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Technical Adequacy of the easyCBM Primary-Level Mathematics Measures (Grades K-2), 2009-2010 Version

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Abstract

In the following technical report, we present evidence of the technical adequacy of the easyCBM® math measures in grades K-2. In addition to reliability information, we present criterion-related validity evidence, both concurrent and predictive, and construct validity evidence. The results represent data gathered throughout the 2009 / 2010 school year in school districts in the Pacific Northwest.

Technical Adequacy of the easyCBM® Primary-Level Mathematics Measures (Grades K-2), 2009 – 2010 Version

In this technical report, we present the results of a year-long series of studies involving the easyCBM® mathematics assessments, grades K-2. Additional technical reports report the results of similar studies of the easyCBM® assessments in reading (Jamgochian et al., 2010; Lai et al., 2010; Saez et al., 2010) and in mathematics, with a focus on later grades (Nese et al., 2010).

Conceptual Framework: Curriculum-Based Measurement and Progress Monitoring

Curriculum-based measurement (CBM), long a bastion of special education, is gaining support among general education teachers seeking a way to monitor the progress their students are making toward achieving grade-level proficiency in key skill and content areas. While reading in particular has received a great deal of attention in the CBM literature, a growing body of work is appearing in the area of mathematics CBM.

By definition, CBM is a formative assessment approach. By sampling skills related to the curricular content covered in a given year of instruction yet not specifically associated with a particular textbook, CBMs provide teachers with a snapshot of their students' current level of proficiency in a particular content area as well as a mechanism for tracking the progress students make in gaining desired academic skills throughout the year. Historically, CBMs have been very brief individually administered measures (Deno, 2003; Good, Gruba, & Kaminski, 2002), yet they are not limited to the 'one minute timed probes' with which many people associate them.

In one of the early definitions of curriculum-based measurement (CBM), Deno (1987) stated that "the term curriculum-based assessment, generally refers to any approach that uses direct observation and recording of a student's performance in the local school curriculum as a basis for gathering information to make instructional decisions…The term curriculum-based measurement refers to a specific set of procedures created through a research and development

program … and grew out of the *Data-Based Program Modification* system developed by Deno and Mirkin (1977)" (p. 41). He noted that CBM is distinct from many teacher-made classroom assessments in two important respects: (a) the procedures reflect technically adequate measures ("they possess reliability and validity to a degree that equals or exceeds that of most achievement tests" (p. 41), and (b) "growth is described by an increasing score on a standard, or constant task. The most common application of CBM requires that a student's performance in each curriculum area be measured on a single global task repeatedly across time" (p. 41).

In the three decades since Deno and his colleagues introduced CBMS, *progress monitoring probes,* as they have come to be called, have increased in popularity, and they are now a regular part of many schools' educational programs (Alonzo, Tindal, & Ketterlin-Geller, 2006). However, CBMs – even those widely used across the United States – often lack the psychometric properties expected of modern technically-adequate assessments. Although the precision of instrument development has advanced tremendously in the past 30 years with the advent of more sophisticated statistical techniques for analyzing tests on an item by item basis rather than relying exclusively on comparisons of means and standard deviations to evaluate comparability of alternate forms, the world of CBMs has not always kept pace with these statistical advances.

A key feature of assessments designed for progress monitoring is that alternate forms must be as equivalent as possible to allow meaningful interpretation of student performance data across time. Without such cross-form equivalence, changes in scores from one testing session to the next are difficult to attribute to changes in student skill or knowledge. Improvements in student scores may, in fact, be an artifact of the second form of the assessment being easier than the form that was administered first. The advent of more sophisticated data analysis techniques (such as the Rasch modeling used in the development of the easyCBM® progress monitoring and

benchmarking assessments) have made it possible to increase the precision with which we develop and evaluate the quality of assessment tools.

The easyCBM® Progress Monitoring and Benchmarking Assessments

The online easyCBM® progress monitoring and benchmarking assessment system was launched in September 2006 as part of a Model Demonstration Center on Progress Monitoring funded by the Office of Special Education Programs (OSEP). At the time this technical report was published, 110,007 teachers had registered easyCBM® accounts, representing schools and districts spread across every state in the country. During the 2008-2009 school year, an average of 305 new accounts were registered each week, and the popularity of the system continues to grow. In the month of October 2010, alone, 11,885 new teachers registered for accounts. The online assessment system provides both universal screener assessments for fall, winter, and spring administration and multiple alternate forms of a variety of progress monitoring measures designed for use in K-8 school settings. Designed to enable comparison of student performance over time, whether used for monitoring progress or screening students three times per year, the easyCBM® assessments at each grade level are best conceptualized as comparable alternate forms of the same measure rather than as different measures, depending on use.

As part of state funding for Response to Intervention (RTI), states need technically adequate measures for monitoring progress. Given the increasing popularity of the easyCBM® online assessment system, it is imperative that a thorough analysis of the measures' technical adequacy be conducted and the results shared with research and practitioner communities. This technical report addresses that need directly, providing the results of a variety of studies examining the reliability of the K-2 measures and evidence of their validity for use as progress monitoring and benchmarking students.

At each grade level, there are 13 alternate forms of each of the mathematics measures on easyCBM®, with 3 designated for seasonal benchmark screenings and the remaining 10

designating for progress monitoring. All easyCBM® forms were scaled to be of equivalent difficulty with a 1PL Rasch model (Alonzo, Lai, & Tindal, 2009; Alonzo & Tindal, 2009a, 2009b). All easyCBM® math items were written to align with the *National Council of Teachers of Mathematics* (NCTM) focal point standards, displayed by grade level in Table 1.

Reliability of the Measures

Data for this study were gathered in the fall of 2009 and winter and spring of 2010 at three school districts in the Pacific Northwest. The kindergarten sample consisted of 3511 students, the grade one sample consisted of 3785 students, and the grade two sample consisted of 3675 students. No other demographic data were available for these samples. Assessment data used in this study include scores from the fall, winter, and spring administrations of the easyCBM® mathematics benchmark tests.

Data Analysis. We examined the reliability of the easyCBM® measures using Cronbach's alpha and split-half estimates in grades K-2. Results from the fall in grades 1 and 2 can be considered a replication of a prior year's study by Anderson, Tindal, and Alonzo (2009), who showed that the fall measures generally demonstrated strong internal consistency, with a Cronbach's alpha of 0.82 in grade 1 and 0.86 in grade 2. However, the study here extends that earlier research by also investigating the winter and spring measures, as well as the kindergarten measures.

Results. Cronbach's alpha estimates were .83, .85, and .87 for the fall, winter, and spring measures respectively. Split-half reliability estimates for all three measures were consistently in the moderate range, with estimates ranging from the .60s to the .70s. The full results for kindergarten are reported on pages 26 – 37, with the fall results presented in Tables 2-9, the winter results in Tables 10-17, and the spring results in Tables 18-25.

