New York State Regents Examination in Chemistry

2010 Field Test Analysis, Equating Procedure, and Scaling of Operational Test Forms

Technical Report

Prepared for the New York State Education Department
by Pearson

August 2011

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Section I: Introduction

Purpose

The purpose of this report is to document the psychometric work on the New York State Regents Examination in Chemistry in 2010. Specifically, contained within this report are procedures for and results of field test analysis, equating, and scaling of operational test forms. Because of a change in vendor mid-year, the field test equating was conducted by Pearson, while the scaling was conducted by the previous vendor. Information on test development can be found in the test design and development report for the New York State Regents Examination in Chemistry.

Section II: Field Test Analysis

In May 2010, field testing was conducted for the New York State Regents Examination in Chemistry to better understand the psychometric quality of the items. The results of this testing are used to help determine which items will be selected for use on operational tests.

Target student samples for participation in this testing were selected such that each would represent the student population expected to take the operational test. The Need/Resource Capacity Categories were used as variables in the sampling plan. See Table 1 for the seven Need/Resource Capacity Categories and their definitions.

Table 1. Need/Resource Capacity Category Definitions

Need/Resource Capacity (N/RC) Category	Definition
High N/RC Districts: New York City	New York City
Large Cities	Buffalo, Rochester, Syracuse, Yonkers
Urban-Suburban	Districts at or above 70th percentile on the index with at least 100 students per square mile or enrollment greater than 2500
Rural	All districts at or above the 70th percentile with fewer than 50 students per square mile or enrollment of less than 2500
Average N/RC Districts	All districts between the 20th and 70th percentiles on the index
Low N/RC Districts	All districts below the 20th percentile on the index
Charter Schools	Each charter school is a district

The data collected from field testing were scored by two entities. The multiple-choice items were scored by the New York State Education Department and the constructed-response items were scored by Measurement Incorporated. Therefore, it was necessary to combine data files for data analysis. Both classical and item response theory analyses were conducted using the data to evaluate the quality of the test items.

File Merging and Data Clean-up

Field test forms contained multiple-choice and constructed-response item types. Response data were contained in two separate files. The multiple-choice data file contained 19,604 student records and the constructed-response data file contained 18,248 student records. To combine the two files, the multiple-choice file served as the base file and constructed-response records were merged to the multiple-choice records using unique test booklet numbers. For multiple-choice records that did not have corresponding constructed-response records, constructed-response items were treated as non-attempted and scored as 0. After the exclusion rules were applied, the resulting field test data file contained 18,973 records.

Multiple-choice response data were then compared to the answer key. All item responses not matching the answer key were assigned scores of 0. The responses matching the answer key were assigned scores of 1. With respect to the constructed-response items, scores from 0 to the maximum point value available for each tested item were kept while out of range values were assigned scores of 0. For IRT calibrations, blanks (i.e., missing data) were assigned scores of 0 to be consistent with how operational test items are scored.

The final data file contained both the scored and unscored student responses. Unscored data were used to calculate the percentage of students who selected the various answer choices for the multiple-choice items or the percentage of students who received the range of possible raw score points for the constructed-response items. Thus, the frequency of students leaving items blank can be calculated. The scored data were used for all other analyses.

Classical Analysis

Classical Test Theory is based on the assumption that an observed test score x is composed of both true score t and error score e. This assumption is expressed as follows:

$$x = t + e$$

In other words, error is associated with measuring a student's true score. For example, the choice of test items or the administration conditions may influence student responses, making a student's observed score higher or lower than the student's true score. The error is considered random. After repeated administrations, the mean of the error scores is virtually zero. Thus, a student's observed score is expected to equal his or her true score. This expectation is expressed as follows:

$$E(x) = t$$

Using a Classical Test Theory framework, field test data can be analyzed to provide information about the quality of test items. Item difficulties, point-biserial correlations, reliability estimates, and various statistics related to rater agreement have been calculated and are summarized in the following section.

Item Difficulty

Item difficulty is an indication of student performance on a specific item. Because this examination contains polytomous items, item means are not appropriate for comparing difficulty across items. Instead weighted item means were calculated by dividing an item's mean by the maximum points possible for that item.

For multiple-choice items, the item difficulty is the proportion of students who answer an item correctly. If 90% of the student responses to a multiple-choice item are correct, then this item is considered easier than a multiple-choice item with correct responses by 30% of the students.

Point-Biserial Correlation

The point-biserial correlation is another classical statistic that can be used to evaluate items. For multiple-choice items, it is the correlation between students' performance on a given item (correct or incorrect) and overall performance scores. This statistic is used to evaluate how well an item identifies students who understand the concept being measured and can be generalized for constructed-response items. The possible range for the point-biserial correlation is -1 to 1, with higher values being more desirable.

Table 2 presents a summary of the classical item analysis for each of the field test forms. The first three columns identify the form number, the number of students who took each form, and the number of items on each field test form. The remaining columns are divided into two sections (i.e., item difficulty and point-biserial correlations). Recall that for constructed-response items, item means were divided by the maximum number of points possible in order to place them in the same metric as the multiple-choice items. For all items except four, item difficulties were below 0.90. With respect to the point-biserial correlations, most of these correlations fell between 0.25 and 0.50.

Table 2. Classical Item Analysis

			Item Difficulty			Point-Biserial		
Form	N-Count	No. of Items	<0.50	0.50 to 0.90	>0.90	<0.25	0.25 to 0.50	>0.50
821	1,136	25	17	8	0	2	17	6
822	1,123	24	6	17	1	0	17	7
823	1,126	25	13	12	0	0	17	8
824	1,129	25	16	9	0	1	18	6
825	1,127	25	13	12	0	1	19	5
826	1,113	25	13	12	0	0	19	6
827	1,121	25	11	14	0	4	15	6
828	1,117	25	11	14	0	1	17	7
829	1,124	24	12	11	1	1	15	8
830	1,120	25	13	12	0	0	22	3
831	1,107	25	9	16	0	1	16	8
832	1,117	24	12	12	0	0	22	2
833	1,101	23	11	11	1	2	12	9
834	1,099	24	8	14	1	0	18	5
835	1,097	25	10	15	0	0	20	5
836	1,103	25	11	14	0	1	18	6
837	1,113	15	2	13	0	0	11	4

* For some forms, the item counts in the 'Item Difficulty' and 'Point-Biserial' columns may not sum to the value in the 'No. of Items' column due to 'DNS' (do not score) items.

In addition to the summary information provided in Table 2, all of the classical item statistics are provided in Appendix A. 'Max' is the maximum number of possible points. 'N-Count' refers to the number of student records in the analysis. 'Alpha' contains the internal consistency statistics discussed below. For multiple-choice items, 'B' represents the proportion of students who left the item blank and 'M1' through 'M4' are the proportions of students who selected each of the four answer choices. For constructed-response items, 'B' represents the proportion of students who left the item blank and 'M0' through 'M4' are the proportions of students who received scores 0 through 4. 'Mean' is the average of the scores received by the students. The final column contains the point-biserial correlation for each item. There are some instances of items missing statistics; this occurs when an item was not scored.

Test Reliability

Classical analysis can also be used to measure the reliability of the test. Reliability is the consistency of the results obtained from a measurement with respect to time or among items or subjects that constitute a test. As such, test reliability can be estimated in a variety of ways. Internal consistency indices are a measure of how consistently examinees respond to items within a test. Two factors influence estimates of internal consistency: test length and homogeneity of items. In general, the more items on the examination the higher the reliability, and the more similar the items are the higher the reliability.

Cronbach's α (alpha) (Cronbach, 1951) has an important use as a measure of the internal consistency of a test. This formula is the extension of an earlier version, the Kuder-Richardson Formula 20 (KR-20), which is the equivalent for dichotomous items.

Table 3 contains the internal consistency statistics for all of the field test forms. These statistics ranged from 0.73 to 0.83 and are based solely on the items in the individual field test forms. It is expected that these statistics associated with the operational tests would be greater because there are more items on the operational test forms.

Table 3. Test and Scoring Reliability

Form Number	Test Reliability	Scoring Reliability
821	0.80	0.91
822	0.82	0.80
823	0.83	0.94
824	0.82	0.92
825	0.81	0.84
826	0.83	0.89
827	0.78	0.96
828	0.82	0.92
829	0.82	0.87
830	0.82	0.90
831	0.82	0.81
832	0.80	0.89
833	0.80	0.89
834	0.79	0.90
835	0.82	0.94
836	0.80	0.87
837	0.73	0.87

Scoring Reliability

One concern with constructed-response items is the reliability of the scoring process (i.e., consistency of the score assignment). Constructed-response items must be read by scorers who assign scores based on a comparison between the rubric and students' responses. Consistency in the way scores are assigned is a critical part of the reliability of the assessment. To measure this consistency, 10% of the test booklets are scored a second time (i.e., second read scores) and compared to the original set of scores (i.e., first read scores).

As an overall measure of scoring reliability, the Pearson Correlation Coefficient between the first and second scores for each of the constructed-response items was computed. This statistic is often used as an overall indicator of scoring reliability and generally ranges from 0 to near 1. Table 3 contains the results from these analyses in the column headed Scoring Reliability. The correlations ranged from 0.80 to 0.96, indicating high scoring reliability.

Inter-rater Agreement

For each constructed-response item, the difference between the first and second reads was computed. When examining inter-rater agreement statistics, it should be kept in mind that the maximum number of points per item varies as shown in the 'Score Points' column of the following tables.

Table 4 contains the proportion of occurrence of these differences for each item. Although most items had a maximum point value of 1, for the items that had maximum point values of 3 and 4, there were no instances of the first read and second read differing by more than 2.

Table 4. Point Differences Between First and Second Reads

			Difference (First Read minus Second Read)						
Form	**Item**	**Score Points**	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**
821	15	1	0.00	0.00	0.00	0.99	0.01	0.00	0.00
821	16	1	0.00	0.00	0.08	0.85	0.08	0.00	0.00
821	17	1	0.00	0.00	0.02	0.96	0.01	0.00	0.00
821	18	1	0.00	0.00	0.02	0.96	0.02	0.00	0.00
821	19	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
821	20	1	0.00	0.00	0.02	0.98	0.01	0.00	0.00
821	21	1	0.00	0.00	0.01	0.98	0.01	0.00	0.00
821	22	1	0.00	0.00	0.01	0.96	0.02	0.00	0.00
821	23	1	0.00	0.00	0.01	0.99	0.01	0.00	0.00
821	24	1	0.00	0.00	0.07	0.89	0.04	0.00	0.00
821	25	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
822	15	1	0.00	0.00	0.04	0.91	0.04	0.00	0.00
822	16	1	0.00	0.00	0.05	0.89	0.05	0.00	0.00
822	17	1	0.00	0.00	0.03	0.93	0.04	0.00	0.00
822	18	1	0.00	0.00	0.11	0.78	0.11	0.00	0.00
822	19	1	0.00	0.00	0.01	0.97	0.02	0.00	0.00
822	20	1	0.00	0.00	0.01	0.98	0.01	0.00	0.00
822	21	1	0.00	0.00	0.01	0.98	0.01	0.00	0.00
822	22	1	0.00	0.00	0.06	0.84	0.10	0.00	0.00
822	23	1	0.00	0.00	0.05	0.89	0.06	0.00	0.00
822	24	1	0.00	0.00	0.07	0.85	0.07	0.00	0.00
823	15	1	0.00	0.00	0.01	0.97	0.01	0.00	0.00
823	16	1	0.00	0.00	0.03	0.92	0.05	0.00	0.00
823	17	1	0.00	0.00	0.07	0.88	0.05	0.00	0.00
823	18	1	0.00	0.00	0.02	0.97	0.01	0.00	0.00
823	19	1	0.00	0.00	0.00	0.99	0.01	0.00	0.00
823	20	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
823	21	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
823	22	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
823	23	1	0.00	0.00	0.00	0.99	0.01	0.00	0.00
823	24	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00

Table 4. Point Differences Between First and Second Reads *(continued)*

			Difference (First Read minus Second Read)						
Form	**Item**	**Score Points**	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**
823	25	1	0.00	0.00	0.04	0.96	0.00	0.00	0.00
824	15	1	0.00	0.00	0.01	0.97	0.02	0.00	0.00
824	16	1	0.00	0.00	0.05	0.95	0.01	0.00	0.00
824	17	1	0.00	0.00	0.01	0.96	0.04	0.00	0.00
824	18	1	0.00	0.00	0.00	0.99	0.01	0.00	0.00
824	19	1	0.00	0.00	0.03	0.97	0.01	0.00	0.00
824	20	1	0.00	0.00	0.04	0.93	0.03	0.00	0.00
824	21	1	0.00	0.00	0.02	0.97	0.01	0.00	0.00
824	22	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
824	23	1	0.00	0.00	0.03	0.95	0.02	0.00	0.00
824	24	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
824	25	1	0.00	0.00	0.04	0.96	0.00	0.00	0.00
825	15	1	0.00	0.00	0.01	0.98	0.01	0.00	0.00
825	16	1	0.00	0.00	0.14	0.71	0.15	0.00	0.00
825	17	1	0.00	0.00	0.03	0.88	0.09	0.00	0.00
825	18	1	0.00	0.00	0.05	0.91	0.04	0.00	0.00
825	19	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
825	20	1	0.00	0.00	0.02	0.97	0.01	0.00	0.00
825	21	1	0.00	0.00	0.04	0.90	0.06	0.00	0.00
825	22	1	0.00	0.00	0.07	0.89	0.04	0.00	0.00
825	23	1	0.00	0.00	0.02	0.96	0.02	0.00	0.00
825	24	1	0.00	0.00	0.00	0.97	0.03	0.00	0.00
825	25	1	0.00	0.00	0.00	0.99	0.01	0.00	0.00
826	15	1	0.00	0.00	0.08	0.89	0.03	0.00	0.00
826	16	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
826	17	1	0.00	0.00	0.03	0.95	0.02	0.00	0.00
826	18	1	0.00	0.00	0.02	0.95	0.03	0.00	0.00
826	19	1	0.00	0.00	0.03	0.92	0.05	0.00	0.00
826	20	1	0.00	0.00	0.03	0.94	0.03	0.00	0.00
826	21	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
826	22	1	0.00	0.00	0.02	0.98	0.00	0.00	0.00
826	23	1	0.00	0.00	0.03	0.96	0.01	0.00	0.00

Table 4. Point Differences Between First and Second Reads *(continued)*

			Difference (First Read minus Second Read)						
Form	**Item**	**Score Points**	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**
826	24	1	0.00	0.00	0.04	0.96	0.01	0.00	0.00
826	25	1	0.00	0.00	0.04	0.93	0.03	0.00	0.00
827	14	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
827	15	1	0.00	0.00	0.01	0.99	0.01	0.00	0.00
827	16	1	0.00	0.00	0.00	0.99	0.01	0.00	0.00
827	17	1	0.00	0.00	0.08	0.84	0.08	0.00	0.00
827	18	1	0.00	0.00	0.01	0.96	0.02	0.00	0.00
827	19	1	0.00	0.00	0.02	0.98	0.00	0.00	0.00
827	20	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
827	21	1	0.00	0.00	0.01	0.99	0.01	0.00	0.00
827	22	1	0.00	0.00	0.04	0.93	0.03	0.00	0.00
827	23	1	0.00	0.00	0.00	0.99	0.01	0.00	0.00
827	24	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
827	25	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
828	14	1	0.00	0.00	0.01	0.99	0.01	0.00	0.00
828	15	1	0.00	0.00	0.04	0.93	0.04	0.00	0.00
828	16	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
828	17	1	0.00	0.00	0.01	0.97	0.02	0.00	0.00
828	18	1	0.00	0.00	0.01	0.98	0.01	0.00	0.00
828	19	1	0.00	0.00	0.02	0.97	0.01	0.00	0.00
828	20	1	0.00	0.00	0.02	0.96	0.02	0.00	0.00
828	21	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
828	22	1	0.00	0.00	0.03	0.95	0.02	0.00	0.00
828	23	1	0.00	0.00	0.01	0.99	0.01	0.00	0.00
828	24	1	0.00	0.00	0.05	0.90	0.04	0.00	0.00
828	25	1	0.00	0.00	0.07	0.89	0.04	0.00	0.00
829	15	1	0.00	0.00	0.03	0.96	0.02	0.00	0.00
829	16	1	0.00	0.00	0.06	0.91	0.04	0.00	0.00
829	17	1	0.00	0.00	0.03	0.98	0.00	0.00	0.00
829	18	1	0.00	0.00	0.01	0.98	0.01	0.00	0.00
829	19	1	0.00	0.00	0.08	0.84	0.08	0.00	0.00
829	20	1	0.00	0.00	0.08	0.82	0.10	0.00	0.00

Table 4. Point Differences Between First and Second Reads *(continued)*

			Difference (First Read minus Second Read)						
Form	**Item**	**Score Points**	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**
829	21	1	0.00	0.00	0.04	0.94	0.03	0.00	0.00
829	22	1	0.00	0.00	0.02	0.96	0.02	0.00	0.00
829	23	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
829	24	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
830	15	1	0.00	0.00	0.04	0.93	0.03	0.00	0.00
830	16	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
830	17	1	0.00	0.00	0.03	0.89	0.08	0.00	0.00
830	18	1	0.00	0.00	0.01	0.98	0.01	0.00	0.00
830	19	1	0.00	0.00	0.02	0.95	0.03	0.00	0.00
830	20	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
830	21	1	0.00	0.00	0.01	0.97	0.02	0.00	0.00
830	22	1	0.00	0.00	0.03	0.95	0.02	0.00	0.00
830	23	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
830	24	1	0.00	0.00	0.06	0.86	0.07	0.00	0.00
830	25	1	0.00	0.00	0.00	0.97	0.03	0.00	0.00
831	15	1	0.00	0.00	0.06	0.87	0.06	0.00	0.00
831	16	1	0.00	0.00	0.10	0.79	0.11	0.00	0.00
831	17	1	0.00	0.00	0.08	0.83	0.09	0.00	0.00
831	18	1	0.00	0.00	0.01	0.94	0.04	0.00	0.00
831	19	1	0.00	0.00	0.07	0.83	0.10	0.00	0.00
831	20	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
831	21	1	0.00	0.00	0.01	0.98	0.01	0.00	0.00
831	22	1	0.00	0.00	0.08	0.87	0.06	0.00	0.00
831	23	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
831	24	1	0.00	0.00	0.01	0.99	0.01	0.00	0.00
831	25	1	0.00	0.00	0.05	0.92	0.03	0.00	0.00
832	14	1	0.00	0.00	0.07	0.86	0.07	0.00	0.00
832	15	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
832	16	1	0.00	0.00	0.04	0.89	0.07	0.00	0.00
832	17	1	0.00	0.00	0.04	0.94	0.02	0.00	0.00
832	18	1	0.00	0.00	0.05	0.92	0.03	0.00	0.00
832	19	1	0.00	0.00	0.01	0.98	0.01	0.00	0.00

Table 4. Point Differences Between First and Second Reads *(continued)*

			Difference (First Read minus Second Read)						
Form	**Item**	**Score Points**	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**
832	20	1	0.00	0.00	0.03	0.95	0.03	0.00	0.00
832	21	1	0.00	0.00	0.01	0.94	0.05	0.00	0.00
832	22	1	0.00	0.00	0.01	0.98	0.01	0.00	0.00
832	23	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
832	24	1	0.00	0.00	0.02	0.95	0.03	0.00	0.00
833	15	1	0.00	0.00	0.03	0.95	0.02	0.00	0.00
833	16	1	0.00	0.00	0.04	0.90	0.06	0.00	0.00
833	17	1	0.00	0.00	0.03	0.93	0.04	0.00	0.00
833	18	1	0.00	0.00	0.00	0.99	0.01	0.00	0.00
833	19	1	0.00	0.00	0.04	0.94	0.02	0.00	0.00
833	20	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
833	21	1	0.00	0.00	0.03	0.97	0.00	0.00	0.00
833	22	1	0.00	0.00	0.02	0.97	0.01	0.00	0.00
833	23	1	0.00	0.00	0.08	0.84	0.08	0.00	0.00
834	15	1	0.00	0.00	0.09	0.83	0.08	0.00	0.00
834	16	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
834	17	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
834	18	1	0.00	0.00	0.04	0.92	0.05	0.00	0.00
834	19	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
834	20	1	0.00	0.00	0.04	0.94	0.02	0.00	0.00
834	21	1	0.00	0.00	0.03	0.94	0.03	0.00	0.00
834	22	1	0.00	0.00	0.02	0.97	0.01	0.00	0.00
834	23	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
834	24	1	0.00	0.00	0.05	0.91	0.04	0.00	0.00
835	15	1	0.00	0.00	0.01	0.97	0.02	0.00	0.00
835	16	1	0.00	0.00	0.01	0.97	0.02	0.00	0.00
835	17	1	0.00	0.00	0.01	0.98	0.01	0.00	0.00
835	18	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
835	19	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
835	20	1	0.00	0.00	0.03	0.90	0.07	0.00	0.00
835	21	1	0.00	0.00	0.01	0.95	0.04	0.00	0.00
835	22	1	0.00	0.00	0.01	0.97	0.01	0.00	0.00

Table 4. Point Differences Between First and Second Reads *(continued)*

			Difference (First Read minus Second Read)						
Form	**Item**	**Score Points**	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**
835	23	1	0.00	0.00	0.01	0.99	0.01	0.00	0.00
835	24	1	0.00	0.00	0.03	0.98	0.00	0.00	0.00
835	25	1	0.00	0.00	0.01	0.98	0.01	0.00	0.00
836	15	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
836	16	1	0.00	0.00	0.12	0.77	0.11	0.00	0.00
836	17	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
836	18	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
836	19	1	0.00	0.00	0.07	0.83	0.10	0.00	0.00
836	20	1	0.00	0.00	0.02	0.89	0.09	0.00	0.00
836	21	1	0.00	0.00	0.05	0.88	0.07	0.00	0.00
836	22	1	0.00	0.00	0.00	1.00	0.00	0.00	0.00
836	23	1	0.00	0.00	0.00	0.99	0.01	0.00	0.00
836	24	1	0.00	0.00	0.02	0.96	0.02	0.00	0.00
836	25	1	0.00	0.00	0.01	0.99	0.00	0.00	0.00
837	13	4	0.00	0.00	0.06	0.84	0.10	0.00	0.00
837	14	3	0.00	0.01	0.18	0.70	0.09	0.01	0.00
837	15	3	0.00	0.00	0.13	0.72	0.15	0.01	0.00

Table 5 contains additional summary information regarding the first and second reads. In the fourth column the percent of exact matches between the first and second scores is provided. “Adj.” is the percentage of differences with a magnitude of one. “Total” is the sum of the two prior columns and contains values between 97.5% and 100%. These values indicate a high degree of agreement.

