR-1	1	0.00	0.00		38	0.00	0.00
	2	0.00	0.00		39	0.00	0.00
	3	0.00	0.01		40	0.00	0.00
	4	0.01	0.01				
	5	0.01	0.00				
	6	0.00	0.00				
	7	0.00	0.00				
	8	0.00	0.00				
	9	0.00	0.00				
	10	0.00	0.00				
	11	0.00	0.00				
	12	0.00	0.00				
	13	0.00	0.00				
	14	0.00	0.00				
	15	0.00	0.00				
	16	0.00	0.00				
	17	0.00	0.01				
	18	0.01	0.00				
	19	0.00	0.00				
	20	0.00	0.00				
	21	0.00	0.00				
	22	0.00	0.00				
	23	0.00	0.00				
	24	0.00	0.00				
	25	0.00	0.00				
	26	0.00	0.00				
	27	0.00	0.00				
	28	0.00	0.00				
	29	0.00	0.00				
	30	0.00	0.00				
	31	0.00	0.00				
	32	0.00	0.00				
	33	0.00	0.00				
	34	0.00	0.00				
	35	0.00	0.00				
	36	0.00	0.00				
	37	0.00	0.00				

Table A42

Comparison of Omit Rates on 2010 Grade 8 Paper-and-Pencil Form T and 2012 Computer-Based Writing Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
WR-1	1	0.00	0.00		38	0.00	0.00
	2	0.00	0.01		39	0.00	0.00
	3	0.00	0.00		40	0.00	0.00
	4	0.00	0.00				
	5	0.00	0.00				
	6	0.00	0.00				
	7	0.00	0.00				
	8	0.00	0.00				
	9	0.00	0.00				
	10	0.00	0.00				
	11	0.00	0.00				
	12	0.00	0.00				
	13	0.00	0.00				
	14	0.00	0.00				
	15	0.00	0.00				
	16	0.00	0.00				
	17	0.00	0.00				
	18	0.00	0.00				
	19	0.00	0.00				
	20	0.00	0.00				
	21	0.00	0.00				
	22	0.00	0.00				
	23	0.00	0.00				
	24	0.00	0.00				
	25	0.00	0.00				
	26	0.00	0.00				
	27	0.00	0.00				
	28	0.00	0.00				
	29	0.00	0.00				
	30	0.00	0.00				
	31	0.00	0.00				
	32	0.00	0.00				
	33	0.00	0.00				
	34	0.00	0.00				
	35	0.00	0.00				
	36	0.00	0.00				
	37	0.00	0.00				

Table A43

Comparison of Omit Rates on 2010 Grade 5 Paper-and-Pencil Form T and 2012 Computer-Based Science Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
SC-1	1	0.00	0.00		38	0.01	0.01
	2	0.00	0.00		39	0.01	0.01
	3	0.00	0.00				
	4	0.01	0.00				
	5	0.00	0.00				
	6	0.00	0.00				
	7	0.00	0.00				
	8	0.01	0.00				
	9	0.00	0.00				
	10	0.00	0.00				
	11	0.01	0.01				
	12	0.01	0.01				
	13	0.00	0.00				
	14	0.01	0.00				
	15	0.00	0.00				
	16	0.00	0.00				
	17	0.01	0.00				
	18	0.01	0.00				
	19	0.00	0.01				
	20	0.01	0.01				
	21	0.02	0.01				
	22	0.02	0.01				
	23	0.01	0.01				
	24	0.01	0.00				
	25	0.01	0.01				
	26	0.01	0.01				
	27	0.01	0.01				
	28	0.01	0.01				
	29	0.01	0.01				
	30	0.01	0.00				
	31	0.01	0.01				
	32	0.01	0.01				
	33	0.01	0.01				
	34	0.01	0.01				
	35	0.01	0.01				
	36	0.01	0.01				
	37	0.01	0.01				

Table A44

Comparison of Omit Rates on 2010 Grade 8 Paper-and-Pencil Form T and 2012 Computer-Based Science Items

Section	Item	2010 Operational	2012 CB	Section	Item	2010 Operational	2012 CB
SC-1	1	0.00	0.00		38	0.01	0.01
	2	0.00	0.00		39	0.00	0.00
	3	0.00	0.00		40	0.00	0.00
	4	0.00	0.00		41	0.01	0.01
	5	0.00	0.00		42	0.01	0.01
	6	0.00	0.00		43	0.01	0.01
	7	0.00	0.00		44	0.01	0.01
	8	0.00	0.00		45	0.01	0.01
	9	0.00	0.00		46	0.01	0.01
	10	0.00	0.00		47	0.01	0.01
	11	0.00	0.00		48	0.01	0.01
	12	0.00	0.00				
	13	0.00	0.00				
	14	0.00	0.00				
	15	0.00	0.00				
	16	0.00	0.00				
	17	0.00	0.00				
	18	0.01	0.01				
	19	0.00	0.00				
	20	0.00	0.00				
	21	0.00	0.00				
	22	0.00	0.00				
	23	0.01	0.01				
	24	0.01	0.01				
	25	0.04	0.05				
	26	0.00	0.00				
	27	0.01	0.01				
	28	0.00	0.00				
	29	0.01	0.01				
	30	0.01	0.01				
	31	0.00	0.00				
	32	0.00	0.00				
	33	0.01	0.01				
	34	0.00	0.00				
	35	0.01	0.01				
	36	0.01	0.01				
	37	0.00	0.00				

Table A45

Characteristics of Grade 3 Reading Comprehension Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	9	29	16	28	26	25	15	30	12	10
Section	RD-1	RD-2	RD-1	RD-2	RD-2	RD-2	RD-1	RD-2	RD-1	RD-1
Passage	2	2	2	2	2	2	2	2	2	2
2010 Bank Value	-0.45	-2.50	-0.10	-2.52	-2.79	-2.62	-0.82	-1.84	-1.99	-1.44
Adjusted CBT Value*	1.16	-0.89	1.49	-0.92	-1.23	-1.09	0.60	-0.42	-0.78	-0.24
Difference	-1.61	-1.61	-1.59	-1.59	-1.55	-1.53	-1.42	-1.42	-1.22	-1.21
Item Type	OE	MC	OE	MC	MC	MC	OE	MC	MC	MC
First item in the CB test	NO									
Scrolling needed to see all answers (MC) or complete answers (OE)	YES	NO	YES	NO	NO	NO	YES	NO	YES	NO
Correct answer visible without scrolling (MC only)									NO	
Question visible when scrolling for answer	NO	NO					NO	NO	NO	

SMALLEST DISCREPANCIES

Item Number	8	2	13	20	21	22	19	18	4	17
Section	RD-1	RD-1	RD-1	RD-2	RD-2	RD-2	RD-2	RD-2	RD-1	RD-2
Passage	1	1	2	1	1	1	1	1	1	1
2010 Bank Value	-0.76	-2.11	-0.60	-0.84	-0.85	-0.96	-0.57	-1.65	-1.12	-0.38
Adjusted CBT Value*	-0.14	-1.51	-0.02	-0.30	-0.35	-0.51	-0.14	-1.34	-0.82	-0.10
Difference	-0.62	-0.60	-0.57	-0.54	-0.51	-0.46	-0.43	-0.31	-0.29	-0.28
Item Type	OE	MC	OE							
First item in the CB test	NO	YES								
Scrolling needed to see all answers (MC) or complete answers (OE)	YES	NO	YES	NO	NO	NO	NO	YES	YES	YES
Correct answer visible without scrolling (MC only)								YES	YES	
Question visible when scrolling for answer	NO	NO					NO	NO	NO	

Table A46

Characteristics of Grade 4 Reading Comprehension Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	31	13	30	12	24	10	16	27	25	8
Section	RD-2	RD-1	RD-2	RD-1	RD-2	RD-1	RD-1	RD-2	RD-2	RD-1
Passage	2	2	2	2	2	2	1	2	2	2
2010 Bank Value	0.96	-2.30	0.43	-1.63	-0.12	-2.00	0.08	-0.29	-1.40	-0.69
Adjusted CBT Value*	2.54	-0.97	1.70	-0.37	1.06	-0.87	1.12	0.74	-0.45	0.24
Difference	-1.59	-1.33	-1.27	-1.26	-1.18	-1.13	-1.05	-1.03	-0.95	-0.93
Item Type	OE	MC	OE	MC	OE	MC	OE	MC	MC	OE
First item in the CB test	NO									
Scrolling needed to see all answers (MC) or complete answers (OE)	YES	NO	YES	YES	YES	NO	YES	NO	NO	YES
Correct answer visible without scrolling (MC only)						NO				
Question visible when scrolling for answer	NO									

SMALLEST DISCREPANCIES

Item Number	21	7	26	19	3	29	4	6	2	1
Section	RD-2	RD-1	RD-2	RD-2	RD-1	RD-2	RD-1	RD-1	RD-1	RD-1
Passage	1	1	2	1	1	2	1	1	1	1
2010 Bank Value	-0.88	-0.17	0.30	0.52	1.51	1.04	1.30	-0.41	0.51	0.35
Adjusted CBT Value*	-0.41	0.28	0.74	0.96	1.95	1.40	1.66	-0.12	0.80	0.18
Difference	-0.47	-0.44	-0.44	-0.44	-0.44	-0.36	-0.35	-0.30	-0.28	0.17
Item Type	MC	OE	MC	OE						
First item in the CB test	NO	YES								
Scrolling needed to see all answers (MC) or complete answers (OE)	NO	YES	NO	NO	YES	NO	NO	NO	NO	YES
Correct answer visible without scrolling (MC only)						NO				
Question visible when scrolling for answer	NO									

Table A47
Characteristics of Grade 5 Reading Comprehension Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES										
Item Number	25	28	22	30	24	27	9	26	29	2
Section	RD-2	RD-2	RD-2	RD-2	RD-2	RD-2	RD-1	RD-2	RD-2	RD-1
Passage	2	2	2	2	2	2	2	2	2	1
2010 Bank Value	-2.11	-1.67	-1.50	-0.84	-1.51	-1.25	-0.78	-1.07	1.07	-3.14
Adjusted CBT Value*	-0.30	0.07	0.08	0.69	-0.02	0.12	0.37	0.05	2.17	-2.05
Difference	-1.82	-1.73	-1.58	-1.52	-1.49	-1.37	-1.15	-1.12	-1.10	-1.09
Item Type	MC	MC	OE	OE	MC	MC	OE	MC	MC	MC
First item in the CB test	NO									
Scrolling needed to see all answers (MC) or complete answers (OE)	YES	NO	YES	YES	NO	NO	YES	NO	NO	YES
Correct answer visible without scrolling (MC only)	NO									
Question visible when scrolling for answer	NO	NO	NO	NO				NO		

SMALLEST DISCREPANCIES										
Item Number	3	16	13	5	7	10	4	6	18	19
Section	RD-1	RD-2	RD-1	RD-1	RD-1	RD-1	RD-1	RD-1	RD-2	RD-2
Passage	1	1	2	1	1	2	1	1	1	1
2010 Bank Value	-2.01	-0.79	-0.67	-1.55	-0.18	0.00	0.52	-0.67	-1.96	-0.15
Adjusted CBT Value*	-1.35	-0.13	-0.02	-0.91	0.26	0.38	0.84	-0.35	-1.69	0.08
Difference	-0.66	-0.66	-0.65	-0.64	-0.44	-0.38	-0.32	-0.32	-0.27	-0.23
Item Type	MC	OE	MC	MC	OE	MC	MC	MC	MC	MC
First item in the CB test	NO	YES	NO							
Scrolling needed to see all answers (MC) or complete answers (OE)	NO	YES	NO	NO	YES	NO	YES	NO	NO	NO
Correct answer visible without scrolling (MC only)	NO									
Question visible when scrolling for answer	NO			NO			NO			

Table A48

Characteristics of Grade 6 Reading Comprehension Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	15	31	26	30	19	2	10	13	29	25
Section	RD-1	RD-2	RD-2	RD-2	RD-2	RD-1	RD-1	RD-1	RD-2	RD-2
Passage	2	2	2	2	1	1	2	2	2	2
2010 Bank Value	-0.16	0.36	-1.20	0.18	-0.71	0.24	-1.59	0.01	-0.48	-0.62
Adjusted CBT Value*	0.69	1.21	-0.37	0.89	-0.01	0.83	-1.03	0.57	0.03	-0.14
Difference	-0.85	-0.85	-0.83	-0.71	-0.69	-0.59	-0.56	-0.56	-0.51	-0.48
Item Type	OE	OE	MC							
First item in the CB test	NO									
Scrolling needed to see all answers (MC) or complete answers (OE)	YES	YES	NO	NO	NO	NO	YES	YES	NO	NO
Correct answer visible without scrolling (MC only)							YES	YES		
Question visible when scrolling for answer	NO	NO					NO	NO		

SMALLEST DISCREPANCIES

Item Number	5	6	4	22	27	8	3	11	14	20
Section	RD-1	RD-1	RD-1	RD-2	RD-2	RD-1	RD-1	RD-1	RD-1	RD-2
Passage	1	1	1	2	2	2	1	2	2	1
2010 Bank Value	0.10	0.54	-0.80	-0.45	0.92	0.04	-0.13	1.30	1.81	0.31
Adjusted CBT Value*	0.34	0.77	-0.58	-0.63	1.11	0.21	0.02	1.17	1.74	0.27
Difference	-0.24	-0.23	-0.22	0.18	-0.18	-0.17	-0.15	0.12	0.08	0.04
Item Type	MC	OE	MC	OE	MC	MC	MC	MC	MC	MC
First item in the CB test	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Scrolling needed to see all answers (MC) or complete answers (OE)	YES	YES	YES	YES	YES	NO	NO	YES	YES	NO
Correct answer visible without scrolling (MC only)	YES		NO		YES			NO	YES	
Question visible when scrolling for answer	NO	NO	YES	NO	NO			NO	NO	

Table A49

Characteristics of Grade 7 Reading Comprehension Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	14	28	13	27	11	23	29	24	12	10
Section	RD-1	RD-2	RD-1	RD-2	RD-1	RD-2	RD-2	RD-2	RD-1	RD-1
Passage	2	2	2	2	2	2	2	2	2	2
2010 Bank Value	-0.46	-0.99	-0.84	-0.91	-1.05	-1.17	-0.12	-0.40	0.23	-1.63
Adjusted CBT Value*	0.70	-0.01	0.13	0.03	-0.19	-0.34	0.70	0.35	0.96	-0.92
Difference	-1.16	-0.98	-0.97	-0.94	-0.85	-0.83	-0.82	-0.75	-0.73	-0.71
Item Type	OE	MC	MC	MC	MC	MC	OE	MC	MC	MC
First item in the CB test	NO									
Scrolling needed to see all answers (MC) or complete answers (OE)	YES	NO	NO	NO	YES	NO	YES	NO	NO	NO
Correct answer visible without scrolling (MC only)						YES				
Question visible when scrolling for answer	NO				NO		NO			

SMALLEST DISCREPANCIES

Item Number	5	17	1	16	15	6	18	20	4	19
Section	RD-1	RD-2	RD-1	RD-2	RD-1	RD-1	RD-2	RD-2	RD-1	RD-2
Passage	1	1	1	1	2	1	1	1	1	1
2010 Bank Value	-0.58	-1.19	-0.94	-0.86	0.69	0.09	0.02	-1.15	-1.44	-0.28
Adjusted CBT Value*	-0.36	-0.98	-0.75	-0.68	0.80	0.20	-0.07	-1.07	-1.36	-0.24
Difference	-0.22	-0.21	-0.19	-0.18	-0.11	-0.11	0.09	-0.09	-0.08	-0.03
Item Type	MC	MC	OE	OE	OE	MC	MC	MC	MC	MC
First item in the CB test	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO
Scrolling needed to see all answers (MC) or complete answers (OE)	YES	NO	YES	YES	YES	NO	NO	YES	NO	NO
Correct answer visible without scrolling (MC only)	NO							NO		
Question visible when scrolling for answer	NO		NO	NO	NO				YES	

Table A50

Characteristics of Grade 8 Reading Comprehension Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	11	8	2	7	28	22	25	29	14	1
Section	RD-1	RD-1	RD-1	RD-1	RD-2	RD-2	RD-2	RD-2	RD-2	RD-1
Passage	2	2	1	1	2	1	2	2	1	1
2010 Bank Value	-1.24	0.17	-0.48	-0.57	-0.09	1.28	-0.47	0.43	-0.41	-0.95
Adjusted CBT Value*	-0.09	1.18	0.46	0.33	0.79	2.13	0.35	1.24	0.39	-0.16
Difference	-1.15	-1.01	-0.94	-0.90	-0.88	-0.85	-0.82	-0.81	-0.81	-0.79
Item Type	MC	OE	OE	OE	OE	MC	MC	OE	OE	OE
First item in the CB test	NO	YES	YES							
Scrolling needed to see all answers (MC) or complete answers (OE)	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES
Correct answer visible without scrolling (MC only)	NO						NO			
Question visible when scrolling for answer	NO	NO	NO	NO	NO		YES	NO	NO	NO