Cronbach's alpha estimates for grade 1 were .78, .86, and .89 for the fall, winter, and spring measures respectively. Split-half reliability estimates for all three measures were consistently in the moderate range, with estimates ranging from the .50s to the .80s. Grade 1 results are reported on pages 38-49, with the fall results presented in Tables 26-33, the winter results in Tables 34-41, and the spring results in Tables 42-49.

Cronbach's alpha estimates for grade 2 were .80, .85, and .82 for fall, winter, and spring respectively. Split-half reliability estimates for all three measures were consistently in the moderate range, with estimates ranging from the .50s to the .80s. Grade 2 results are reported on pages 50-61, with the fall results present in Tables 50-57, winter in Tables 58-65, and spring in Tables 66-73.

Reliability of the Slope

Data used for the reliability of the slope analyses were the same as those used in the reliability of the measure analyses. The data were gathered during the 2009-2010 school year, and all students in attendance at the schools during the assessment period participated in the testing. Data includes scores from the easyCBM® mathematics assessments.

Analyses. We used a two-level hierarchical linear growth model to represent student math growth within one academic year, with *time* at level-1 and *student* at level-2. Data from the easyCBM® math measure were collected in a multiple-time-point design during the fall, winter, and spring, and were used as the criterion variable. Each student's math growth was represented by an individual growth trajectory over time. Analyses were separated by grade level and ethnicity group. In addition, analyses were separated by quartile based on fall easyCBM® math score, in effect conditioning the results on fall score status. The fixed and random effects for the intercept and slope and the reliability of the growth estimates are reported for each student group. The growth reliability of the growth estimates was defined as the ratio between the level-2

variance component and the sum of the level-2 and level-1 components, with the latter divided by the number of students within that particular group, that is

$$\lambda_{0j} = \frac{\tau_{00}}{\tau_{00} + \sigma^2 / n_j},$$

where τ_{00} represents level-2 variance of the growth estimate and σ / n_j represents the measurement error for the level-2 variance (Raudenbush & Bryk, 2002). All analyses were conducted using *R*, the free online statistical software (R Development Core Team, 2010).

Results

The full reliability results for kindergarten are reported in Table 74. The reliability coefficients of the growth slope for Kindergarten were .45, .62, .52, and .24, for quartiles 1 through 4, respectively. Reliability results for Grade 1 are reported in Table 75. The Grade 1 reliability coefficients for were .70, .77, .76, and .21, for quartiles 1 through 4, respectively. Reliability results for Grade 2 are reported in Table 76. The grade 2 reliability coefficients were .42, .61, .47, and .19, for quartiles 1 through 4, respectively.

Validity of the Performance Level Score

In this section, we document the criterion and construct validity evidence for the performance level score of easyCBM® math measures in grades K-2. These findings extend the content validity evidence for easyCBM® as reported in Nese et al. (2010) with the results of an alignment study. The criterion validity evidences presented in this document are divided into sections, one for predictive and the other for concurrent validity evidences. Construct validity evidence is similarly presented in two sections, organized by the type of analysis conducted. For the criterion validity evidence, we examine the relation between easyCBM® and the math portion of the TerraNova. For the construct validity evidence, we first examine the fit of the items to the Rasch model, which assumes unidimensionality. Poorly fitting items therefore indicate a departure from the unidimensional assumption. Second, we conduct a confirmatory factor

analysis (CFA) to examine the fit of items to the theoretical, unidimensional model. We test the unidimensional model against a three-factor model to show that the added dimensions do not significantly improve the fit of the model.

Given that two types of easyCBM® validity evidence are presented in this section, each stemming from separate studies, we describe our methods and results by each validity type.

Methods: Criterion Validity

Data used for the criterion validity analyses were obtained as part of a larger study to establish easyCBM® math norms, which utilized a national stratified random sample. Participants included students from 76 schools in 54 cities across 26 states in 4 geographic locations: Northeast, Midwest, South, and West. Table 77 displays the number of schools in each locale. The average classroom teacher full time equivalency (FTE) for all schools was 29.23 with a standard deviation of 12.96, a minimum of 4.4 and a maximum of 60.5. A total of 88% of schools in the sample were eligible for Title 1, with 55% having school-wide Title 1 funding. One school was a charter school; all others were standard public schools. Tables 78-80 provide descriptive statistics on the student profile of the schools included in the study.

The TerraNova was administered in May, while easyCBM® was administered during the fall, winter, and spring. Thus, using the TerraNova as the criterion, easyCBM® fall and winter measures were examined for predictive validity, while the spring measure was examined for its concurrent validity. Students in kindergarten, first, and second grade took level 10, 11, and 12 of the math portion of TerraNova 3, respectively. According to the TerraNova developers, (CTB McGraw-Hill, 2010) the level 10 form has 30 items and takes approximately 40 minutes to administer, while the level 11 and 12 forms each have 47 items and take approximately 65 minutes and 60 minutes to administer, respectively. The TerraNova 3 contains multiple subtests assessing: (a) number and number relations; (b) computation and numerical estimation; (c) operation concepts; (d) measurement; (e) geometry and spatial sense; (f) data analysis, statistics,

and probability; (g) patterns, functions, and algebra; and (h) problem solving and reasoning.

Analyses. To examine the predictive and concurrent validity of easyCBM® we conducted regression and correlation analyses. Four separate regression models were completed at each grade level. First, a full model was run, which included all easyCBM® assessments administered throughout the year. This model provided an indication of the total relation between the easyCBM® mathematics measures and the TeraNova. Second, individual models were run for each seasonal administration. For the seasonal models, only the students' total score for the seasonal benchmark was entered as a predictor. Correlations are reported in both the full model and the individual models. The fall and winter models can be interpreted as evidence for easyCBM® predictive validity, as there were several months between the administration of easyCBM and the TerraNova. The spring model, however, can be interpreted as evidence of easyCBM® concurrent validity, as easyCBM was administered at nearly the same time as the TerraNova.

Results: Criterion Validity

The full results of the regression analysis are reported in Tables 81 - 125. The results are first reported by the full model, then by each seasonal model. For the full model, we report descriptive statistics, correlations, model summary, ANOVA, regression coefficients, and collinearity diagnostics. Within the regression coefficients table are semi-partial correlations, and collinearity statistics. For the seasonal models, we report only the model summary, ANOVA, and coefficients.

Grade K. The regression tables for the Kindergarten sample are reported in Tables 81-95. The full regression model for kindergarten was statistically significant, $F(3, 149) = 55.83$, $p < .05$. Approximately 53% of the total variance in the TerraNova was accounted for by the three seasonal easyCBM® benchmark tests. The spring benchmark had the highest coefficient, $b = 3.54$, $t(149) = 6.25$, $p < .05$, and uniquely explained 12.4% of the variance. The total unique

variance was 21.6%; meaning 31.4% of the total variance accounted for by the model could be considered shared variance between the easyCBM® predictors. Multicollinearity was indicated by Tolerance and Variance Inflation Factor (VIF) statistics. Tolerance ranged from .50 to .69, while VIF ranged from 1.45 to 1.85. No formal rule exists regarding acceptable levels of Tolerance or VIF. Generally, however, when tolerance is below .3 or VIF is above 5, it is cause for concern.