Table 5. First and Second Read Descriptive Statistics and Agreement

				Agreement (%)			Raw Score Mean		Raw Score Standard Deviation			
Form	Item	Score Points	Total N-Count	Exact	Adj.	Total	First Read	Second Read	First Read	Second Read	Intra-Class Corre-lation	Wt Kappa
821	15	1	163	98.8	1.2	100.0	0.5	0.5	0.50	0.50	0.98	0.98
821	16	1	158	84.8	15.2	100.0	0.3	0.3	0.46	0.46	0.64	0.64
821	17	1	161	96.3	3.7	100.0	0.1	0.1	0.32	0.33	0.82	0.82
821	18	1	160	96.3	3.7	100.0	0.4	0.4	0.49	0.49	0.92	0.92
821	19	1	161	99.4	0.6	100.0	0.6	0.6	0.50	0.50	0.99	0.99
821	20	1	164	97.6	2.4	100.0	0.3	0.3	0.46	0.47	0.94	0.94
821	21	1	160	98.1	1.9	100.0	0.3	0.3	0.45	0.46	0.95	0.95
821	22	1	163	96.3	3.7	100.0	0.5	0.5	0.50	0.50	0.93	0.93
821	23	1	161	98.8	1.2	100.0	0.5	0.5	0.50	0.50	0.98	0.98
821	24	1	163	89.0	11.0	100.0	0.4	0.4	0.49	0.49	0.77	0.77
821	25	1	159	99.4	0.6	100.0	0.2	0.2	0.41	0.41	0.98	0.98
822	15	1	160	91.3	8.7	100.0	0.8	0.8	0.41	0.41	0.74	0.74
822	16	1	164	89.0	11.0	100.0	0.6	0.6	0.49	0.49	0.77	0.77
822	17	1	163	92.6	7.4	100.0	0.7	0.7	0.47	0.48	0.84	0.84
822	18	1	157	77.7	22.3	100.0	0.6	0.6	0.49	0.49	0.53	0.53
822	19	1	164	97.0	3.0	100.0	0.4	0.4	0.50	0.49	0.94	0.94
822	20	1	158	98.1	1.9	100.0	0.3	0.3	0.47	0.47	0.96	0.96
822	21	1	160	98.1	1.9	100.0	0.1	0.1	0.25	0.26	0.86	0.86
822	22	1	159	83.6	16.4	100.0	0.7	0.6	0.48	0.49	0.65	0.65
822	23	1	160	89.4	10.6	100.0	0.4	0.4	0.49	0.49	0.77	0.77
822	24	1	161	85.1	14.9	100.0	0.2	0.2	0.40	0.40	0.52	0.52
823	15	1	153	97.4	2.6	100.0	0.4	0.4	0.49	0.49	0.95	0.95
823	16	1	154	92.2	7.8	100.0	0.3	0.3	0.46	0.46	0.81	0.81
823	17	1	148	87.8	12.2	100.0	0.8	0.8	0.43	0.43	0.67	0.67
823	18	1	155	97.4	2.6	100.0	0.2	0.2	0.42	0.43	0.93	0.93
823	19	1	155	99.4	0.6	100.0	0.3	0.3	0.45	0.45	0.98	0.98
823	20	1	158	100.0	0.0	100.0	0.2	0.2	0.37	0.37	1.00	1.00
823	21	1	152	99.3	0.7	100.0	0.3	0.3	0.44	0.44	0.98	0.98
823	22	1	151	100.0	0.0	100.0	0.3	0.3	0.46	0.46	1.00	1.00
823	23	1	154	99.4	0.6	100.0	0.2	0.2	0.39	0.39	0.98	0.98

Table 5. First and Second Read Descriptive Statistics and Agreement (continued)

				Agreement (%)			Raw Score Mean		Raw Score Standard Deviation			
Form	Item	Score Points	Total N-Count	Exact	Adj.	Total	First Read	Second Read	First Read	Second Read	Intra-Class Corre-lation	Wt Kappa
823	24	1	156	100.0	0.0	100.0	0.3	0.3	0.45	0.45	1.00	1.00
823	25	1	156	96.2	3.8	100.0	0.7	0.7	0.48	0.46	0.92	0.91
824	15	1	158	96.8	3.2	100.0	0.2	0.2	0.42	0.42	0.91	0.91
824	16	1	155	94.8	5.2	100.0	0.1	0.2	0.34	0.37	0.81	0.80
824	17	1	157	95.5	4.5	100.0	0.3	0.2	0.44	0.42	0.88	0.88
824	18	1	157	98.7	1.3	100.0	0.5	0.5	0.50	0.50	0.97	0.97
824	19	1	158	96.8	3.2	100.0	0.4	0.4	0.49	0.49	0.94	0.93
824	20	1	161	93.2	6.8	100.0	0.4	0.4	0.49	0.50	0.86	0.86
824	21	1	148	96.6	3.4	100.0	0.5	0.5	0.50	0.50	0.93	0.93
824	22	1	155	99.4	0.6	100.0	0.3	0.3	0.46	0.46	0.98	0.98
824	23	1	151	95.4	4.6	100.0	0.3	0.3	0.44	0.44	0.88	0.88
824	24	1	157	100.0	0.0	100.0	0.2	0.2	0.37	0.37	1.00	1.00
824	25	1	155	96.1	3.9	100.0	0.3	0.4	0.48	0.49	0.92	0.92
825	15	1	162	98.1	1.9	100.0	0.5	0.5	0.50	0.50	0.96	0.96
825	16	1	163	70.6	29.4	100.0	0.5	0.5	0.50	0.50	0.41	0.41
825	17	1	161	88.2	11.8	100.0	0.2	0.2	0.41	0.37	0.63	0.62
825	18	1	164	91.5	8.5	100.0	0.5	0.6	0.50	0.50	0.83	0.83
825	19	1	163	100.0	0.0	100.0	0.4	0.4	0.49	0.49	1.00	1.00
825	20	1	158	97.5	2.5	100.0	0.1	0.1	0.31	0.33	0.88	0.87
825	21	1	155	90.3	9.7	100.0	0.5	0.5	0.50	0.50	0.81	0.81
825	22	1	161	89.4	10.6	100.0	0.7	0.7	0.47	0.46	0.76	0.76
825	23	1	161	95.7	4.3	100.0	0.2	0.2	0.42	0.41	0.87	0.87
825	24	1	159	97.5	2.5	100.0	0.3	0.3	0.47	0.46	0.94	0.94
825	25	1	163	99.4	0.6	100.0	0.3	0.3	0.44	0.44	0.98	0.98
826	15	1	158	88.6	11.4	100.0	0.4	0.4	0.49	0.50	0.77	0.77
826	16	1	153	99.3	0.7	100.0	0.1	0.1	0.35	0.35	0.97	0.97
826	17	1	161	95.0	5.0	100.0	0.5	0.5	0.50	0.50	0.90	0.90
826	18	1	153	95.4	4.6	100.0	0.4	0.4	0.49	0.48	0.90	0.90
826	19	1	155	92.3	7.7	100.0	0.5	0.5	0.50	0.50	0.85	0.85
826	20	1	157	93.6	6.4	100.0	0.2	0.2	0.43	0.43	0.82	0.82

Table 5. First and Second Read Descriptive Statistics and Agreement (continued)

				Agreement (%)			Raw Score Mean		Raw Score Standard Deviation			
Form	Item	Score Points	Total N-Count	Exact	Adj.	Total	First Read	Second Read	First Read	Second Read	Intra-Class Corre-lation	Wt Kappa
826	21	1	157	99.4	0.6	100.0	0.5	0.5	0.50	0.50	0.99	0.99
826	22	1	158	98.1	1.9	100.0	0.3	0.4	0.47	0.48	0.96	0.96
826	23	1	157	95.5	4.5	100.0	0.4	0.4	0.48	0.49	0.90	0.90
826	24	1	157	95.5	4.5	100.0	0.4	0.5	0.50	0.50	0.91	0.91
826	25	1	153	93.5	6.5	100.0	0.2	0.2	0.39	0.40	0.79	0.79
827	14	1	884	100.0	0.0	100.0	0.5	0.5	0.50	0.50	1.00	1.00
827	15	1	165	98.8	1.2	100.0	0.6	0.6	0.49	0.49	0.97	0.97
827	16	1	163	99.4	0.6	100.0	0.6	0.6	0.49	0.49	0.99	0.99
827	17	1	161	83.9	16.1	100.0	0.6	0.6	0.50	0.50	0.67	0.67
827	18	1	168	96.4	3.6	100.0	0.5	0.5	0.50	0.50	0.93	0.93
827	19	1	164	98.2	1.8	100.0	0.5	0.5	0.50	0.50	0.96	0.96
827	20	1	166	100.0	0.0	100.0	0.5	0.5	0.50	0.50	1.00	1.00
827	21	1	165	98.8	1.2	100.0	0.5	0.5	0.50	0.50	0.98	0.98
827	22	1	166	93.4	6.6	100.0	0.3	0.3	0.44	0.44	0.83	0.83
827	23	1	164	99.4	0.6	100.0	0.1	0.1	0.30	0.29	0.96	0.96
827	24	1	166	100.0	0.0	100.0	0.2	0.2	0.38	0.38	1.00	1.00
827	25	1	168	99.4	0.6	100.0	0.4	0.4	0.49	0.49	0.99	0.99
828	14	1	161	98.8	1.2	100.0	0.7	0.7	0.46	0.46	0.97	0.97
828	15	1	160	92.5	7.5	100.0	0.6	0.6	0.50	0.50	0.85	0.85
828	16	1	160	100.0	0.0	100.0	0.5	0.5	0.50	0.50	1.00	1.00
828	17	1	161	96.9	3.1	100.0	0.6	0.6	0.49	0.49	0.94	0.94
828	18	1	159	98.1	1.9	100.0	0.3	0.3	0.46	0.46	0.96	0.96
828	19	1	158	97.5	2.5	100.0	0.6	0.6	0.49	0.49	0.95	0.95
828	20	1	158	96.2	3.8	100.0	0.3	0.3	0.45	0.45	0.90	0.90
828	21	1	160	99.4	0.6	100.0	0.5	0.5	0.50	0.50	0.99	0.99
828	22	1	157	94.9	5.1	100.0	0.4	0.4	0.49	0.50	0.90	0.90
828	23	1	155	98.7	1.3	100.0	0.3	0.3	0.46	0.46	0.97	0.97
828	24	1	156	90.4	9.6	100.0	0.1	0.1	0.34	0.34	0.58	0.58
828	25	1	163	89.0	11.0	100.0	0.4	0.4	0.49	0.50	0.77	0.77
829	15	1	160	95.6	4.4	100.0	0.4	0.4	0.49	0.49	0.91	0.91

Table 5. First and Second Read Descriptive Statistics and Agreement (continued)

				Agreement (%)			Raw Score Mean		Raw Score Standard Deviation			
Form	Item	Score Points	Total N-Count	Exact	Adj.	Total	First Read	Second Read	First Read	Second Read	Intra-Class Corre-lation	Wt Kappa
829	16	1	161	90.7	9.3	100.0	0.3	0.3	0.47	0.48	0.79	0.79
829	17	1	160	97.5	2.5	100.0	0.6	0.7	0.48	0.47	0.95	0.95
829	18	1	159	98.1	1.9	100.0	0.8	0.8	0.43	0.42	0.95	0.95
829	19	1	160	84.4	15.6	100.0	0.5	0.5	0.50	0.50	0.68	0.68
829	20	1	160	81.9	18.1	100.0	0.3	0.3	0.47	0.46	0.59	0.58
829	21	1	160	93.8	6.2	100.0	0.4	0.4	0.48	0.48	0.86	0.86
829	22	1	161	96.3	3.7	100.0	0.7	0.7	0.46	0.46	0.91	0.91
829	23	1	156	100.0	0.0	100.0	0.5	0.5	0.50	0.50	1.00	1.00
829	24	1	160	99.4	0.6	100.0	0.3	0.3	0.46	0.47	0.99	0.99
830	15	1	150	92.7	7.3	100.0	0.2	0.2	0.43	0.43	0.80	0.80
830	16	1	157	99.4	0.6	100.0	0.4	0.4	0.49	0.49	0.99	0.99
830	17	1	153	88.9	11.1	100.0	0.5	0.5	0.50	0.50	0.78	0.78
830	18	1	151	98.0	2.0	100.0	0.3	0.3	0.46	0.46	0.95	0.95
830	19	1	148	95.3	4.7	100.0	0.3	0.3	0.45	0.45	0.88	0.88
830	20	1	148	98.6	1.4	100.0	0.2	0.2	0.39	0.40	0.96	0.96
830	21	1	152	97.4	2.6	100.0	0.3	0.3	0.46	0.46	0.94	0.94
830	22	1	150	95.3	4.7	100.0	0.3	0.3	0.45	0.45	0.89	0.89
830	23	1	157	99.4	0.6	100.0	0.2	0.2	0.41	0.42	0.98	0.98
830	24	1	154	86.4	13.6	100.0	0.6	0.6	0.49	0.49	0.71	0.71
830	25	1	156	97.4	2.6	100.0	0.8	0.8	0.41	0.43	0.93	0.93
831	15	1	156	87.2	12.8	100.0	0.9	0.9	0.30	0.30	0.26	0.26
831	16	1	156	79.5	20.5	100.0	0.7	0.7	0.44	0.45	0.48	0.48
831	17	1	159	83.0	17.0	100.0	0.6	0.6	0.48	0.49	0.64	0.64
831	18	1	160	94.4	5.6	100.0	0.8	0.7	0.43	0.44	0.85	0.85
831	19	1	160	83.1	16.9	100.0	0.3	0.3	0.48	0.46	0.62	0.62
831	20	1	159	99.4	0.6	100.0	0.8	0.8	0.42	0.42	0.98	0.98
831	21	1	159	98.1	1.9	100.0	0.5	0.5	0.50	0.50	0.96	0.96
831	22	1	158	86.7	13.3	100.0	0.3	0.3	0.44	0.45	0.67	0.67
831	23	1	159	98.7	1.3	100.0	0.7	0.7	0.46	0.45	0.97	0.97
831	24	1	158	98.7	1.3	100.0	0.6	0.6	0.49	0.49	0.97	0.97

Table 5. First and Second Read Descriptive Statistics and Agreement (continued)

				Agreement (%)			Raw Score Mean		Raw Score Standard Deviation			
Form	Item	Score Points	Total N-Count	Exact	Adj.	Total	First Read	Second Read	First Read	Second Read	Intra-Class Corre-lation	Wt Kappa
831	25	1	159	91.8	8.2	100.0	0.5	0.5	0.50	0.50	0.84	0.84
832	14	1	160	86.3	13.7	100.0	0.2	0.2	0.40	0.40	0.56	0.56
832	15	1	158	100.0	0.0	100.0	0.8	0.8	0.43	0.43	1.00	1.00
832	16	1	162	88.9	11.1	100.0	0.6	0.5	0.50	0.50	0.78	0.78
832	17	1	159	93.7	6.3	100.0	0.1	0.2	0.35	0.38	0.77	0.76
832	18	1	160	91.9	8.1	100.0	0.4	0.4	0.49	0.50	0.83	0.83
832	19	1	163	98.2	1.8	100.0	0.6	0.6	0.50	0.50	0.96	0.96
832	20	1	153	94.8	5.2	100.0	0.2	0.2	0.41	0.41	0.84	0.84
832	21	1	158	94.3	5.7	100.0	0.9	0.8	0.32	0.37	0.77	0.76
832	22	1	156	98.1	1.9	100.0	0.4	0.4	0.49	0.49	0.96	0.96
832	23	1	162	100.0	0.0	100.0	0.3	0.3	0.44	0.44	1.00	1.00
832	24	1	164	94.5	5.5	100.0	0.1	0.1	0.35	0.34	0.77	0.77
833	15	1	155	95.5	4.5	100.0	0.5	0.5	0.50	0.50	0.91	0.91
833	16	1	155	89.7	10.3	100.0	0.4	0.4	0.49	0.48	0.78	0.78
833	17	1	158	93.0	7.0	100.0	0.5	0.5	0.50	0.50	0.86	0.86
833	18	1	156	99.4	0.6	100.0	0.6	0.5	0.50	0.50	0.99	0.99
833	19	1	153	94.1	5.9	100.0	0.6	0.7	0.48	0.47	0.87	0.87
833	20	1	158	99.4	0.6	100.0	0.4	0.4	0.50	0.50	0.99	0.99
833	21	1	157	97.5	2.5	100.0	0.3	0.3	0.44	0.46	0.94	0.94
833	22	1	154	96.8	3.2	100.0	0.3	0.3	0.45	0.45	0.92	0.92
833	23	1	155	83.9	16.1	100.0	0.5	0.5	0.50	0.50	0.68	0.68
834	15	1	159	83.0	17.0	100.0	0.3	0.3	0.46	0.47	0.60	0.60
834	16	1	157	99.4	0.6	100.0	0.5	0.5	0.50	0.50	0.99	0.99
834	17	1	158	100.0	0.0	100.0	0.4	0.4	0.50	0.50	1.00	1.00
834	18	1	155	91.6	8.4	100.0	0.5	0.5	0.50	0.50	0.83	0.83
834	19	1	159	99.4	0.6	100.0	0.7	0.7	0.47	0.47	0.99	0.99
834	20	1	160	94.4	5.6	100.0	0.6	0.6	0.50	0.50	0.89	0.89
834	21	1	160	93.8	6.2	100.0	0.5	0.5	0.50	0.50	0.87	0.87
834	22	1	155	97.4	2.6	100.0	0.2	0.2	0.42	0.42	0.93	0.93
834	23	1	149	100.0	0.0	100.0	0.3	0.3	0.47	0.47	1.00	1.00

Table 5. First and Second Read Descriptive Statistics and Agreement (continued)

				Agreement (%)			Raw Score Mean		Raw Score Standard Deviation			
Form	Item	Score Points	Total N-Count	Exact	Adj.	Total	First Read	Second Read	First Read	Second Read	Intra-Class Corre-lation	Wt Kappa
834	24	1	158	91.1	8.9	100.0	0.2	0.2	0.40	0.41	0.73	0.73
835	15	1	159	96.9	3.1	100.0	0.7	0.7	0.47	0.47	0.93	0.93
835	16	1	162	96.9	3.1	100.0	0.3	0.3	0.47	0.46	0.93	0.93
835	17	1	155	98.1	1.9	100.0	0.3	0.3	0.48	0.47	0.96	0.96
835	18	1	158	100.0	0.0	100.0	0.8	0.8	0.37	0.37	1.00	1.00
835	19	1	160	99.4	0.6	100.0	0.7	0.7	0.47	0.47	0.99	0.99
835	20	1	157	89.8	10.2	100.0	0.2	0.2	0.42	0.39	0.69	0.69
835	21	1	155	94.8	5.2	100.0	0.3	0.3	0.45	0.44	0.87	0.87
835	22	1	152	97.4	2.6	100.0	0.2	0.2	0.42	0.42	0.92	0.92
835	23	1	161	98.8	1.2	100.0	0.4	0.4	0.50	0.50	0.97	0.97
835	24	1	160	97.5	2.5	100.0	0.6	0.6	0.50	0.49	0.95	0.95
835	25	1	155	98.1	1.9	100.0	0.2	0.2	0.41	0.42	0.94	0.94
836	15	1	163	100.0	0.0	100.0	0.6	0.6	0.49	0.49	1.00	1.00
836	16	1	160	76.9	23.1	100.0	0.5	0.5	0.50	0.50	0.53	0.53
836	17	1	161	99.4	0.6	100.0	0.7	0.7	0.46	0.45	0.98	0.98
836	18	1	162	100.0	0.0	100.0	0.2	0.2	0.41	0.41	1.00	1.00
836	19	1	157	83.4	16.6	100.0	0.4	0.3	0.48	0.48	0.64	0.64
836	20	1	155	89.0	11.0	100.0	0.7	0.6	0.47	0.49	0.77	0.76
836	21	1	158	88.0	12.0	100.0	0.3	0.2	0.44	0.43	0.68	0.68
836	22	1	160	100.0	0.0	100.0	0.3	0.3	0.46	0.46	1.00	1.00
836	23	1	161	98.8	1.2	100.0	0.4	0.4	0.49	0.49	0.97	0.97
836	24	1	157	96.2	3.8	100.0	0.3	0.3	0.44	0.44	0.90	0.90
836	25	1	163	98.8	1.2	100.0	0.1	0.1	0.34	0.35	0.95	0.95
837	13	4	161	83.9	16.1	100.0	2.3	2.3	1.05	1.01	0.93	0.85
837	14	3	159	70.4	27.0	97.5	1.7	1.8	1.06	1.05	0.84	0.73
837	15	3	160	71.9	27.5	99.4	1.5	1.5	0.90	0.89	0.81	0.70

* Adj. = difference of one

Constructed-Response Item Means and Standard Deviations

The average score for each constructed-response item was computed based on the first and second reads. In addition, the standard deviation of the scores was computed.

Table 5 contains the means and standard deviations for the first and second read scores. The largest difference between the item means for the first and second scores was 0.1, while there were minimal differences among standard deviation statistics.

Intra-class Correlation

The intra-class correlation was computed for each item. This correlation is an estimate of the reliability of scoring based on an average of the first and second reads. Correlations greater than 0.60 are considered very strong because they explain more than one-third of the variance in scores. All but ten items had intra-class correlations greater than or equal to 0.62 (See Table 5). Consistent with other information provided in the table, these values indicate a very high level of scoring reliability.

Weighted Kappa

Weighted Kappa (Cohen, 1968) was calculated for each item based on the first and second reads. This statistic produces an estimate of the reliability of the score classifications relative to what would be expected to occur by chance.

Weighted Kappa is an estimate of the reliability of the score classifications. That is, the Kappa statistic is a measure of reproducibility for categorical data. Guidelines for the evaluation of this statistic are:

- $k > 0.75$ denotes excellent reproducibility
- $0.4 < k \leq 0.75$ denotes good reproducibility
- $0 < k \leq 0.4$ denotes marginal reproducibility

The results found in Table 5 show a high degree of consistency between the first and second reads. The Weighted Kappa statistics ranged from 0.26 to 1.0, which in all but one case indicates good to excellent reproducibility.

Based on the scoring reliability analyses, there is strong evidence that the scoring of the constructed-response items was performed in a highly reliable manner.

Item Response Theory (IRT) Statistics

As discussed above, the item mean is a statistic used to evaluate item difficulty. However, many different test forms are used during field testing and different samples of students are responding to these items. The average ability of the different samples of students varies and a direct comparison of item means across test forms may lead to

inaccurate interpretations. Therefore, Item Response Theory (IRT) was also used to evaluate item difficulty.

Specifically, the Rasch Partial Credit Model (PCM) (Masters, 1982) was used. With use of this model, the difficulty of items and the ability of examinees are placed on the same metric. Thus, the difficulty of an item and the ability of a person can be meaningfully compared across field test forms. Also, the use of this model provides greater flexibility in situations where different samples or test forms are used because the parameters generated are generally not considered to be sample dependent or test dependent. A description of this model, results of item calibration, and item fit evaluation are below.