SMALLEST DISCREPANCIES

Item Number	15	20	10	18	12	21	4	6	3	5
Section	RD-2	RD-2	RD-1	RD-2	RD-1	RD-2	RD-1	RD-1	RD-1	RD-1
Passage	1	1	2	1	2	1	1	1	1	1
2010 Bank Value	-0.26	-0.23	-0.01	-0.72	1.13	-0.68	-0.30	0.18	0.04	0.50
Adjusted CBT Value*	0.24	0.21	0.43	-0.32	1.50	-0.36	0.00	0.47	0.19	0.49
Difference	-0.50	-0.44	-0.44	-0.40	-0.37	-0.32	-0.30	-0.30	-0.15	0.00
Item Type	OE	MC	MC							
First item in the CB test	NO	NO								
Scrolling needed to see all answers (MC) or complete answers (OE)	YES	NO	YES	YES	NO	NO	NO	NO	NO	NO
Correct answer visible without scrolling (MC only)		NO	NO							
Question visible when scrolling for answer	NO		NO	NO						

Table A51

Characteristics of Grade 3 Mathematics Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	74	54	22	9	39	41	49	8	55	1
Section	MA2	MA1								
2010 Bank Value	-0.3	0.55	-1.1	-2.5	0.67	1.69	0.7	-2.5	0.01	-1.3
Adjusted CBT Value*	1.93	1.73	-0	-1.6	1.45	2.44	1.41	-1.8	0.7	-0.6
Difference	-2.3	-1.2	-1	-0.9	-0.8	-0.8	-0.7	-0.7	-0.7	-0.7
Item Type	MC	OE	MC	MC	MC	MC	OE	MC	OE	MC
First item in the CB form	NO	YES								
Presentation of answer changes on CB form	NO									
Presentation changes from 2X2 matrix to 4X1										
Scrolling needed to answer question	YES	YES	YES	NO	NO	NO	NO	YES	NO	
Scrolling needed to see all answers (MC only)	YES	YES	YES						YES	
Correct answer visible without scrolling (MC only)	NO		YES							
Question visible when scrolling for answer	NO	NO	NO						NO	
Tool needed	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO
Click and/or drag needed	YES	YES					YES			
Tool box used	YES	NO					YES			
Use of tools changes how question is answered	YES	YES					YES			
Question uses a table/plot/graph	YES	NO	NO	YES	YES	YES	NO	YES	YES	NO

Table A51 (Continued)

Characteristics of Grade 3 Mathematics Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

SMALLEST DISCREPANCIES

Item Number	28	84	20	78	80	5	79	92	90	46
Section	MA1	MA2	MA1	MA2	MA2	MA1	MA2	MA2	MA2	MA1
2010 Bank Value	0.71	1.75	-1.5	0.19	0.74	-0.3	-0.9	0.55	0.53	-1.3
Adjusted CBT Value*	0.75	1.8	-1.5	0.22	0.77	-0.2	-0.9	0.56	0.53	-1.3
Difference	-0.1	-0.1	0.04	-0	-0	-0	-0	-0	0	0
Item Type	MC	OE	OE	OE						
First item in the CB form	NO									
Presentation of answer changes on CB form	NO									
Presentation changes from 2X2 matrix to 4X1										
Scrolling needed to answer question	NO									
Scrolling needed to see all answers (MC only)										
Correct answer visible without scrolling (MC only)										
Question visible when scrolling for answer	NO	YES	YES	YES						
Tool needed								NO	NO	YES
Click and/or drag needed								YES	YES	NO
Tool box used								YES	YES	YES
Use of tools changes how question is answered								YES	YES	YES
Question uses a table/plot/graph	YES	NO	YES	YES	NO	NO	NO	NO	NO	YES

Table A52

Characteristics of Grade 4 Mathematics Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	52	91	41	58	72	56	53	95	24	1
Section	MA1	MA2	MA1	MA2	MA2	MA1	MA1	MA2	MA1	MA1
2010 Bank Value	0.31	0.21	-1.2	-1.1	-0	0.98	-0.1	1.41	-0.1	-0.4
Adjusted CBT Value*	1.23	1.05	-1.9	-1.8	0.6	1.6	-0.7	1.96	-0.6	0.09
Difference	-0.9	-0.8	0.68	0.65	-0.6	-0.6	0.59	-0.6	0.48	-0.5
Item Type	OE	OE	MC	MC	MC	OE	OE	OE	MC	MC
First item in the CB form	NO	YES								
Presentation of answer changes on CB form	NO	YES	NO							
Presentation changes from 2X2 matrix to 4X1									YES	
Scrolling needed to answer question	YES	NO	NO	NO	NO	YES	YES	YES	YES	NO
Scrolling needed to see all answers (MC only)									YES	
Correct answer visible without scrolling (MC only)									YES	
Question visible when scrolling for answer	NO					NO	NO	NO	NO	
Tool needed	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO
Click and/or drag needed	YES	YES					YES			
Tool box used	NO	YES					NO			
Use of tools changes how question is answered	YES	YES					YES			
Question uses a table/plot/graph	YES	YES	YES	NO	NO	YES	YES	YES	YES	NO

Table A52 (Continued)

Characteristics of Grade 4 Mathematics Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

SMALLEST DISCREPANCIES

Item Number	16	89	32	61	62	49	20	70	40	25
Section	MA1	MA2	MA1	MA2	MA2	MA1	MA1	MA2	MA1	MA1
2010 Bank Value	0.81	-1.7	-0.7	0.89	1.23	-0.8	-1.7	0.98	-0.7	0.89
Adjusted CBT Value*	0.78	-1.7	-0.8	0.86	1.25	-0.8	-1.7	0.99	-0.7	0.9
Difference	0.03	-0	0.03	0.03	-0	0.02	0.02	-0	0.01	-0
Item Type	MC									
First item in the CB form	NO									
Presentation of answer changes on CB form	NO									
Presentation changes from 2X2 matrix to 4X1										
Scrolling needed to answer question	NO									
Scrolling needed to see all answers (MC only)										
Correct answer visible without scrolling (MC only)										
Question visible when scrolling for answer										
Tool needed	NO									
Click and/or drag needed										
Tool box used										
Use of tools changes how question is answered										
Question uses a table/plot/graph	NO	YES	NO	NO	NO	NO	YES	NO	NO	YES

Table A53

Characteristics of Grade 5 Mathematics Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	91	103	7	73	59	51	113	112	43	76
Section	MA3	MA3	MA1	MA2	MA2	MA2	MA3	MA3	MA1	MA2
2010 Bank Value	-1.3	0.03	-2.1	1.02	-1.3	-0.2	1.1	0.62	-0.1	-1.2
Adjusted CBT Value*	1.31	1.38	-0.9	1.89	-0.4	0.63	1.84	1.35	0.52	-1.8
Difference	-2.6	-1.4	-1.2	-0.9	-0.9	-0.8	-0.7	-0.7	-0.7	0.66
Item Type	MC	MC	MC	MC	MC	MC	OE	OE	GD	MC
First item in the CB form	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO
Presentation of answer changes on CB form	NO									
Presentation changes from 2X2 matrix to 4X1	NO									
Scrolling needed to answer question	NO	NO	NO	NO	YES	NO	YES	YES	NO	NO
Scrolling needed to see all answers (MC only)						YES				
Correct answer visible without scrolling (MC only)						NO				
Question visible when scrolling for answer						NO		NO		
Tool needed	NO	YES	NO	NO	NO	NO	NO	NO	YES	NO
Click and/or drag needed			YES						YES	
Tool box used			YES						NO	
Use of tools changes how question is answered			YES						YES	
Question uses a table/plot/graph	YES	YES	NO	NO	YES	NO	YES	YES	NO	YES

Table A53 (Continued)

Characteristics of Grade 5 Mathematics Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

SMALLEST DISCREPANCIES											
Item Number	14	32	35	27	67	96	97	58	25	6	
Section	MA1	MA1	MA1	MA1	MA2	MA3	MA3	MA2	MA1	MA1	
2010 Bank Value	0.34	0.85	1.18	1.13	1.45	0.3	-2.8	1.32	-0.5	0.32	
Adjusted CBT Value*	0.37	0.82	1.16	1.15	1.47	0.31	-2.8	1.32	-0.5	0.32	
Difference	-0	0.03	0.02	-0	-0	-0	0.01	0	0	0	
Item Type	MC										
First item in the CB form	NO	NO	NO	NO	N	NO	NO	NO	NO	NO	
Presentation of answer changes on CB form	NO										
Presentation changes from 2X2 matrix to 4X1	NO										
Scrolling needed to answer question	NO										
Scrolling needed to see all answers (MC only)	NO										
Correct answer visible without scrolling (MC only)	NO										
Question visible when scrolling for answer	NO										
Tool needed	NO										
Click and/or drag needed	NO										
Tool box used	NO										
Use of tools changes how question is answered	NO	YES	YES	NO							
Question uses a table/plot/graph	NO	YES	YES	NO							

Table A54

Characteristics of Grade 6 Mathematics Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	113	108	90	57	82	6	116	84	91	98
Section	MA3	MA3	MA3	MA2	MA2	MA1	MA3	MA2	MA3	MA3
2010 Bank Value	0.8	-0.8	-3.5	-1.8	0.3	-0.5	1.2	0.06	-1.5	-0.9
Adjusted CBT Value*	1.91	0.18	-2.6	-0.9	1.11	0.28	1.84	0.68	-2.1	-1.4
Difference	-1.1	-0.9	-0.9	-0.9	-0.8	-0.8	-0.6	-0.6	0.58	0.57
Item Type	OE	OE	MC	MC	OE	MC	OE	OE	MC	MC
First item in the CB form	NO	NO	YES	NO						
Presentation of answer changes on CB form	NO									
Presentation changes from 2X2 matrix to 4X1										
Scrolling needed to answer question	YES	YES	YES	NO	NO	NO	YES	YES	NO	NO
Scrolling needed to see all answers (MC only)				YES						
Correct answer visible without scrolling (MC only)				NO						
Question visible when scrolling for answer	NO	NO	NO				NO	NO		
Tool needed	YES	YES	NO	NO	YES	NO	NO	YES	NO	NO
Click and/or drag needed	YES	YES			YES			YES		
Tool box used	YES	NO			NO			NO		
Use of tools changes how question is answered	YES	YES			YES			YES		
Question uses a table/plot/graph	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES

Table A54 (Continued)

Characteristics of Grade 6 Mathematics Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

SMALLEST DISCREPANCIES

Item Number	94	79	77	26	75	14	34	30	9	18
Section	MA3	MA2	MA2	MA1	MA2	MA1	MA1	MA1	MA1	MA1
2010 Bank Value	-0.4	0.71	0.97	-0.1	0.72	1.59	-1.2	-0.5	-1.2	-0.3
Adjusted CBT Value*	-0.4	0.74	0.94	-0.1	0.75	1.61	-1.1	-0.5	-1.1	-0.3
Difference	0.04	-0	0.03	0.03	-0	-0	-0	-0	0	0
Item Type	MC	GD	GD	MC	GD	MC	GD	MC	MC	MC
First item in the CB form	NO									
Presentation of answer changes on CB form	NO									
Presentation changes from 2X2 matrix to 4X1										
Scrolling needed to answer question	NO	NO	YES	NO						
Scrolling needed to see all answers (MC only)										
Correct answer visible without scrolling (MC only)										
Question visible when scrolling for answer				NO						
Tool needed	NO	YES	YES	NO	YES	NO	YES	NO	NO	NO
Click and/or drag needed		YES	YES		YES		YES			
Tool box used		NO	NO		NO		NO			
Use of tools changes how question is answered		YES	YES		YES		YES			
Question uses a table/plot/graph	YES	NO	YES	NO	NO	NO	NO	NO	YES	NO

Table A55
 Characteristics of Grade 7 Mathematics Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	110	43	68	65	44	111	63	41	73	57
Section	MA3	MA1	MA2	MA2	MA1	MA3	MA2	MA1	MA2	MA2
2010 Bank Value	0.07	0.11	0.89	0.63	-0.8	-0.9	-0.1	-1.1	-0.2	-1.2
Adjusted CBT Value*	1.35	1.2	1.94	1.61	0.18	-0	0.8	-0.3	0.47	-0.5
Difference	-1.3	-1.1	-1.1	-1	-0.9	-0.9	-0.9	-0.8	-0.7	-0.7
Item Type	OE	OE	MC	MC	OE	OE	MC	OE	OE	MC
First Item in the CB form	NO									
Presentation of answer changes on CB form	NO									
Presentation changes from 2X2 matrix to 4X1										
Scrolling needed to answer question	YES	NO	NO	NO	NO	YES	NO	NO	YES	NO
Scrolling needed to see all answers (MC only)					NO					
Question visible when scrolling for answer	YES		NO			NO				
Tool needed	YES	NO	NO	NO	NO	NO	NO	YES	YES	NO
Click and/or drag needed	NO							YES	YES	
Tool box used	YES							NO	NO	
Use of tools changes how question is answered	YES							YES	YES	
Question uses a table/plot/graph		YES	NO							

Table A55 (Continued)

Characteristics of Grade 7 Mathematics Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

SMALLEST DISCREPANCIES

Item Number	62	23	81	55	10	108	82	4	29	5
Section	MA2	MA1	MA2	MA2	MA1	MA3	MA2	MA1	MA1	MA1
2010 Bank Value	2.06	0.36	1.41	0.66	0.01	0.34	1.78	-0.2	0.88	0.59
Adjusted CBT Value*	2.09	0.39	1.38	0.67	0	0.33	1.77	-0.2	0.87	0.59
Difference	0	0	0.03	0	0.01	0.01	0.01	0	0	0
Item Type	MC	MC	OE	MC	MC	OE	OE	MC	MC	MC
First item in the CB form	NO									
Presentation of answer changes on CB form	NO									
Presentation changes from 2X2 matrix to 4X1										
Scrolling needed to answer question	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
Scrolling needed to see all answers (MC only)										
Question visible when scrolling for answer						NO				
Tool needed	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
Click and/or drag needed						YES				
Tool box used						NO				
Use of tools changes how question is answered						YES				
Question uses a table/plot/graph	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO

Table A56

Characteristics of Grade 8 Mathematics Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	109	84	91	115	117	83	15	111	71	110
Section	MA3	MA3	MA3	MA3	MA3	MA3	MA1	MA3	MA2	MA3
2010 Bank Value	-0.8	-1.1	0.04	0.06	1.11	-1.6	-0.2	0.77	-0.7	-0.7
Adjusted CBT Value*	0.47	0.03	1.13	1	1.99	-0.8	0.63	1.57	0.05	0.05
Difference	-1.2	-1.2	-1.1	-0.9	-0.9	-0.9	-0.9	-0.8	-0.8	-0.8
Item Type	OE	MC	MC	OE	OE	MC	MC	OE	OE	OE
First item in the CB form	NO									
Presentation of answer changes on CB form	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
Presentation changes from 2X2 matrix to 4X1						YES				
Scrolling needed to answer question	YES	NO	NO	YES	YES	YES	NO	YES	NO	YES
Scrolling needed to see all answers (MC only)						YES				
Correct answer visible without scrolling (MC only)						NO				
Question visible when scrolling for answer	NO			NO	NO	NO		NO		NO
Tool needed	YES	NO	NO	NO	NO	NO	NO	YES	NO	YES
Click and/or drag needed	YES							YES		YES
Tool box used	NO							YES		NO
Use of tools changes how question is answered	YES							YES		YES
Question uses a table/plot/graph	YES	YES	NO	YES	YES	YES	YES	YES	NO	YES

Table A56 (Continued)

Characteristics of Grade 8 Mathematics Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

SMALLEST DISCREPANCIES										
Item Number	9	98	14	10	85	8	51	99	23	106
Section	MA1	MA3	MA1	MA1	MA3	MA1	MA2	MA3	MA1	MA3
2010 Bank Value	-0.6	-1.1	-0.6	0.07	0.46	0.4	0.46	-1.4	-0.4	-0.9
Adjusted CBT Value*	-0.6	-1	-0.6	0.13	0.42	0.36	0.49	-1.4	-0.4	-0.9
Difference	-0.1	-0.1	-0.1	-0.1	0.04	0.04	-0	0.03	-0	-0
Item Type	MC	OE								
First item in the CB form	NO									
Presentation of answer changes on CB form	NO									
Presentation changes from 2X2 matrix to 4X1										
Scrolling needed to answer question	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
Scrolling needed to see all answers (MC only)					YES					
Correct answer visible without scrolling (MC only)					YES					
Question visible when scrolling for answer					NO					
Tool needed	NO									
Click and/or drag needed										
Tool box used										
Use of tools changes how question is answered										
Question uses a table/plot/graph	NO	YES	NO	NO	YES	NO	NO	YES	NO	YES

Table A57

Characteristics of Grade 3 Writing Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	1	30	17	24	15	28	18	29	22	27
2010 Bank Value	-1.21	-0.22	-0.05	0.11	-0.59	-0.50	0.85	0.74	-1.49	1.15
Adjusted CBT Value*	-0.35	0.31	0.47	0.57	-1.01	-0.12	1.21	1.07	-1.19	1.42
Difference	-0.87	-0.53	-0.52	-0.46	0.42	-0.39	-0.36	-0.33	-0.30	-0.27
First item in the CB test	YES	NO								
Presentation of answer changes on CB form	NO	NO	NO	YES	NO	NO	NO	YES	NO	NO
Answer Key sentences wrapped in P&P but not in CBT				YES				YES		
Scrolling needed to answer question	YES									
Scrolling needed to see all answers (MC only)	YES									
Correct answer visible without scrolling (MC only)	NO	YES	NO	NO	NO	YES	NO	NO	YES	YES
Question visible when scrolling for answer	NO	YES	NO	NO	YES	YES	NO	NO	YES	NO