Predictive validity. The fall and winter models, run to examine the predictive validity evidence of easyCBM®, were both significant $F(1, 215) = 139.46$, $p < .05$, and $F(1, 163) = 61.54$, $p < .05$ respectively. The fall model accounted for 39% of the variance in TerraNova, while the winter model accounted for 27% of the variance in TerraNova.

Concurrent validity. The spring model, run to examine the concurrent validity evidence of easyCBM®, was significant $F(1, 225) = 241.68$, $p < .05$. The model accounted for 52% of the variance in TerraNova.

Grade 1. The regression tables for Grade 1 are reported in Tables 96-110. The full regression model for grade one was statistically significant, $F(3, 142) = 67.72$, $p < .05$. Approximately 59% of the total variance in the TerraNova was accounted for by the three seasonal easyCBM® benchmark tests. The spring benchmark had the highest coefficient, $b = 3.17$, $t(142) = 4.83$, $p < .05$, and uniquely explained 6.8% of the variance. The total unique variance was 12.0%; meaning 47% of the total variance accounted for by the model could be considered shared variance between the easyCBM® predictors. Tolerance ranged from .41 to .52, while VIF ranged from 1.94 to 1.96.

Predictive validity. The fall and winter models, run to examine the predictive validity evidence of easyCBM®, were both significant $F(1, 214) = 139.42$, $p < .05$, and $F(1, 157) = 140.45$, $p < .05$ respectively. The fall model accounted for 39% of the variance in TerraNova, while the winter model accounted for 47% of the variance in TerraNova.

Concurrent validity. The spring model, run to examine the concurrent validity evidence of easyCBM®, was significant $F(1, 240) = 274.50$, $p < .05$. The model accounted for 53% of the variance in TerraNova.

Grade 2. The regression tables for Grade 2 are reported in Tables 111-125. The full regression model for grade two was statistically significant, $F(3, 145) = 96.43$, $p < .05$. Approximately 66% of the total variance in the TerraNova was accounted for by the three seasonal easyCBM® benchmark tests. The winter benchmark had the highest coefficient, $b = 2.37$, $t(145) = 4.74$, $p < .05$, and uniquely explained 5.2% of the variance. The total unique variance was 12.2%; meaning 53.8% of the total variance accounted for by the model could be considered shared variance between the easyCBM® predictors. Tolerance ranged from .41 to .44, while VIF ranged from 2.26 to 2.43.

Predictive validity. The fall and winter models, run to examine the predictive validity evidence of easyCBM®, were both significant $F(1, 153) = 176.45$, $p < .05$, and $F(1, 172) = 200.81$, $p < .05$ respectively. Both the fall and winter models accounted for approximately 54% of the variance in TerraNova.

Concurrent validity. The spring model, run to examine the concurrent validity evidence of easyCBM®, was significant $F(1, 168) = 178.58$, $p < .05$. The model accounted for 52% of the variance in TerraNova.

Methods: Construct Validity

Setting, Subjects, and Procedure. There were two separate analyses run to examine the construct validity of easyCBM®, each with a different sample. For the Rasch analyses, the sample was the same as the criterion validity analyses, coming from a national stratified random sample. For the CFA analyses, however, the sample was the same as the reliability studies, coming from 3 districts across the state of Oregon. Approximately 50% of students in the total sample were male. The sample size for Kindergarten ranged from 1179 to 1201 by the seasonal

focal point, Grade 1 ranged from 1684 to 2475, while Grade 2 had 682 students in the sample.

To investigate the construct validity of easyCBM®, we examined the dimensionality of the 45 item easyCBM® benchmark assessments during the fall, winter, and spring. Our a priori, theoretical model was a unidimensional assessment, displayed in Figure 1.

Analyses. We conducted two separate analyses with easyCBM® to test the proposed measurement model, displayed in Figure 1. First, we conducted Rasch analyses and examined the fit of the items to the Rasch model. Given that the Rasch model assumes unidimensionality, items displaying poor fit indicate a departure from the theoretical model. In other words, items displaying poor fit are those that function differently from others in the assessment, and may be operating on a different dimension. Second, we used CFA to augment the Rasch analysis by testing both the theoretical model, and a rival hypothesis measurement model, displayed in Figure 2.

When conducting the Rasch analysis, we ran all 45 items from each assessment simultaneously with Winsteps version 3.68.2. We then produced bubble maps and an item fit table for each focal point within each assessment. The tables and bubble maps represent the statistics from the 45 item simultaneous model, but are divided into the focal points to increase clarity and enhance interpretation. When viewing the bubble maps (e.g., Figure 3), each bubble represents an item. The vertical axis of the figure represents the difficulty, with easier items appearing near the bottom of the figure and difficult items appearing near the top. The diameter of the bubble represents the error associated with the item, with larger bubbles indicating larger error. Finally, and perhaps most importantly, the vertical line on the figure represents the ideal fit to the unidimensional Rasch model. Items falling to the left or right of this line represent items that are over- or underfit respectively. The further the item is from the line, the poorer the fit to the unidimensional Rasch model. Following each of these figures is a table providing the actual statistics behind the figure (e.g., Table 126). The items are presented by their fit to the Rasch

model, with the most underfit item displayed first, and the most overfit item displayed at the bottom of the table.

For the CFA, a structural model comparison was conducted to verify that a unidimensional model (Figure 1) was the best model for the easyCBM® math data for students in grades K-2. For the model comparison analyses, first a three-factor CFA was evaluated, where each factor represented an NCTM focal point. All factor loadings were freed, all factors were allowed to correlate freely, and factor variances were constrained to 1.0. The model had a simple, or congeneric, factor structure in which each observed variable loaded on only one factor. The Mplus 5.21 (Muthén & Muthén, 2009) software with WLSMV[1] estimator was used for all CFA analyses. Next, a CFA for a unidimensional model was evaluated, and a difference test was conducted to determine whether the three-factor model fit the data significantly better than the unidimensional model in which it was nested. Using the WLSMV estimator, the chi-square and degrees of freedom values are adjusted and cannot be interpreted in the usual manner (Muthén & Muthén, 1998-2007) to compare models. Thus, the DIFFTEST option in Mplus 5.21 (Muthén & Muthén, 2009) was used to compare the nested models, as it offers a correct chi-square difference test using the WLSMV estimator. The DIFFTEST compared the more restrictive three-factor model with the less restrictive unidimensional model. According to Muthén and Muthén (1998-2007), only the *p*-value of the difference test should be interpreted, not the chi-square and degrees of freedom values. A significant chi-square difference value indicated that the unidimensional model fit the data significantly better than did the three-factor model; that is, a significant *p*-value indicated that the three-factor model significantly worsened the fit of the less restrictive unidimensional model.