The PCM provides an overall difficulty estimate for each item. Specifically for constructed-response items when there are several points possible, individual estimates of difficulty for each of the possible score points are also calculated (i.e., step values). Each step value represents the difficulty of a student receiving a particular score point given that they have already received the prior score point. For example, if a 3-point item had step values of -1.0, 1.0, and 0.0, one could say that it is relatively easy to obtain a score of 1. However, it is much more difficult to obtain a 2 given the student has the ability to score a 1 because the difference in difficulty between a 1 and a 2 is much greater than the difference between a 0 and a 1. Also, the difference between a 2 and a 3 is not as great as the difference between a 1 and a 2. Thus, with this example, a small step is needed to go from a 0 to a 1, a large step is needed to move from a 1 to a 2, and a moderate step is needed to proceed from a 2 to a 3.

Item Calibration

As discussed above, the use of Rasch item difficulty statistics provide an advantage over the use of classical item means because they can be compared across test forms. Different samples of students responded to the various test forms. Although the samples were selected to be similar with respect to student ability, there are differences. By equating the test forms (See the Equating Procedure section below), the Rasch item difficulties account for those differences and these statistics can be compared across test forms.

Rasch item difficulty values generally range from -3.00 to +3.00. An item with a Rasch difficulty greater than +2.0 is considered very difficult and should be examined carefully. If the item is measuring an important concept that students are having difficulty with, then the item can be useful. However, if the item is measuring a trivial concept or is written in a confusing manner, then it may not be appropriate to use on an operational test form. Likewise, any item with a Rasch difficulty less than -2.0 is considered very easy and usually provides little information regarding student achievement. The vast majority of test items should range between -2.0 and +2.0. This range represents approximately two standard deviations around the average difficulty of 0. Thus, one would expect that, based on chance, roughly 5% of the items will fall outside of that range and therefore, these are items that should be closely examined for content.

Item Fit Evaluation

The INFIT statistic is used to determine whether items are functioning in a way that is congruent with the assumptions of the Rasch model. Under these assumptions, how a student will respond to an item depends on the proficiency of the student and the difficulty of the item, both of which are on the same measurement scale. If an item is as difficult as a student is able, the student will have a 50% chance of getting the item correct. If a student is more able than an item is difficult, under the assumptions of the Rasch model, that student has a greater than 50% chance of correctly answering the item. On the other hand, if the item is more difficult than the student is able, he or she has a less than 50% chance of correctly responding to the item. Rasch fit statistics estimate the extent to which an item is functioning in this predicted manner. Items showing a poor fit with the Rasch model typically have values outside the range of 0.7 to 1.3.

Table 6 contains a summary of the Partial Credit Model item analysis for each of the field test forms. The first column lists the form numbers. The next two columns list the number of students who participated and the number of items on each field test form. The remaining columns are divided into two sections. The first section pertains to the Rasch item difficulties while the second pertains to the INFIT statistics. Most of the items fell within the moderate -2.0 to +2.0 difficulty range and only one item had an INFIT statistic outside the typical range.

Table 6. Partial Credit Model Item Analysis

			Rasch			INFIT		
Form	N-Count	No. of Items	<-2.0	-2.0 to 2.0	>2.0	<-0.70	-0.70 to 1.30	>1.30
821	1,136	25	1	23	1	0	25	0
822	1,123	24	1	22	1	0	24	0
823	1,126	25	0	22	3	0	25	0
824	1,129	25	0	23	2	0	24	1
825	1,127	25	0	24	1	0	25	0
826	1,113	25	0	23	2	0	25	0
827	1,121	25	1	23	1	0	25	0
828	1,117	25	0	24	1	0	25	0
829	1,124	24	1	23	0	0	24	0
830	1,120	25	1	22	2	0	25	0
831	1,107	25	0	25	0	0	25	0
832	1,117	24	0	22	2	0	24	0
833	1,101	23	2	21	0	0	23	0
834	1,099	24	2	21	0	0	23	0
835	1,097	25	2	22	1	0	25	0
836	1,103	25	0	24	1	0	25	0
837	1,113	15	1	14	0	0	15	0

* For some forms, the item counts in the 'Rasch' and 'INFIT' columns may not sum to the value in the 'No. of Items' column due to 'DNS' (do not score) items.

All of the individual IRT item statistics are provided in Appendix B. The column titled RID contains the Rasch item difficulty statistics. S1–S6 contain the step values for the constructed-response items. Finally, INFIT contains the INFIT statistic for each item.

Differential Item Functioning (DIF) Statistics

Statistical procedures are employed to observe whether, on the basis of data, there exists the possibility of unfair treatment of different populations. DIF statistics are used to identify items for which members of a focal group have a different probability of getting the items correct than members of a reference group after the groups have been matched on ability level on the test.

For the multiple-choice items, the Mantel-Haenszel Delta (MHD) DIF statistics were computed (Dorans & Holland, 1992) to classify test items in three levels of DIF for each comparison: negligible DIF (A), moderate DIF (B), and large DIF (C). An item was flagged if it exhibited a B or C category of DIF using the following rules derived from

National Assessment of Educational Progress (NAEP) guidelines (Allen, Carlson, & Zalanak, 1999):

- MHD not significantly different from 0 (based on alpha = 0.05) **or** |MHD| < 1.0 are classified as A.

- MHD significantly different from 0 and {|MHD| ≥ 1.0 and < 1.5} **or**
  MHD not significantly different from 0 and |MHD| ≥ 1.0 are classified as B.

- |MHD| ≥ 1.5 and significantly different from 0 are classified as C.

For the constructed-response items, the effect size of the standardized mean difference (SMD) was used to flag DIF. The SMD reflects the size of the differences in performance on constructed-response items between student groups matched on the total score. It is the difference between the unweighted item mean of the focal group and the weighted item mean of the reference group. The weights applied to the reference group are applied so that the weighted number of reference group students is the same as in the focal group (within the same ability group). The SMD is divided by the total group item standard deviation to get a measure of the effect size (ES) for the SMD. The SMD effect size groups each item into one of three categories: negligible DIF (AA), moderate DIF (BB), and large DIF (CC). Only categories BB and CC were flagged in the results.

- Probability is > 0.05 **or** if |ES| is ≤ 0.17, classified as AA.

- Probability is > 0.05 and if 0.17 < |ES| ≤ 0.25, classified as BB.

- Probability is > 0.05 and if |ES| is > 0.25, classified as CC.

Although DIF statistics are typically conducted by gender and ethnicity, the low n-counts for ethnic subgroups did not allow for these statistics to be meaningful. The n-counts for gender allowed for comparisons to be made but were still somewhat low, so resulting statistics should be interpreted with caution.

The DIF statistics for gender are shown in Appendix C. Flagging of items appears in the 'DIF Category' column, and if an item is flagged, the 'Favored Group' column indicates which gender is favored.

Section III: Equating Procedure

The 2010 field test administration for the New York State Regents Examination in Chemistry consisted of 16 field test forms numbered 821–836 and one anchor form labeled 837. The field test forms contained multiple-choice and constructed-response items. All students participating in the field test were administered one of the 17 test forms. The test forms were spiraled within the classroom so that the groups of students

taking each form were equivalent. A complete listing of these field test forms can be seen in Appendix A, where item type (e.g., multiple-choice, constructed-response) and the maximum points for each item are displayed.

The anchor form was equated to the item bank using a common-item equating design. The anchor item difficulty parameters were fixed to their 2009 item bank values. This places the item difficulty estimates and the ability estimates of the students taking the anchor form onto the item bank scale. After the anchor form was placed onto the bank scale, the mean ability estimates for the form was computed using ability estimates of non-extreme students. This ability estimate was used to equate the remaining field test forms as well as update the item parameters for the anchor form.

As part of the anchor item equating, an item-stability check was performed. After fixing all of the items to their 2009 bank values, any item with a displacement value with a magnitude greater than 0.30 was no longer fixed and the test form was reanalyzed. If more than one item had a displacement value with a magnitude greater than 0.30, then the item with the largest displacement was freed and the test form was reanalyzed. In a stepwise fashion, this procedure was repeated until all remaining fixed anchor items had displacements with magnitudes less than or equal to 0.30.

Applying the anchor item-stability check to the anchor form resulted in one item having a displacement value with a magnitude greater than 0.30. This indicates a strong level of stability in the items used on the anchor form.

The equated mean ability estimate for form 837 was 0.24. This value served as the target mean ability estimate for the equating process.

After the anchor form was equated and the target mean was computed, the field test forms were equated using the equivalent groups design. The first step was to calibrate each form separately, where all the item parameters were free to estimate (without constraint). From those initial calibrations, the mean ability estimates for each field test form were obtained. The second step was to determine the equating constant for each form by subtracting the mean ability for a given field test form from the target mean ability calculated from the anchor form (i.e., form 837). The respective equating constant was then added to each of the item parameters on a given form. If the resulting mean of the ability estimates for those students did not equal that of the target mean, then the procedure was repeated until the mean abilities for each of the field test forms equaled the target mean ability. Table 7 shows the mean abilities and constants used for the equating.

Table 7. Initial Mean Abilities and Equating Constants

Form Number	Mean Ability	Constant
821	-0.28	0.50
822	0.41	-0.16
823	-0.19	0.42
824	-0.33	0.55
825	-0.06	0.29
826	-0.11	0.34
827	0.06	0.18
828	0.01	0.22
829	0.36	-0.11
830	-0.14	0.37
831	0.33	-0.09
832	-0.11	0.34
833	0.10	0.14
834	0.28	-0.03
835	0.33	-0.08
836	-0.06	0.30

The equated item parameters for the field test items can now be compared across test forms since the equating process places all items on the same scale. In addition, when items are combined to form unique operational test forms, raw score to scale score tables can be generated based on these parameters. The following section contains a description of the development of the operational test forms and scoring tables.

Section IV: Scaling of Operational Test Forms

Operational test items are selected based on content coverage, content accuracy, and statistical quality. The sets of items on each operational test conform to the coverage suggested by content experts. These expert judgments are based on the learning standards established by the New York State Education Department. With respect to statistical quality, classical and Rasch statistics are examined to determine how well items function. Also, items are selected such that they range in difficulty in order to measure students across ability levels. Appendix D contains the 2010 operational test maps with content information regarding each item included on the January 2010, June 2010, and August 2010 operational test forms.

In order to limit wide fluctuations of raw scores that correspond to scale scores of 65 and 85 across administrations, the average Rasch item difficulty for the operational test

is considered. For this examination, an average Rasch difficulty of approximately -0.088 is used as a target for each administration. In most cases, meeting this target will provide raw scores of similar magnitude to other forms. However, differences with these scores also occur due to the distribution of the Rasch item difficulty parameters.

Scoring tables display the relationship between raw scores on the operational test and assigned scale scores. Appendix E contains the scoring tables used for January, June, and August 2010 operational test forms. Four steps are taken in order to produce these tables and resulting conversion charts.

The first step is to develop a raw score (i.e., number of points on the test form) to theta (i.e., student ability) to scale score relationship for the baseline operational test form. This relationship is determined when standards are set and then used for every administration moving forward until the standards are revisited. The baseline target was determined by the New York State Education Department to be June 2004. The raw score to theta relationship from that examination was used and then scale scores are calculated based on the raw score cuts according to the following formula:

$$p(x) = m_3x^3 + m_2x^2 + m_1x + m_0$$

The raw score of zero was assigned a scale score of zero and the maximum raw score was assigned a scale score of 100. The raw scores corresponding to the scale scores of 65 and 85 were also fixed. The polynomial relationship shown above was then used to assign all scale scores to the remaining raw scores. The resulting values for $m_1 – m_3$ are the transformation constants used to produce the final raw score to scale score table.

The second step is to develop a raw score to theta relationship for the new operational test form using the field test equated PCM item parameters. This is accomplished by doing a calibration where all items are anchored to their field test parameters. The number of points on the test form (i.e., raw score) expected across student ability levels is based on the difficulty of the items on the form. Thus, given a particular student ability level (i.e., theta), if the points are more difficult to earn on the new test than the points on the June 2004 test, the number of points expected of this student on the new test will be less than the number of points expected of this student on the baseline form.

The third step is to use linear interpolation to determine the raw score to theta to scale score relationship for the new test. The theta values associated with scale scores of 65 and 85 on the baseline form are used along with the raw score to theta relationship developed in the previous step. In other words, the baseline 65 and 85 theta values are used as reference points and linear interpolation assigns the other scale scores.

Finally, a conversion chart is created based on the scoring table generated in the third step. Scale scores are rounded to the nearest whole number in all cases except

for 0, 65, 85, and 100. A raw score of zero is assigned a scale score of zero. The maximum raw score is assigned a scale score of 100. With respect to 65 and 85 scale scores, the raw scores with scale scores of 65 or 85 after rounding are assigned those values.

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Appendix A: Classical Item Analysis

Table 8. Classical Item Analysis

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	821	MC	01	1	1,136	0.80	0.00		0.88	0.05	0.04	0.02			0.88	0.35
2010_Chem_FT	821	MC	02	1	1,136	0.80	0.00		0.08	0.67	0.15	0.10			0.67	0.43
2010_Chem_FT	821	MC	03	1	1,136	0.80	0.00		0.19	0.15	0.25	0.40			0.40	0.24
2010_Chem_FT	821	MC	04	1	1,136	0.80	0.01		0.46	0.08	0.27	0.17			0.27	0.40
2010_Chem_FT	821	MC	05	1	1,136	0.80	0.00		0.08	0.18	0.57	0.17			0.57	0.45
2010_Chem_FT	821	MC	06	1	1,136	0.80	0.02		0.08	0.14	0.18	0.58			0.58	0.30
2010_Chem_FT	821	MC	07	1	1,136	0.80	0.01		0.17	0.37	0.15	0.31			0.37	0.21
2010_Chem_FT	821	MC	08	1	1,136	0.80	0.01		0.35	0.04	0.49	0.11			0.49	0.36
2010_Chem_FT	821	MC	09	1	1,136	0.80	0.01		0.09	0.08	0.06	0.76			0.76	0.35
2010_Chem_FT	821	MC	10	1	1,136	0.80	0.00		0.03	0.11	0.17	0.69			0.69	0.43
2010_Chem_FT	821	MC	11	1	1,136	0.80	0.02		0.13	0.49	0.16	0.20			0.49	0.28
2010_Chem_FT	821	MC	12	1	1,136	0.80	0.03		0.48	0.23	0.19	0.06			0.48	0.50
2010_Chem_FT	821	MC	13	1	1,136	0.80	0.03		0.10	0.13	0.27	0.47			0.47	0.51
2010_Chem_FT	821	MC	14	1	1,136	0.80	0.04		0.38	0.19	0.23	0.16			0.38	0.27
2010_Chem_FT	821	CR	15	1	1,136	0.80	0.11	0.48	0.41						0.41	0.39
2010_Chem_FT	821	CR	16	1	1,136	0.80	0.12	0.56	0.32						0.32	0.58
2010_Chem_FT	821	CR	17	1	1,136	0.80	0.37	0.51	0.12						0.12	0.45
2010_Chem_FT	821	CR	18	1	1,136	0.80	0.26	0.42	0.32						0.32	0.58
2010_Chem_FT	821	CR	19	1	1,136	0.80	0.23	0.25	0.51						0.51	0.57
2010_Chem_FT	821	CR	20	1	1,136	0.80	0.28	0.51	0.20						0.20	0.35
2010_Chem_FT	821	CR	21	1	1,136	0.80	0.22	0.51	0.27						0.27	0.45

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	821	CR	22	1	1,136	0.80	0.25	0.35	0.41						0.41	0.48
2010_Chem_FT	821	CR	23	1	1,136	0.80	0.23	0.26	0.50						0.50	0.58
2010_Chem_FT	821	CR	24	1	1,136	0.80	0.31	0.29	0.40						0.40	0.54
2010_Chem_FT	821	CR	25	1	1,136	0.80	0.37	0.43	0.20						0.20	0.47
2010_Chem_FT	822	MC	01	1	1,123	0.82	0.00		0.03	0.12	0.06	0.79			0.79	0.41
2010_Chem_FT	822	MC	02	1	1,123	0.82	0.00		0.92	0.05	0.02	0.01			0.92	0.33
2010_Chem_FT	822	MC	03	1	1,123	0.82	0.01		0.02	0.77	0.11	0.10			0.77	0.36
2010_Chem_FT	822	MC	04	1	1,123	0.82	0.00		0.35	0.05	0.54	0.06			0.54	0.42
2010_Chem_FT	822	MC	05	1	1,123	0.82	0.00		0.20	0.57	0.14	0.09			0.57	0.46
2010_Chem_FT	822	MC	06	1	1,123	0.82	0.01		0.39	0.21	0.29	0.09			0.39	0.37
2010_Chem_FT	822	MC	07	1	1,123	0.82	0.01		0.17	0.04	0.09	0.70			0.70	0.52
2010_Chem_FT	822	MC	08	1	1,123	0.82	0.01		0.15	0.05	0.11	0.68			0.68	0.43
2010_Chem_FT	822	MC	09	1	1,123	0.82	0.01		0.15	0.13	0.67	0.04			0.67	0.40
2010_Chem_FT	822	MC	10	1	1,123	0.82	0.01		0.05	0.12	0.71	0.11			0.71	0.54
2010_Chem_FT	822	MC	11	1	1,123	0.82	0.01		0.03	0.78	0.12	0.06			0.78	0.43
2010_Chem_FT	822	MC	12	1	1,123	0.82	0.01		0.06	0.07	0.58	0.28			0.58	0.44
2010_Chem_FT	822	MC	13	1	1,123	0.82	0.01		0.75	0.06	0.09	0.09			0.75	0.50
2010_Chem_FT	822	MC	14	1	1,123	0.82	0.01		0.17	0.61	0.11	0.09			0.61	0.38
2010_Chem_FT	822	CR	15	1	1,123	0.82	0.11	0.18	0.71						0.71	0.54
2010_Chem_FT	822	CR	16	1	1,123	0.82	0.10	0.34	0.56						0.56	0.51
2010_Chem_FT	822	CR	17	1	1,123	0.82	0.08	0.28	0.64						0.64	0.52
2010_Chem_FT	822	CR	18	1	1,123	0.82	0.12	0.34	0.54						0.54	0.42
2010_Chem_FT	822	CR	19	1	1,123	0.82	0.28	0.39	0.33						0.33	0.49

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	822	CR	20	1	1,123	0.82	0.28	0.45	0.27						0.27	0.43
2010_Chem_FT	822	CR	21	1	1,123	0.82	0.31	0.60	0.09						0.09	0.33
2010_Chem_FT	822	CR	22	1	1,123	0.82	0.15	0.25	0.60						0.60	0.51
2010_Chem_FT	822	CR	23	1	1,123	0.82	0.24	0.37	0.39						0.39	0.53
2010_Chem_FT	822	CR	24	1	1,123	0.82	0.27	0.51	0.21						0.21	0.40
2010_Chem_FT	823	MC	01	1	1,126	0.83	0.01		0.16	0.77	0.02	0.04			0.77	0.42
2010_Chem_FT	823	MC	02	1	1,126	0.83	0.02		0.12	0.14	0.57	0.15			0.57	0.28
2010_Chem_FT	823	MC	03	1	1,126	0.83	0.01		0.22	0.62	0.09	0.05			0.62	0.52
2010_Chem_FT	823	MC	04	1	1,126	0.83	0.01		0.80	0.05	0.08	0.06			0.80	0.45
2010_Chem_FT	823	MC	05	1	1,126	0.83	0.01		0.02	0.34	0.42	0.21			0.42	0.34
2010_Chem_FT	823	MC	06	1	1,126	0.83	0.01		0.22	0.07	0.22	0.48			0.48	0.54
2010_Chem_FT	823	MC	07	1	1,126	0.83	0.00		0.05	0.72	0.19	0.03			0.72	0.30
2010_Chem_FT	823	MC	08	1	1,126	0.83	0.01		0.55	0.27	0.06	0.11			0.55	0.33
2010_Chem_FT	823	MC	09	1	1,126	0.83	0.01		0.68	0.06	0.16	0.09			0.68	0.53
2010_Chem_FT	823	MC	10	1	1,126	0.83	0.01		0.14	0.60	0.16	0.10			0.60	0.42
2010_Chem_FT	823	MC	11	1	1,126	0.83	0.02		0.09	0.10	0.66	0.13			0.66	0.37
2010_Chem_FT	823	MC	12	1	1,126	0.83	0.01		0.60	0.27	0.07	0.05			0.60	0.52
2010_Chem_FT	823	MC	13	1	1,126	0.83	0.02		0.24	0.22	0.19	0.33			0.33	0.43
2010_Chem_FT	823	MC	14	1	1,126	0.83	0.03		0.14	0.44	0.17	0.22			0.44	0.46
2010_Chem_FT	823	CR	15	1	1,126	0.83	0.23	0.42	0.35						0.35	0.52
2010_Chem_FT	823	CR	16	1	1,126	0.83	0.21	0.52	0.27						0.27	0.49
2010_Chem_FT	823	CR	17	1	1,126	0.83	0.14	0.17	0.68						0.68	0.44
2010_Chem_FT	823	CR	18	1	1,126	0.83	0.32	0.52	0.16						0.16	0.41

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	823	CR	19	1	1,126	0.83	0.29	0.42	0.29						0.29	0.41
2010_Chem_FT	823	CR	20	1	1,126	0.83	0.31	0.51	0.18						0.18	0.47
2010_Chem_FT	823	CR	21	1	1,126	0.83	0.38	0.36	0.26						0.26	0.54
2010_Chem_FT	823	CR	22	1	1,126	0.83	0.21	0.50	0.29						0.29	0.52
2010_Chem_FT	823	CR	23	1	1,126	0.83	0.25	0.59	0.16						0.16	0.40
2010_Chem_FT	823	CR	24	1	1,126	0.83	0.31	0.44	0.25						0.25	0.49
2010_Chem_FT	823	CR	25	1	1,126	0.83	0.28	0.16	0.56						0.56	0.54
2010_Chem_FT	824	MC	01	1	1,129	0.82	0.01		0.19	0.04	0.72	0.04			0.72	0.49
2010_Chem_FT	824	MC	02	1	1,129	0.82	0.01		0.45	0.29	0.23	0.02			0.45	0.42
2010_Chem_FT	824	MC	03	1	1,129	0.82	0.01		0.16	0.11	0.17	0.54			0.54	0.42
2010_Chem_FT	824	MC	04	1	1,129	0.82	0.01		0.09	0.09	0.72	0.10			0.72	0.36
2010_Chem_FT	824	MC	05	1	1,129	0.82	0.01		0.09	0.54	0.21	0.16			0.54	0.29
2010_Chem_FT	824	MC	06	1	1,129	0.82	0.01		0.16	0.33	0.03	0.47			0.47	0.45
2010_Chem_FT	824	MC	07	1	1,129	0.82	0.02		0.59	0.09	0.21	0.09			0.59	0.40
2010_Chem_FT	824	MC	08	1	1,129	0.82	0.02		0.59	0.19	0.08	0.12			0.59	0.39
2010_Chem_FT	824	MC	09	1	1,129	0.82	0.01		0.68	0.12	0.10	0.09			0.68	0.39
2010_Chem_FT	824	MC	10	1	1,129	0.82	0.01		0.11	0.16	0.13	0.60			0.60	0.47
2010_Chem_FT	824	MC	11	1	1,129	0.82	0.01		0.45	0.43	0.04	0.06			0.45	0.51
2010_Chem_FT	824	MC	12	1	1,129	0.82	0.02		0.08	0.71	0.11	0.09			0.71	0.48
2010_Chem_FT	824	MC	13	1	1,129	0.82	0.02		0.22	0.19	0.48	0.08			0.48	0.33
2010_Chem_FT	824	MC	14	1	1,129	0.82	0.02		0.07	0.07	0.44	0.39			0.39	0.14
2010_Chem_FT	824	CR	15	1	1,129	0.82	0.18	0.61	0.20						0.20	0.46
2010_Chem_FT	824	CR	16	1	1,129	0.82	0.19	0.66	0.14						0.14	0.36