SMALLEST DISCREPANCIES

Item Number	13	32	7	16	23	11	6	5	8	9
2010 Bank Value	-0.40	-0.01	0.82	1.48	0.24	-0.66	-0.59	-0.66	-2.31	-0.55
Adjusted CBT Value*	-0.46	0.06	0.76	1.53	0.29	-0.71	-0.56	-0.65	-2.30	-0.55
Difference	0.07	-0.07	0.06	-0.05	-0.05	0.05	-0.03	-0.01	0.00	0.00
First item in the CB test	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Presentation of answer changes on CB form	NO	NO	NO	NO	NO	YES	NO	YES	NO	NO
Answer Key sentences wrapped in P&P but not in CBT						YES		YES		
Scrolling needed to answer question	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
Scrolling needed to see all answers (MC only)	YES	YES			YES	YES	YES	YES	YES	YES
Correct answer visible without scrolling (MC only)	NO	YES			NO	YES	YES	YES	YES	YES
Question visible when scrolling for answer	YES	NO			YES	YES	YES	NO	YES	YES

Table A58

Characteristics of Grade 4 Writing Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	17	8	23	21	7	12	2	13	32	25
2010 Bank Value	-0.60	-0.17	-0.04	-0.24	0.23	-0.88	-0.70	-0.55	0.85	-0.87
Adjusted CBT Value*	0.12	0.27	0.36	0.07	0.53	-0.63	-0.46	-0.32	1.06	-1.09
Difference	-0.72	-0.44	-0.41	-0.31	-0.29	-0.25	-0.24	-0.23	-0.22	0.21
First item in the CB test	NO									
Presentation of answer changes on CB form	NO	YES	NO	NO	YES	NO	NO	NO	NO	NO
Answer Key sentences wrapped in P&P but not in CBT		YES			YES					
Scrolling needed to answer question	YES									
Scrolling needed to see all answers (MC only)	YES									
Correct answer visible without scrolling (MC only)	NO	NO	NO	YES	NO	NO	YES	YES	YES	NO
Question visible when scrolling for answer	NO	NO	NO	YES	NO	NO	YES	YES	YES	YES

SMALLEST DISCREPANCIES

Item Number	24	11	9	19	29	5	6	10	1	22
2010 Bank Value	1.63	-1.39	-0.35	0.27	1.54	-0.99	0.14	-0.42	0.53	-0.50
Adjusted CBT Value*	1.55	-1.32	-0.28	0.32	1.59	-1.04	0.18	-0.39	0.55	-0.49
Difference	0.07	-0.07	-0.07	-0.05	-0.05	0.05	-0.04	-0.03	-0.02	-0.01
First item in the CB test	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
Presentation of answer changes on CB form	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO
Answer Key sentences wrapped in P&P but not in CBT								YES		
Scrolling needed to answer question	YES	YES	YES	NO	NO	YES	YES	YES	YES	NO
Scrolling needed to see all answers (MC only)	YES	YES	YES			YES	YES	YES	YES	
Correct answer visible without scrolling (MC only)	YES	NO	NO			YES	NO	YES	NO	
Question visible when scrolling for answer	NO	YES	NO			YES		NO	NO	

Table A59

Characteristics of Grade 5 Writing Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	29	35	23	19	18	28	17	9	24	3
2010 Bank Value	1.08	0.00	0.75	-0.55	0.45	0.20	-0.01	1.57	0.22	-0.55
Adjusted CBT Value*	1.61	0.45	1.20	-0.16	0.84	0.58	0.35	1.92	0.56	-0.22
Difference	-0.53	-0.45	-0.45	-0.40	-0.39	-0.38	-0.36	-0.35	-0.34	-0.34
First item in the CB test	NO									
Presentation of answer changes on CB form	NO	YES	NO	YES	YES	NO	NO	NO	NO	NO
Sentence wrapped in P&P test		YES		YES	YES					
Scrolling needed to answer question	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES
Scrolling needed to see all answers (MC only)	YES	YES	YES		YES	YES	YES	YES	YES	YES
Correct answer visible without scrolling (MC only)	NO	NO	YES		NO	YES	NO	YES	YES	YES
Question visible when scrolling for answer	NO	NO	YES		NO	YES	NO	YES	YES	YES

SMALLEST DISCREPANCIES

Item Number	25	10	20	4	33	21	34	26	2	6
2010 Bank Value	-0.06	1.63	0.70	-1.16	0.99	-1.53	0.87	-0.24	0.14	-1.55
Adjusted CBT Value*	0.01	1.57	0.75	-1.12	0.96	-1.56	0.91	-0.21	0.17	-1.57
Difference	-0.07	0.06	-0.05	-0.04	0.04	0.04	-0.04	-0.03	-0.03	0.02
First item in the CB test	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Presentation of answer changes on CB form	NO	NO	NO	NO	YES	NO	YES	NO	YES	YES
Sentence wrapped in P&P test					YES		YES		YES	YES
Scrolling needed to answer question	NO	NO	YES	NO	YES	NO	YES	YES	YES	YES
Scrolling needed to see all answers (MC only)			YES		YES		YES	YES	YES	YES
Correct answer visible without scrolling (MC only)			NO		YES		YES	YES	NO	NO
Question visible when scrolling for answer			YES		NO		NO	NO	NO	NO

Table A60

Characteristics of Grade 6 Writing Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	3	35	11	19	30	34	36	20	13	18
2010 Bank Value	-1.22	1.21	-1.71	0.33	0.67	-0.26	-0.39	0.34	-0.42	0.08
Adjusted CBT Value*	-0.59	1.80	-1.20	0.76	1.08	0.15	-0.01	0.73	-0.04	0.45
Difference	-0.63	-0.59	-0.51	-0.43	-0.41	-0.40	-0.38	-0.38	-0.38	-0.37
First item in the CB test	NO									
Presentation of answer changes on CB form	NO	NO	NO	NO	YES	NO	NO	NO	NO	YES
Answer Key sentences wrapped in P&P but not in CBT						YES				**
Scrolling needed to answer question	YES	NO	YES	YES						
Scrolling needed to see all answers (MC only)	YES		YES	YES						
Correct answer visible without scrolling (MC only)	NO	NO	NO	NO	NO	YES	YES		YES	NO
Question visible when scrolling for answer	NO		YES	NO						

**opposite; answer key sentences wrapped in CB form but not in P&P.

SMALLEST DISCREPANCIES

Item Number	26	12	8	10	15	4	24	29	7	32
2010 Bank Value	0.33	0.02	1.40	0.34	-0.21	0.95	0.04	-1.40	0.67	0.90
Adjusted CBT Value*	0.50	0.19	1.55	0.49	-0.08	1.05	0.12	-1.34	0.62	0.93
Difference	-0.17	-0.17	-0.15	-0.15	-0.14	-0.10	-0.08	-0.06	0.05	-0.03
First item in the CB test	NO	NO	NO							
Presentation of answer changes on CB form	NO	YES	YES	NO	NO	NO	YES	NO	NO	NO
Answer Key sentences wrapped in P&P but not in CBT		YES	YES				YES			
Scrolling needed to answer question	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES
Scrolling needed to see all answers (MC only)	YES		YES	YES	YES	YES	YES	YES	YES	YES
Correct answer visible without scrolling (MC only)	NO		NO	YES	YES	NO	YES	YES	YES	NO
Question visible when scrolling for answer	NO		NO	NO	NO	YES	NO	NO	NO	NO

Table A61

Characteristics of Grade 7 Writing Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	26	20	4	27	34	32	14	13	11	39
2010 Bank Value	-0.41	-1.20	-0.05	0.15	-0.04	-0.31	-1.48	-0.52	0.38	-0.46
Adjusted CBT Value*	0.48	-0.51	0.57	0.71	0.48	0.06	-1.11	-0.16	0.73	-0.11
Difference	-0.89	-0.69	-0.62	-0.55	-0.52	-0.37	-0.37	-0.36	-0.35	-0.35
First item in the CB test	NO									
Presentation of answer changes on CB form	YES	NO	YES	YES	NO	NO	YES	YES	NO	NO
Answer Key sentences wrapped in P&P but not in CBT	YES		YES	YES			YES	YES		
Scrolling needed to answer question	YES	NO	YES	YES						
Scrolling needed to see all answers (MC only)	YES		YES	YES						
Correct answer visible without scrolling (MC only)	NO	YES	NO	NO	NO	YES	YES		NO	YES
Question visible when scrolling for answer	NO	YES	NO	YES	NO	YES	YES		NO	NO

SMALLEST DISCREPANCIES

Item Number	1	29	3	37	18	33	17	19	10	35
2010 Bank Value	-0.99	-1.03	-1.45	0.75	0.28	-0.57	-1.70	1.81	0.68	0.64
Adjusted CBT Value*	-0.86	-1.13	-1.35	0.85	0.37	-0.51	-1.74	1.84	0.65	0.64
Difference	-0.13	0.10	-0.10	-0.10	-0.09	-0.06	0.04	-0.03	0.03	0.01
First item in the CB test	YES	NO	NO	NO						
Presentation of answer changes on CB form	NO	NO	NO							
Answer Key sentences wrapped in P&P but not in CBT	NO	YES	YES	NO	YES	YES	YES	YES	YES	YES
Scrolling needed to answer question	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES
Scrolling needed to see all answers (MC only)	YES	YES		YES	YES	YES	YES	YES	YES	YES
Correct answer visible without scrolling (MC only)	YES	YES		YES	NO	YES	YES	YES	YES	YES
Question visible when scrolling for answer	YES	NO		NO	NO	NO	NO	NO	NO	YES

Table A62

Characteristics of Grade 8 Writing Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	8	24	28	2	6	22	13	31	33	7
2010 Bank Value	-0.66	0.71	-0.37	1.38	0.56	-2.22	-1.34	-0.90	-1.02	-1.20
Adjusted CBT Value*	0.28	1.40	0.31	2.02	1.20	-1.62	-0.75	-0.32	-0.45	-0.64
Difference	-0.94	-0.69	-0.68	-0.64	-0.64	-0.59	-0.59	-0.58	-0.57	-0.57
First item in the CB test	NO									
Presentation of answer changes on CB form	YES	NO	YES	NO	NO	NO	NO	YES	YES	NO
Answer Key sentences wrapped in P&P but not in CBT	YES		YES					YES	YES	
Scrolling needed to answer question	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES
Scrolling needed to see all answers (MC only)	YES	YES	YES	YES	YES		YES	YES	YES	YES
Correct answer visible without scrolling (MC only)	YES	NO	YES	YES	NO		YES	YES	YES	YES
Question visible when scrolling for answer	NO	NO	NO	NO	NO		NO	NO	NO	NO

SMALLEST DISCREPANCIES

Item Number	3	11	1	21	40	16	23	4	37	29
2010 Bank Value	0.11	0.63	-0.86	0.80	-0.44	-0.09	-1.18	0.52	0.66	0.02
Adjusted CBT Value*	0.33	0.85	-0.66	1.01	-0.25	0.04	-1.07	0.44	0.71	0.03
Difference	-0.22	-0.22	-0.21	-0.21	-0.19	-0.14	-0.11	0.08	-0.06	0.00
First item in the CB test	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
Presentation of answer changes on CB form	YES	NO	YES	NO	YES	YES	NO	NO	YES	NO
Answer Key sentences wrapped in P&P but not in CBT	YES		YES		YES	YES			YES	
Scrolling needed to answer question	YES	YES	YES	YES						
Scrolling needed to see all answers (MC only)	YES	YES	YES	YES						
Correct answer visible without scrolling (MC only)	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES
Question visible when scrolling for answer	NO	NO	NO	YES	NO	NO	NO	YES	NO	NO

Table A63

Characteristics of Grade 5 Science Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES

Item Number	38	18	2	17	37	13	22	27	36	31
2010 Bank Value	-2.04	1.71	2.15	0.44	0.20	-0.38	0.20	-0.18	-0.02	-0.01
Adjusted CBT Value*	-0.79	2.42	2.74	1.01	0.74	0.12	0.69	0.31	0.46	0.39
Difference	-1.25	-0.71	-0.59	-0.57	-0.55	-0.50	-0.49	-0.49	-0.47	-0.40
Item Type	MC	MC	MC	MC	MC	MC	OE	MC	MC	MC
Presentation of answer changes on CB form	YES	NO	NO	NO	NO	NO	YES*	NO	NO	NO
Presentation changes from 2X2 matrix to 4X1	YES									
Scrolling needed to answer question	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
Scrolls for question and answer are separate	YES							NO		
Scrolling needed to see all answers (MC only)	YES									
Correct answer visible without scrolling (MC only)	NO									
Question visible when scrolling for answer	YES							NO		
Question uses a table	YES	NO	NO	NO	YES	NO	NO	NO	NO	NO
Question uses a plot or graph	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO
Plot/graph displayed differently in CB test	NO									

* For OE item instead of MC item, presentation of answer changes.

Table A63 (Continued)

Characteristics of Grade 5 Science Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

SMALLEST DISCREPANCIES

Item Number	20	21	7	3	6	16	25	10	32	11
2010 Bank Value	1.37	1.14	-0.14	-0.14	-0.47	-0.95	-0.20	0.58	-0.65	-1.15
Adjusted CBT Value*	1.44	1.07	-0.09	-0.09	-0.51	-0.99	-0.23	0.56	-0.65	-1.15
Difference	-0.07	0.07	-0.05	-0.04	0.04	0.04	0.03	0.02	0.00	0.00
Item Type	OE	OE	MC	MC	MC	MC	MC	MC	MC	MC
Presentation of answer changes on CB form	YES*	YES*	NO	NO	NO	NO	YES	NO	NO	NO
Presentation changes from 2X2 matrix to 4X1								YES		
Scrolling needed to answer question	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO
Scrolls for question and answer are separate	NO	NO						NO		
Scrolling needed to see all answers (MC only)								YES		
Correct answer visible without scrolling (MC only)								YES		
Question visible when scrolling for answer	NO	NO						NO		
Question uses a table	NO	NO	NO	NO	YES	NO	NO	YES	NO	NO
Question uses a plot or graph	YES	NO	NO	YES	NO	NO	YES	NO	NO	NO
Plot/graph displayed differently in CB test	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Table A64

Characteristics of Grade 8 Science Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

LARGEST DISCREPANCIES										
Item Number	30	39	9	47	44	33	34	8	13	16
2010 Bank Value	-0.67	0.09	-0.05	-0.86	-1.09	-0.12	-1.23	0.86	-0.31	-0.10
Adjusted CBT Value*	-0.07	0.64	0.46	-0.35	-0.64	0.34	-0.82	1.26	0.08	0.27
Difference	-0.59	-0.55	-0.51	-0.51	-0.46	-0.45	-0.41	-0.39	-0.39	-0.37
Item Type	MC									
Presentation of answer changes on CB form	NO									
Presentation changes from 2X2 matrix to 4X1										
Scrolling needed to answer question	YES	YES	NO							
Scrolls for question and answer are separate	NO	NO								
Scrolling needed to see all answers (MC only)	YES	YES								
Correct answer visible without scrolling (MC only)	YES	NO								
Question visible when scrolling for answer	NO	NO								
Question uses a table	NO	YES	NO							
Question uses a plot or graph	YES	YES	NO	NO	NO	NO	YES	NO	NO	NO
Plot/graph displayed differently in CB test	NO									

Table A64 (Continued)

Characteristics of Grade 8 Science Items with Largest and Smallest Discrepancies Between Paper-and-Pencil and Computer-Based Item Parameters

SMALLEST DISCREPANCIES

Item Number	4	2	46	35	24	22	17	43	3	12
2010 Bank Value	-0.35	0.86	-0.64	0.81	0.74	-1.23	-0.67	-0.27	0.78	0.53
Adjusted CBT Value*	-0.26	0.94	-0.57	0.76	0.79	-1.26	-0.65	-0.29	0.80	0.55
Difference	-0.09	-0.08	-0.07	0.05	-0.05	0.03	-0.02	0.02	-0.02	-0.02
Item Type	MC	MC	MC	MC	OE	MC	MC	MC	MC	MC
Presentation of answer changes on CB form	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Presentation changes from 2X2 matrix to 4X1										
Scrolling needed to answer question	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
Scrolls for question and answer are separate					NO					
Scrolling needed to see all answers (MC only)										
Correct answer visible without scrolling (MC only)										
Question visible when scrolling for answer					NO					
Question uses a table	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
Question uses a plot or graph	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Plot/graph displayed differently in CB test	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Figure A1
 Plot of 2012 Computer-Based Form T Reading Difficulty Estimates against 2010 Paper-and-Pencil Form T Bank Values