The theorized unidimensional model was compared against the three-factor model

[1] WLSMV represents weighted least square parameter estimates using a diagonal weight matrix with standard errors and mean and variance adjusted chi-square test statistic that use a full weight matrix (Muthén & Muthén, 1998-2007).

because the easyCBM® math items were written to align to the three NCTM focal points at each grade. Theoretically, a three-factor model would therefore be equally plausible to a unidimensional model. Following the validity logic of Kane (1992), we evaluated the fit of the three-factor model with respect to the unidimensional model to rule out a plausible alternative (3-factor model). In other words, if it could be shown that the rival hypothesized 3-factor model does not result in significantly better fit over the unidimensional model, the rival hypothesis would be ruled out, enhancing the validity evidence for the unidimensional model. In addition to the DIFFTEST, the correlations between the factors were examined on the three-factor model.

Results: Construct Validity

The results are reported by each focal point within each of the seasonal administrations, although each administration was run as a full model. According to Wright and Linacre (1994) high stakes test items should have a mean square outfit ranging from 0.80 to 1.20. Less high stakes tests that are still important (e.g., perhaps the results are used as an indicator for basing decisions) should range from 0.7 to 1.3.

Grade K. For the fall administration, the mean square outfit ranged from 0.77 to 1.32. All but 2 fall items ranged between 0.7 and 1.3, and all but 4 items ranged between 0.8 and 1.2. Winter items ranged from .52 to 1.23. All but 4 winter items ranged between 0.7 and 1.3, and all but 9 items ranged between 0.8 and 1.2. Spring items ranged from 0.59 to 1.24. All but 4 spring items ranged between 0.7 to 1.3, and all but 12 items ranged between 0.8 and 1.2.

Table 153 reports the results of a Chi-square difference test between a three-factor model and a unidimensional model. At each seasonal administration a significant *p* value is reported, indicating that adding the additional dimensions did not result in significantly better fit. Table 154 reports the correlations between the factors on the three-factor model to be quite high, ranging from .79 to .85 in the fall, .80 to .85 in the winter, and .86 to .90 in the spring.

Grade 1. For the fall administration, the mean square outfit ranged from 0.80 to 1.48. All

but 5 fall items ranged between 0.7 and 1.3, and all but 11 items ranged between 0.8 and 1.2. Winter items ranged from 0.52 to 1.20. All but 2 winter items ranged between 0.7 and 1.3, and all but 10 items ranged between 0.8 and 1.2. Spring items ranged from 0.51 to 1.29. All but 6 spring items ranged between 0.7 to 1.3, and all but 13 items ranged between 0.8 and 1.2.

Table 153 reports a significant *p* value at each seasonal administration, indicating that adding the additional dimensions does not result in significantly better fit. Table 155 reports the correlations between the factors on the three-factor model to be quite high, ranging from .57 to .78 in the fall, .74 to .82 in the winter, and .83 to .91 in the spring.

Grade 2. For the fall administration, the mean square outfit ranged from 0.71 to 1.45. All but 2 fall items ranged between 0.7 and 1.3, and all but 9 items ranged between 0.8 and 1.2. Winter items ranged from 0.67 to 1.79. All but 6 winter items ranged between 0.7 and 1.3, and all but 11 items ranged between 0.8 and 1.2. Spring items ranged from 0.67 to 1.57. All but 6 spring items ranged between 0.7 to 1.3, and all but 15 items ranged between 0.8 and 1.2.

Table 156 reports a significant *p* value for the fall easyCBM® administration, indicating that adding the additional dimensions does not result in significantly better fit. However, the model specifications were not met for the winter and spring administrations for either the three-factor model or the unidimensional model. For the fall administration, Table 36 reports the correlations between the factors on the three-factor model to be quite high, ranging from .78 to .86.

Validity of the Slope

In this section, we document the predictive validity of the slope of improvement for the easyCBM® math measures, for grades K-2. We presented the results for each grade level disaggregated by students' fall achievement (quartiles).

Methods

Setting and Subjects. Data for this study were the same as those used for the criterion validity studies (refer to criterion validity methods section for further information on the sample). The Kindergarten sample consisted of 2400 students, the grade one sample consisted of 3782 students, and the grade two sample consisted of 2940 students.

Data Sources. Assessment data used in this study include scores from the fall, winter, and spring administrations of the easyCBM® mathematics benchmark tests, and scores from the math portion of the TerraNova 3 (refer to criterion validity methods section for further information on the TerraNova).

Analyses. We examined students' rate of growth (slope) in a year using a two-level hierarchical linear growth model (HLM; Raudenbush & Bryk, 2002). The level-1 model was represented by time and at level-2 model by student. The easyCBM® math measures, collected in the fall of 2009, and winter and spring of 2010, were the dependent variables. Student initial math achievement grouped into quartiles was modeled at the intercept and slope. Data for each grade level were analyzed separately. The level-2 residuals from the final model were correlated with students' performance scores on the TerraNova.

Results

Full results for the Kindergarten analysis are reported in Table 157. Students' rates of growth (slope) in a year varied for each quartile, with predictive validity coefficients ranging from low to moderately high, at .68, .29, .44, and .74 for quartiles 1 through 4, respectively. Table 158 reports the results for Grade 1. Students' rates of growth in Grade 1 were moderate to moderately high, with predictive validity coefficients at .58, .51, .74, and .82 for quartiles 1 through 4, respectively. Table 159 reports the results for Grade 2. Students' rates of growth in Grade 2 were moderately low to moderately high, with predictive validity coefficients at .58, .36, .68, and .46 for quartiles 1 through 4, respectively.

Discussion

The results of the analyses reported here provide substantial technical adequacy evidence for the K-2 easyCBM® math measures. Similar to Anderson, Tindal, and Alonzo (2009), we found the internal consistency of the fall measures at grades 1 and 2 to be quite strong. Given that all easyCBM® measures were constructed using the same process, and designed to be of equivalent difficulty, it was not surprising that our analyses showed that all the measures in grades K-2 had similarly strong internal consistency. The split-half reliability estimates, which had not been estimated in previous studies, were somewhat lower than the overall reliability. The lower estimates are likely the result of having fewer items used in the estimation.

We also examined the reliability of the slope using a multi-level model split into quartiles of normative achievement. The reliability of the coefficients produced were typically in the moderate range, with the exception of the top quartile, which was generally low. The low reliability at the top quartile could be due to a number of factors, including the design and construction of the easyCBM® assessments or the instruction occurring in the classroom. For instance, Anderson, Lai, Alonzo, and Tindal (in press) used a Rasch model to demonstrate that although there are many easyCBM® math items aligned with the estimated ability of students performing below grade-level expectations, relatively few items are aligned with the estimated ability of students performing above grade-level expectations. The mathematics measures on easyCBM® were purposefully designed for use within a response to intervention (RTI) framework, and as such, to accurately capture and monitor the skills and knowledge of low performing students who may need additional instructional attention. However, the low slope reliability estimates obtained for the top quartile could also be due to the instruction occurring in the classroom. For instance, while much instructional attention may be given to students performing at or below grade-level expectations, less may be given to students performing above expectations. The decreased instructional attention may then lead to lower growth, which leads

to less variance in the slope estimates, which leads to lower reliability estimates. Nese et al. (2010) similarly found that students performing in the top quartile often had lower slope estimates than students in other quartiles in grades 3-8. Regardless, the easyCBM® slope of improvement appears to be adequately reliable for students performing in the lower 3 quartiles, but caution is warranted when interpreting gains for students performing above the 75th percentile.