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	824	CR	17	1	1,129	0.82	0.18	0.61	0.21						0.21	0.41
2010_Chem_FT	824	CR	18	1	1,129	0.82	0.20	0.41	0.39						0.39	0.52
2010_Chem_FT	824	CR	19	1	1,129	0.82	0.25	0.41	0.35						0.35	0.60
2010_Chem_FT	824	CR	20	1	1,129	0.82	0.20	0.40	0.39						0.39	0.52
2010_Chem_FT	824	CR	21	1	1,129	0.82	0.26	0.30	0.45						0.45	0.44
2010_Chem_FT	824	CR	22	1	1,129	0.82	0.35	0.34	0.31						0.31	0.46
2010_Chem_FT	824	CR	23	1	1,129	0.82	0.30	0.42	0.28						0.28	0.52
2010_Chem_FT	824	CR	24	1	1,129	0.82	0.34	0.57	0.10						0.10	0.40
2010_Chem_FT	824	CR	25	1	1,129	0.82	0.33	0.39	0.28						0.28	0.55
2010_Chem_FT	825	MC	01	1	1,127	0.81	0.00		0.06	0.04	0.05	0.85			0.85	0.37
2010_Chem_FT	825	MC	02	1	1,127	0.81	0.01		0.64	0.07	0.23	0.05			0.64	0.20
2010_Chem_FT	825	MC	03	1	1,127	0.81	0.00		0.01	0.02	0.77	0.19			0.77	0.39
2010_Chem_FT	825	MC	04	1	1,127	0.81	0.01		0.12	0.06	0.09	0.73			0.73	0.39
2010_Chem_FT	825	MC	05	1	1,127	0.81	0.01		0.03	0.24	0.35	0.38			0.38	0.47
2010_Chem_FT	825	MC	06	1	1,127	0.81	0.01		0.26	0.06	0.10	0.57			0.57	0.39
2010_Chem_FT	825	MC	07	1	1,127	0.81	0.01		0.05	0.09	0.39	0.46			0.46	0.30
2010_Chem_FT	825	MC	08	1	1,127	0.81	0.01		0.06	0.70	0.07	0.15			0.70	0.34
2010_Chem_FT	825	MC	09	1	1,127	0.81	0.01		0.15	0.27	0.54	0.04			0.54	0.36
2010_Chem_FT	825	MC	10	1	1,127	0.81	0.01		0.07	0.69	0.17	0.06			0.69	0.47
2010_Chem_FT	825	MC	11	1	1,127	0.81	0.02		0.11	0.68	0.09	0.10			0.68	0.46
2010_Chem_FT	825	MC	12	1	1,127	0.81	0.01		0.32	0.10	0.24	0.33			0.33	0.41
2010_Chem_FT	825	MC	13	1	1,127	0.81	0.01		0.51	0.06	0.28	0.14			0.51	0.46
2010_Chem_FT	825	MC	14	1	1,127	0.81	0.03		0.15	0.14	0.27	0.41			0.41	0.49

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	825	CR	15	1	1,127	0.81	0.13	0.42	0.46						0.46	0.34
2010_Chem_FT	825	CR	16	1	1,127	0.81	0.12	0.48	0.40						0.40	0.41
2010_Chem_FT	825	CR	17	1	1,127	0.81	0.17	0.58	0.24						0.24	0.46
2010_Chem_FT	825	CR	18	1	1,127	0.81	0.16	0.33	0.51						0.51	0.52
2010_Chem_FT	825	CR	19	1	1,127	0.81	0.24	0.37	0.39						0.39	0.60
2010_Chem_FT	825	CR	20	1	1,127	0.81	0.19	0.71	0.10						0.10	0.28
2010_Chem_FT	825	CR	21	1	1,127	0.81	0.20	0.34	0.47						0.47	0.51
2010_Chem_FT	825	CR	22	1	1,127	0.81	0.20	0.15	0.65						0.65	0.45
2010_Chem_FT	825	CR	23	1	1,127	0.81	0.36	0.40	0.24						0.24	0.51
2010_Chem_FT	825	CR	24	1	1,127	0.81	0.33	0.37	0.30						0.30	0.41
2010_Chem_FT	825	CR	25	1	1,127	0.81	0.34	0.43	0.23						0.23	0.51
2010_Chem_FT	826	MC	01	1	1,113	0.83	0.00		0.10	0.11	0.74	0.05			0.74	0.46
2010_Chem_FT	826	MC	02	1	1,113	0.83	0.01		0.16	0.59	0.19	0.06			0.59	0.33
2010_Chem_FT	826	MC	03	1	1,113	0.83	0.01		0.65	0.05	0.16	0.12			0.65	0.47
2010_Chem_FT	826	MC	04	1	1,113	0.83	0.01		0.18	0.16	0.43	0.21			0.43	0.31
2010_Chem_FT	826	MC	05	1	1,113	0.83	0.01		0.57	0.11	0.26	0.04			0.57	0.48
2010_Chem_FT	826	MC	06	1	1,113	0.83	0.01		0.08	0.73	0.09	0.09			0.73	0.42
2010_Chem_FT	826	MC	07	1	1,113	0.83	0.01		0.24	0.16	0.55	0.04			0.55	0.41
2010_Chem_FT	826	MC	08	1	1,113	0.83	0.02		0.68	0.10	0.09	0.10			0.68	0.40
2010_Chem_FT	826	MC	09	1	1,113	0.83	0.01		0.04	0.07	0.15	0.74			0.74	0.42
2010_Chem_FT	826	MC	10	1	1,113	0.83	0.01		0.63	0.12	0.16	0.08			0.63	0.46
2010_Chem_FT	826	MC	11	1	1,113	0.83	0.02		0.16	0.12	0.12	0.58			0.58	0.46
2010_Chem_FT	826	MC	12	1	1,113	0.83	0.02		0.14	0.24	0.50	0.10			0.50	0.26

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	826	MC	13	1	1,113	0.83	0.01		0.23	0.12	0.36	0.27			0.36	0.36
2010_Chem_FT	826	MC	14	1	1,113	0.83	0.02		0.24	0.59	0.11	0.05			0.59	0.41
2010_Chem_FT	826	CR	15	1	1,113	0.83	0.21	0.39	0.40						0.40	0.44
2010_Chem_FT	826	CR	16	1	1,113	0.83	0.26	0.61	0.13						0.13	0.35
2010_Chem_FT	826	CR	17	1	1,113	0.83	0.23	0.40	0.36						0.36	0.48
2010_Chem_FT	826	CR	18	1	1,113	0.83	0.21	0.43	0.36						0.36	0.52
2010_Chem_FT	826	CR	19	1	1,113	0.83	0.19	0.35	0.46						0.46	0.53
2010_Chem_FT	826	CR	20	1	1,113	0.83	0.25	0.54	0.22						0.22	0.44
2010_Chem_FT	826	CR	21	1	1,113	0.83	0.19	0.32	0.49						0.49	0.52
2010_Chem_FT	826	CR	22	1	1,113	0.83	0.29	0.37	0.33						0.33	0.55
2010_Chem_FT	826	CR	23	1	1,113	0.83	0.31	0.34	0.34						0.34	0.55
2010_Chem_FT	826	CR	24	1	1,113	0.83	0.36	0.22	0.42						0.42	0.60
2010_Chem_FT	826	CR	25	1	1,113	0.83	0.34	0.48	0.19						0.19	0.44
2010_Chem_FT	827	MC	01	1	1,121	0.78	0.01		0.30	0.63	0.04	0.02			0.63	0.43
2010_Chem_FT	827	MC	02	1	1,121	0.78	0.00		0.46	0.06	0.47	0.01			0.47	0.43
2010_Chem_FT	827	MC	03	1	1,121	0.78	0.00		0.13	0.53	0.17	0.17			0.53	0.46
2010_Chem_FT	827	MC	04	1	1,121	0.78	0.01		0.27	0.13	0.08	0.52			0.52	0.46
2010_Chem_FT	827	MC	05	1	1,121	0.78	0.00		0.05	0.09	0.02	0.84			0.84	0.42
2010_Chem_FT	827	MC	06	1	1,121	0.78	0.01		0.14	0.60	0.16	0.09			0.60	0.20
2010_Chem_FT	827	MC	07	1	1,121	0.78	0.00		0.10	0.28	0.59	0.03			0.28	0.28
2010_Chem_FT	827	MC	08	1	1,121	0.78	0.00		0.12	0.54	0.16	0.18			0.54	0.24
2010_Chem_FT	827	MC	09	1	1,121	0.78	0.00		0.11	0.08	0.69	0.12			0.69	0.41
2010_Chem_FT	827	MC	10	1	1,121	0.78	0.02		0.14	0.22	0.46	0.16			0.46	0.29

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	827	MC	11	1	1,121	0.78	0.01		0.07	0.17	0.02	0.74			0.74	0.21
2010_Chem_FT	827	MC	12	1	1,121	0.78	0.01		0.02	0.04	0.04	0.90			0.90	0.46
2010_Chem_FT	827	MC	13	1	1,121	0.78	0.02		0.09	0.12	0.64	0.13			0.64	0.32
2010_Chem_FT	827	MC	14	1	1,121	0.78	0.03		0.22	0.12	0.47	0.16			0.47	0.22
2010_Chem_FT	827	CR	15	1	1,121	0.78	0.05	0.41	0.54						0.54	0.51
2010_Chem_FT	827	CR	16	1	1,121	0.78	0.06	0.34	0.60						0.60	0.38
2010_Chem_FT	827	CR	17	1	1,121	0.78	0.11	0.40	0.48						0.48	0.47
2010_Chem_FT	827	CR	18	1	1,121	0.78	0.10	0.35	0.54						0.54	0.56
2010_Chem_FT	827	CR	19	1	1,121	0.78	0.12	0.40	0.48						0.48	0.53
2010_Chem_FT	827	CR	20	1	1,121	0.78	0.13	0.35	0.51						0.51	0.53
2010_Chem_FT	827	CR	21	1	1,121	0.78	0.23	0.39	0.39						0.39	0.56
2010_Chem_FT	827	CR	22	1	1,121	0.78	0.23	0.51	0.26						0.26	0.53
2010_Chem_FT	827	CR	23	1	1,121	0.78	0.38	0.53	0.09						0.09	0.34
2010_Chem_FT	827	CR	24	1	1,121	0.78	0.34	0.45	0.21						0.21	0.36
2010_Chem_FT	827	CR	25	1	1,121	0.78	0.27	0.32	0.40						0.40	0.48
2010_Chem_FT	828	MC	01	1	1,117	0.82	0.00		0.19	0.07	0.69	0.05			0.69	0.37
2010_Chem_FT	828	MC	02	1	1,117	0.82	0.00		0.79	0.12	0.08	0.01			0.79	0.36
2010_Chem_FT	828	MC	03	1	1,117	0.82	0.01		0.40	0.16	0.36	0.07			0.40	0.41
2010_Chem_FT	828	MC	04	1	1,117	0.82	0.01		0.42	0.51	0.04	0.02			0.42	0.31
2010_Chem_FT	828	MC	05	1	1,117	0.82	0.01		0.12	0.07	0.09	0.71			0.71	0.42
2010_Chem_FT	828	MC	06	1	1,117	0.82	0.01		0.26	0.15	0.07	0.50			0.50	0.28
2010_Chem_FT	828	MC	07	1	1,117	0.82	0.02		0.09	0.44	0.26	0.19			0.44	0.24
2010_Chem_FT	828	MC	08	1	1,117	0.82	0.02		0.21	0.14	0.59	0.05			0.59	0.45

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	828	MC	09	1	1,117	0.82	0.00		0.76	0.07	0.09	0.07			0.76	0.52
2010_Chem_FT	828	MC	10	1	1,117	0.82	0.02		0.12	0.14	0.52	0.20			0.52	0.35
2010_Chem_FT	828	MC	11	1	1,117	0.82	0.02		0.68	0.07	0.18	0.05			0.68	0.46
2010_Chem_FT	828	MC	12	1	1,117	0.82	0.01		0.64	0.07	0.13	0.14			0.64	0.56
2010_Chem_FT	828	MC	13	1	1,117	0.82	0.01		0.59	0.07	0.29	0.04			0.59	0.49
2010_Chem_FT	828	CR	14	1	1,117	0.82	0.14	0.19	0.67						0.67	0.39
2010_Chem_FT	828	CR	15	1	1,117	0.82	0.12	0.38	0.50						0.50	0.52
2010_Chem_FT	828	CR	16	1	1,117	0.82	0.17	0.39	0.44						0.44	0.60
2010_Chem_FT	828	CR	17	1	1,117	0.82	0.17	0.31	0.52						0.52	0.53
2010_Chem_FT	828	CR	18	1	1,117	0.82	0.19	0.52	0.30						0.30	0.43
2010_Chem_FT	828	CR	19	1	1,117	0.82	0.24	0.22	0.54						0.54	0.61
2010_Chem_FT	828	CR	20	1	1,117	0.82	0.32	0.42	0.26						0.26	0.45
2010_Chem_FT	828	CR	21	1	1,117	0.82	0.28	0.31	0.41						0.41	0.33
2010_Chem_FT	828	CR	22	1	1,117	0.82	0.27	0.28	0.45						0.45	0.42
2010_Chem_FT	828	CR	23	1	1,117	0.82	0.29	0.42	0.29						0.29	0.51
2010_Chem_FT	828	CR	24	1	1,117	0.82	0.38	0.48	0.14						0.14	0.42
2010_Chem_FT	828	CR	25	1	1,117	0.82	0.35	0.26	0.40						0.40	0.44
2010_Chem_FT	829	MC	01	1	1,124	0.82	0.00		0.10	0.02	0.83	0.05			0.83	0.44
2010_Chem_FT	829	MC	02	1	1,124	0.82	0.00		0.93	0.06	0.01	0.00			0.93	0.28
2010_Chem_FT	829	MC	03	1	1,124	0.82	0.00		0.01	0.03	0.11	0.85			0.85	0.36
2010_Chem_FT	829	MC	04	1	1,124	0.82	0.01		0.13	0.14	0.15	0.57			0.57	0.49
2010_Chem_FT	829	MC	05	1	1,124	0.82	0.00		0.19	0.29	0.13	0.38			0.38	0.37
2010_Chem_FT	829	MC	06	1	1,124	0.82	0.00		0.70	0.22	0.05	0.04			0.70	0.45

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	829	MC	07	1	1,124	0.82	0.01		0.13	0.16	0.46	0.24			0.46	0.25
2010_Chem_FT	829	MC	08	1	1,124	0.82	0.01		0.85	0.03	0.06	0.05			0.85	0.45
2010_Chem_FT	829	MC	09	1	1,124	0.82	0.01		0.31	0.12	0.49	0.08			0.49	0.35
2010_Chem_FT	829	MC	10	1	1,124	0.82	0.00		0.41	0.09	0.42	0.07			0.42	0.43
2010_Chem_FT	829	MC	11	1	1,124	0.82	0.01		0.13	0.75	0.08	0.03			0.75	0.42
2010_Chem_FT	829	MC	12	1	1,124	0.82	0.01		0.15	0.48	0.10	0.26			0.48	0.23
2010_Chem_FT	829	MC	13	1	1,124	0.82	0.01		0.18	0.15	0.18	0.49			0.49	0.48
2010_Chem_FT	829	MC	14	1	1,124	0.82	0.03		0.07	0.62	0.08	0.21			0.62	0.37
2010_Chem_FT	829	CR	15	1	1,124	0.82	0.14	0.51	0.35						0.35	0.55
2010_Chem_FT	829	CR	16	1	1,124	0.82	0.21	0.49	0.29						0.29	0.53
2010_Chem_FT	829	CR	17	1	1,124	0.82	0.13	0.28	0.59						0.59	0.56
2010_Chem_FT	829	CR	18	1	1,124	0.82	0.12	0.18	0.69						0.69	0.56
2010_Chem_FT	829	CR	19	1	1,124	0.82	0.22	0.35	0.43						0.43	0.49
2010_Chem_FT	829	CR	20	1	1,124	0.82	0.23	0.44	0.33						0.33	0.53
2010_Chem_FT	829	CR	21	1	1,124	0.82	0.22	0.44	0.33						0.33	0.54
2010_Chem_FT	829	CR	22	1	1,124	0.82	0.20	0.16	0.64						0.64	0.50
2010_Chem_FT	829	CR	23	1	1,124	0.82	0.20	0.28	0.53						0.53	0.54
2010_Chem_FT	829	CR	24	1	1,124	0.82	0.26	0.43	0.32						0.32	0.52
2010_Chem_FT	830	MC	01	1	1,120	0.82	0.01		0.15	0.57	0.21	0.07			0.57	0.37
2010_Chem_FT	830	MC	02	1	1,120	0.82	0.01		0.06	0.80	0.09	0.05			0.80	0.26
2010_Chem_FT	830	MC	03	1	1,120	0.82	0.01		0.24	0.11	0.51	0.14			0.51	0.36
2010_Chem_FT	830	MC	04	1	1,120	0.82	0.01		0.08	0.67	0.06	0.19			0.67	0.55
2010_Chem_FT	830	MC	05	1	1,120	0.82	0.01		0.03	0.05	0.87	0.05			0.87	0.38

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	830	MC	06	1	1,120	0.82	0.01		0.42	0.37	0.12	0.08			0.37	0.40
2010_Chem_FT	830	MC	07	1	1,120	0.82	0.02		0.05	0.05	0.73	0.15			0.73	0.37
2010_Chem_FT	830	MC	08	1	1,120	0.82	0.01		0.10	0.15	0.10	0.63			0.63	0.45
2010_Chem_FT	830	MC	09	1	1,120	0.82	0.01		0.59	0.27	0.07	0.07			0.59	0.35
2010_Chem_FT	830	MC	10	1	1,120	0.82	0.01		0.07	0.62	0.18	0.13			0.62	0.47
2010_Chem_FT	830	MC	11	1	1,120	0.82	0.00		0.03	0.13	0.78	0.05			0.78	0.48
2010_Chem_FT	830	MC	12	1	1,120	0.82	0.04		0.12	0.16	0.44	0.24			0.44	0.35
2010_Chem_FT	830	MC	13	1	1,120	0.82	0.02		0.26	0.54	0.10	0.07			0.26	0.31
2010_Chem_FT	830	MC	14	1	1,120	0.82	0.03		0.10	0.18	0.22	0.47			0.47	0.43
2010_Chem_FT	830	CR	15	1	1,120	0.82	0.29	0.51	0.20						0.20	0.49
2010_Chem_FT	830	CR	16	1	1,120	0.82	0.20	0.48	0.33						0.33	0.53
2010_Chem_FT	830	CR	17	1	1,120	0.82	0.25	0.36	0.39						0.39	0.49
2010_Chem_FT	830	CR	18	1	1,120	0.82	0.33	0.38	0.29						0.29	0.49
2010_Chem_FT	830	CR	19	1	1,120	0.82	0.34	0.44	0.22						0.22	0.45
2010_Chem_FT	830	CR	20	1	1,120	0.82	0.37	0.51	0.13						0.13	0.43
2010_Chem_FT	830	CR	21	1	1,120	0.82	0.37	0.45	0.18						0.18	0.49
2010_Chem_FT	830	CR	22	1	1,120	0.82	0.28	0.43	0.28						0.28	0.47
2010_Chem_FT	830	CR	23	1	1,120	0.82	0.28	0.48	0.24						0.24	0.44
2010_Chem_FT	830	CR	24	1	1,120	0.82	0.23	0.18	0.59						0.59	0.52
2010_Chem_FT	830	CR	25	1	1,120	0.82	0.22	0.02	0.76						0.76	0.50
2010_Chem_FT	831	MC	01	1	1,107	0.82	0.00		0.82	0.03	0.03	0.11			0.82	0.43
2010_Chem_FT	831	MC	02	1	1,107	0.82	0.00		0.22	0.11	0.11	0.55			0.55	0.34
2010_Chem_FT	831	MC	03	1	1,107	0.82	0.01		0.03	0.16	0.78	0.02			0.78	0.47

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	831	MC	04	1	1,107	0.82	0.02		0.12	0.29	0.18	0.39			0.39	0.29
2010_Chem_FT	831	MC	05	1	1,107	0.82	0.01		0.27	0.10	0.47	0.15			0.47	0.40
2010_Chem_FT	831	MC	06	1	1,107	0.82	0.01		0.69	0.19	0.06	0.05			0.69	0.25
2010_Chem_FT	831	MC	07	1	1,107	0.82	0.01		0.49	0.41	0.05	0.04			0.41	0.23
2010_Chem_FT	831	MC	08	1	1,107	0.82	0.00		0.24	0.58	0.11	0.07			0.58	0.35
2010_Chem_FT	831	MC	09	1	1,107	0.82	0.02		0.23	0.55	0.10	0.10			0.55	0.46
2010_Chem_FT	831	MC	10	1	1,107	0.82	0.01		0.10	0.13	0.63	0.14			0.63	0.39
2010_Chem_FT	831	MC	11	1	1,107	0.82	0.01		0.53	0.08	0.18	0.20			0.53	0.37
2010_Chem_FT	831	MC	12	1	1,107	0.82	0.01		0.66	0.09	0.15	0.09			0.66	0.51
2010_Chem_FT	831	MC	13	1	1,107	0.82	0.03		0.22	0.24	0.38	0.13			0.38	0.36
2010_Chem_FT	831	MC	14	1	1,107	0.82	0.05		0.12	0.18	0.19	0.46			0.46	0.33
2010_Chem_FT	831	CR	15	1	1,107	0.82	0.07	0.10	0.82						0.82	0.45
2010_Chem_FT	831	CR	16	1	1,107	0.82	0.08	0.21	0.71						0.71	0.47
2010_Chem_FT	831	CR	17	1	1,107	0.82	0.14	0.35	0.52						0.52	0.49
2010_Chem_FT	831	CR	18	1	1,107	0.82	0.17	0.17	0.66						0.66	0.48
2010_Chem_FT	831	CR	19	1	1,107	0.82	0.26	0.44	0.30						0.30	0.51
2010_Chem_FT	831	CR	20	1	1,107	0.82	0.17	0.07	0.76						0.76	0.66
2010_Chem_FT	831	CR	21	1	1,107	0.82	0.21	0.28	0.51						0.51	0.56
2010_Chem_FT	831	CR	22	1	1,107	0.82	0.25	0.49	0.26						0.26	0.52
2010_Chem_FT	831	CR	23	1	1,107	0.82	0.20	0.14	0.66						0.66	0.57
2010_Chem_FT	831	CR	24	1	1,107	0.82	0.23	0.30	0.47						0.47	0.55
2010_Chem_FT	831	CR	25	1	1,107	0.82	0.24	0.28	0.48						0.48	0.55
2010_Chem_FT	832	MC	01	1	1,117	0.80	0.01		0.10	0.07	0.80	0.03			0.80	0.51