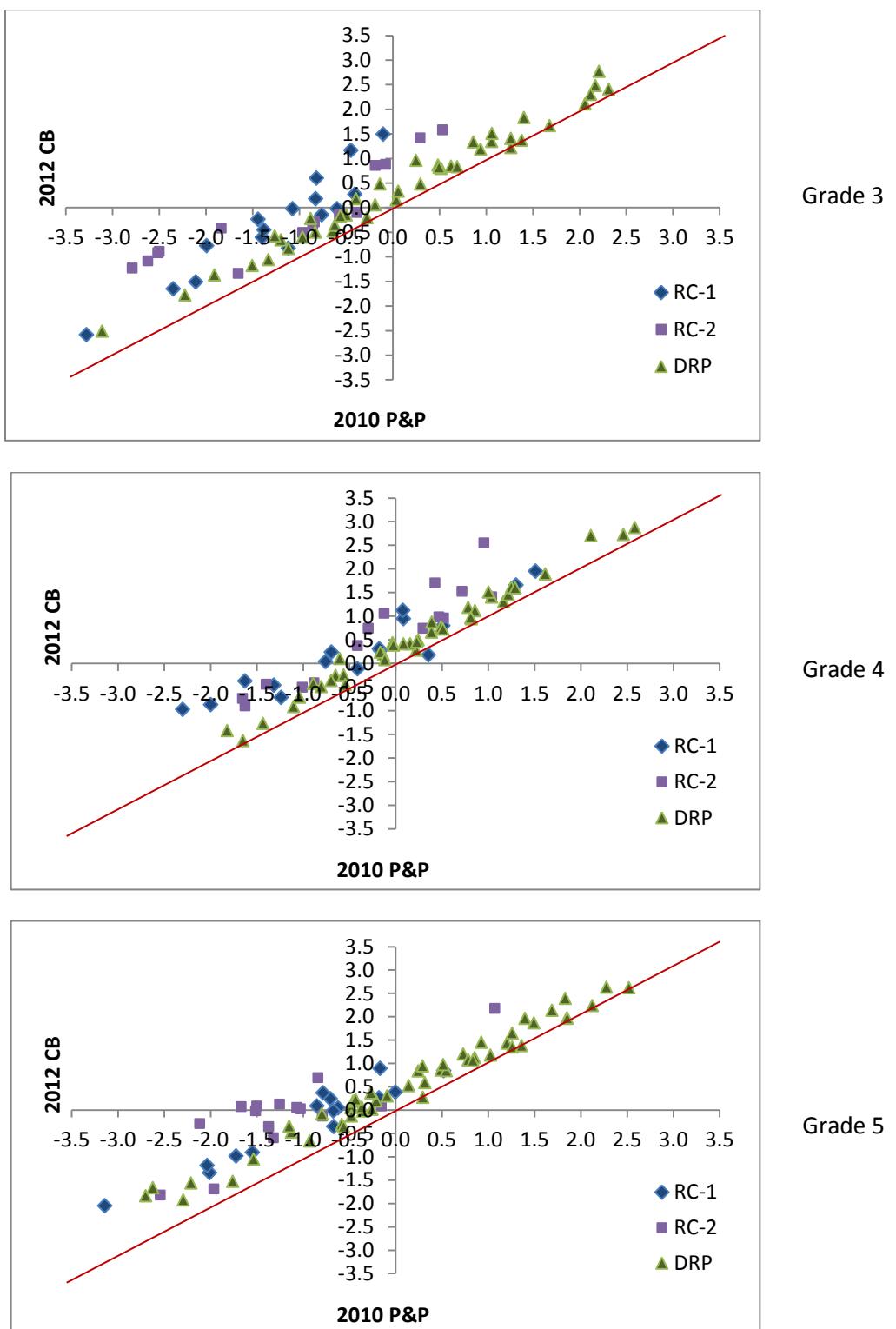


Figure A1 (Continued)

Plot of 2012 Computer-Based Form T Reading Difficulty Estimates against 2010 Paper-and-Pencil Form T Bank Values

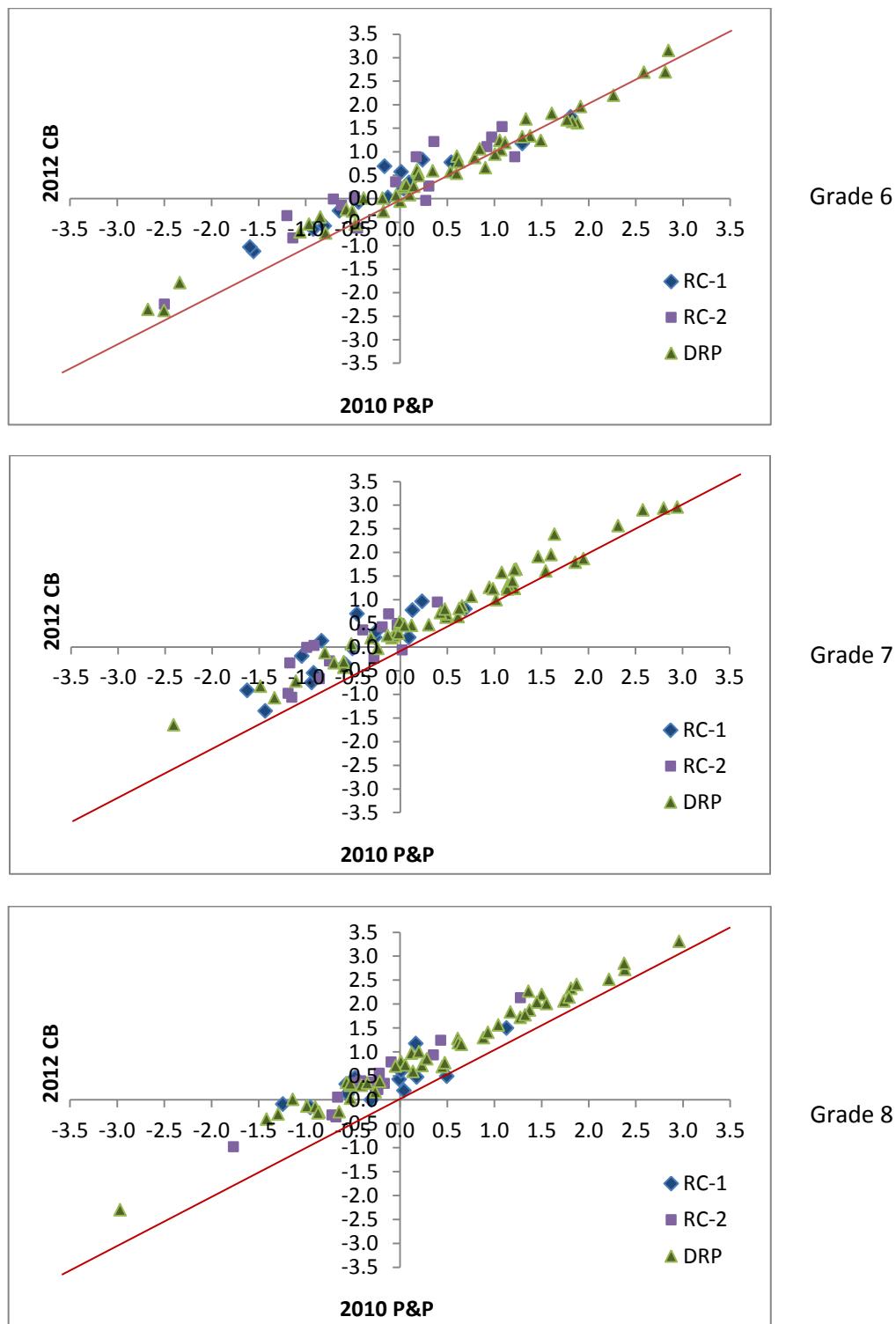


Figure A2

Plot of 2012 Computer-Based Form T Mathematics Difficulty Estimates against 2010 Paper-and-Pencil Form T Bank Values

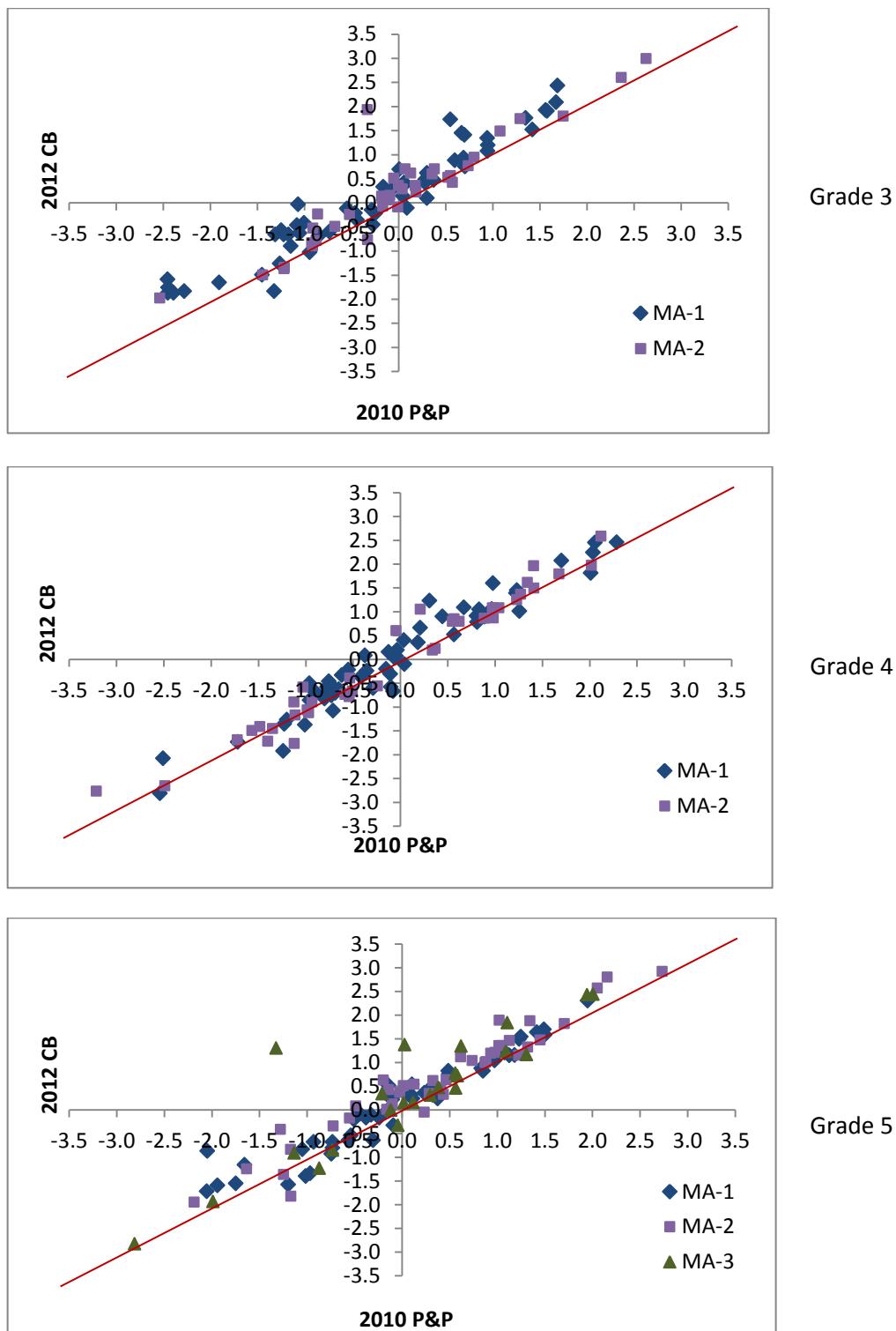


Figure A2 (Continued)

Plot of 2012 Computer-Based Form T Mathematics Difficulty Estimates against 2010 Paper-and-Pencil Form T Bank Values

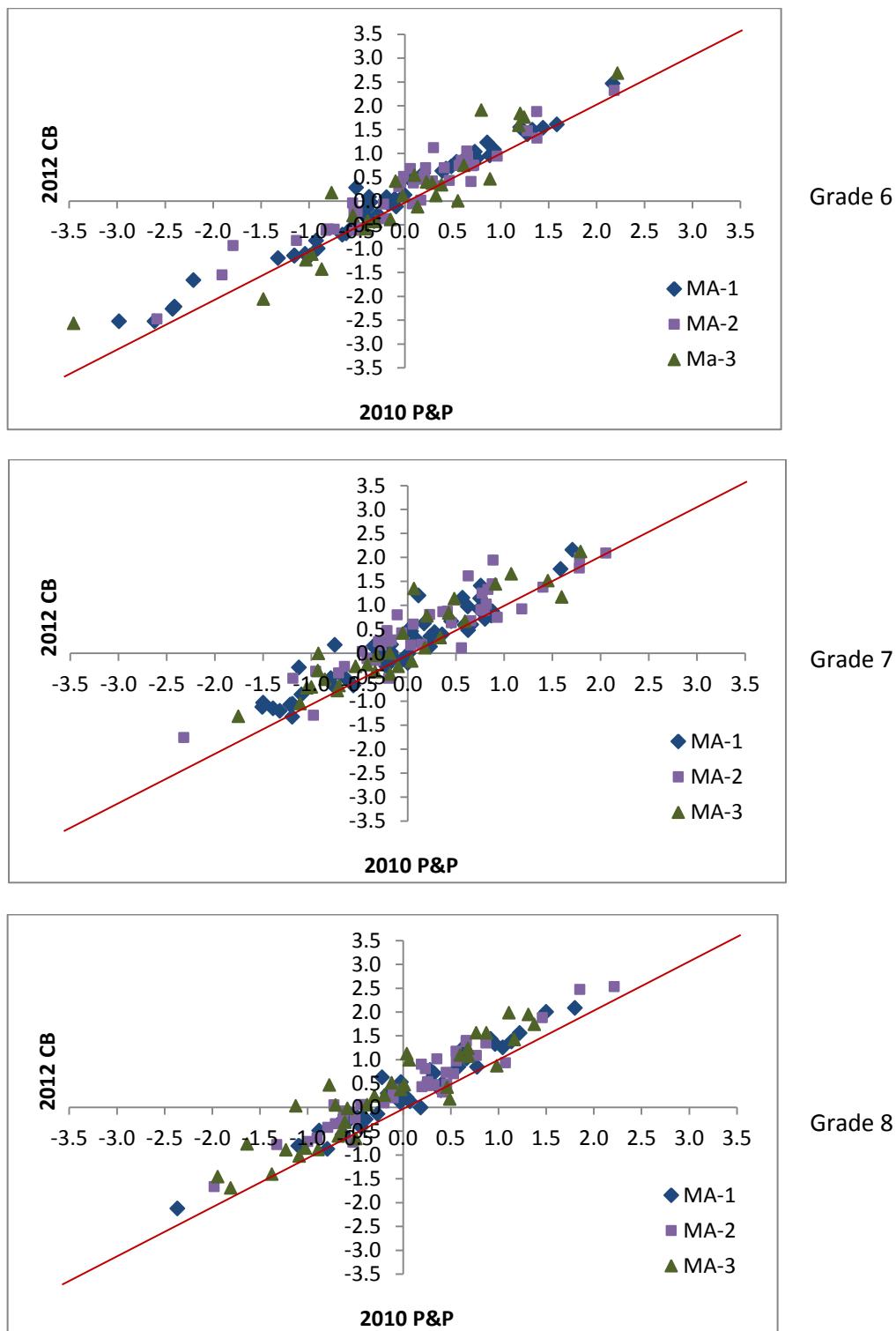


Figure A3

Plot of 2012 Computer-Based Form T Writing Difficulty Estimates against 2010 Paper-and-Pencil Form T Bank Values

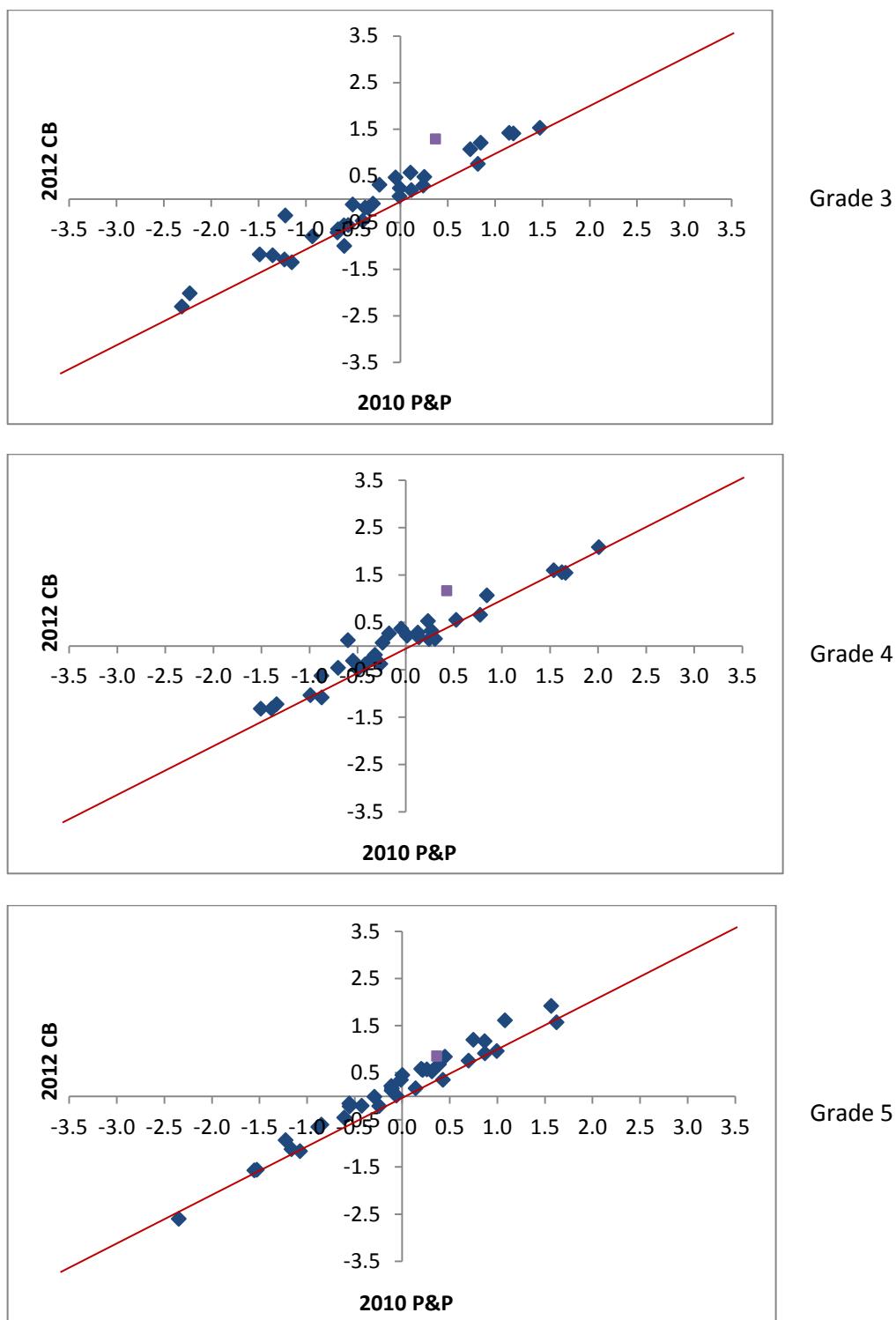


Figure A3 (Continued)