When investigating the criterion related validity evidence, we found a quite strong relation between easyCBM® and the TerraNova. The TerraNova was used as the criterion as a proxy for the state test because students in Oregon are not administered the state test until grade 3. However, while the relation was strong, it was not as strong as has been found in previous research examining the relation between the easyCBM® grades 3-8 math measures and the Oregon and Washington state tests (Anderson, Alonzo, & Tindal, 2010a & 2010b). Yet, given that a different criterion was used in each study it is difficult to compare the results. The criterion analyses conducted here operated under the assumption that the TerraNova is an adequate proxy for the state test. If this assumption holds, a reasonable conclusion would be that the easyCBM® K-2 measures, while adequate, are not as strong a predictor of student performance as the 3-8 measures. However, if this assumption does not hold, it is difficult to draw any substantial conclusions outside of easyCBM® having a generally strong relation with the TerraNova.

The construct validity analyses provided strong evidence that all easyCBM® math items measure the same construct. Nearly all items had a mean square outfit falling within the range specified by Wright and Linacre (1994) for tests used for important decisions, and most fell within the range for high-stakes tests. An examination of the tables and figures shows most items had very little error associated with them – an finding that can partially be attributed to the large sample. Using CFA, we were able to rule out a plausible alternative hypothesis measurement

model. At each grade level, a significant *p* value indicated that the 3-factor model did not fit the data significantly better than the a-priori theorized unidimensional model.

Using methods similar to those used for the reliability of the slope estimates, we examined the predictive validity of the slope. Interestingly, the predictive validity coefficients did not follow any particular pattern, as they did in the reliability of the slope analyses. In fact, students in the top quartile had the highest predictive validity coefficients of any quartile in grades K and 1. This finding may be related to these high-performing students' initial score, which established their place in the top-most quartile, being a very strong predictor of their score on the TerraNova, even when they experienced very little growth on the easyCBM measures fall to spring (because they had already topped out on the measure).

References

Alonzo, J., Lai, C., & Tindal, G. (2009). *The development of K-8 progress monitoring measures in mathematics for use with the 2% and the general education populations: Grade 2* (Technical Report No. 0920). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

Alonzo, J., Nese, J., Lai, C., Anderson, D., Park, B., & Tindal, G. (2010). *The alignment of easyCBM math measures to curriculum standards* (Technical Report No. 1002) Eugene, OR: Behavioral Research and Teaching, University of Oregon.

Alonzo, J., & Tindal, G. (2009a). *The development of K-8 progress monitoring measures in mathematics for use with the 2% and general education populations: Grade 1* (Technical Report No. 0919). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

Alonzo, J., & Tindal, G. (2009b). *The development of K-8 progress monitoring measures in mathematics for use with the 2% and general education populations: Kindergarten* (Technical Report No. 0921). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

Anderson, D., Alonzo, J., & Tindal, G. (2010a). *easyCBM®: Criterion related validity evidence: Oregon state test.* (Technical Report #1011). Eugene, OR: Behavioral Research and Teaching.

Anderson, D., Alonzo, J., & Tindal, G. (2010b). *easyCBM®: Criterion related validity evidence: Washington state test.* (Technical Report #1010). Eugene, OR: Behavioral Research and Teaching.

Anderson, D., Lai, C. F., Alonzo, J., & Tindal, G. (in press). Examining a grade level math CBM designed for exceptionally low performing students. *Educational Assessment*.

Anderson, D., Tindal, G., & Alonzo, J. (2009). *Internal consistency of general outcome measures in grades 1-8* (Technical Report No. 0915). Eugene, OR: Behavioral Research and Teaching, University of Oregon.

CTB McGraw-Hill. (2010). *TerraNova3 complete battery: Product quick facts.* Retrieved October 13, 2010, from http://www.ctb.com/ctb.com/control/ctbProductViewAction?p=products&productId=733

Kane, M. (1992). An argument-based approach to validity. *Psychological Bulletin, 112*, 527-535. doi: 10.1037/0033-2909.112.3.527

Muthén, L. K., & Muthén, B. O. (1998-2007). *Mplus User's Guide* (Fifth ed.). Los Angeles: Authors.

Muthén, L. K., & Muthén, B. O. (2009). Mplus version 5.21 [computer software]. Los Angeles: Authors.

R Development Core Team. (2010). *R: A language and environment for statistical computing*. Vienna: R Foundation for Statistical Computing. Retrieved from http://www.R-project.org

Raudenbush, S., & Bryk, A. (2002). *Hierarchical linear models: Applications and data analysis methods*. Thousand Oaks, CA: Sage Publications, Inc.

Wright, B. D., & Linacre, J. M. (1994). Reasonable mean-square fit values. *Rasch Measurement Transactions, 8*(3), 370.

Table 1

National Council of Teachers of Mathematics Focal Point Standards

Grade	Focal Point 1	Focal Point 2	Focal Point 3
k	Number and Operations	Geometry	Measurement
1	Number and Operations	Geometry	Number and Operations and Algebra
2	Number and Operations	Measurement	Number and Operations and Algebra

Note. Table displays the focal points items were written to measure. NCTM Grade 2 focal points differ from those displayed, and new items written to the current NCTM focal points will be released in 2010.

Grade k

Fall Reliability

Table 2
Case Processing Summary

		N	%
Cases	Valid	802	22.8
	Excluded[a]	2709	77.2
	Total	3511	100.0

a. Listwise deletion based on all variables in the procedure.

Table 3
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.825	.830	45

Table 4
Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	.620	.253	.929	.676	3.670	.030	45
Item Variances	.206	.066	.250	.184	3.786	.003	45
Inter-Item Covariances	.020	-.011	.114	.125	-10.625	.000	45

Table 5
Scale Statistics

Mean	Variance	Std. Deviation	N of Items
27.92	47.918	6.922	45

Split-half Reliability: Fall

Table 6
Case Processing Summary

		N	%
Cases	Valid	802	22.8
	Excluded[a]	2709	77.2
	Total	3511	100.0

a. Listwise deletion based on all variables in the procedure.