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	832	MC	02	1	1,117	0.80	0.00		0.06	0.26	0.29	0.38			0.38	0.45
2010_Chem_FT	832	MC	03	1	1,117	0.80	0.00		0.31	0.63	0.04	0.03			0.31	0.30
2010_Chem_FT	832	MC	04	1	1,117	0.80	0.00		0.64	0.08	0.20	0.07			0.64	0.36
2010_Chem_FT	832	MC	05	1	1,117	0.80	0.00		0.06	0.11	0.18	0.64			0.64	0.48
2010_Chem_FT	832	MC	06	1	1,117	0.80	0.01		0.36	0.45	0.11	0.06			0.45	0.34
2010_Chem_FT	832	MC	07	1	1,117	0.80	0.01		0.10	0.20	0.43	0.27			0.43	0.35
2010_Chem_FT	832	MC	08	1	1,117	0.80	0.02		0.17	0.15	0.50	0.16			0.50	0.42
2010_Chem_FT	832	MC	09	1	1,117	0.80	0.00		0.06	0.09	0.79	0.06			0.79	0.44
2010_Chem_FT	832	MC	10	1	1,117	0.80	0.02		0.10	0.53	0.25	0.11			0.53	0.36
2010_Chem_FT	832	MC	11	1	1,117	0.80	0.01		0.06	0.08	0.11	0.75			0.75	0.49
2010_Chem_FT	832	MC	12	1	1,117	0.80	0.01		0.09	0.07	0.14	0.69			0.69	0.52
2010_Chem_FT	832	MC	13	1	1,117	0.80	0.02		0.15	0.05	0.36	0.42			0.42	0.44
2010_Chem_FT	832	CR	14	1	1,117	0.80	0.11	0.70	0.19						0.19	0.42
2010_Chem_FT	832	CR	15	1	1,117	0.80	0.11	0.20	0.68						0.68	0.49
2010_Chem_FT	832	CR	16	1	1,117	0.80	0.11	0.35	0.54						0.54	0.34
2010_Chem_FT	832	CR	17	1	1,117	0.80	0.20	0.64	0.16						0.16	0.44
2010_Chem_FT	832	CR	18	1	1,117	0.80	0.18	0.44	0.37						0.37	0.41
2010_Chem_FT	832	CR	19	1	1,117	0.80	0.13	0.37	0.51						0.51	0.38
2010_Chem_FT	832	CR	20	1	1,117	0.80	0.23	0.54	0.23						0.23	0.45
2010_Chem_FT	832	CR	21	1	1,117	0.80	0.15	0.06	0.79						0.79	0.44
2010_Chem_FT	832	CR	22	1	1,117	0.80	0.27	0.36	0.37						0.37	0.44
2010_Chem_FT	832	CR	23	1	1,117	0.80	0.30	0.43	0.27						0.27	0.50
2010_Chem_FT	832	CR	24	1	1,117	0.80	0.38	0.47	0.15						0.15	0.47

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	833	MC	01	1	1,101	0.80	0.00		0.14	0.47	0.35	0.03			0.35	0.36
2010_Chem_FT	833	MC	02	1	1,101	0.80	0.01		0.06	0.04	0.85	0.04			0.85	0.34
2010_Chem_FT	833	MC	03	1	1,101	0.80	0.01		0.12	0.23	0.51	0.13			0.51	0.31
2010_Chem_FT	833	MC	04	1	1,101	0.80	0.00		0.92	0.03	0.01	0.04			0.92	0.35
2010_Chem_FT	833	MC	05	1	1,101	0.80	0.00		0.03	0.04	0.88	0.04			0.88	0.32
2010_Chem_FT	833	MC	06	1	1,101	0.80	0.01		0.61	0.09	0.12	0.17			0.61	0.37
2010_Chem_FT	833	MC	07	1	1,101	0.80	0.02		0.19	0.23	0.40	0.16			0.40	0.35
2010_Chem_FT	833	MC	08	1	1,101	0.80	0.00		0.05	0.10	0.18	0.66			0.66	0.40
2010_Chem_FT	833	MC	09	1	1,101	0.80	0.01		0.38	0.37	0.13	0.10			0.38	0.36
2010_Chem_FT	833	MC	10	1	1,101	0.80	0.01		0.63	0.10	0.20	0.06			0.63	0.49
2010_Chem_FT	833	MC	11	1	1,101	0.80	0.01		0.04	0.16	0.14	0.66			0.66	0.51
2010_Chem_FT	833	MC	12	1	1,101	0.80	0.01		0.50	0.09	0.26	0.14			0.50	0.38
2010_Chem_FT	833	MC	13	1	1,101	0.80	0.05		0.18	0.22	0.30	0.26			0.30	0.24
2010_Chem_FT	833	MC	14	1	1,101	0.80	0.03		0.14	0.30	0.27	0.27			0.27	0.19
2010_Chem_FT	833	CR	15	1	1,101	0.80	0.17	0.37	0.46						0.46	0.56
2010_Chem_FT	833	CR	16	1	1,101	0.80	0.23	0.41	0.36						0.36	0.54
2010_Chem_FT	833	CR	17	1	1,101	0.80	0.27	0.24	0.49						0.49	0.52
2010_Chem_FT	833	CR	18	1	1,101	0.80	0.22	0.25	0.53						0.53	0.58
2010_Chem_FT	833	CR	19	1	1,101	0.80	0.21	0.22	0.58						0.58	0.56
2010_Chem_FT	833	CR	20	1	1,101	0.80	0.18	0.44	0.38						0.38	0.57
2010_Chem_FT	833	CR	21	1	1,101	0.80	0.31	0.43	0.26						0.26	0.53
2010_Chem_FT	833	CR	22	1	1,101	0.80	0.31	0.44	0.24						0.24	0.55

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	833	CR	23	1	1,101	0.80	0.30	0.19	0.50						0.50	0.45
2010_Chem_FT	834	MC	01	1	1,099	0.79	0.00		0.14	0.04	0.07	0.75			0.75	0.31
2010_Chem_FT	834	MC	02	1	1,099	0.79	0.00		0.27	0.60	0.05	0.08			0.60	0.33
2010_Chem_FT	834	MC	03	1	1,099	0.79	0.01		0.26	0.51	0.12	0.10			0.51	0.34
2010_Chem_FT	834	MC	04	1	1,099	0.79	0.00		0.43	0.04	0.05	0.47			0.43	0.37
2010_Chem_FT	834	MC	05	1	1,099	0.79	0.00		0.03	0.91	0.04	0.02			0.91	0.34
2010_Chem_FT	834	MC	06	1	1,099	0.79	0.00		0.06	0.89	0.03	0.01			0.89	0.40
2010_Chem_FT	834	MC	07	1	1,099	0.79	0.01		0.12	0.46	0.22	0.20			0.46	0.37
2010_Chem_FT	834	MC	08	1												
2010_Chem_FT	834	MC	09	1	1,099	0.79	0.01		0.06	0.76	0.08	0.09			0.76	0.33
2010_Chem_FT	834	MC	10	1	1,099	0.79	0.02		0.13	0.15	0.54	0.16			0.54	0.25
2010_Chem_FT	834	MC	11	1	1,099	0.79	0.02		0.06	0.09	0.79	0.04			0.79	0.45
2010_Chem_FT	834	MC	12	1	1,099	0.79	0.01		0.04	0.73	0.17	0.06			0.73	0.40
2010_Chem_FT	834	MC	13	1	1,099	0.79	0.01		0.53	0.16	0.20	0.09			0.53	0.46
2010_Chem_FT	834	MC	14	1	1,099	0.79	0.02		0.18	0.05	0.63	0.12			0.63	0.36
2010_Chem_FT	834	CR	15	1	1,099	0.79	0.12	0.57	0.30						0.30	0.47
2010_Chem_FT	834	CR	16	1	1,099	0.79	0.17	0.28	0.55						0.55	0.57
2010_Chem_FT	834	CR	17	1	1,099	0.79	0.25	0.38	0.38						0.38	0.57
2010_Chem_FT	834	CR	18	1	1,099	0.79	0.26	0.30	0.44						0.44	0.51
2010_Chem_FT	834	CR	19	1	1,099	0.79	0.17	0.23	0.60						0.60	0.54
2010_Chem_FT	834	CR	20	1	1,099	0.79	0.17	0.29	0.54						0.54	0.47
2010_Chem_FT	834	CR	21	1	1,099	0.79	0.21	0.27	0.52						0.52	0.43
2010_Chem_FT	834	CR	22	1	1,099	0.79	0.32	0.48	0.20						0.20	0.48

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	834	CR	23	1	1,099	0.79	0.33	0.38	0.30						0.30	0.57
2010_Chem_FT	834	CR	24	1	1,099	0.79	0.32	0.49	0.19						0.19	0.38
2010_Chem_FT	835	MC	01	1	1,097	0.82	0.00		0.88	0.06	0.02	0.04			0.88	0.41
2010_Chem_FT	835	MC	02	1	1,097	0.82	0.01		0.07	0.15	0.20	0.57			0.57	0.26
2010_Chem_FT	835	MC	03	1	1,097	0.82	0.01		0.03	0.10	0.61	0.26			0.61	0.34
2010_Chem_FT	835	MC	04	1	1,097	0.82	0.00		0.07	0.04	0.81	0.08			0.81	0.45
2010_Chem_FT	835	MC	05	1	1,097	0.82	0.00		0.07	0.04	0.10	0.78			0.78	0.38
2010_Chem_FT	835	MC	06	1	1,097	0.82	0.01		0.23	0.11	0.16	0.49			0.49	0.31
2010_Chem_FT	835	MC	07	1	1,097	0.82	0.00		0.06	0.12	0.04	0.78			0.78	0.45
2010_Chem_FT	835	MC	08	1	1,097	0.82	0.01		0.10	0.09	0.24	0.56			0.56	0.42
2010_Chem_FT	835	MC	09	1	1,097	0.82	0.01		0.02	0.05	0.04	0.88			0.88	0.35
2010_Chem_FT	835	MC	10	1	1,097	0.82	0.00		0.33	0.53	0.06	0.07			0.53	0.46
2010_Chem_FT	835	MC	11	1	1,097	0.82	0.01		0.05	0.03	0.86	0.05			0.86	0.45
2010_Chem_FT	835	MC	12	1	1,097	0.82	0.02		0.20	0.32	0.36	0.10			0.36	0.40
2010_Chem_FT	835	MC	13	1	1,097	0.82	0.01		0.10	0.64	0.09	0.15			0.64	0.42
2010_Chem_FT	835	MC	14	1	1,097	0.82	0.01		0.48	0.18	0.18	0.15			0.48	0.33
2010_Chem_FT	835	CR	15	1	1,097	0.82	0.15	0.16	0.68						0.68	0.55
2010_Chem_FT	835	CR	16	1	1,097	0.82	0.26	0.43	0.31						0.31	0.55
2010_Chem_FT	835	CR	17	1	1,097	0.82	0.23	0.48	0.28						0.28	0.46
2010_Chem_FT	835	CR	18	1	1,097	0.82	0.07	0.11	0.82						0.82	0.44
2010_Chem_FT	835	CR	19	1	1,097	0.82	0.09	0.24	0.67						0.67	0.51
2010_Chem_FT	835	CR	20	1	1,097	0.82	0.13	0.62	0.25						0.25	0.47
2010_Chem_FT	835	CR	21	1	1,097	0.82	0.17	0.58	0.25						0.25	0.50

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	835	CR	22	1	1,097	0.82	0.30	0.54	0.17						0.17	0.40
2010_Chem_FT	835	CR	23	1	1,097	0.82	0.31	0.32	0.37						0.37	0.51
2010_Chem_FT	835	CR	24	1	1,097	0.82	0.22	0.24	0.54						0.54	0.51
2010_Chem_FT	835	CR	25	1	1,097	0.82	0.29	0.51	0.21						0.21	0.50
2010_Chem_FT	836	MC	01	1	1,103	0.80	0.01		0.82	0.12	0.04	0.02			0.82	0.27
2010_Chem_FT	836	MC	02	1	1,103	0.80	0.00		0.66	0.18	0.11	0.04			0.66	0.50
2010_Chem_FT	836	MC	03	1	1,103	0.80	0.00		0.24	0.60	0.10	0.06			0.60	0.43
2010_Chem_FT	836	MC	04	1	1,103	0.80	0.01		0.72	0.14	0.06	0.08			0.72	0.46
2010_Chem_FT	836	MC	05	1	1,103	0.80	0.01		0.13	0.07	0.08	0.71			0.71	0.52
2010_Chem_FT	836	MC	06	1	1,103	0.80	0.01		0.24	0.10	0.12	0.53			0.53	0.41
2010_Chem_FT	836	MC	07	1	1,103	0.80	0.01		0.16	0.24	0.47	0.12			0.47	0.30
2010_Chem_FT	836	MC	08	1	1,103	0.80	0.03		0.13	0.16	0.56	0.12			0.56	0.25
2010_Chem_FT	836	MC	09	1	1,103	0.80	0.01		0.09	0.15	0.06	0.69			0.69	0.44
2010_Chem_FT	836	MC	10	1	1,103	0.80	0.01		0.23	0.64	0.07	0.05			0.64	0.36
2010_Chem_FT	836	MC	11	1	1,103	0.80	0.01		0.10	0.19	0.19	0.51			0.51	0.42
2010_Chem_FT	836	MC	12	1	1,103	0.80	0.02		0.24	0.10	0.35	0.29			0.24	0.18
2010_Chem_FT	836	MC	13	1	1,103	0.80	0.02		0.28	0.50	0.13	0.06			0.50	0.36
2010_Chem_FT	836	MC	14	1	1,103	0.80	0.03		0.26	0.41	0.13	0.16			0.41	0.28
2010_Chem_FT	836	CR	15	1	1,103	0.80	0.14	0.25	0.61						0.61	0.57
2010_Chem_FT	836	CR	16	1	1,103	0.80	0.13	0.41	0.46						0.46	0.50
2010_Chem_FT	836	CR	17	1	1,103	0.80	0.10	0.22	0.68						0.68	0.56
2010_Chem_FT	836	CR	18	1	1,103	0.80	0.33	0.47	0.20						0.20	0.41
2010_Chem_FT	836	CR	19	1	1,103	0.80	0.21	0.47	0.32						0.32	0.51

Table 8. Classical Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	Alpha	B	M0	M1	M2	M3	M4	M5	M6	Mean	Point-Biserial
2010_Chem_FT	836	CR	20	1	1,103	0.80	0.19	0.23	0.58						0.58	0.57
2010_Chem_FT	836	CR	21	1	1,103	0.80	0.22	0.52	0.26						0.26	0.25
2010_Chem_FT	836	CR	22	1	1,103	0.80	0.39	0.32	0.29						0.29	0.53
2010_Chem_FT	836	CR	23	1	1,103	0.80	0.27	0.32	0.41						0.41	0.49
2010_Chem_FT	836	CR	24	1	1,103	0.80	0.43	0.31	0.25						0.25	0.46
2010_Chem_FT	836	CR	25	1	1,103	0.80	0.37	0.47	0.15						0.15	0.44
2010_Chem_FT	837	MC	01	1	1,113	0.73	0.00		0.57	0.19	0.12	0.11			0.57	0.32
2010_Chem_FT	837	MC	02	1	1,113	0.73	0.00		0.04	0.16	0.08	0.72			0.72	0.51
2010_Chem_FT	837	MC	03	1	1,113	0.73	0.00		0.05	0.06	0.23	0.65			0.65	0.40
2010_Chem_FT	837	MC	04	1	1,113	0.73	0.01		0.75	0.12	0.06	0.06			0.75	0.40
2010_Chem_FT	837	MC	05	1	1,113	0.73	0.01		0.68	0.14	0.13	0.04			0.68	0.35
2010_Chem_FT	837	MC	06	1	1,113	0.73	0.01		0.07	0.76	0.08	0.08			0.76	0.26
2010_Chem_FT	837	MC	07	1	1,113	0.73	0.00		0.06	0.88	0.05	0.01			0.88	0.35
2010_Chem_FT	837	MC	08	1	1,113	0.73	0.01		0.18	0.55	0.25	0.01			0.55	0.28
2010_Chem_FT	837	MC	09	1	1,113	0.73	0.03		0.53	0.16	0.15	0.13			0.53	0.47
2010_Chem_FT	837	MC	10	1	1,113	0.73	0.01		0.12	0.05	0.78	0.04			0.78	0.46
2010_Chem_FT	837	MC	11	1	1,113	0.73	0.02		0.65	0.19	0.06	0.08			0.65	0.44
2010_Chem_FT	837	MC	12	1	1,113	0.73	0.01		0.19	0.07	0.71	0.02			0.71	0.47
2010_Chem_FT	837	CR	13	4	1,113	0.73	0.10	0.07	0.12	0.25	0.38	0.08			2.09	0.75
2010_Chem_FT	837	CR	14	3	1,113	0.73	0.16	0.09	0.26	0.24	0.25				1.49	0.61
2010_Chem_FT	837	CR	15	3	1,113	0.73	0.11	0.10	0.35	0.32	0.12				1.36	0.68

Appendix B: Partial Credit Model Item Analysis

Table 9. Partial Credit Model Item Analysis

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	821	MC	01	1	1,136	-2.1028							0.93
2010_Chem_FT	821	MC	02	1	1,136	-0.6042							0.97
2010_Chem_FT	821	MC	03	1	1,136	0.7139							1.22
2010_Chem_FT	821	MC	04	1	1,136	1.4242							1.02
2010_Chem_FT	821	MC	05	1	1,136	-0.0878							0.99
2010_Chem_FT	821	MC	06	1	1,136	-0.1775							1.15
2010_Chem_FT	821	MC	07	1	1,136	0.8735							1.25
2010_Chem_FT	821	MC	08	1	1,136	0.2746							1.09
2010_Chem_FT	821	MC	09	1	1,136	-1.1318							0.99
2010_Chem_FT	821	MC	10	1	1,136	-0.7173							0.97
2010_Chem_FT	821	MC	11	1	1,136	0.2956							1.19
2010_Chem_FT	821	MC	12	1	1,136	0.2998							0.94
2010_Chem_FT	821	MC	13	1	1,136	0.3672							0.93
2010_Chem_FT	821	MC	14	1	1,136	0.7976							1.19
2010_Chem_FT	821	CR	15	1	1,136	0.6357							1.06
2010_Chem_FT	821	CR	16	1	1,136	1.1477							0.83
2010_Chem_FT	821	CR	17	1	1,136	2.5423							0.87
2010_Chem_FT	821	CR	18	1	1,136	1.1237							0.83
2010_Chem_FT	821	CR	19	1	1,136	0.1570							0.85
2010_Chem_FT	821	CR	20	1	1,136	1.8486							1.05
2010_Chem_FT	821	CR	21	1	1,136	1.4189							0.96

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	821	CR	22	1	1,136	0.6790							0.95
2010_Chem_FT	821	CR	23	1	1,136	0.2032							0.84
2010_Chem_FT	821	CR	24	1	1,136	0.6965							0.89
2010_Chem_FT	821	CR	25	1	1,136	1.8867							0.93
2010_Chem_FT	822	MC	01	1	1,123	-1.3670							1.01
2010_Chem_FT	822	MC	02	1	1,123	-2.6094							0.97
2010_Chem_FT	822	MC	03	1	1,123	-1.2373							1.09
2010_Chem_FT	822	MC	04	1	1,123	0.0563							1.07
2010_Chem_FT	822	MC	05	1	1,123	-0.1045							1.02
2010_Chem_FT	822	MC	06	1	1,123	0.7854							1.11
2010_Chem_FT	822	MC	07	1	1,123	-0.8150							0.93
2010_Chem_FT	822	MC	08	1	1,123	-0.6827							1.04
2010_Chem_FT	822	MC	09	1	1,123	-0.6183							1.09
2010_Chem_FT	822	MC	10	1	1,123	-0.8515							0.90
2010_Chem_FT	822	MC	11	1	1,123	-1.3167							0.99
2010_Chem_FT	822	MC	12	1	1,123	-0.1768							1.04
2010_Chem_FT	822	MC	13	1	1,123	-1.1313							0.93
2010_Chem_FT	822	MC	14	1	1,123	-0.3418							1.12
2010_Chem_FT	822	CR	15	1	1,123	-0.8884							0.88
2010_Chem_FT	822	CR	16	1	1,123	-0.0417							0.95
2010_Chem_FT	822	CR	17	1	1,123	-0.4829							0.94
2010_Chem_FT	822	CR	18	1	1,123	0.0296							1.08
2010_Chem_FT	822	CR	19	1	1,123	1.0998							0.94

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	822	CR	20	1	1,123	1.4580							0.99
2010_Chem_FT	822	CR	21	1	1,123	2.9689							0.98
2010_Chem_FT	822	CR	22	1	1,123	-0.2680							0.96
2010_Chem_FT	822	CR	23	1	1,123	0.7854							0.91
2010_Chem_FT	822	CR	24	1	1,123	1.8486							1.00
2010_Chem_FT	823	MC	01	1	1,126	-1.2472							0.97
2010_Chem_FT	823	MC	02	1	1,126	-0.1162							1.22
2010_Chem_FT	823	MC	03	1	1,126	-0.3930							0.92
2010_Chem_FT	823	MC	04	1	1,126	-1.4716							0.91
2010_Chem_FT	823	MC	05	1	1,126	0.6276							1.16
2010_Chem_FT	823	MC	06	1	1,126	0.3296							0.92
2010_Chem_FT	823	MC	07	1	1,126	-0.9337							1.13
2010_Chem_FT	823	MC	08	1	1,126	-0.0184							1.17
2010_Chem_FT	823	MC	09	1	1,126	-0.7084							0.88
2010_Chem_FT	823	MC	10	1	1,126	-0.2510							1.05
2010_Chem_FT	823	MC	11	1	1,126	-0.6104							1.10
2010_Chem_FT	823	MC	12	1	1,126	-0.2737							0.92
2010_Chem_FT	823	MC	13	1	1,126	1.1061							1.03
2010_Chem_FT	823	MC	14	1	1,126	0.5245							1.02
2010_Chem_FT	823	CR	15	1	1,126	0.9894							0.93
2010_Chem_FT	823	CR	16	1	1,126	1.4259							0.96
2010_Chem_FT	823	CR	17	1	1,126	-0.7084							1.00
2010_Chem_FT	823	CR	18	1	1,126	2.2780							0.98