Plot of 2012 Computer-Based Form T Writing Difficulty Estimates against 2010 Paper-and-Pencil Form T Bank Values

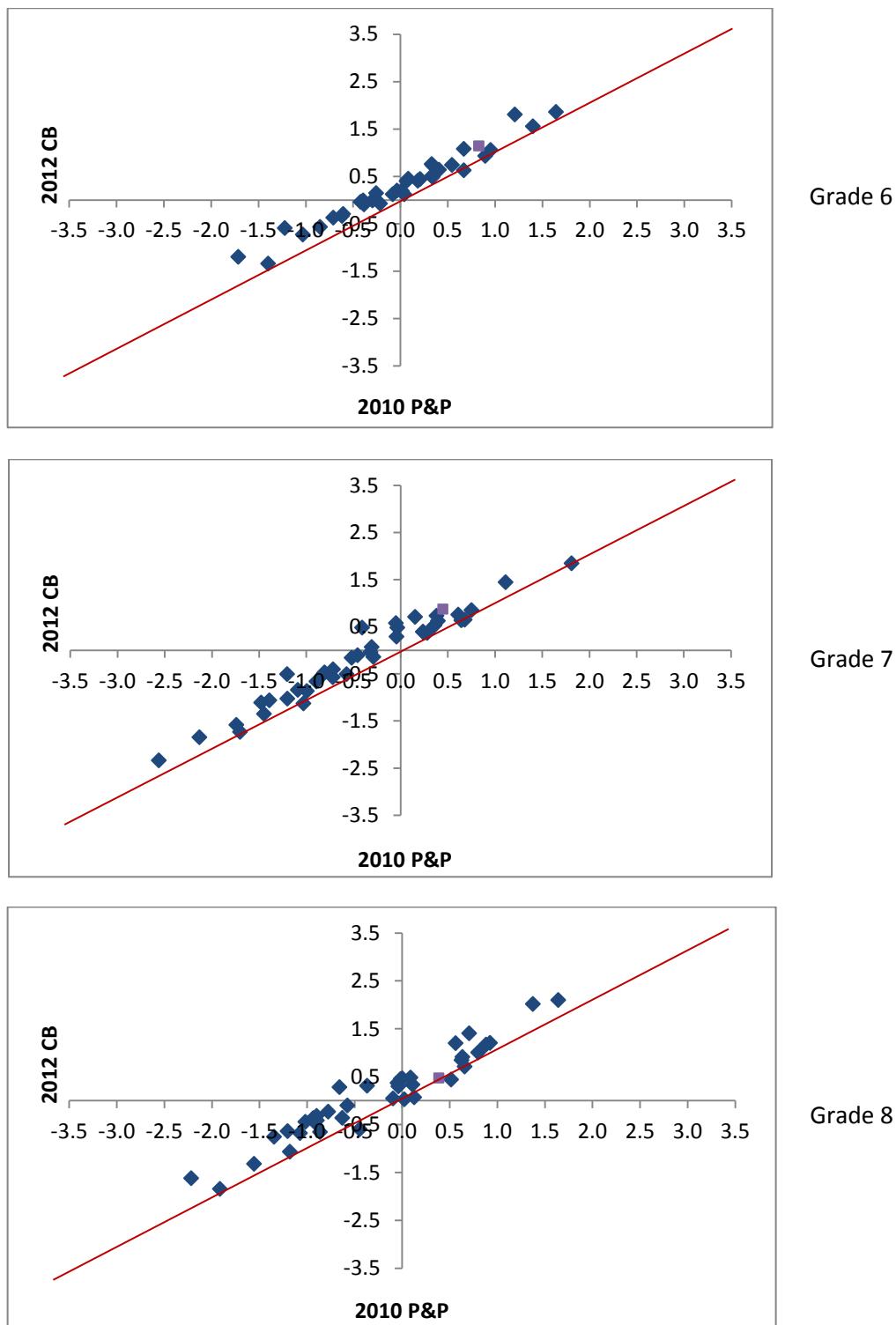


Figure A4

Plot of 2012 Computer-Based Form T Science Difficulty Estimates against 2010 Paper-and-Pencil Form T Bank Values

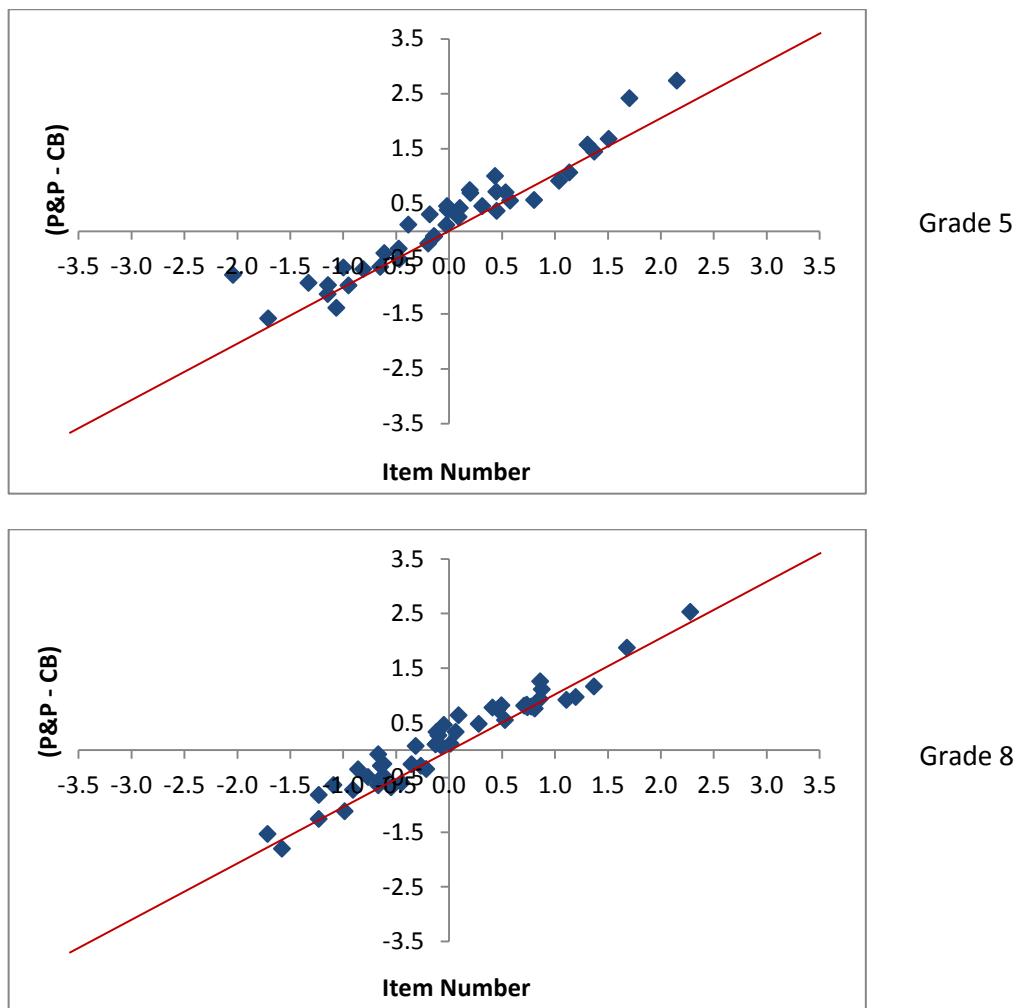


Figure A5

Plot of Grade 3 Reading 2012 CB Theta Estimates Against Grade 3 Reading 2012 Operational Theta Estimates

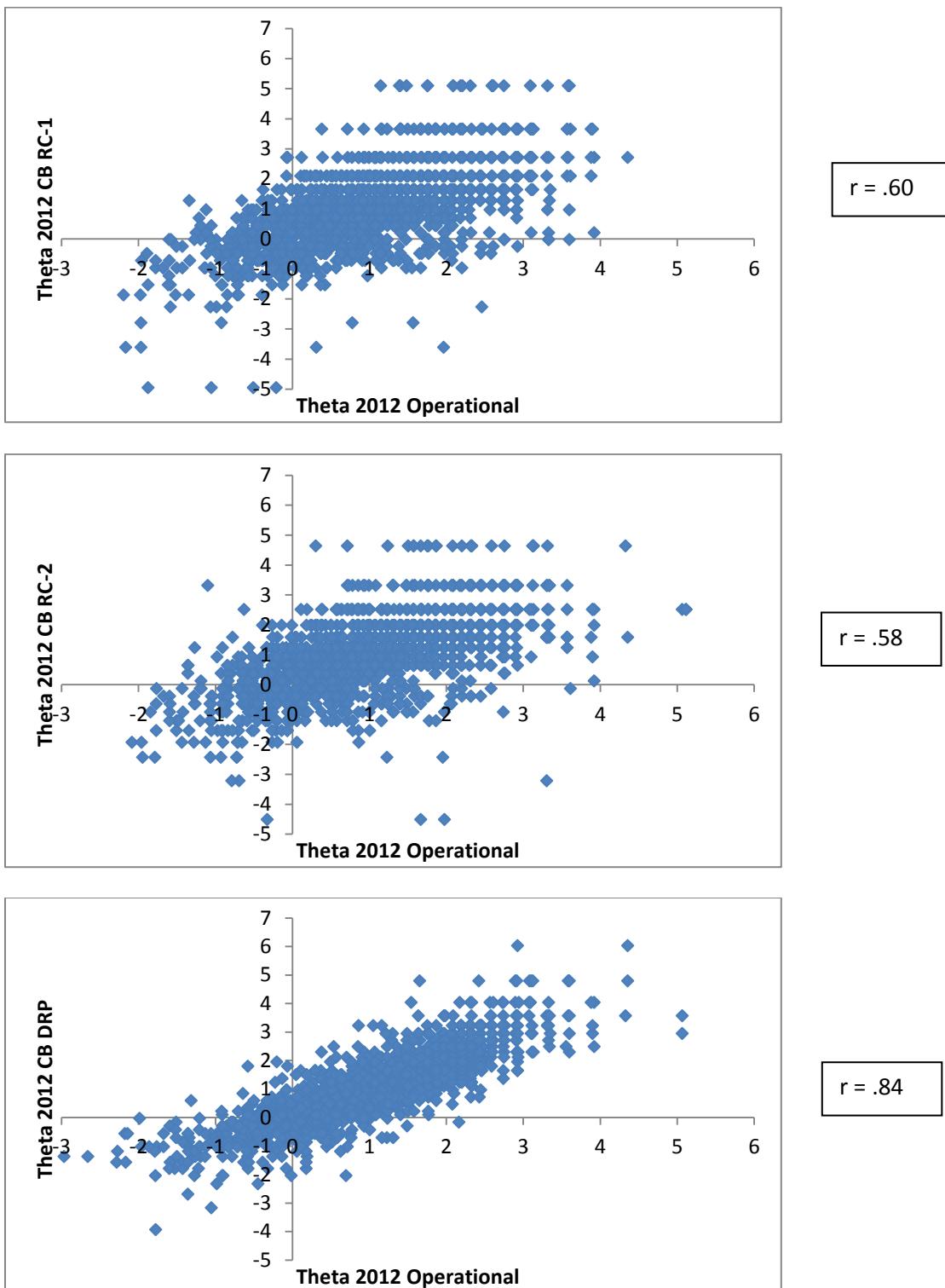


Figure A6

Plot of Grade 4 Reading 2012 CB Theta Estimates Against Grade 4 Reading 2012 Operational Theta Estimates

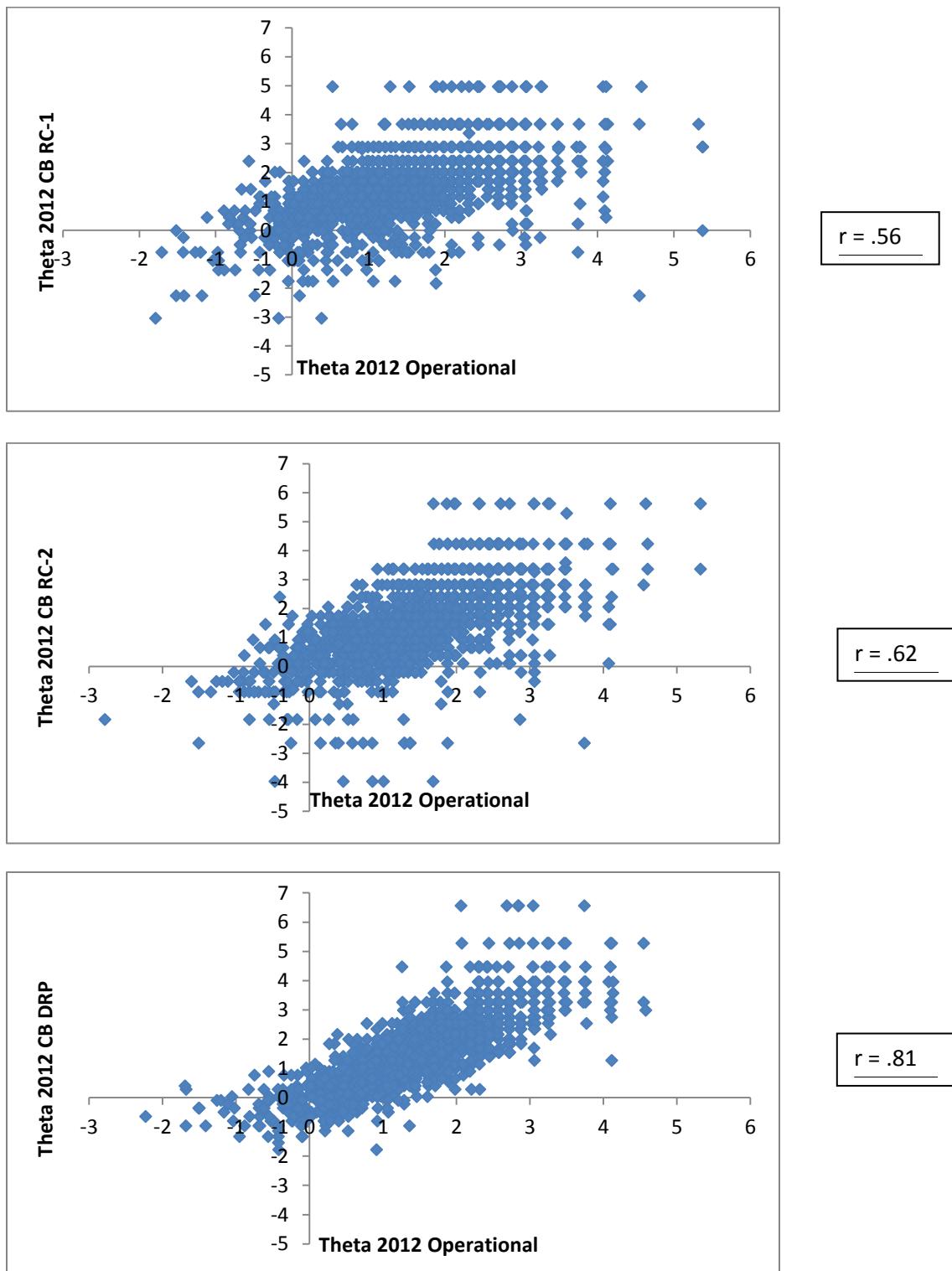


Figure A7

Plot of Grade 5 Reading 2012 CB Theta Estimates Against Grade 5 Reading 2012 Operational Theta Estimates