Table 7
Reliability Statistics

Cronbach's Alpha	Part 1	Value	.658
		N of Items	23[a]
	Part 2	Value	.753
		N of Items	22[b]
	Total N of Items		45
Correlation Between Forms			.667
Spearman-Brown Coefficient	Equal Length		.800
	Unequal Length		.800
Guttman Split-Half Coefficient			.798

a. The items are: FallFP1Q1C, FallFP1Q2C, FallFP1Q3C, FallFP1Q4C, FallFP1Q6C, FallFP1Q7C, FallFP1Q8C, FallFP1Q9C, FallFP1Q10C, FallFP1Q11C, FallFP1Q12C, FallFP1Q13C, FallFP1Q14C, FallFP1Q15C, FallFP1Q16C, FallFP2Q1C, FallFP2Q2C, FallFP2Q3C, FallFP2Q4C, FallFP2Q5C, FallFP2Q6C, FallFP2Q7C, FallFP2Q8C.

b. The items are: FallFP2Q9C, FallFP2Q10C, FallFP2Q11C, FallFP2Q12C, FallFP2Q13C, FallFP2Q14C, FallFP2Q15C, FallFP2Q16C, FallFP3Q1C, FallFP3Q2C, FallFP3Q3C, FallFP3Q4C, FallFP3Q6C, FallFP3Q7C, FallFP3Q8C, FallFP3Q9C, FallFP3Q10C, FallFP3Q11C, FallFP3Q12C, FallFP3Q13C, FallFP3Q14C, FallFP3Q16C.

Table 8
Summary Item Statistics

		Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	Part 1	.610	.277	.915	.638	3.306	.029	23[a]
	Part 2	.631	.253	.929	.676	3.670	.033	22[b]
	Both Parts	.620	.253	.929	.676	3.670	.030	45
Item Variances	Part 1	.211	.078	.250	.172	3.220	.003	23[a]
	Part 2	.201	.066	.250	.184	3.786	.003	22[b]
	Both Parts	.206	.066	.250	.184	3.786	.003	45
Inter-Item Covariances	Part 1	.016	-.011	.054	.065	-5.031	.000	23[a]
	Part 2	.024	.000	.114	.114	-882.506	.000	22[b]
	Both Parts	.020	-.011	.114	.125	-10.625	.000	45

a. The items are: FallFP1Q1C, FallFP1Q2C, FallFP1Q3C, FallFP1Q4C, FallFP1Q6C, FallFP1Q7C, FallFP1Q8C, FallFP1Q9C, FallFP1Q10C, FallFP1Q11C, FallFP1Q12C, FallFP1Q13C, FallFP1Q14C, FallFP1Q15C, FallFP1Q16C, FallFP2Q1C, FallFP2Q2C, FallFP2Q3C, FallFP2Q4C, FallFP2Q5C, FallFP2Q6C, FallFP2Q7C, FallFP2Q8C.

b. The items are: FallFP2Q9C, FallFP2Q10C, FallFP2Q11C, FallFP2Q12C, FallFP2Q13C, FallFP2Q14C, FallFP2Q15C, FallFP2Q16C, FallFP3Q1C, FallFP3Q2C, FallFP3Q3C, FallFP3Q4C, FallFP3Q6C, FallFP3Q7C, FallFP3Q8C, FallFP3Q9C, FallFP3Q10C, FallFP3Q11C, FallFP3Q12C, FallFP3Q13C, FallFP3Q14C, FallFP3Q16C.

Table 9
Scale Statistics

	Mean	Variance	Std. Deviation	N of Items
Part 1	14.03	13.054	3.613	23[a]
Part 2	13.88	15.738	3.967	22[b]
Both Parts	27.92	47.918	6.922	45

a. The items are: FallFP1Q1C, FallFP1Q2C, FallFP1Q3C, FallFP1Q4C, FallFP1Q6C, FallFP1Q7C, FallFP1Q8C, FallFP1Q9C, FallFP1Q10C, FallFP1Q11C, FallFP1Q12C, FallFP1Q13C, FallFP1Q14C, FallFP1Q15C, FallFP1Q16C, FallFP2Q1C, FallFP2Q2C, FallFP2Q3C, FallFP2Q4C, FallFP2Q5C, FallFP2Q6C, FallFP2Q7C, FallFP2Q8C.

b. The items are: FallFP2Q9C, FallFP2Q10C, FallFP2Q11C, FallFP2Q12C, FallFP2Q13C, FallFP2Q14C, FallFP2Q15C, FallFP2Q16C, FallFP3Q1C, FallFP3Q2C, FallFP3Q3C, FallFP3Q4C, FallFP3Q6C, FallFP3Q7C, FallFP3Q8C, FallFP3Q9C, FallFP3Q10C, FallFP3Q11C, FallFP3Q12C, FallFP3Q13C, FallFP3Q14C, FallFP3Q16C.

Winter Reliability

Table 10
Case Processing Summary

		N	%
Cases	Valid	1151	32.8
	Excluded[a]	2360	67.2
	Total	3511	100.0

a. Listwise deletion based on all variables in the procedure.

Table 11
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.852	.857	45

Table 12
Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	.700	.314	.967	.653	3.083	.025	45
Item Variances	.185	.032	.250	.218	7.824	.004	45
Inter-Item Covariances	.021	-.006	.097	.103	-17.569	.000	45

Table 13
Scale Statistics

Mean	Variance	Std. Deviation	N of Items
31.49	49.975	7.069	45

Split-half Reliability: Winter

Table 14
Case Processing Summary

		N	%
Cases	Valid	1151	32.8
	Excluded[a]	2360	67.2
	Total	3511	100.0

a. Listwise deletion based on all variables in the procedure.

Table 15
Reliability Statistics

Cronbach's Alpha	Part 1	Value	.787
		N of Items	23[a]
	Part 2	Value	.710
		N of Items	22[b]
	Total N of Items		45
Correlation Between Forms			.693
Spearman-Brown Coefficient	Equal Length		.819
	Unequal Length		.819
Guttman Split-Half Coefficient			.818

a. The items are: WintFP1Q1C, WintFP1Q2C, WintFP1Q3C, WintFP1Q4C, WintFP1Q6C, WintFP1Q7C, WintFP1Q8C, WintFP1Q9C, WintFP1Q10C, WintFP1Q11C, WintFP1Q12C, WintFP1Q13C, WintFP1Q15C, WintFP1Q16C, WintFP2Q1C, WintFP2Q2C, WintFP2Q3C, WintFP2Q4C, WintFP2Q5C, WintFP2Q6C, WintFP2Q7C, WintFP2Q8C, WintFP2Q9C.

b. The items are: WintFP2Q10C, WintFP2Q11C, WintFP2Q12C, WintFP2Q13C, WintFP2Q14C, WintFP2Q15C, WintFP2Q16C, WintFP3Q1C, WintFP3Q2C, WintFP3Q3C, WintFP3Q4C, WintFP3Q6C, WintFP3Q7C, WintFP3Q8C, WintFP3Q9C, WintFP3Q10C, WintFP3Q11C, WintFP3Q12C, WintFP3Q13C, WintFP3Q14C, WintFP3Q15C, WintFP3Q16C.