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	823	CR	19	1	1,126	1.3457							1.05
2010_Chem_FT	823	CR	20	1	1,126	2.0550							0.93
2010_Chem_FT	823	CR	21	1	1,126	1.5140							0.88
2010_Chem_FT	823	CR	22	1	1,126	1.3457							0.92
2010_Chem_FT	823	CR	23	1	1,126	2.2160							1.00
2010_Chem_FT	823	CR	24	1	1,126	1.5876							0.94
2010_Chem_FT	823	CR	25	1	1,126	-0.0805							0.91
2010_Chem_FT	824	MC	01	1	1,129	-0.9123							0.91
2010_Chem_FT	824	MC	02	1	1,129	0.4721							1.03
2010_Chem_FT	824	MC	03	1	1,129	0.0092							1.03
2010_Chem_FT	824	MC	04	1	1,129	-0.9072							1.03
2010_Chem_FT	824	MC	05	1	1,129	0.0049							1.19
2010_Chem_FT	824	MC	06	1	1,129	0.3343							1.00
2010_Chem_FT	824	MC	07	1	1,129	-0.2246							1.05
2010_Chem_FT	824	MC	08	1	1,129	-0.2509							1.06
2010_Chem_FT	824	MC	09	1	1,129	-0.6942							1.04
2010_Chem_FT	824	MC	10	1	1,129	-0.2641							0.96
2010_Chem_FT	824	MC	11	1	1,129	0.4375							0.93
2010_Chem_FT	824	MC	12	1	1,129	-0.8413							0.92
2010_Chem_FT	824	MC	13	1	1,129	0.2829							1.14
2010_Chem_FT	824	MC	14	1	1,129	0.7358							1.36
2010_Chem_FT	824	CR	15	1	1,129	1.8477							0.93
2010_Chem_FT	824	CR	16	1	1,129	2.3451							1.03

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	824	CR	17	1	1,129	1.8157							1.00
2010_Chem_FT	824	CR	18	1	1,129	0.7448							0.92
2010_Chem_FT	824	CR	19	1	1,129	0.9741							0.82
2010_Chem_FT	824	CR	20	1	1,129	0.7269							0.92
2010_Chem_FT	824	CR	21	1	1,129	0.4678							1.01
2010_Chem_FT	824	CR	22	1	1,129	1.1720							0.98
2010_Chem_FT	824	CR	23	1	1,129	1.3295							0.90
2010_Chem_FT	824	CR	24	1	1,129	2.8444							0.91
2010_Chem_FT	824	CR	25	1	1,129	1.3505							0.87
2010_Chem_FT	825	MC	01	1	1,127	-1.8218							0.96
2010_Chem_FT	825	MC	02	1	1,127	-0.4377							1.25
2010_Chem_FT	825	MC	03	1	1,127	-1.1863							0.99
2010_Chem_FT	825	MC	04	1	1,127	-0.9651							1.03
2010_Chem_FT	825	MC	05	1	1,127	0.8392							0.96
2010_Chem_FT	825	MC	06	1	1,127	-0.1224							1.06
2010_Chem_FT	825	MC	07	1	1,127	0.4332							1.17
2010_Chem_FT	825	MC	08	1	1,127	-0.7802							1.09
2010_Chem_FT	825	MC	09	1	1,127	0.0583							1.10
2010_Chem_FT	825	MC	10	1	1,127	-0.7208							0.96
2010_Chem_FT	825	MC	11	1	1,127	-0.6626							0.96
2010_Chem_FT	825	MC	12	1	1,127	1.0552							1.01
2010_Chem_FT	825	MC	13	1	1,127	0.1862							0.98
2010_Chem_FT	825	MC	14	1	1,127	0.6620							0.94

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	825	CR	15	1	1,127	0.4290							1.12
2010_Chem_FT	825	CR	16	1	1,127	0.7059							1.03
2010_Chem_FT	825	CR	17	1	1,127	1.5799							0.93
2010_Chem_FT	825	CR	18	1	1,127	0.1777							0.91
2010_Chem_FT	825	CR	19	1	1,127	0.7766							0.81
2010_Chem_FT	825	CR	20	1	1,127	2.7991							1.01
2010_Chem_FT	825	CR	21	1	1,127	0.3948							0.92
2010_Chem_FT	825	CR	22	1	1,127	-0.5206							0.98
2010_Chem_FT	825	CR	23	1	1,127	1.5967							0.87
2010_Chem_FT	825	CR	24	1	1,127	1.2139							1.01
2010_Chem_FT	825	CR	25	1	1,127	1.6480							0.86
2010_Chem_FT	826	MC	01	1	1,113	-1.0344							0.95
2010_Chem_FT	826	MC	02	1	1,113	-0.2215							1.15
2010_Chem_FT	826	MC	03	1	1,113	-0.5361							0.97
2010_Chem_FT	826	MC	04	1	1,113	0.5486							1.18
2010_Chem_FT	826	MC	05	1	1,113	-0.1273							0.98
2010_Chem_FT	826	MC	06	1	1,113	-0.9638							0.99
2010_Chem_FT	826	MC	07	1	1,113	-0.0383							1.06
2010_Chem_FT	826	MC	08	1	1,113	-0.6962							1.03
2010_Chem_FT	826	MC	09	1	1,113	-1.0620							0.95
2010_Chem_FT	826	MC	10	1	1,113	-0.4045							0.99
2010_Chem_FT	826	MC	11	1	1,113	-0.1630							1.00
2010_Chem_FT	826	MC	12	1	1,113	0.2216							1.25

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	826	MC	13	1	1,113	0.9101							1.11
2010_Chem_FT	826	MC	14	1	1,113	-0.1945							1.05
2010_Chem_FT	826	CR	15	1	1,113	0.7018							1.03
2010_Chem_FT	826	CR	16	1	1,113	2.4823							1.03
2010_Chem_FT	826	CR	17	1	1,113	0.9101							0.97
2010_Chem_FT	826	CR	18	1	1,113	0.9054							0.92
2010_Chem_FT	826	CR	19	1	1,113	0.4153							0.92
2010_Chem_FT	826	CR	20	1	1,113	1.7823							0.97
2010_Chem_FT	826	CR	21	1	1,113	0.2787							0.93
2010_Chem_FT	826	CR	22	1	1,113	1.0685							0.88
2010_Chem_FT	826	CR	23	1	1,113	1.0150							0.89
2010_Chem_FT	826	CR	24	1	1,113	0.6113							0.83
2010_Chem_FT	826	CR	25	1	1,113	2.0123							0.94
2010_Chem_FT	827	MC	01	1	1,121	-0.3741							0.99
2010_Chem_FT	827	MC	02	1	1,121	0.3659							0.99
2010_Chem_FT	827	MC	03	1	1,121	0.0897							0.96
2010_Chem_FT	827	MC	04	1	1,121	0.1484							0.96
2010_Chem_FT	827	MC	05	1	1,121	-1.6552							0.93
2010_Chem_FT	827	MC	06	1	1,121	-0.2120							1.23
2010_Chem_FT	827	MC	07	1	1,121	1.3454							1.09
2010_Chem_FT	827	MC	08	1	1,121	0.0477							1.19
2010_Chem_FT	827	MC	09	1	1,121	-0.6876							1.00
2010_Chem_FT	827	MC	10	1	1,121	0.4163							1.14

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	827	MC	11	1	1,121	-1.0065							1.16
2010_Chem_FT	827	MC	12	1	1,121	-2.2047							0.81
2010_Chem_FT	827	MC	13	1	1,121	-0.4278							1.09
2010_Chem_FT	827	MC	14	1	1,121	0.3743							1.22
2010_Chem_FT	827	CR	15	1	1,121	0.0351							0.91
2010_Chem_FT	827	CR	16	1	1,121	-0.2597							1.04
2010_Chem_FT	827	CR	17	1	1,121	0.3199							0.95
2010_Chem_FT	827	CR	18	1	1,121	0.0393							0.86
2010_Chem_FT	827	CR	19	1	1,121	0.3241							0.89
2010_Chem_FT	827	CR	20	1	1,121	0.1777							0.89
2010_Chem_FT	827	CR	21	1	1,121	0.7840							0.85
2010_Chem_FT	827	CR	22	1	1,121	1.4596							0.85
2010_Chem_FT	827	CR	23	1	1,121	2.8445							0.94
2010_Chem_FT	827	CR	24	1	1,121	1.7645							1.02
2010_Chem_FT	827	CR	25	1	1,121	0.6926							0.94
2010_Chem_FT	828	MC	01	1	1,117	-0.6961							1.09
2010_Chem_FT	828	MC	02	1	1,117	-1.3054							1.07
2010_Chem_FT	828	MC	03	1	1,117	0.7264							1.03
2010_Chem_FT	828	MC	04	1	1,117	0.6205							1.15
2010_Chem_FT	828	MC	05	1	1,117	-0.8181							1.03
2010_Chem_FT	828	MC	06	1	1,117	0.2478							1.19
2010_Chem_FT	828	MC	07	1	1,117	0.5201							1.22
2010_Chem_FT	828	MC	08	1	1,117	-0.1758							1.00

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	828	MC	09	1	1,117	-1.1304							0.86
2010_Chem_FT	828	MC	10	1	1,117	0.1571							1.12
2010_Chem_FT	828	MC	11	1	1,117	-0.6662							0.97
2010_Chem_FT	828	MC	12	1	1,117	-0.4449							0.87
2010_Chem_FT	828	MC	13	1	1,117	-0.1936							0.96
2010_Chem_FT	828	CR	14	1	1,117	-0.5975							1.04
2010_Chem_FT	828	CR	15	1	1,117	0.2348							0.92
2010_Chem_FT	828	CR	16	1	1,117	0.5201							0.82
2010_Chem_FT	828	CR	17	1	1,117	0.1571							0.91
2010_Chem_FT	828	CR	18	1	1,117	1.2685							0.98
2010_Chem_FT	828	CR	19	1	1,117	0.0574							0.81
2010_Chem_FT	828	CR	20	1	1,117	1.4967							0.94
2010_Chem_FT	828	CR	21	1	1,117	0.6998							1.13
2010_Chem_FT	828	CR	22	1	1,117	0.5027							1.03
2010_Chem_FT	828	CR	23	1	1,117	1.2987							0.89
2010_Chem_FT	828	CR	24	1	1,117	2.3379							0.90
2010_Chem_FT	828	CR	25	1	1,117	0.7442							1.00
2010_Chem_FT	829	MC	01	1	1,124	-1.6937							0.91
2010_Chem_FT	829	MC	02	1	1,124	-2.8413							0.99
2010_Chem_FT	829	MC	03	1	1,124	-1.8649							1.03
2010_Chem_FT	829	MC	04	1	1,124	-0.1175							0.98
2010_Chem_FT	829	MC	05	1	1,124	0.8557							1.12
2010_Chem_FT	829	MC	06	1	1,124	-0.7666							1.01

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	829	MC	07	1	1,124	0.4400							1.28
2010_Chem_FT	829	MC	08	1	1,124	-1.8895							0.89
2010_Chem_FT	829	MC	09	1	1,124	0.3208							1.15
2010_Chem_FT	829	MC	10	1	1,124	0.6273							1.04
2010_Chem_FT	829	MC	11	1	1,124	-1.1174							1.00
2010_Chem_FT	829	MC	12	1	1,124	0.3296							1.30
2010_Chem_FT	829	MC	13	1	1,124	0.3031							1.00
2010_Chem_FT	829	MC	14	1	1,124	-0.3360							1.12
2010_Chem_FT	829	CR	15	1	1,124	1.0404							0.88
2010_Chem_FT	829	CR	16	1	1,124	1.3260							0.89
2010_Chem_FT	829	CR	17	1	1,124	-0.1987							0.88
2010_Chem_FT	829	CR	18	1	1,124	-0.7412							0.85
2010_Chem_FT	829	CR	19	1	1,124	0.5914							0.98
2010_Chem_FT	829	CR	20	1	1,124	1.1184							0.90
2010_Chem_FT	829	CR	21	1	1,124	1.0988							0.91
2010_Chem_FT	829	CR	22	1	1,124	-0.4766							0.94
2010_Chem_FT	829	CR	23	1	1,124	0.1225							0.92
2010_Chem_FT	829	CR	24	1	1,124	1.2030							0.91
2010_Chem_FT	830	MC	01	1	1,120	-0.0969							1.12
2010_Chem_FT	830	MC	02	1	1,120	-1.4055							1.12
2010_Chem_FT	830	MC	03	1	1,120	0.1989							1.14
2010_Chem_FT	830	MC	04	1	1,120	-0.6441							0.86
2010_Chem_FT	830	MC	05	1	1,120	-2.0249							0.92

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	830	MC	06	1	1,120	0.8844							1.06
2010_Chem_FT	830	MC	07	1	1,120	-0.9994							1.05
2010_Chem_FT	830	MC	08	1	1,120	-0.4432							0.99
2010_Chem_FT	830	MC	09	1	1,120	-0.2135							1.13
2010_Chem_FT	830	MC	10	1	1,120	-0.3411							0.97
2010_Chem_FT	830	MC	11	1	1,120	-1.3175							0.89
2010_Chem_FT	830	MC	12	1	1,120	0.5251							1.14
2010_Chem_FT	830	MC	13	1	1,120	1.5221							1.11
2010_Chem_FT	830	MC	14	1	1,120	0.3923							1.04
2010_Chem_FT	830	CR	15	1	1,120	1.9012							0.89
2010_Chem_FT	830	CR	16	1	1,120	1.1294							0.91
2010_Chem_FT	830	CR	17	1	1,120	0.7824							0.96
2010_Chem_FT	830	CR	18	1	1,120	1.3486							0.94
2010_Chem_FT	830	CR	19	1	1,120	1.7681							0.96
2010_Chem_FT	830	CR	20	1	1,120	2.5531							0.91
2010_Chem_FT	830	CR	21	1	1,120	2.0360							0.89
2010_Chem_FT	830	CR	22	1	1,120	1.3591							0.97
2010_Chem_FT	830	CR	23	1	1,120	1.6421							0.98
2010_Chem_FT	830	CR	24	1	1,120	-0.1910							0.92
2010_Chem_FT	830	CR	25	1	1,120	-1.1738							0.87
2010_Chem_FT	831	MC	01	1	1,107	-1.5415							0.95
2010_Chem_FT	831	MC	02	1	1,107	-0.0176							1.13
2010_Chem_FT	831	MC	03	1	1,107	-1.2360							0.95

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	831	MC	04	1	1,107	0.8045							1.15
2010_Chem_FT	831	MC	05	1	1,107	0.3765							1.05
2010_Chem_FT	831	MC	06	1	1,107	-0.7304							1.20
2010_Chem_FT	831	MC	07	1	1,107	0.7090							1.24
2010_Chem_FT	831	MC	08	1	1,107	-0.1241							1.12
2010_Chem_FT	831	MC	09	1	1,107	-0.0176							1.00
2010_Chem_FT	831	MC	10	1	1,107	-0.4156							1.07
2010_Chem_FT	831	MC	11	1	1,107	0.1011							1.10
2010_Chem_FT	831	MC	12	1	1,107	-0.5675							0.93
2010_Chem_FT	831	MC	13	1	1,107	0.8183							1.08
2010_Chem_FT	831	MC	14	1	1,107	0.4467							1.13
2010_Chem_FT	831	CR	15	1	1,107	-1.5697							0.91
2010_Chem_FT	831	CR	16	1	1,107	-0.8487							0.94
2010_Chem_FT	831	CR	17	1	1,107	0.1711							0.96
2010_Chem_FT	831	CR	18	1	1,107	-0.5530							0.94
2010_Chem_FT	831	CR	19	1	1,107	1.2876							0.90
2010_Chem_FT	831	CR	20	1	1,107	-1.1467							0.71
2010_Chem_FT	831	CR	21	1	1,107	0.1886							0.87
2010_Chem_FT	831	CR	22	1	1,107	1.4847							0.87
2010_Chem_FT	831	CR	23	1	1,107	-0.5482							0.85
2010_Chem_FT	831	CR	24	1	1,107	0.4072							0.89
2010_Chem_FT	831	CR	25	1	1,107	0.3546							0.88
2010_Chem_FT	832	MC	01	1	1,117	-1.4033							0.86

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	832	MC	02	1	1,117	0.8286							0.97
2010_Chem_FT	832	MC	03	1	1,117	1.2117							1.13
2010_Chem_FT	832	MC	04	1	1,117	-0.4744							1.11
2010_Chem_FT	832	MC	05	1	1,117	-0.4744							0.96
2010_Chem_FT	832	MC	06	1	1,117	0.4960							1.13
2010_Chem_FT	832	MC	07	1	1,117	0.5834							1.11
2010_Chem_FT	832	MC	08	1	1,117	0.2233							1.03
2010_Chem_FT	832	MC	09	1	1,117	-1.3454							0.94
2010_Chem_FT	832	MC	10	1	1,117	0.1066							1.10
2010_Chem_FT	832	MC	11	1	1,117	-1.0482							0.91
2010_Chem_FT	832	MC	12	1	1,117	-0.7211							0.89
2010_Chem_FT	832	MC	13	1	1,117	0.6098							1.00
2010_Chem_FT	832	CR	14	1	1,117	1.9526							0.97
2010_Chem_FT	832	CR	15	1	1,117	-0.6863							0.93
2010_Chem_FT	832	CR	16	1	1,117	0.0632							1.12
2010_Chem_FT	832	CR	17	1	1,117	2.1556							0.91
2010_Chem_FT	832	CR	18	1	1,117	0.8605							1.03
2010_Chem_FT	832	CR	19	1	1,117	0.1974							1.08
2010_Chem_FT	832	CR	20	1	1,117	1.6960							0.94
2010_Chem_FT	832	CR	21	1	1,117	-1.3517							0.92
2010_Chem_FT	832	CR	22	1	1,117	0.8742							1.00
2010_Chem_FT	832	CR	23	1	1,117	1.4274							0.91
2010_Chem_FT	832	CR	24	1	1,117	2.2858							0.86

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	833	MC	01	1	1,101	0.9928							1.08
2010_Chem_FT	833	MC	02	1	1,101	-1.7912							1.03
2010_Chem_FT	833	MC	03	1	1,101	0.1861							1.17
2010_Chem_FT	833	MC	04	1	1,101	-2.5961							0.91
2010_Chem_FT	833	MC	05	1	1,101	-2.1373							1.00
2010_Chem_FT	833	MC	06	1	1,101	-0.3102							1.09
2010_Chem_FT	833	MC	07	1	1,101	0.7549							1.12
2010_Chem_FT	833	MC	08	1	1,101	-0.5749							1.06
2010_Chem_FT	833	MC	09	1	1,101	0.8146							1.10
2010_Chem_FT	833	MC	10	1	1,101	-0.3797							0.95
2010_Chem_FT	833	MC	11	1	1,101	-0.5700							0.92
2010_Chem_FT	833	MC	12	1	1,101	0.2300							1.09
2010_Chem_FT	833	MC	13	1	1,101	1.2903							1.22
2010_Chem_FT	833	MC	14	1	1,101	1.4332							1.25
2010_Chem_FT	833	CR	15	1	1,101	0.4501							0.87
2010_Chem_FT	833	CR	16	1	1,101	0.9311							0.89
2010_Chem_FT	833	CR	17	1	1,101	0.2959							0.92
2010_Chem_FT	833	CR	18	1	1,101	0.1025							0.85
2010_Chem_FT	833	CR	19	1	1,101	-0.1285							0.87
2010_Chem_FT	833	CR	20	1	1,101	0.8423							0.85
2010_Chem_FT	833	CR	21	1	1,101	1.5102							0.87
2010_Chem_FT	833	CR	22	1	1,101	1.6067							0.85
2010_Chem_FT	833	CR	23	1	1,101	0.2300							1.01

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	834	MC	01	1	1,099	-1.0540							1.12
2010_Chem_FT	834	MC	02	1	1,099	-0.2693							1.14
2010_Chem_FT	834	MC	03	1	1,099	0.1914							1.12
2010_Chem_FT	834	MC	04	1	1,099	0.5510							1.08
2010_Chem_FT	834	MC	05	1	1,099	-2.4180							0.96
2010_Chem_FT	834	MC	06	1	1,099	-2.1771							0.91
2010_Chem_FT	834	MC	07	1	1,099	0.4319							1.08
2010_Chem_FT	834	MC	08	1									
2010_Chem_FT	834	MC	09	1	1,099	-1.1397							1.07
2010_Chem_FT	834	MC	10	1	1,099	0.0513							1.23
2010_Chem_FT	834	MC	11	1	1,099	-1.3271							0.93
2010_Chem_FT	834	MC	12	1	1,099	-0.9440							1.01
2010_Chem_FT	834	MC	13	1	1,099	0.0820							0.99
2010_Chem_FT	834	MC	14	1	1,099	-0.3746							1.09
2010_Chem_FT	834	CR	15	1	1,099	1.2415							0.95
2010_Chem_FT	834	CR	16	1	1,099	-0.0102							0.86
2010_Chem_FT	834	CR	17	1	1,099	0.8448							0.85
2010_Chem_FT	834	CR	18	1	1,099	0.5245							0.92
2010_Chem_FT	834	CR	19	1	1,099	-0.2330							0.89
2010_Chem_FT	834	CR	20	1	1,099	0.0294							0.97
2010_Chem_FT	834	CR	21	1	1,099	0.1433							1.03
2010_Chem_FT	834	CR	22	1	1,099	1.8889							0.88
2010_Chem_FT	834	CR	23	1	1,099	1.2671							0.83

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	834	CR	24	1	1,099	1.9765							1.00
2010_Chem_FT	835	MC	01	1	1,097	-2.1386							0.91
2010_Chem_FT	835	MC	02	1	1,097	-0.1482							1.26
2010_Chem_FT	835	MC	03	1	1,097	-0.3146							1.16
2010_Chem_FT	835	MC	04	1	1,097	-1.5083							0.93
2010_Chem_FT	835	MC	05	1	1,097	-1.2823							1.03
2010_Chem_FT	835	MC	06	1	1,097	0.2814							1.20
2010_Chem_FT	835	MC	07	1	1,097	-1.3133							0.95
2010_Chem_FT	835	MC	08	1	1,097	-0.0570							1.05
2010_Chem_FT	835	MC	09	1	1,097	-2.1874							0.96
2010_Chem_FT	835	MC	10	1	1,097	0.0607							1.01
2010_Chem_FT	835	MC	11	1	1,097	-1.9314							0.88
2010_Chem_FT	835	MC	12	1	1,097	0.9264							1.05
2010_Chem_FT	835	MC	13	1	1,097	-0.4997							1.05
2010_Chem_FT	835	MC	14	1	1,097	0.2950							1.18
2010_Chem_FT	835	CR	15	1	1,097	-0.7122							0.87
2010_Chem_FT	835	CR	16	1	1,097	1.2140							0.87
2010_Chem_FT	835	CR	17	1	1,097	1.3587							0.99
2010_Chem_FT	835	CR	18	1	1,097	-1.6129							0.92
2010_Chem_FT	835	CR	19	1	1,097	-0.6518							0.91
2010_Chem_FT	835	CR	20	1	1,097	1.6047							0.95
2010_Chem_FT	835	CR	21	1	1,097	1.5631							0.90
2010_Chem_FT	835	CR	22	1	1,097	2.1961							1.00