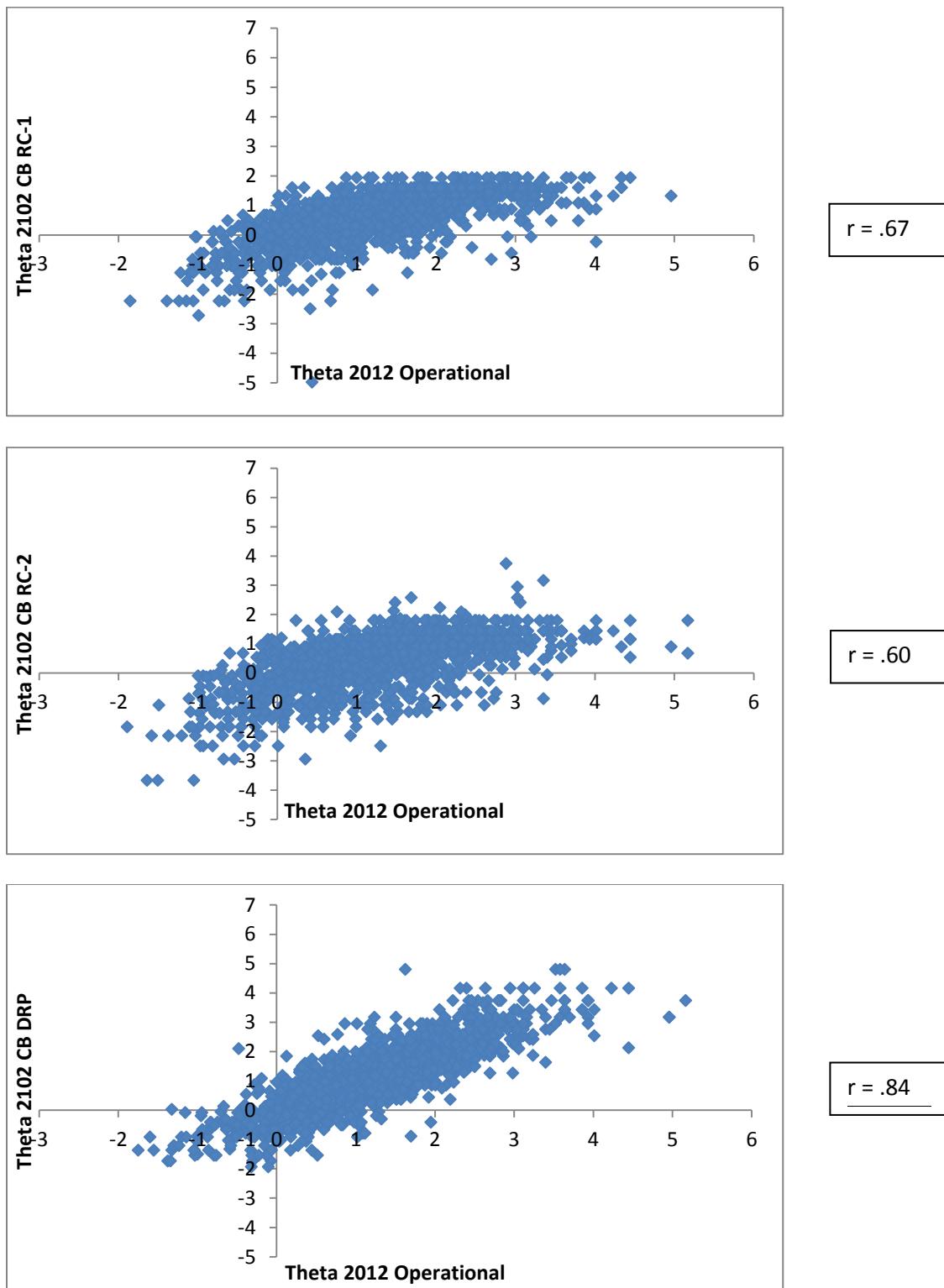


Figure A8

Plot of Grade 6 Reading 2012 CB Theta Estimates Against Grade 6 Reading 2012 Operational Theta Estimates

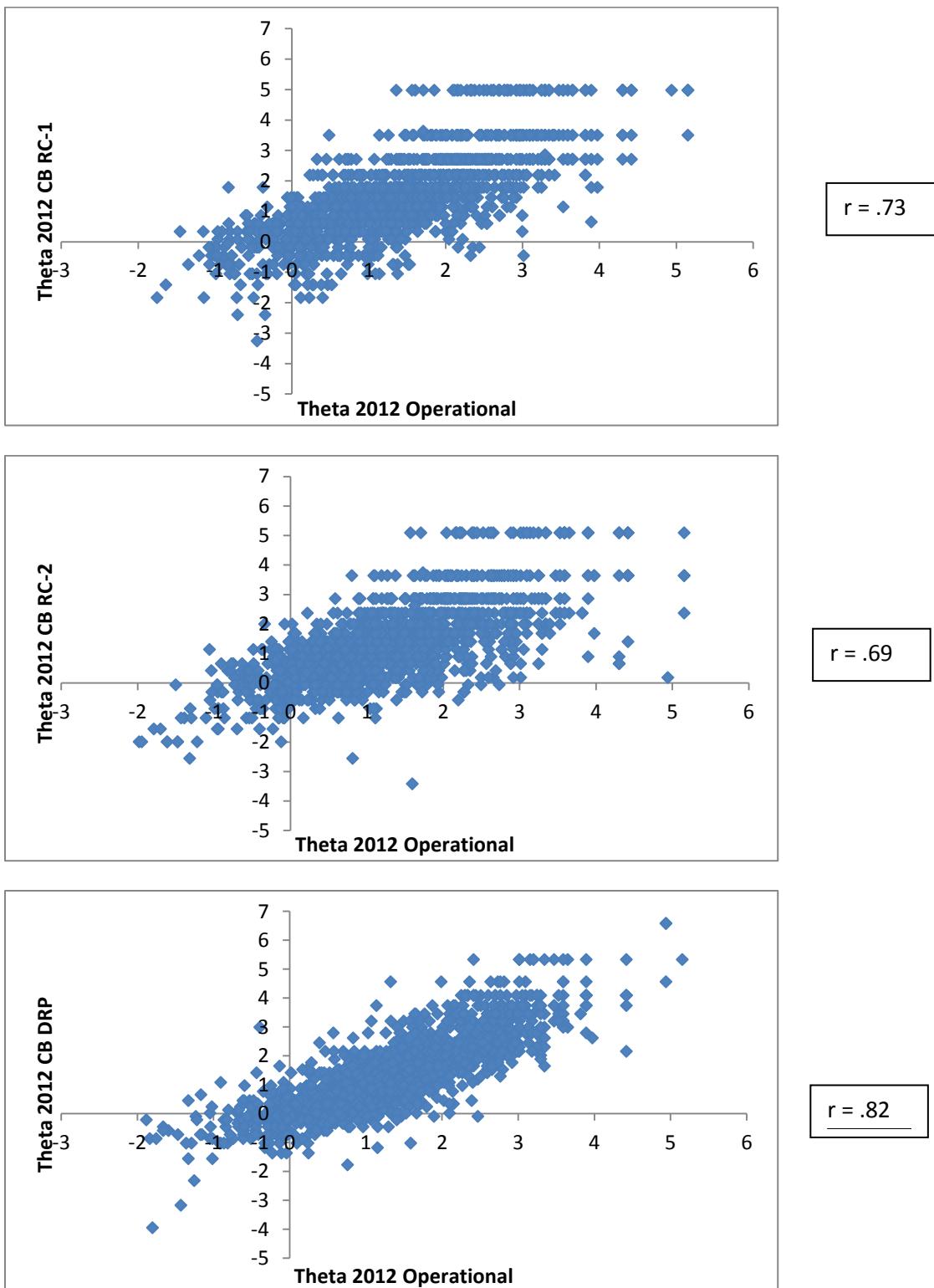


Figure A9

Plot of Grade 7 Reading 2012 CB Theta Estimates Against Grade 7 Reading 2012 Operational Theta Estimates

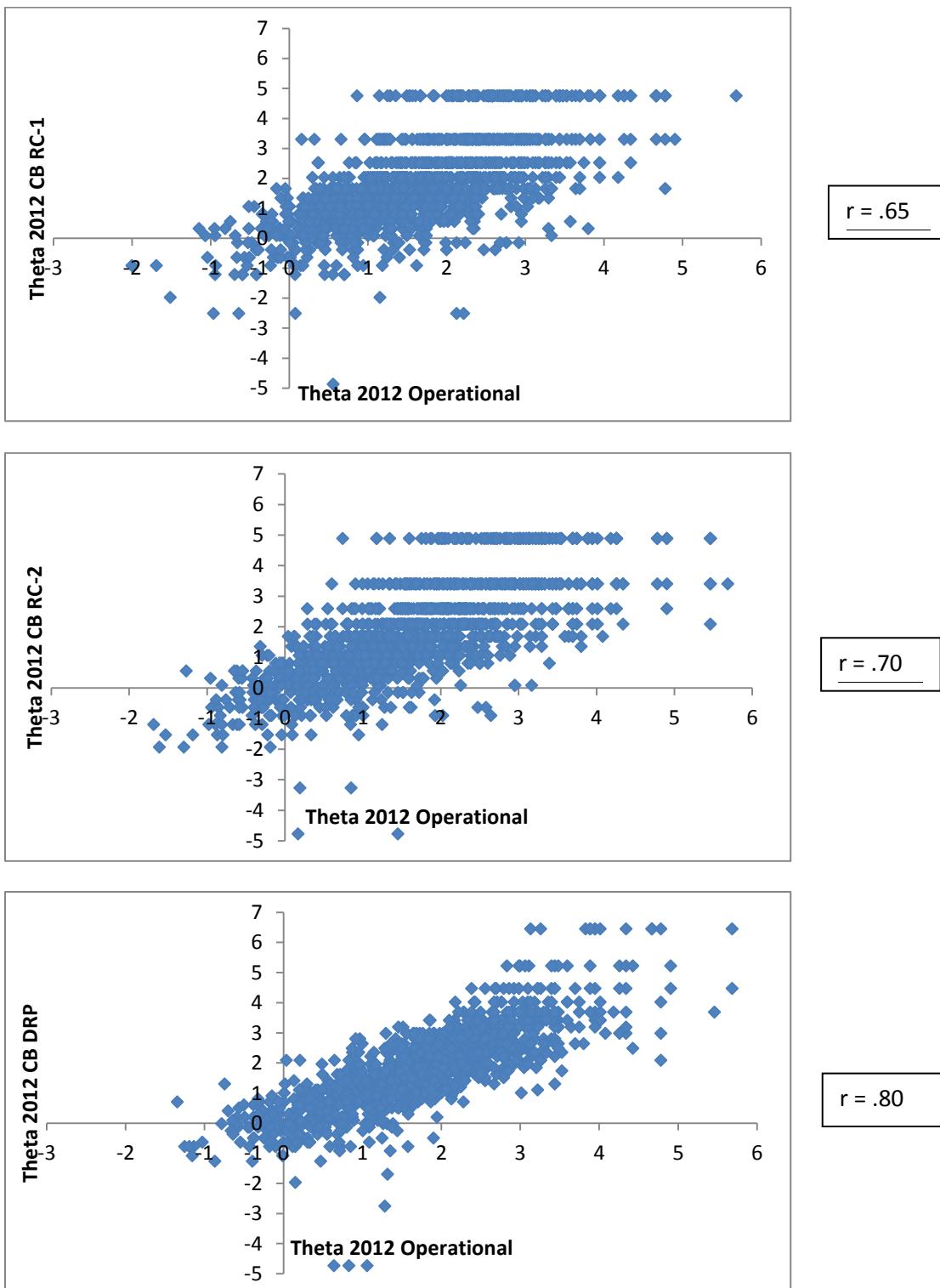


Figure A10

Plot of Grade 8 Reading 2012 CB Theta Estimates Against Grade 8 Reading 2012 Operational Theta Estimates

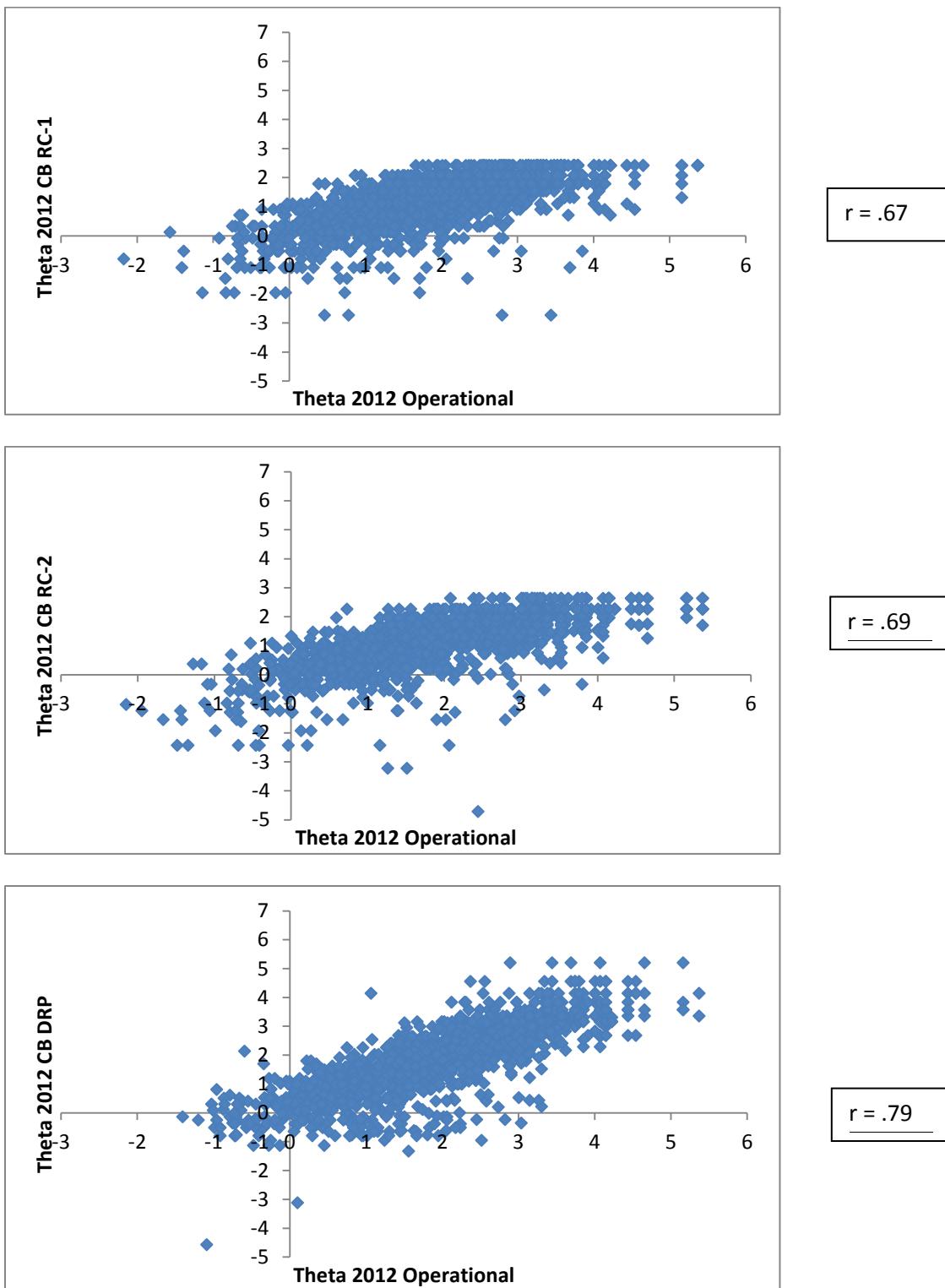


Figure A11

Plot of Grade 3 Mathematics 2012 CB Theta Estimates Against Grade 3 Mathematics 2012 Operational Theta Estimates

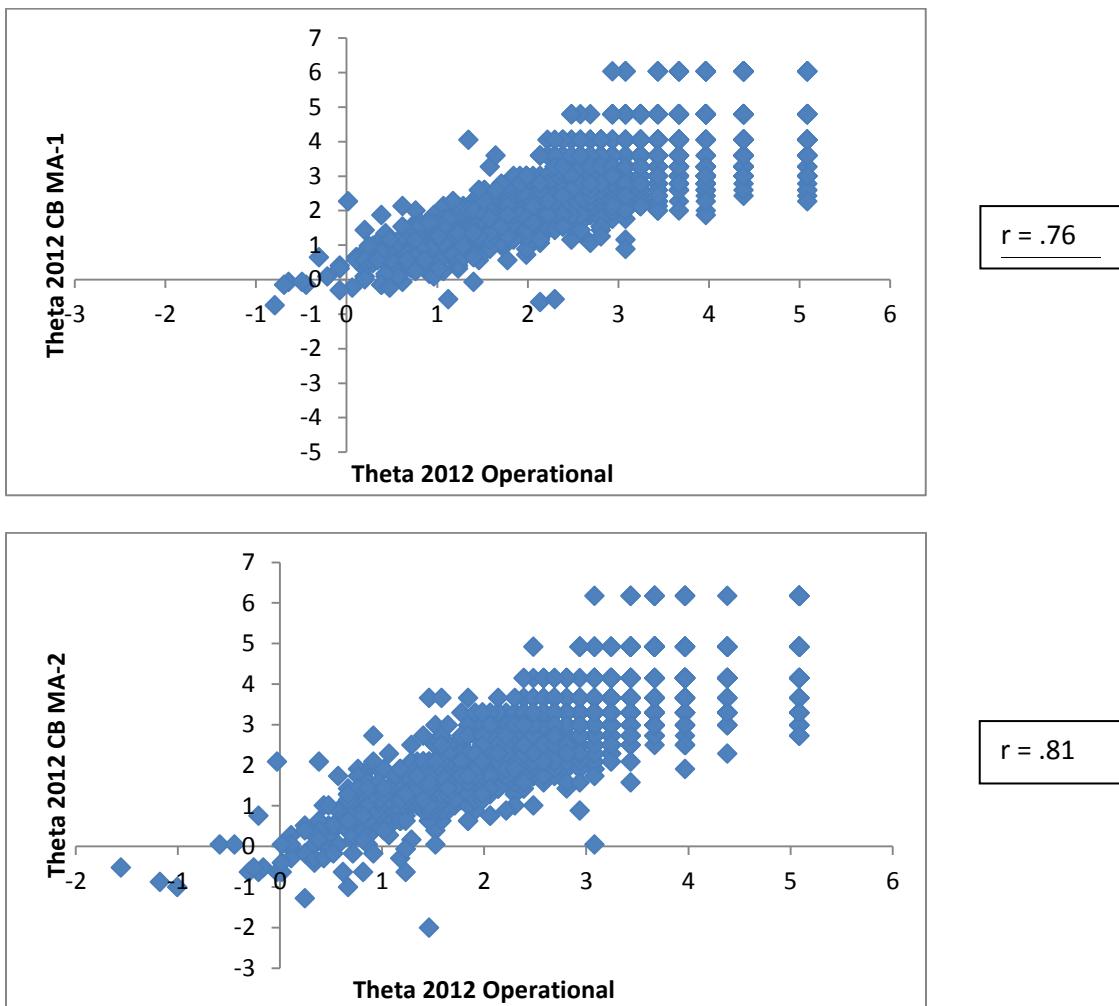


Figure A12

Plot of Grade 4 Mathematics 2012 CB Theta Estimates Against Grade 4 Mathematics 2012 Operational Theta Estimates