Table 16
Summary Item Statistics

		Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	Part 1	.730	.370	.967	.597	2.613	.028	23[a]
	Part 2	.668	.314	.900	.586	2.870	.022	22[b]
	Both Parts	.700	.314	.967	.653	3.083	.025	45
Item Variances	Part 1	.170	.032	.250	.218	7.813	.006	23[a]
	Part 2	.201	.090	.250	.160	2.778	.002	22[b]
	Both Parts	.185	.032	.250	.218	7.824	.004	45
Inter-Item Covariances	Part 1	.024	-.001	.080	.081	-62.726	.000	23[a]
	Part 2	.020	-.002	.072	.074	-31.802	.000	22[b]
	Both Parts	.021	-.006	.097	.103	-17.569	.000	45

a. The items are: WintFP1Q1C, WintFP1Q2C, WintFP1Q3C, WintFP1Q4C, WintFP1Q6C, WintFP1Q7C, WintFP1Q8C, WintFP1Q9C, WintFP1Q10C, WintFP1Q11C, WintFP1Q12C, WintFP1Q13C, WintFP1Q15C, WintFP1Q16C, WintFP2Q1C, WintFP2Q2C, WintFP2Q3C, WintFP2Q4C, WintFP2Q5C, WintFP2Q6C, WintFP2Q7C, WintFP2Q8C, WintFP2Q9C.

b. The items are: WintFP2Q10C, WintFP2Q11C, WintFP2Q12C, WintFP2Q13C, WintFP2Q14C, WintFP2Q15C, WintFP2Q16C, WintFP3Q1C, WintFP3Q2C, WintFP3Q3C, WintFP3Q4C, WintFP3Q6C, WintFP3Q7C, WintFP3Q8C, WintFP3Q9C, WintFP3Q10C, WintFP3Q11C, WintFP3Q12C, WintFP3Q13C, WintFP3Q14C, WintFP3Q15C, WintFP3Q16C.

Table 17
Scale Statistics

	Mean	Variance	Std. Deviation	N of Items
Part 1	16.80	15.826	3.978	23[a]
Part 2	14.69	13.717	3.704	22[b]
Both Parts	31.49	49.975	7.069	45

a. The items are: WintFP1Q1C, WintFP1Q2C, WintFP1Q3C, WintFP1Q4C, WintFP1Q6C, WintFP1Q7C, WintFP1Q8C, WintFP1Q9C, WintFP1Q10C, WintFP1Q11C, WintFP1Q12C, WintFP1Q13C, WintFP1Q15C, WintFP1Q16C, WintFP2Q1C, WintFP2Q2C, WintFP2Q3C, WintFP2Q4C, WintFP2Q5C, WintFP2Q6C, WintFP2Q7C, WintFP2Q8C, WintFP2Q9C.

b. The items are: WintFP2Q10C, WintFP2Q11C, WintFP2Q12C, WintFP2Q13C, WintFP2Q14C, WintFP2Q15C, WintFP2Q16C, WintFP3Q1C, WintFP3Q2C, WintFP3Q3C, WintFP3Q4C, WintFP3Q6C, WintFP3Q7C, WintFP3Q8C, WintFP3Q9C, WintFP3Q10C, WintFP3Q11C, WintFP3Q12C, WintFP3Q13C, WintFP3Q14C, WintFP3Q15C, WintFP3Q16C.

Spring Reliability

Table 18
Case Processing Summary

		N	%
Cases	Valid	1156	32.9
	Excluded[a]	2355	67.1
	Total	3511	100.0

a. Listwise deletion based on all variables in the procedure.

Table 19
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.866	.872	45

Table 20
Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	.742	.285	.927	.642	3.248	.027	45
Item Variances	.165	.067	.250	.183	3.710	.003	45
Inter-Item Covariances	.021	-.009	.062	.071	-6.941	.000	45

Table 21
Scale Statistics

Mean	Variance	Std. Deviation	N of Items
33.40	48.499	6.964	45

Split-half Reliability: Spring

Table 22
Case Processing Summary

		N	%
Cases	Valid	1156	32.9
	Excluded[a]	2355	67.1
	Total	3511	100.0

a. Listwise deletion based on all variables in the procedure.

Table 23
Reliability Statistics

Cronbach's Alpha	Part 1	Value	.797
		N of Items	23[a]
	Part 2	Value	.751
		N of Items	22[b]
	Total N of Items		45
Correlation Between Forms			.693
Spearman-Brown Coefficient	Equal Length		.819
	Unequal Length		.819
Guttman Split-Half Coefficient			.818

a. The items are: SprFP1Q1C, SprFP1Q2C, SprFP1Q3C, SprFP1Q4C, SprFP1Q5C, SprFP1Q6C, SprFP1Q7C, SprFP1Q8C, SprFP1Q9C, SprFP1Q10C, SprFP1Q11C, SprFP1Q12C, SprFP1Q13C, SprFP1Q14C, SprFP1Q15C, SprFP1Q16C, SprFP2Q1C, SprFP2Q2C, SprFP2Q3C, SprFP2Q4C, SprFP2Q5C, SprFP2Q6C, SprFP2Q7C.

b. The items are: SprFP2Q8C, SprFP2Q10C, SprFP2Q11C, SprFP2Q12C, SprFP2Q14C, SprFP2Q15C, SprFP2Q16C, SprFP3Q1C, SprFP3Q2C, SprFP3Q3C, SprFP3Q4C, SprFP3Q5C, SprFP3Q6C, SprFP3Q7C, SprFP3Q8C, SprFP3Q9C, SprFP3Q10C, SprFP3Q11C, SprFP3Q12C, SprFP3Q13C, SprFP3Q15C, SprFP3Q16C.

Table 24
Summary Item Statistics

		Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	Part 1	.764	.322	.925	.603	2.874	.026	23[a]
	Part 2	.719	.285	.927	.642	3.248	.028	22[b]
	Both Parts	.742	.285	.927	.642	3.248	.027	45
Item Variances	Part 1	.156	.070	.250	.181	3.591	.003	23[a]
	Part 2	.175	.067	.250	.183	3.710	.004	22[b]
	Both Parts	.165	.067	.250	.183	3.710	.003	45
Inter-Item Covariances	Part 1	.023	.002	.062	.060	35.685	.000	23[a]
	Part 2	.021	-.007	.055	.061	-8.088	.000	22[b]
	Both Parts	.021	-.009	.062	.071	-6.941	.000	45

a. The items are: SprFP1Q1C, SprFP1Q2C, SprFP1Q3C, SprFP1Q4C, SprFP1Q5C, SprFP1Q6C, SprFP1Q7C, SprFP1Q8C, SprFP1Q9C, SprFP1Q10C, SprFP1Q11C, SprFP1Q12C, SprFP1Q13C, SprFP1Q14C, SprFP1Q15C, SprFP1Q16C, SprFP2Q1C, SprFP2Q2C, SprFP2Q3C, SprFP2Q4C, SprFP2Q5C, SprFP2Q6C, SprFP2Q7C.

b. The items are: SprFP2Q8C, SprFP2Q10C, SprFP2Q11C, SprFP2Q12C, SprFP2Q14C, SprFP2Q15C, SprFP2Q16C, SprFP3Q1C, SprFP3Q2C, SprFP3Q3C, SprFP3Q4C, SprFP3Q5C, SprFP3Q6C, SprFP3Q7C, SprFP3Q8C, SprFP3Q9C, SprFP3Q10C, SprFP3Q11C, SprFP3Q12C, SprFP3Q13C, SprFP3Q15C, SprFP3Q16C.