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	835	CR	23	1	1,097	0.8539							0.95
2010_Chem_FT	835	CR	24	1	1,097	0.0381							0.94
2010_Chem_FT	835	CR	25	1	1,097	1.8637							0.88
2010_Chem_FT	836	MC	01	1	1,103	-1.5143							1.12
2010_Chem_FT	836	MC	02	1	1,103	-0.5522							0.92
2010_Chem_FT	836	MC	03	1	1,103	-0.2268							1.02
2010_Chem_FT	836	MC	04	1	1,103	-0.8903							0.96
2010_Chem_FT	836	MC	05	1	1,103	-0.8271							0.89
2010_Chem_FT	836	MC	06	1	1,103	0.0873							1.05
2010_Chem_FT	836	MC	07	1	1,103	0.3781							1.15
2010_Chem_FT	836	MC	08	1	1,103	-0.0618							1.22
2010_Chem_FT	836	MC	09	1	1,103	-0.6895							0.98
2010_Chem_FT	836	MC	10	1	1,103	-0.4335							1.08
2010_Chem_FT	836	MC	11	1	1,103	0.1743							1.03
2010_Chem_FT	836	MC	12	1	1,103	1.5902							1.18
2010_Chem_FT	836	MC	13	1	1,103	0.2264							1.09
2010_Chem_FT	836	MC	14	1	1,103	0.6626							1.17
2010_Chem_FT	836	CR	15	1	1,103	-0.3040							0.84
2010_Chem_FT	836	CR	16	1	1,103	0.4390							0.94
2010_Chem_FT	836	CR	17	1	1,103	-0.6350							0.84
2010_Chem_FT	836	CR	18	1	1,103	1.8342							0.95
2010_Chem_FT	836	CR	19	1	1,103	1.1276							0.90
2010_Chem_FT	836	CR	20	1	1,103	-0.1327							0.85

Table 9. Partial Credit Model Item Analysis *(continued)*

Test	Form	Type	Item	Max	N-Count	RID	S1	S2	S3	S4	S5	S6	INFIT
2010_Chem_FT	836	CR	21	1	1,103	1.4634							1.15
2010_Chem_FT	836	CR	22	1	1,103	1.3114							0.86
2010_Chem_FT	836	CR	23	1	1,103	0.6626							0.94
2010_Chem_FT	836	CR	24	1	1,103	1.5123							0.93
2010_Chem_FT	836	CR	25	1	1,103	2.2147							0.90
2010_Chem_FT	837	MC	01	1	1,113	0.0000							1.11
2010_Chem_FT	837	MC	02	1	1,113	-0.9300							0.95
2010_Chem_FT	837	MC	03	1	1,113	-0.4900							1.03
2010_Chem_FT	837	MC	04	1	1,113	-0.9300							0.98
2010_Chem_FT	837	MC	05	1	1,113	-0.7000							1.11
2010_Chem_FT	837	MC	06	1	1,113	-1.2900							1.25
2010_Chem_FT	837	MC	07	1	1,113	-2.0146							0.99
2010_Chem_FT	837	MC	08	1	1,113	-0.0100							1.16
2010_Chem_FT	837	MC	09	1	1,113	0.1000							0.96
2010_Chem_FT	837	MC	10	1	1,113	-1.4800							1.08
2010_Chem_FT	837	MC	11	1	1,113	-0.1800							0.96
2010_Chem_FT	837	MC	12	1	1,113	-1.0600							1.07
2010_Chem_FT	837	CR	13	4	1,113	0.1900	-1.3400	-0.9300	-0.1300	2.4000			0.95
2010_Chem_FT	837	CR	14	3	1,113	0.2900	0.0800	-0.4700	0.3900				1.06
2010_Chem_FT	837	CR	15	3	1,113	0.7000	-1.4500	0.0200	1.4300				0.94

Appendix C: DIF Statistics

Table 10. DIF Statistics

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
821	1	MC	-0.18	0.15	-0.02		
821	2	MC	-0.58	2.88	-0.09		
821	3	MC	0.18	0.39	0.04		
821	4	MC	0.08	0.05	0.02		
821	5	MC	-0.04	0.01	0.00		
821	6	MC	-0.17	0.33	-0.03		
821	7	MC	0.20	0.44	0.04		
821	8	MC	0.05	0.03	0.00		
821	9	MC	0.30	0.65	0.04		
821	10	MC	0.27	0.63	0.05		
821	11	MC	-0.51	3.03	-0.10		
821	12	MC	-0.38	1.39	-0.06		
821	13	MC	-0.47	2.03	-0.07		
821	14	MC	-0.04	0.01	-0.01		
821	15	OE		2.33	0.08		
821	16	OE		4.44	-0.11		
821	17	OE		1.18	-0.05		
821	18	OE		5.89	-0.11		
821	19	OE		1.78	0.06		
821	20	OE		0.25	0.02		
821	21	OE		0.05	0.02		
821	22	OE		1.55	0.07		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
821	23	OE		3.58	0.09		
821	24	OE		0.22	0.01		
821	25	OE		4.50	0.10		
822	1	MC	-0.01	0.00	0.00		
822	2	MC	0.81	2.05	0.07		
822	3	MC	-0.38	1.09	-0.05		
822	4	MC	-0.39	1.51	-0.08		
822	5	MC	-1.17	12.86	-0.21	B	M
822	6	MC	-1.17	13.46	-0.19	B	M
822	7	MC	0.21	0.33	0.04		
822	8	MC	0.20	0.37	0.04		
822	9	MC	-0.01	0.00	0.01		
822	10	MC	0.88	5.42	0.12		
822	11	MC	0.30	0.60	0.04		
822	12	MC	-0.39	1.46	-0.07		
822	13	MC	0.13	0.11	0.03		
822	14	MC	-0.62	3.85	-0.12		
822	15	OE		0.03	0.01		
822	16	OE		7.51	-0.14		
822	17	OE		0.79	-0.05		
822	18	OE		7.56	0.15		
822	19	OE		1.10	0.04		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
822	20	OE		3.70	0.10		
822	21	OE		1.07	0.06		
822	22	OE		2.79	0.08		
822	23	OE		8.90	0.16		
822	24	OE		0.98	0.05		
823	1	MC	-0.57	2.16	-0.09		
823	2	MC	-0.32	1.10	-0.06		
823	3	MC	-0.25	0.53	-0.03		
823	4	MC	-0.07	0.03	-0.01		
823	5	MC	0.20	0.44	0.03		
823	6	MC	-1.00	8.60	-0.15		
823	7	MC	0.46	1.88	0.08		
823	8	MC	0.31	1.01	0.06		
823	9	MC	-0.43	1.36	-0.07		
823	10	MC	0.40	1.54	0.08		
823	11	MC	-0.01	0.00	-0.01		
823	12	MC	-0.61	3.16	-0.09		
823	13	MC	-0.49	2.13	-0.09		
823	14	MC	0.18	0.31	0.03		
823	15	OE		0.07	-0.01		
823	16	OE		1.58	0.07		
823	17	OE		0.18	0.03		
823	18	OE		0.34	0.03		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
823	19	OE		10.94	0.19	BB	F
823	20	OE		8.32	-0.14		
823	21	OE		0.40	-0.02		
823	22	OE		2.50	0.09		
823	23	OE		0.00	0.00		
823	24	OE		2.72	0.08		
823	25	OE		0.19	0.02		
824	1	MC	-0.04	0.02	-0.01		
824	2	MC	-0.95	9.11	-0.16		
824	3	MC	0.24	0.58	0.03		
824	4	MC	0.35	1.01	0.05		
824	5	MC	0.11	0.15	0.02		
824	6	MC	-0.76	5.58	-0.14		
824	7	MC	0.60	3.44	0.10		
824	8	MC	-0.66	4.24	-0.12		
824	9	MC	-0.33	0.99	-0.06		
824	10	MC	-0.12	0.13	-0.03		
824	11	MC	-0.45	1.80	-0.06		
824	12	MC	-0.01	0.00	0.01		
824	13	MC	0.64	4.33	0.11		
824	14	MC	-0.28	0.87	-0.05		
824	15	OE		2.09	-0.06		
824	16	OE		3.94	0.10		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
824	17	OE		4.66	-0.12		
824	18	OE		5.01	-0.12		
824	19	OE		0.00	0.00		
824	20	OE		0.18	0.03		
824	21	OE		17.42	0.23	BB	F
824	22	OE		0.07	0.01		
824	23	OE		5.19	0.11		
824	24	OE		0.11	0.05		
824	25	OE		4.30	0.11		
825	1	MC	0.81	3.38	0.10		
825	2	MC	-0.07	0.05	-0.02		
825	3	MC	0.14	0.13	0.03		
825	4	MC	-0.01	0.00	-0.01		
825	5	MC	0.26	0.59	0.04		
825	6	MC	0.45	2.05	0.08		
825	7	MC	-0.56	3.52	-0.11		
825	8	MC	-0.54	2.60	-0.10		
825	9	MC	-0.68	5.08	-0.14		
825	10	MC	-1.26	12.46	-0.19	B	M
825	11	MC	0.38	1.20	0.07		
825	12	MC	-1.50	19.77	-0.24	C	M
825	13	MC	0.21	0.43	0.04		
825	14	MC	-0.49	2.14	-0.07		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
825	15	OE		0.64	0.06		
825	16	OE		9.02	0.16		
825	17	OE		4.19	0.10		
825	18	OE		0.32	-0.03		
825	19	OE		0.53	-0.03		
825	20	OE		0.18	-0.04		
825	21	OE		23.01	0.25	BB	F
825	22	OE		0.70	0.04		
825	23	OE		2.66	-0.07		
825	24	OE		10.39	0.18	BB	F
825	25	OE		4.54	-0.11		
826	1	MC	-1.49	15.47	-0.20	B	M
826	2	MC	0.37	1.41	0.06		
826	3	MC	-0.20	0.33	-0.03		
826	4	MC	-0.50	2.69	-0.09		
826	5	MC	-0.49	2.09	-0.08		
826	6	MC	-0.61	2.78	-0.07		
826	7	MC	0.18	0.32	0.02		
826	8	MC	0.02	0.00	0.01		
826	9	MC	-0.25	0.46	-0.01		
826	10	MC	-0.25	0.57	-0.07		
826	11	MC	0.78	5.51	0.14		
826	12	MC	-0.76	6.57	-0.18		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
826	13	MC	-0.18	0.32	-0.04		
826	14	MC	-0.04	0.02	0.01		
826	15	OE		2.95	0.09		
826	16	OE		1.41	-0.05		
826	17	OE		3.98	0.10		
826	18	OE		2.41	0.07		
826	19	OE		0.52	0.05		
826	20	OE		1.37	-0.06		
826	21	OE		1.60	0.07		
826	22	OE		0.12	0.00		
826	23	OE		9.95	0.15		
826	24	OE		0.12	0.01		
826	25	OE		2.84	0.07		
827	1	MC	-0.35	1.09	-0.06		
827	2	MC	-0.56	2.99	-0.10		
827	3	MC	0.10	0.10	0.03		
827	4	MC	0.28	0.73	0.06		
827	5	MC	0.70	2.48	0.08		
827	6	MC	-0.71	5.47	-0.14		
827	7	MC	0.13	0.16	0.03		
827	8	MC	-0.53	3.26	-0.08		
827	9	MC	-0.42	1.58	-0.06		
827	10	MC	0.20	0.43	0.05		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
827	11	MC	-0.09	0.07	-0.03		
827	12	MC	-0.70	1.37	-0.05		
827	13	MC	-0.18	0.32	-0.02		
827	14	OE		0.25	0.04		
827	15	OE		0.32	-0.03		
827	16	OE		3.27	-0.11		
827	17	OE		5.02	0.11		
827	18	OE		1.03	-0.07		
827	19	OE		13.01	0.19	BB	F
827	20	OE		0.22	-0.04		
827	21	OE		4.80	-0.12		
827	22	OE		5.11	0.10		
827	23	OE		5.19	-0.12		
827	24	OE		8.39	0.17		
827	25	OE		10.02	0.18	BB	F
828	1	MC	0.43	1.65	0.07		
828	2	MC	0.50	1.74	0.07		
828	3	MC	-1.15	12.81	-0.20	B	M
828	4	MC	-0.13	0.19	-0.01		
828	5	MC	-0.71	4.19	-0.11		
828	6	MC	0.38	1.64	0.09		
828	7	MC	-0.05	0.02	-0.01		
828	8	MC	-0.10	0.09	-0.01		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
828	9	MC	-0.48	1.36	-0.06		
828	10	MC	-0.27	0.80	-0.04		
828	11	MC	0.39	1.30	0.08		
828	12	MC	0.30	0.68	0.05		
828	13	MC	-0.42	1.57	-0.06		
828	14	OE		0.01	-0.02		
828	15	OE		0.96	-0.06		
828	16	OE		0.05	-0.01		
828	17	OE		0.69	0.05		
828	18	OE		0.84	0.05		
828	19	OE		1.01	0.04		
828	20	OE		0.11	-0.02		
828	21	OE		1.36	0.05		
828	22	OE		0.76	0.05		
828	23	OE		0.75	-0.04		
828	24	OE		0.00	-0.02		
828	25	OE		2.72	0.09		
829	1	MC	-1.23	7.25	-0.16	B	M
829	2	MC	1.22	3.75	0.12		
829	3	MC	-0.63	2.00	-0.08		
829	4	MC	-0.21	0.41	-0.03		
829	5	MC	-0.57	3.27	-0.11		
829	6	MC	-0.25	0.50	-0.03		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
829	7	MC	-0.22	0.56	-0.03		
829	8	MC	0.95	3.81	0.11		
829	9	MC	-0.78	6.60	-0.14		
829	10	MC	-0.59	3.41	-0.10		
829	11	MC	0.24	0.42	0.03		
829	12	MC	-0.01	0.00	-0.02		
829	13	MC	-0.79	5.81	-0.14		
829	14	MC	-0.27	0.73	-0.05		
829	15	OE		9.01	0.14		
829	16	OE		0.92	0.04		
829	17	OE		0.08	-0.01		
829	18	OE		0.71	0.04		
829	19	OE		0.01	0.02		
829	20	OE		3.46	0.09		
829	21	OE		4.66	0.10		
829	22	OE		10.06	0.16		
829	23	OE		11.32	0.18	BB	F
829	24	OE		4.38	-0.10		
830	1	MC	0.35	1.22	0.08		
830	2	MC	-0.54	2.03	-0.08		
830	3	MC	-0.24	0.60	-0.04		
830	4	MC	-1.55	16.62	-0.21	C	M
830	5	MC	0.52	1.17	0.07		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
830	6	MC	-0.49	2.24	-0.08		
830	7	MC	-0.22	0.38	-0.03		
830	8	MC	0.11	0.11	0.02		
830	9	MC	-0.12	0.15	-0.01		
830	10	MC	0.46	1.92	0.07		
830	11	MC	-0.28	0.48	-0.03		
830	12	MC	-1.08	12.63	-0.21	B	M
830	13	MC	-0.68	4.04	-0.11		
830	14	MC	-0.58	3.37	-0.11		
830	15	OE		6.07	0.11		
830	16	OE		0.10	0.02		
830	17	OE		7.11	0.14		
830	18	OE		1.08	-0.06		
830	19	OE		5.33	0.12		
830	20	OE		3.78	0.10		
830	21	OE		8.36	0.15		
830	22	OE		0.81	0.05		
830	23	OE		0.12	0.02		
830	24	OE		0.83	0.05		
830	25	OE		2.99	0.09		
831	1	MC	-1.14	7.17	-0.13	B	M
831	2	MC	0.18	0.33	0.03		
831	3	MC	-0.25	0.38	-0.03		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
831	4	MC	-0.62	4.06	-0.12		
831	5	MC	-0.18	0.31	-0.04		
831	6	MC	0.00	0.00	-0.01		
831	7	MC	0.05	0.03	0.00		
831	8	MC	0.27	0.76	0.06		
831	9	MC	0.19	0.33	0.04		
831	10	MC	0.16	0.25	0.03		
831	11	MC	0.34	1.23	0.08		
831	12	MC	0.24	0.47	0.03		
831	13	MC	0.48	2.36	0.07		
831	14	MC	-0.73	5.61	-0.14		
831	15	OE		2.79	-0.10		
831	16	OE		0.59	0.04		
831	17	OE		0.16	0.03		
831	18	OE		0.66	0.04		
831	19	OE		2.97	-0.09		
831	20	OE		0.00	0.00		
831	21	OE		0.09	0.03		
831	22	OE		6.11	0.13		
831	23	OE		1.40	0.07		
831	24	OE		0.52	0.03		
831	25	OE		2.37	-0.08		
832	1	MC	-0.33	0.59	-0.04		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
832	2	MC	-0.65	3.85	-0.10		
832	3	MC	0.66	3.97	0.09		
832	4	MC	0.21	0.41	0.02		
832	5	MC	-0.43	1.61	-0.07		
832	6	MC	0.01	0.00	0.02		
832	7	MC	0.12	0.16	0.01		
832	8	MC	-0.40	1.57	-0.06		
832	9	MC	-0.46	1.27	-0.06		
832	10	MC	-0.66	4.54	-0.12		
832	11	MC	-0.25	0.40	-0.02		
832	12	MC	0.42	1.25	0.05		
832	13	MC	0.34	1.03	0.05		
832	14	OE		0.11	0.01		
832	15	OE		1.38	-0.08		
832	16	OE		2.97	0.10		
832	17	OE		2.18	0.07		
832	18	OE		5.30	0.12		
832	19	OE		1.85	-0.06		
832	20	OE		3.59	0.09		
832	21	OE		1.10	0.05		
832	22	OE		2.09	0.08		
832	23	OE		4.80	-0.09		
832	24	OE		4.01	-0.07		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
833	1	MC	-0.22	0.47	-0.04		
833	2	MC	0.11	0.07	0.02		
833	3	MC	-0.37	1.47	-0.07		
833	4	MC	-0.44	0.53	-0.05		
833	5	MC	1.62	10.77	0.19	C	F
833	6	MC	-0.49	2.39	-0.09		
833	7	MC	-0.26	0.68	-0.06		
833	8	MC	-0.21	0.39	-0.04		
833	9	MC	-0.22	0.48	-0.04		
833	10	MC	0.37	1.18	0.05		
833	11	MC	0.05	0.02	0.01		
833	12	MC	-0.42	1.85	-0.09		
833	13	MC	-0.20	0.38	-0.05		
833	14	MC	-0.07	0.05	-0.03		
833	15	OE		4.21	0.11		
833	16	OE		5.12	0.12		
833	17	OE		1.04	0.06		
833	18	OE		14.53	0.19	BB	F
833	19	OE		0.00	0.00		
833	20	OE		0.09	0.03		
833	21	OE		0.38	0.04		
833	22	OE		0.78	-0.03		
833	23	OE		13.56	-0.19	BB	M

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
834	1	MC	-0.53	2.29	-0.10		
834	2	MC	-1.01	10.45	-0.19	B	M
834	3	MC	0.20	0.40	0.03		
834	4	MC	0.57	3.17	0.10		
834	5	MC	-0.01	0.00	0.01		
834	6	MC	0.44	0.74	0.05		
834	7	MC	-0.99	10.10	-0.19		
834	8	MC					
834	9	MC	-1.20	10.74	-0.19	B	M
834	10	MC	-0.24	0.62	-0.05		
834	11	MC	0.40	1.04	0.07		
834	12	MC	-0.21	0.35	-0.03		
834	13	MC	-0.23	0.49	-0.03		
834	14	MC	0.70	4.94	0.13		
834	15	OE		3.50	0.10		
834	16	OE		1.36	-0.05		
834	17	OE		9.06	0.15		
834	18	OE		0.00	0.00		
834	19	OE		14.40	0.20	BB	F
834	20	OE		3.67	0.09		
834	21	OE		1.18	-0.07		
834	22	OE		3.15	0.09		
834	23	OE		0.00	0.01		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
834	24	OE		2.02	-0.06		
835	1	MC	-0.28	0.29	-0.04		
835	2	MC	0.14	0.23	0.03		
835	3	MC	-0.58	3.44	-0.12		
835	4	MC	-0.57	1.87	-0.06		
835	5	MC	0.55	2.13	0.09		
835	6	MC	-0.03	0.01	-0.01		
835	7	MC	-0.33	0.67	-0.03		
835	8	MC	0.24	0.57	0.04		
835	9	MC	0.97	3.82	0.12		
835	10	MC	0.99	9.06	0.17		
835	11	MC	-0.38	0.59	-0.04		
835	12	MC	-0.34	1.02	-0.05		
835	13	MC	0.51	2.39	0.08		
835	14	MC	-0.74	5.88	-0.13		
835	15	OE		0.00	0.01		
835	16	OE		0.67	-0.04		
835	17	OE		2.85	-0.09		
835	18	OE		0.33	-0.04		
835	19	OE		0.42	0.02		
835	20	OE		8.45	-0.15		
835	21	OE		0.83	-0.05		
835	22	OE		2.09	0.07		

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
835	23	OE		4.04	0.11		
835	24	OE		1.58	0.06		
835	25	OE		1.54	0.06		
836	1	MC	-0.28	0.53	-0.05		
836	2	MC	0.31	0.77	0.06		
836	3	MC	-0.23	0.48	-0.05		
836	4	MC	-0.65	3.31	-0.07		
836	5	MC	-0.56	2.18	-0.08		
836	6	MC	0.04	0.02	0.00		
836	7	MC	-0.08	0.07	0.00		
836	8	MC	-0.30	0.95	-0.07		
836	9	MC	0.35	1.03	0.07		
836	10	MC	0.77	5.78	0.14		
836	11	MC	-0.53	2.78	-0.10		
836	12	MC	-0.23	0.44	-0.04		
836	13	MC	-0.43	1.97	-0.08		
836	14	MC	0.23	0.55	0.04		
836	15	OE		0.36	0.02		
836	16	OE		2.01	0.08		
836	17	OE		0.20	-0.03		
836	18	OE		2.15	-0.08		
836	19	OE		2.50	-0.08		