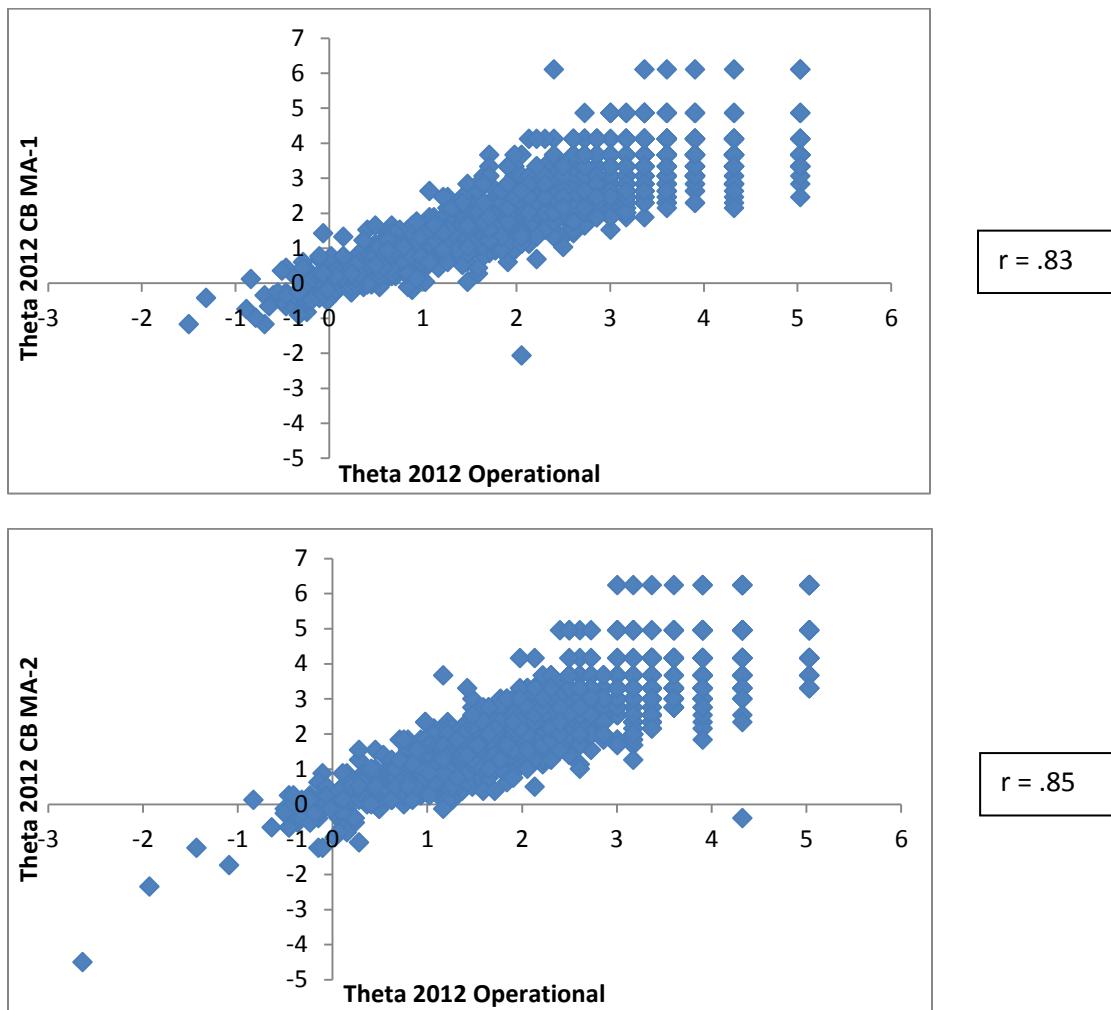


Figure A13

Plot of Grade 5 Mathematics 2012 CB Theta Estimates Against Grade 5 Mathematics 2012 Operational Theta Estimates

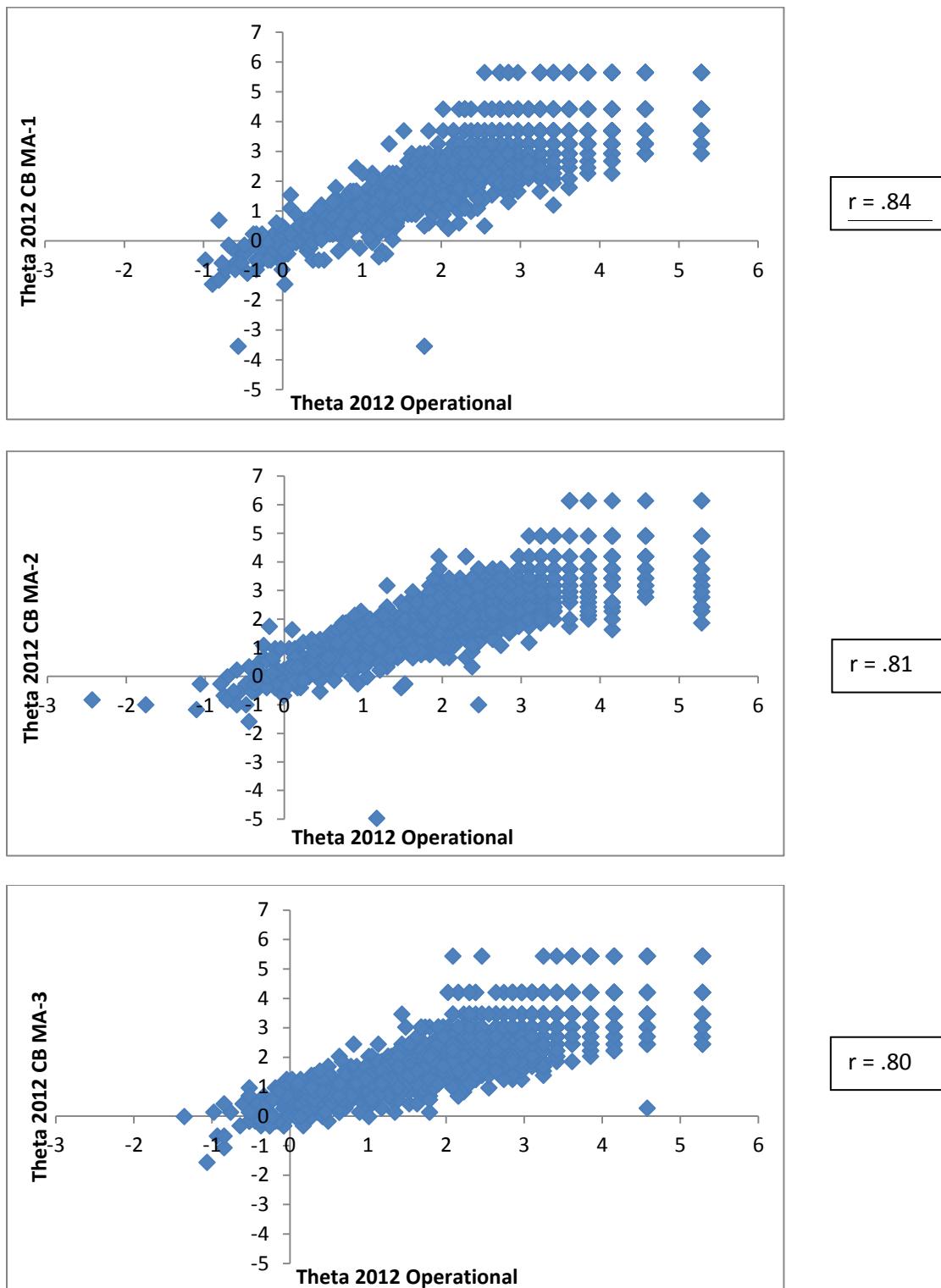


Figure A14

Plot of Grade 6 Mathematics 2012 CB Theta Estimates Against Grade 6 Mathematics 2012 Operational Theta Estimates

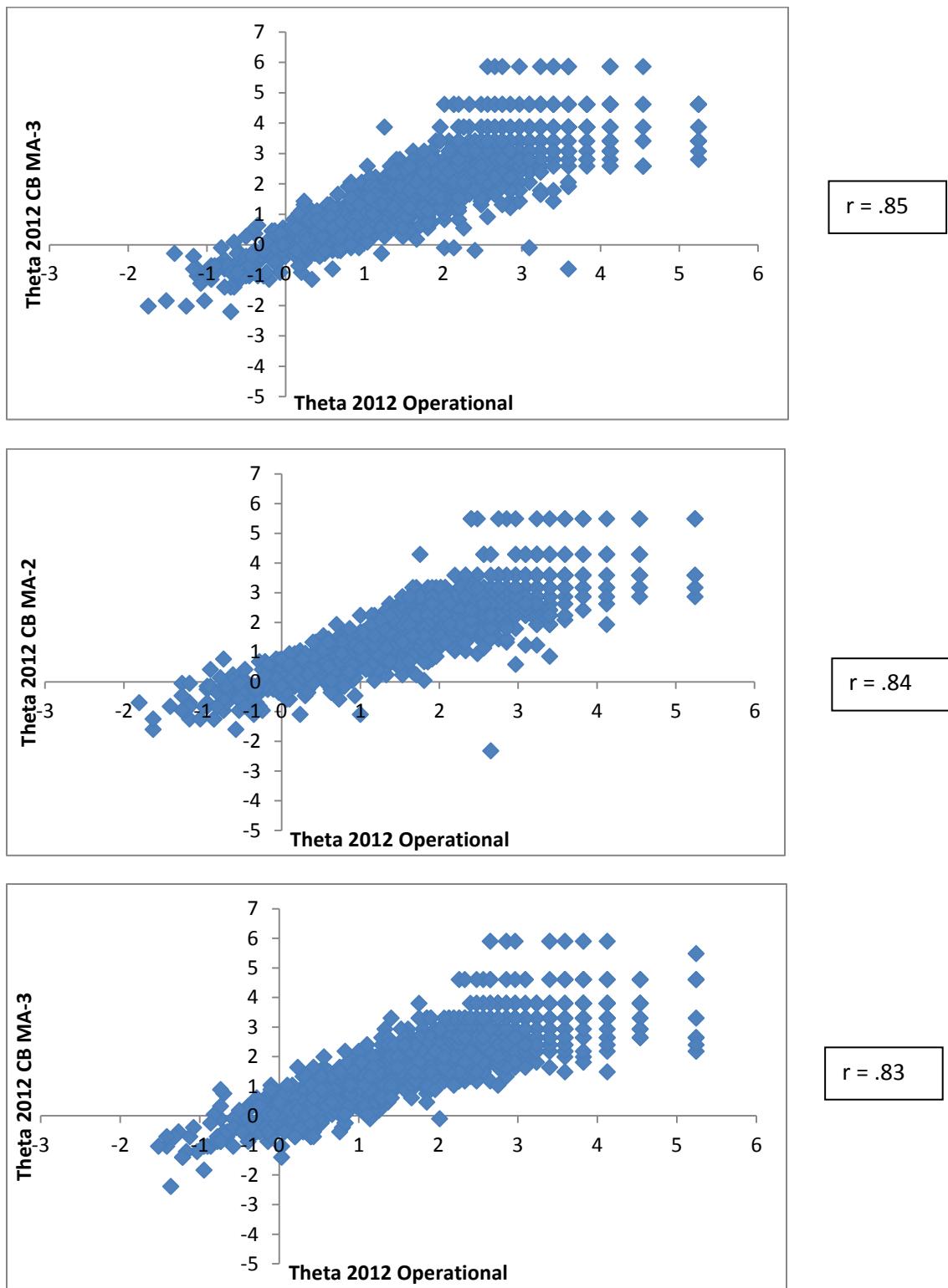


Figure A15

Plot of Grade 7 Mathematics 2012 CB Theta Estimates Against Grade 7 Mathematics 2012 Operational Theta Estimates

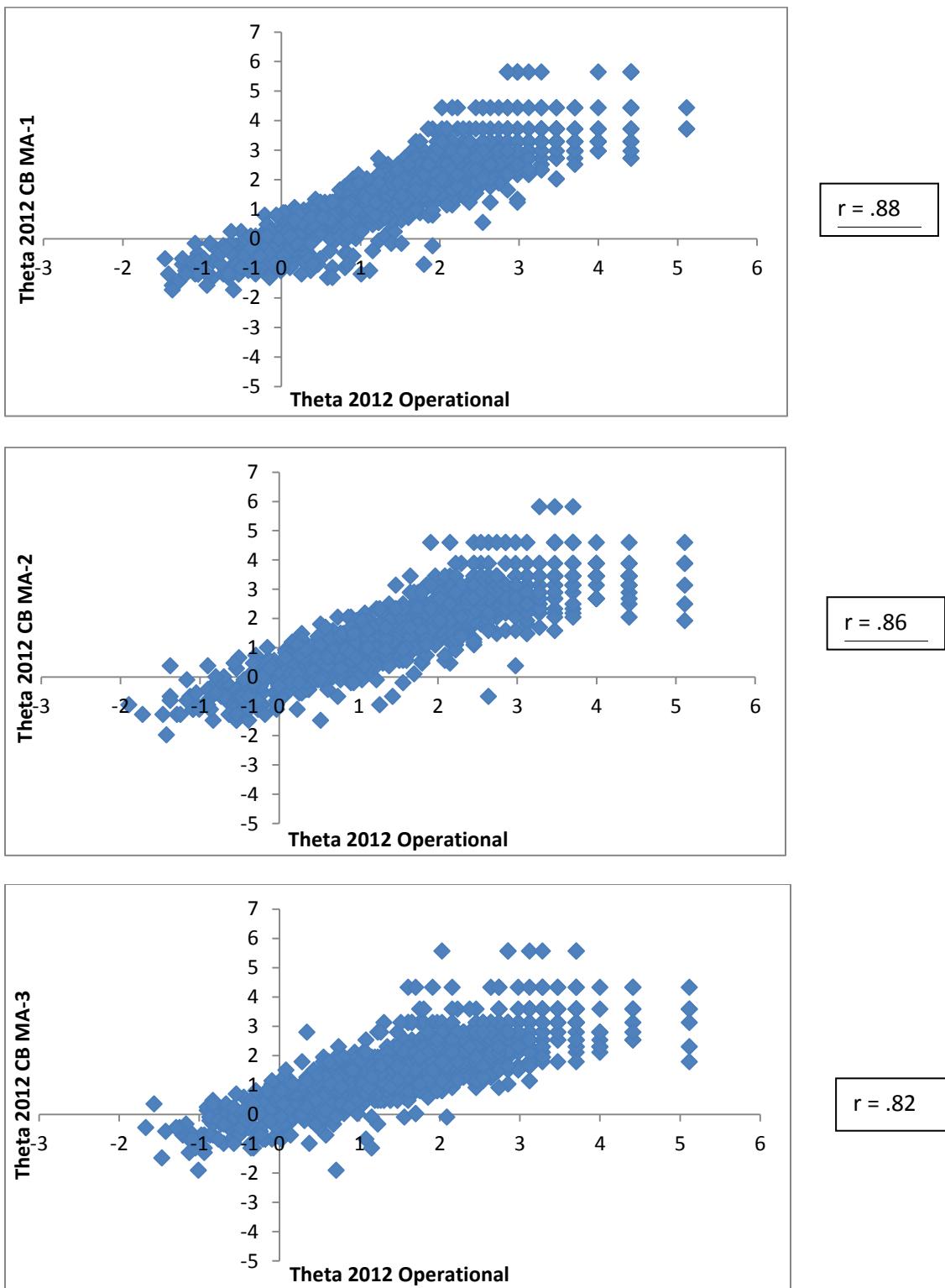


Figure A16

Plot of Grade 8 Mathematics 2012 CB Theta Estimates Against Grade 8 Mathematics 2012 Operational Theta Estimates