*DIF Category meanings: A/AA=negligible, B/BB=moderate, C/CC=large

Table 10. DIF Statistics *(continued)*

Form	Item	Item Type	MH Delta	MH Chi-Sq	Effect Size	DIF Category	Favored Group
836	20	OE		6.38	0.11		
836	21	OE		0.48	-0.05		
836	22	OE		0.47	-0.03		
836	23	OE		4.80	0.11		
836	24	OE		0.40	0.04		
836	25	OE		5.39	0.12		
837	1	MC	-0.30	0.93	-0.06		
837	2	MC	0.15	0.17	0.02		
837	3	MC	-0.26	0.61	-0.04		
837	4	MC	0.28	0.60	0.04		
837	5	MC	-1.23	13.96	-0.20	B	M
837	6	MC	0.06	0.03	0.01		
837	7	MC	-1.40	7.81	-0.15	B	M
837	8	MC	0.26	0.73	0.05		
837	9	MC	0.75	5.42	0.12		
837	10	MC	-0.46	1.31	-0.07		
837	11	MC	1.12	11.22	0.19	B	F
837	12	MC	0.08	0.05	0.00		
837	13	OE		0.00	0.00		
837	14	OE		0.39	-0.03		
837	15	OE		1.21	0.05		

Appendix D: Operational Test Maps

Table 11. Operational Test Map for January 2010

Position	Item Type	Max Points	Mean	Point-Biserial	Rasch	S1	S2	S3	S4
1	MC	1	0.87	0.39	-2.13				
2	MC	1	0.63	0.39	-0.54				
3	MC	1	0.33	0.21	0.90				
4	MC	1	0.84	0.40	-1.81				
5	MC	1	0.78	0.42	-1.37				
6	MC	1	0.88	0.26	-2.22				
7	MC	1	0.52	0.46	0.01				
8	MC	1	0.45	0.41	0.40				
9	MC	1	0.54	0.52	-0.06				
10	MC	1	0.73	0.48	-1.10				
11	MC	1	0.60	0.32	-0.37				
12	MC	1	0.79	0.47	-1.49				
13	MC	1	0.48	0.51	0.21				
14	MC	1	0.80	0.43	-1.48				
15	MC	1	0.66	0.45	-0.65				
16	MC	1	0.56	0.50	-0.16				
17	MC	1	0.53	0.38	-0.05				
18	MC	1	0.34	0.31	0.94				
19	MC	1	0.44	0.41	0.44				
20	MC	1	0.45	0.41	0.35				
21	MC	1	0.35	0.31	0.90				

Table 11. Operational Test Map for January 2010 *(continued)*

Position	Item Type	Max Points	Mean	Point-Biserial	Rasch	S1	S2	S3	S4
22	MC	1	0.45	0.39	0.36				
23	MC	1	0.65	0.46	-0.62				
24	MC	1	0.55	0.42	-0.14				
25	MC	1	0.42	0.44	0.48				
26	MC	1	0.62	0.33	-0.47				
27	MC	1	0.81	0.38	-1.52				
28	MC	1	0.45	0.21	0.39				
29	MC	1	0.56	0.51	-0.16				
30	MC	1	0.79	0.35	-1.42				
31	MC	1	0.43	0.32	0.49				
32	MC	1	0.47	0.33	0.26				
33	MC	1	0.71	0.46	-0.97				
34	MC	1	0.53	0.49	-0.02				
35	MC	1	0.69	0.35	-0.83				
36	MC	1	0.63	0.47	-0.47				
37	MC	1	0.56	0.55	-0.16				
38	MC	1	0.49	0.47	0.16				
39	MC	1	0.43	0.31	0.48				
40	MC	1	0.44	0.26	0.42				
41	MC	1	0.49	0.41	0.17				
42	MC	1	0.80	0.35	-1.51				
43	MC	1	0.81	0.34	-1.58				

Table 11. Operational Test Map for January 2010 *(continued)*

Position	Item Type	Max Points	Mean	Point-Biserial	Rasch	S1	S2	S3	S4
44	MC	1	0.54	0.46	-0.07				
45	MC	1	0.58	0.42	-0.25				
46	MC	1	0.62	0.52	-0.48				
47	MC	1	0.80	0.26	-1.56				
48	MC	1	0.54	0.32	-0.08				
49	MC	1	0.72	0.30	-0.98				
50	MC	1	0.53	0.38	-0.02				
51	CR	1	0.38	0.55	0.68				
52	CR	1	0.40	0.53	0.65				
53	CR	1	0.44	0.57	0.40				
54	CR	1	0.45	0.31	0.39				
55	CR	1	0.81	0.51	-1.53				
56	CR	2	0.71	0.57	0.74	-0.07	0.07		
57	CR	1	0.63	0.44	-0.51				
58	CR	1	0.53	0.45	-0.04				
59	CR	1	0.36	0.53	0.83				
60	CR	1	0.41	0.54	0.58				
61	CR	1	0.23	0.49	1.57				
62	CR	1	0.20	0.43	1.76				
63	CR	1	0.51	0.53	0.11				
64	CR	1	0.68	0.53	-0.75				
65	CR	1	0.23	0.52	1.53				

Table 11. Operational Test Map for January 2010 *(continued)*

Position	Item Type	Max Points	Mean	Point-Biserial	Rasch	S1	S2	S3	S4
66	CR	1	0.45	0.41	0.36				
67	CR	1	0.38	0.47	0.72				
68	CR	1	0.28	0.56	1.25				
69	CR	1	0.17	0.45	1.96				
70	CR	1	0.74	0.51	-1.10				
71	CR	1	0.26	0.53	1.33				
72	CR	1	0.62	0.46	-0.47				
73	CR	1	0.75	0.43	-1.15				
74	CR	1	0.64	0.45	-0.56				
75	CR	1	0.55	0.43	-0.10				
76	CR	1	0.38	0.59	0.75				
77	CR	1	0.37	0.44	0.77				
78	CR	1	0.40	0.38	0.61				
79	CR	1	0.54	0.39	-0.06				
80	CR	1	0.31	0.57	1.13				
81	CR	1	0.23	0.58	1.65				
82	CR	1	0.20	0.47	1.74				
83	CR	1	0.26	0.47	1.38				
84	CR	1	0.11	0.41	2.59				

Table 12. Operational Test Map for June 2010

Position	Item Type	Max Points	Mean	Point-Biserial	Rasch	S1	S2	S3	S4
1	MC	1	0.75	0.34	-1.11				
2	MC	1	0.81	0.38	-1.49				
3	MC	1	0.75	0.51	-1.08				
4	MC	1	0.66	0.37	-0.54				
5	MC	1	0.55	0.47	-0.05				
6	MC	1	0.74	0.37	-1.03				
7	MC	1	0.48	0.41	0.32				
8	MC	1	0.70	0.40	-0.82				
9	MC	1	0.62	0.41	-0.40				
10	MC	1	0.48	0.32	0.32				
11	MC	1	0.43	0.35	0.57				
12	MC	1	0.73	0.46	-1.01				
13	MC	1	0.72	0.36	-0.93				
14	MC	1	0.61	0.36	-0.32				
15	MC	1	0.38	0.27	0.77				
16	MC	1	0.51	0.39	0.15				
17	MC	1	0.72	0.44	-0.93				
18	MC	1	0.26	0.32	1.45				
19	MC	1	0.72	0.42	-0.89				
20	MC	1	0.65	0.28	-0.54				
21	MC	1	0.41	0.35	0.63				

Table 12. Operational Test Map for June 2010 *(continued)*

Position	Item Type	Max Points	Mean	Point-Biserial	Rasch	S1	S2	S3	S4
22	MC	1	0.81	0.42	-1.49				
23	MC	1	0.76	0.39	-1.30				
24	MC	1	0.38	0.37	0.80				
25	MC	1	0.62	0.43	-0.40				
26	MC	1	0.53	0.28	-0.09				
27	MC	1	0.62	0.47	-0.36				
28	MC	1	0.76	0.33	-1.13				
29	MC	1	0.74	0.38	-1.06				
30	MC	1	0.56	0.36	-0.11				
31	MC	1	0.74	0.43	-1.01				
32	MC	1	0.83	0.31	-1.67				
33	MC	1	0.62	0.46	-0.36				
34	MC	1	0.50	0.38	0.20				
35	MC	1	0.53	0.26	0.02				
36	MC	1	0.82	0.50	-1.61				
37	MC	1	0.30	0.25	1.23				
38	MC	1	0.58	0.37	-0.33				
39	MC	1	0.70	0.34	-0.79				
40	MC	1	0.54	0.50	0.00				
41	MC	1	0.53	0.29	0.07				
42	MC	1	0.68	0.41	-0.67				
43	MC	1	0.32	0.35	1.01				

Table 12. Operational Test Map for June 2010 *(continued)*

Position	Item Type	Max Points	Mean	Point-Biserial	Rasch	S1	S2	S3	S4
44	MC	1	0.47	0.33	0.36				
45	MC	1	0.59	0.32	-0.20				
46	MC	1	0.78	0.37	-1.33				
47	MC	1	0.50	0.35	0.21				
48	MC	1	0.56	0.36	-0.08				
49	MC	1	0.61	0.46	-0.30				
50	MC	1	0.72	0.38	-0.90				
51	CR	1	0.56	0.26	-0.09				
52	CR	1	0.42	0.54	0.63				
53	CR	1	0.24	0.34	1.64				
54	CR	1	0.21	0.43	1.77				
55	CR	1	0.65	0.49	-0.56				
56	CR	2	1.31	0.56	-0.38	0.21	-0.21		
57	CR	1	0.48	0.43	0.29				
58	CR	1	0.36	0.53	0.88				
59	CR	1	0.18	0.48	2.09				
60	CR	1	0.43	0.55	0.56				
61	CR	1	0.44	0.57	0.48				
62	CR	1	0.30	0.49	1.22				
63	CR	1	0.24	0.45	1.55				
64	CR	1	0.22	0.52	1.72				
65	CR	1	0.44	0.48	0.49				

Table 12. Operational Test Map for June 2010 *(continued)*

Position	Item Type	Max Points	Mean	Point-Biserial	Rasch	S1	S2	S3	S4
66	CR	1	0.39	0.33	0.75				
67	CR	1	0.54	0.50	0.04				
68	CR	1	0.41	0.46	0.64				
69	CR	2	1.63	0.42	-1.34	-0.16	0.16		
70	CR	1	0.66	0.38	-0.59				
71	CR	1	0.57	0.45	-0.16				
72	CR	1	0.31	0.44	1.16				
73	CR	1	0.38	0.45	0.80				
74	CR	1	0.53	0.51	0.07				
75	CR	1	0.34	0.54	1.02				
76	CR	1	0.60	0.43	-0.28				
77	CR	1	0.43	0.52	0.54				
78	CR	1	0.57	0.50	-0.13				
79	CR	1	0.61	0.49	-0.33				
80	CR	1	0.19	0.45	1.90				
81	CR	1	0.45	0.52	0.48				
82	CR	1	0.45	0.49	0.46				
83	CR	1	0.23	0.33	1.63				

Table 13. Operational Test Map for August 2010

Position	Item Type	Max Points	Mean	Point-Biserial	Rasch	S1	S2	S3	S4
1	MC	1	0.85	0.36	-1.87				
2	MC	1	0.74	0.47	-1.15				
3	MC	1	0.64	0.28	-0.58				
4	MC	1	0.31	0.39	0.97				
5	MC	1	0.60	0.10	-0.35				
6	MC	1	0.55	0.30	-0.11				
7	MC	1	0.79	0.41	-1.47				
8	MC	1	0.68	0.36	-0.80				
9	MC	1	0.77	0.48	-1.29				
10	MC	1	0.72	0.43	-0.96				
11	MC	1	0.65	0.33	-0.65				
12	MC	1	0.63	0.40	-0.51				
13	MC	1	0.53	0.41	-0.05				
14	MC	1	0.75	0.41	-1.20				
15	MC	1	0.62	0.40	-0.48				
16	MC	1	0.70	0.37	-0.87				
17	MC	1	0.57	0.35	-0.20				
18	MC	1	0.51	0.28	0.06				
19	MC	1	0.52	0.42	0.05				
20	MC	1	0.48	0.40	0.22				
21	MC	1	0.43	0.33	0.48				
22	MC	1	0.34	0.45	0.92				

Table 13. Operational Test Map for August 2010 *(continued)*

Position	Item Type	Max Points	Mean	Point-Biserial	Rasch	S1	S2	S3	S4
23	MC	1	0.74	0.41	-1.14				
24	MC	1	0.77	0.45	-1.32				
25	MC	1	0.36	0.27	0.80				
26	MC	1	0.74	0.41	-1.13				
27	MC	1	0.59	0.42	-0.32				
28	MC	1	0.46	0.33	0.43				
29	MC	1	0.73	0.31	-1.05				
30	MC	1	0.75	0.35	-1.18				
31	MC	1	0.88	0.39	-2.22				
32	MC	1	0.37	0.32	0.72				
33	MC	1	0.45	0.43	0.36				
34	MC	1	0.50	0.51	0.11				
35	MC	1	0.50	0.39	0.13				
36	MC	1	0.69	0.25	-0.87				
37	MC	1	0.54	0.30	-0.06				
38	MC	1	0.61	0.44	-0.44				
39	MC	1	0.56	0.42	-0.20				
40	MC	1	0.55	0.43	-0.10				
41	MC	1	0.70	0.34	-0.88				
42	MC	1	0.42	0.38	0.48				
43	MC	1	0.76	0.47	-1.22				
44	MC	1	0.72	0.48	-0.99				

Table 13. Operational Test Map for August 2010 *(continued)*

Position	Item Type	Max Points	Mean	Point-Biserial	Rasch	S1	S2	S3	S4
45	MC	1	0.62	0.44	-0.49				
46	MC	1	0.61	0.41	-0.42				
47	MC	1	0.41	0.33	0.56				
48	MC	1	0.44	0.47	0.42				
49	MC	1	0.29	0.40	1.18				
50	MC	1	0.33	0.30	1.01				
51	CR	1	0.53	0.48	0.00				
52	CR	1	0.73	0.40	-1.08				
53	CR	2	0.88	0.58	0.35	0.58	-0.58		
54	CR	1	0.60	0.45	-0.41				
55	CR	1	0.63	0.51	-0.54				
56	CR	1	0.51	0.57	0.05				
57	CR	2	1.33	0.64	-0.67	-0.51	0.51		
58	CR	1	0.30	0.47	1.16				
59	CR	1	0.33	0.54	0.98				
60	CR	1	0.20	0.55	1.77				
61	CR	1	0.70	0.41	-0.88				
62	CR	1	0.35	0.56	0.85				
63	CR	1	0.33	0.52	0.97				
64	CR	1	0.40	0.45	0.62				
65	CR	1	0.44	0.53	0.43				
66	CR	1	0.26	0.49	1.39				

Table 13. Operational Test Map for August 2010 *(continued)*

Position	Item Type	Max Points	Mean	Point-Biserial	Rasch	S1	S2	S3	S4
67	CR	1	0.47	0.55	0.24				
68	CR	1	0.29	0.51	1.21				
69	CR	1	0.29	0.55	1.23				
70	CR	1	0.46	0.51	0.34				
71	CR	2	0.67	0.62	0.91	-0.41	0.41		
72	CR	1	0.60	0.51	-0.37				
73	CR	1	0.46	0.48	0.30				
74	CR	1	0.36	0.58	0.82				
75	CR	1	0.75	0.33	-1.15				
76	CR	1	0.59	0.50	-0.31				
77	CR	1	0.33	0.60	0.99				
78	CR	2	0.71	0.61	0.72	0.39	-0.39		
79	CR	1	0.16	0.50	2.11				
80	CR	1	0.34	0.52	0.92				
81	CR	1	0.16	0.52	2.16				

Appendix E: Scoring Tables

Table 14. Scoring Table for January 2010

Raw Score	Ability	Scale Score		Raw Score	Ability	Scale Score		Raw Score	Ability	Scale Score		Raw Score	Ability	Scale Score
0	-5.6070	0.802		22	-1.2460	42.264		44	0.1020	61.318		66	1.4830	76.880
1	-4.8880	3.174		23	-1.1740	43.435		45	0.1590	61.995		67	1.5620	77.738
2	-4.1690	5.960		24	-1.1040	44.565		46	0.2160	62.668		68	1.6440	78.613
3	-3.7380	8.599		25	-1.0360	45.646		47	0.2730	63.332		69	1.7300	79.533
4	-3.4240	11.128		26	-0.9690	46.695		48	0.3300	63.992		70	1.8190	80.466
5	-3.1750	13.544		27	-0.9040	47.708		49	0.3870	64.652		71	1.9130	81.439
6	-2.9670	15.862		28	-0.8390	48.699		50	0.4450	65.320		72	2.0110	82.435
7	-2.7870	18.081		29	-0.7760	49.641		51	0.5030	65.981		73	2.1160	83.472
8	-2.6270	20.201		30	-0.7130	50.574		52	0.5610	66.636		74	2.2280	84.551
9	-2.4830	22.230		31	-0.6520	51.460		53	0.6200	67.299		75	2.3480	85.668
10	-2.3520	24.161		32	-0.5910	52.332		54	0.6800	67.978		76	2.4780	86.826
11	-2.2310	26.009		33	-0.5310	53.176		55	0.7400	68.654		77	2.6210	88.035
12	-2.1180	27.801		34	-0.4720	53.995		56	0.8020	69.341		78	2.7800	89.298
13	-2.0110	29.522		35	-0.4130	54.797		57	0.8640	70.036		79	2.9590	90.608
14	-1.9110	31.166		36	-0.3540	55.587		58	0.9270	70.736		80	3.1670	91.980
15	-1.8160	32.735		37	-0.2960	56.358		59	0.9910	71.447		81	3.4160	93.413
16	-1.7250	34.272		38	-0.2390	57.099		60	1.0560	72.172		82	3.7300	94.917
17	-1.6380	35.729		39	-0.1810	57.835		61	1.1230	72.918		83	4.1630	96.500
18	-1.5540	37.136		40	-0.1240	58.557		62	1.1910	73.670		84	4.8830	98.160
19	-1.4730	38.504		41	-0.0680	59.257		63	1.2610	74.442		85	5.6030	99.719
20	-1.3950	39.803		42	-0.0110	59.951		64	1.3330	75.233				
21	-1.3200	41.047		43	0.0460	60.649		65	1.4070	76.046				

Table 15. Scoring Table for June 2010

Raw Score	Ability	Scale Score		Raw Score	Ability	Scale Score		Raw Score	Ability	Scale Score		Raw Score	Ability	Scale Score
0	-5.4720	1.252		22	-1.2400	42.362		44	0.0490	60.685		66	1.4270	76.265
1	-4.7600	3.588		23	-1.1730	43.452		45	0.1040	61.342		67	1.5060	77.130
2	-4.0480	6.590		24	-1.1070	44.517		46	0.1600	62.007		68	1.5890	78.026
3	-3.6240	9.428		25	-1.0420	45.551		47	0.2160	62.668		69	1.6750	78.944
4	-3.3180	12.131		26	-0.9790	46.540		48	0.2720	63.321		70	1.7650	79.902
5	-3.0760	14.630		27	-0.9170	47.505		49	0.3290	63.981		71	1.8590	80.882
6	-2.8740	16.986		28	-0.8560	48.445		50	0.3860	64.641		72	1.9580	81.899
7	-2.7010	19.192		29	-0.7960	49.342		51	0.4430	65.297		73	2.0630	82.955
8	-2.5480	21.294		30	-0.7370	50.223		52	0.5020	65.970		74	2.1750	84.045
9	-2.4100	23.295		31	-0.6780	51.084		53	0.5600	66.625		75	2.2950	85.183
10	-2.2850	25.177		32	-0.6200	51.923		54	0.6200	67.299		76	2.4260	86.372
11	-2.1700	26.970		33	-0.5630	52.727		55	0.6800	67.978		77	2.5680	87.599
12	-2.0620	28.701		34	-0.5060	53.526		56	0.7410	68.665		78	2.7270	88.889
13	-1.9620	30.327		35	-0.4500	54.297		57	0.8030	69.352		79	2.9060	90.235
14	-1.8670	31.891		36	-0.3940	55.052		58	0.8670	70.070		80	3.1130	91.639
15	-1.7770	33.395		37	-0.3380	55.801		59	0.9310	70.781		81	3.3610	93.113
16	-1.6910	34.842		38	-0.2820	56.541		60	0.9970	71.514		82	3.6730	94.661
17	-1.6090	36.212		39	-0.2270	57.251		61	1.0640	72.261		83	4.1040	96.300
18	-1.5310	37.527		40	-0.1720	57.949		62	1.1330	73.029		84	4.8220	98.032
19	-1.4540	38.821		41	-0.1170	58.645		63	1.2030	73.803		85	5.5400	99.582
20	-1.3810	40.036		42	-0.0610	59.342		64	1.2750	74.596				
21	-1.3100	41.213		43	-0.0060	60.012		65	1.3500	75.420				

Table 16. Scoring Table for August 2010

Raw Score	Ability	Scale Score		Raw Score	Ability	Scale Score		Raw Score	Ability	Scale Score		Raw Score	Ability	Scale Score
0	-5.5190	1.095		22	-1.2220	42.655		44	0.0790	61.043		66	1.4070	76.046
1	-4.8030	3.449		23	-1.1530	43.777		45	0.1340	61.698		67	1.4830	76.880
2	-4.0870	6.387		24	-1.0850	44.869		46	0.1880	62.338		68	1.5620	77.738
3	-3.6590	9.148		25	-1.0190	45.914		47	0.2430	62.985		69	1.6450	78.623
4	-3.3480	11.837		26	-0.9550	46.913		48	0.2980	63.622		70	1.7320	79.555
5	-3.1020	14.345		27	-0.8910	47.910		49	0.3530	64.258		71	1.8230	80.508
6	-2.8970	16.708		28	-0.8290	48.848		50	0.4080	64.896		72	1.9190	81.500
7	-2.7200	18.947		29	-0.7680	49.761		51	0.4640	65.538		73	2.0210	82.536
8	-2.5640	21.068		30	-0.7070	50.661		52	0.5200	66.173		74	2.1300	83.609
9	-2.4230	23.100		31	-0.6480	51.518		53	0.5770	66.815		75	2.2470	84.733
10	-2.2950	25.023		32	-0.5890	52.361		54	0.6340	67.458		76	2.3750	85.915
11	-2.1770	26.859		33	-0.5310	53.176		55	0.6920	68.113		77	2.5150	87.150
12	-2.0660	28.636		34	-0.4740	53.968		56	0.7510	68.776		78	2.6710	88.447
13	-1.9630	30.311		35	-0.4170	54.743		57	0.8100	69.430		79	2.8480	89.823
14	-1.8660	31.908		36	-0.3610	55.494		58	0.8710	70.115		80	3.0530	91.260
15	-1.7730	33.462		37	-0.3050	56.240		59	0.9320	70.792		81	3.2990	92.775
16	-1.6850	34.943		38	-0.2490	56.972		60	0.9950	71.492		82	3.6100	94.377
17	-1.6010	36.346		39	-0.1940	57.670		61	1.0590	72.206		83	4.0390	96.080
18	-1.5200	37.713		40	-0.1390	58.368		62	1.1250	72.940		84	4.7560	97.892
19	-1.4420	39.021		41	-0.0840	59.058		63	1.1920	73.681		85	5.4730	99.436
20	-1.3660	40.285		42	-0.0300	59.719		64	1.2620	74.453				
21	-1.2930	41.494		43	0.0250	60.391		65	1.3330	75.233				