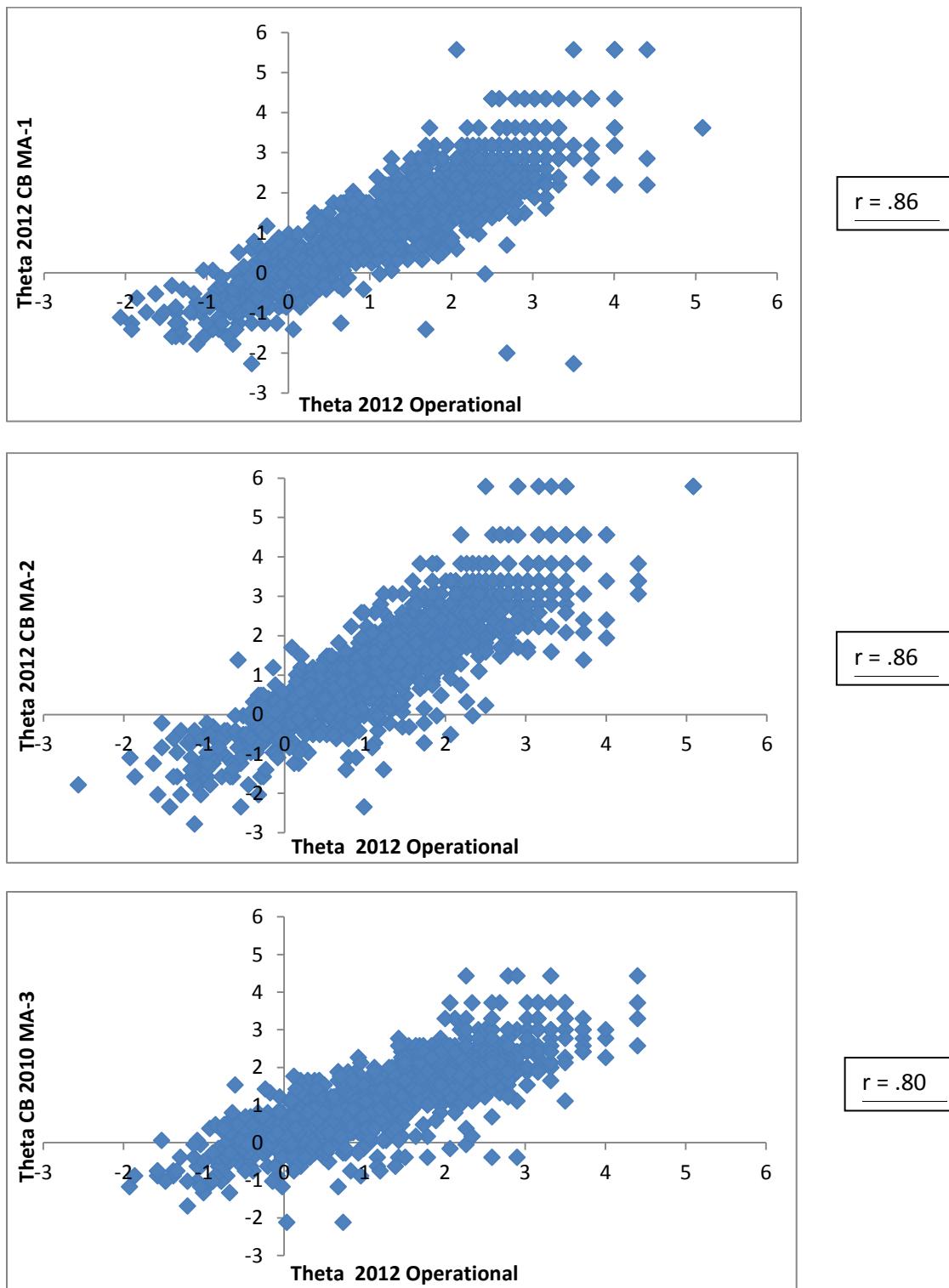


Figure A17

Plot of Grade 3 Writing 2012 CB Theta Estimates Against Grade 3 Writing 2012 Operational Theta Estimates

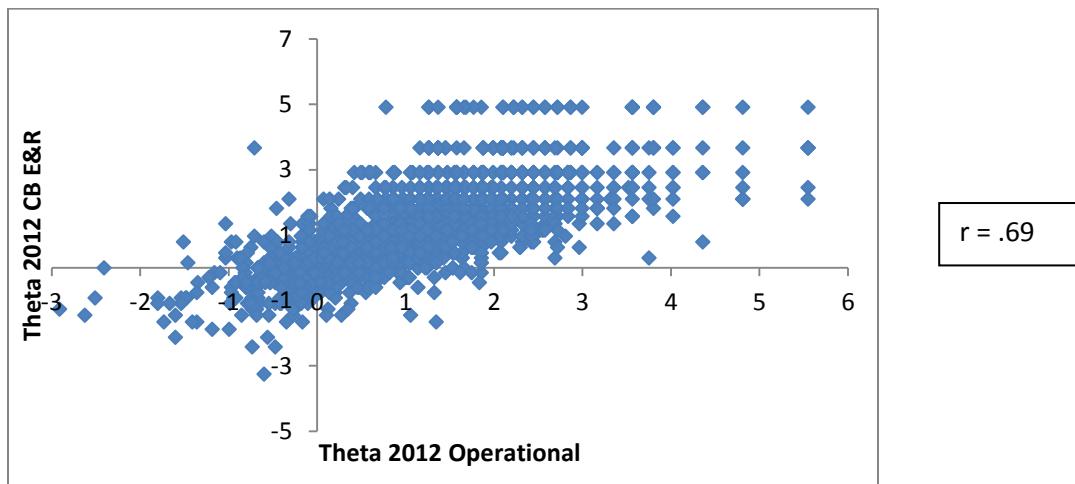


Figure A18

Plot of Grade 4 Writing 2012 CB Theta Estimates Against Grade 4 Writing 2012 Operational Theta Estimates

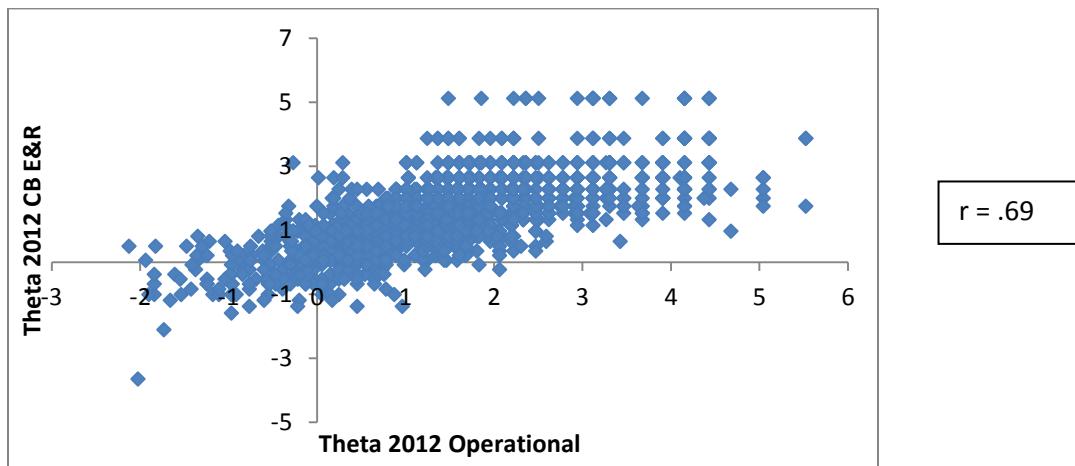


Figure A19

Plot of Grade 5 Writing 2012 CB Theta Estimates Against Grade 5 Writing 2012 Operational Theta Estimates

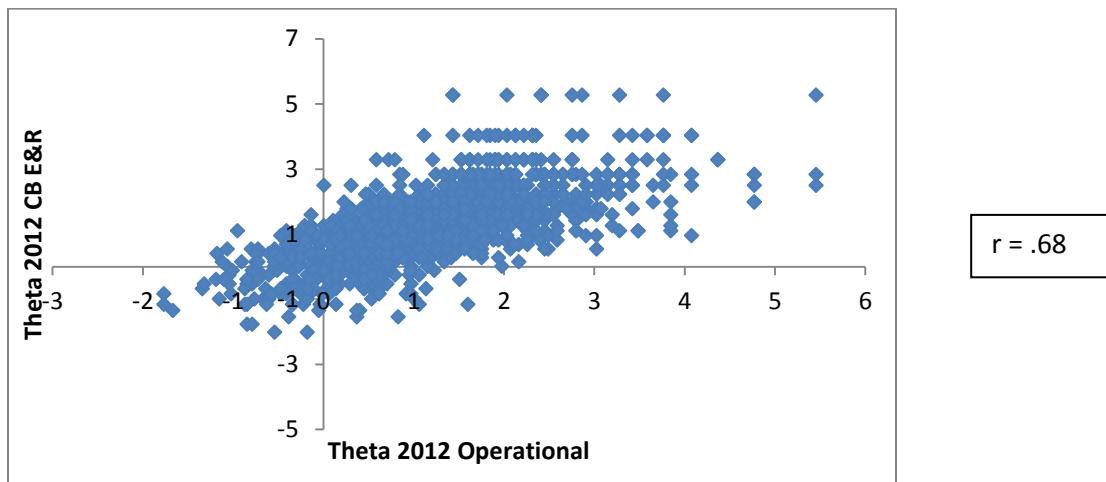


Figure A20

Plot of Grade 6 Writing 2012 CB Theta Estimates Against Grade 6 Writing 2012 Operational Theta Estimates

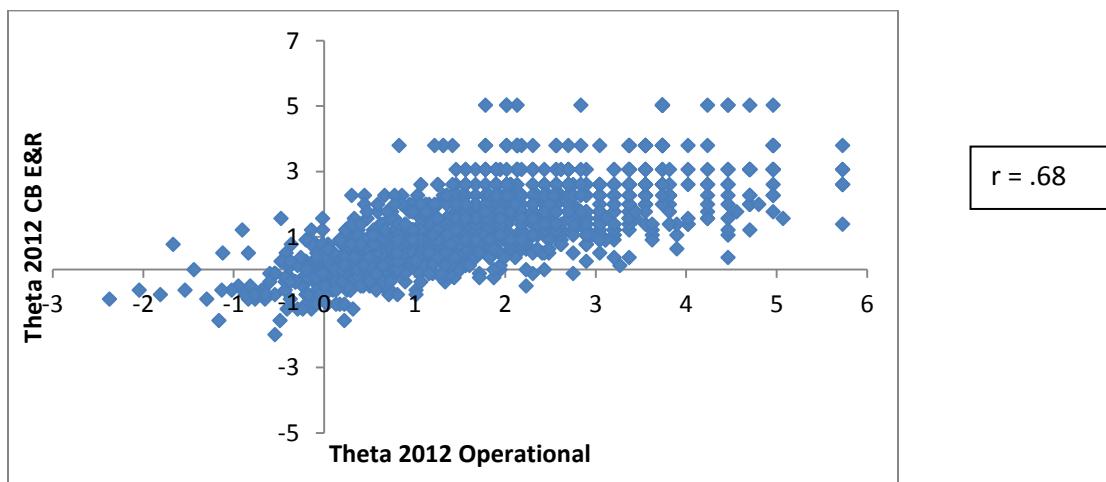


Figure A21

Plot of Grade 7 Writing 2012 CB Theta Estimates Against Grade 7 Writing 2012 Operational Theta Estimates

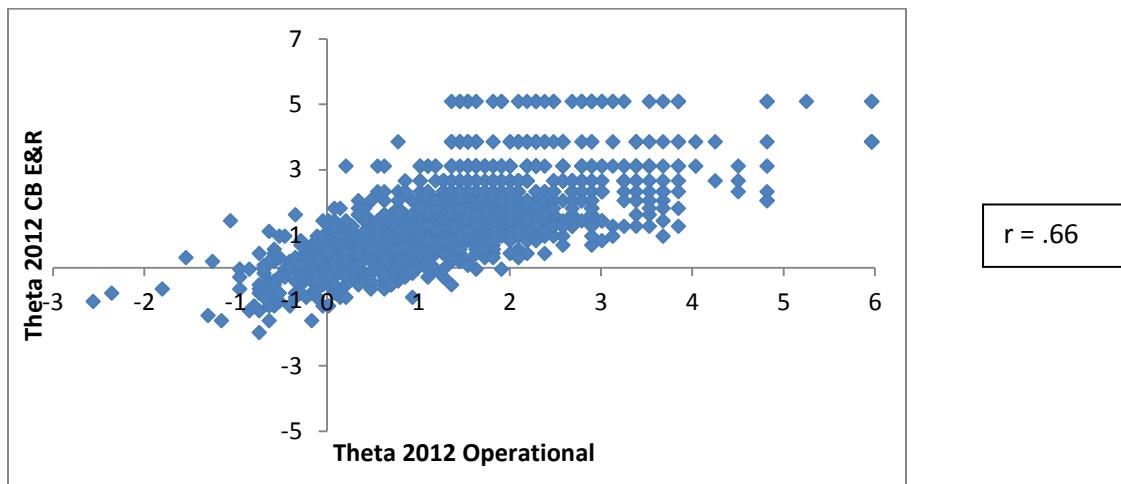


Figure A22

Plot of Grade 8 Writing 2012 CB Theta Estimates Against Grade 8 Writing 2012 Operational Theta Estimates

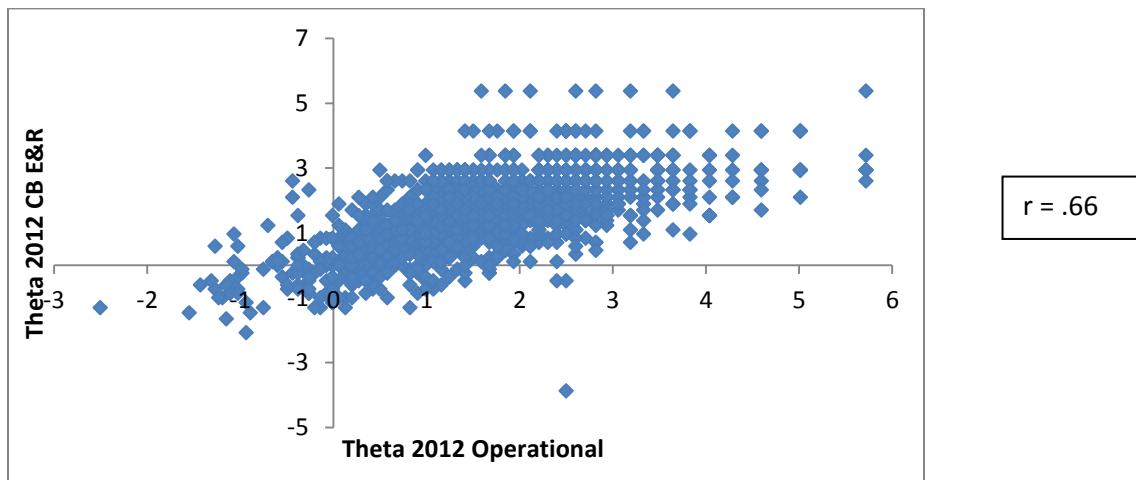


Figure A23

Plot of Grade 5 Science 2012 CB Theta Estimates Against Grade 5 Science 2012 Operational Theta Estimates

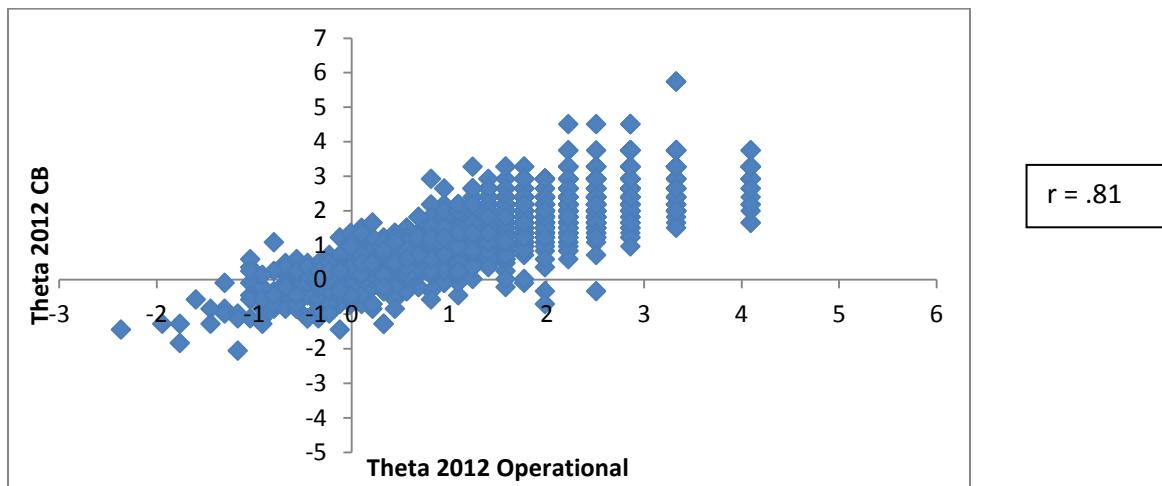


Figure A24

Plot of Grade 8 Science 2012 CB Theta Estimates Against Grade 8 Science 2012 Operational Theta Estimates