Table 25
Scale Statistics

	Mean	Variance	Std. Deviation	N of Items
Part 1	17.58	15.064	3.881	23[a]
Part 2	15.83	13.595	3.687	22[b]
Both Parts	33.40	48.499	6.964	45

a. The items are: SprFP1Q1C, SprFP1Q2C, SprFP1Q3C, SprFP1Q4C, SprFP1Q5C, SprFP1Q6C, SprFP1Q7C, SprFP1Q8C, SprFP1Q9C, SprFP1Q10C, SprFP1Q11C, SprFP1Q12C, SprFP1Q13C, SprFP1Q14C, SprFP1Q15C, SprFP1Q16C, SprFP2Q1C, SprFP2Q2C, SprFP2Q3C, SprFP2Q4C, SprFP2Q5C, SprFP2Q6C, SprFP2Q7C.

b. The items are: SprFP2Q8C, SprFP2Q10C, SprFP2Q11C, SprFP2Q12C, SprFP2Q14C, SprFP2Q15C, SprFP2Q16C, SprFP3Q1C, SprFP3Q2C, SprFP3Q3C, SprFP3Q4C, SprFP3Q5C, SprFP3Q6C, SprFP3Q7C, SprFP3Q8C, SprFP3Q9C, SprFP3Q10C, SprFP3Q11C, SprFP3Q12C, SprFP3Q13C, SprFP3Q15C, SprFP3Q16C.

Grade 1

Fall Reliability

Table 26
Case Processing Summary

		N	%
Cases	Valid	1571	56.9
	Excluded[a]	1189	43.1
	Total	2760	100.0

a. Listwise deletion based on all variables in the procedure.

Table 27
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.778	.783	45

Table 28
Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	.556	.255	.941	.686	3.688	.037	45
Item Variances	.211	.055	.250	.195	4.534	.002	45
Inter-Item Covariances	.015	-.013	.100	.113	-7.787	.000	45

Table 29
Scale Statistics

Mean	Variance	Std. Deviation	N of Items
25.00	39.589	6.292	45

Split-half Reliability: Fall

Table 30
Case Processing Summary

		N	%
Cases	Valid	1571	56.9
	Excluded[a]	1189	43.1
	Total	2760	100.0

a. Listwise deletion based on all variables in the procedure.

Table 31
Reliability Statistics

Cronbach's Alpha	Part 1	Value	.725
		N of Items	23[a]
	Part 2	Value	.552
		N of Items	22[b]
	Total N of Items		45
Correlation Between Forms			.569
Spearman-Brown Coefficient	Equal Length		.725
	Unequal Length		.725
Guttman Split-Half Coefficient			.716

a. The items are: FallFP1Q1C, FallFP1Q2C, FallFP1Q3C, FallFP1Q4C, FallFP1Q5C, FallFP1Q6C, FallFP1Q7C, FallFP1Q8C, FallFP1Q9C, FallFP1Q10C, FallFP1Q11C, FallFP1Q12C, FallFP1Q13C, FallFP1Q14C, FallFP1Q15C, FallFP1Q16C, FallFP2Q1C, FallFP2Q2C, FallFP2Q3C, FallFP2Q4C, FallFP2Q6C, FallFP2Q7C, FallFP2Q8C.

b. The items are: FallFP2Q9C, FallFP2Q10C, FallFP2Q11C, FallFP2Q12C, FallFP2Q13C, FallFP2Q14C, FallFP2Q15C, FallFP2Q16C, FallFP3Q1C, FallFP3Q2C, FallFP3Q3C, FallFP3Q4C, FallFP3Q5C, FallFP3Q6C, FallFP3Q7C, FallFP3Q8C, FallFP3Q9C, FallFP3Q10C, FallFP3Q12C, FallFP3Q13C, FallFP3Q15C, FallFP3Q16C.

Table 32
Summary Item Statistics

		Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	Part 1	.622	.255	.941	.686	3.688	.033	23[a]
	Part 2	.486	.286	.856	.570	2.993	.033	22[b]
	Both Parts	.556	.255	.941	.686	3.688	.037	45
Item Variances	Part 1	.204	.055	.250	.195	4.534	.003	23[a]
	Part 2	.218	.124	.250	.126	2.022	.001	22[b]
	Both Parts	.211	.055	.250	.195	4.534	.002	45
Inter-Item Covariances	Part 1	.021	-.013	.075	.087	-5.813	.000	23[a]
	Part 2	.012	-.012	.051	.063	-4.420	.000	22[b]
	Both Parts	.015	-.013	.100	.113	-7.787	.000	45

a. The items are: FallFP1Q1C, FallFP1Q2C, FallFP1Q3C, FallFP1Q4C, FallFP1Q5C, FallFP1Q6C, FallFP1Q7C, FallFP1Q8C, FallFP1Q9C, FallFP1Q10C, FallFP1Q11C, FallFP1Q12C, FallFP1Q13C, FallFP1Q14C, FallFP1Q15C, FallFP1Q16C, FallFP2Q1C, FallFP2Q2C, FallFP2Q3C, FallFP2Q4C, FallFP2Q6C, FallFP2Q7C, FallFP2Q8C.

b. The items are: FallFP2Q9C, FallFP2Q10C, FallFP2Q11C, FallFP2Q12C, FallFP2Q13C, FallFP2Q14C, FallFP2Q15C, FallFP2Q16C, FallFP3Q1C, FallFP3Q2C, FallFP3Q3C, FallFP3Q4C, FallFP3Q5C, FallFP3Q6C, FallFP3Q7C, FallFP3Q8C, FallFP3Q9C, FallFP3Q10C, FallFP3Q12C, FallFP3Q13C, FallFP3Q15C, FallFP3Q16C.

Table 33
Scale Statistics

	Mean	Variance	Std. Deviation	N of Items
Part 1	14.30	15.288	3.910	23[a]
Part 2	10.69	10.133	3.183	22[b]
Both Parts	25.00	39.589	6.292	45

a. The items are: FallFP1Q1C, FallFP1Q2C, FallFP1Q3C, FallFP1Q4C, FallFP1Q5C, FallFP1Q6C, FallFP1Q7C, FallFP1Q8C, FallFP1Q9C, FallFP1Q10C, FallFP1Q11C, FallFP1Q12C, FallFP1Q13C, FallFP1Q14C, FallFP1Q15C, FallFP1Q16C, FallFP2Q1C, FallFP2Q2C, FallFP2Q3C, FallFP2Q4C, FallFP2Q6C, FallFP2Q7C, FallFP2Q8C.

b. The items are: FallFP2Q9C, FallFP2Q10C, FallFP2Q11C, FallFP2Q12C, FallFP2Q13C, FallFP2Q14C, FallFP2Q15C, FallFP2Q16C, FallFP3Q1C, FallFP3Q2C, FallFP3Q3C, FallFP3Q4C, FallFP3Q5C, FallFP3Q6C, FallFP3Q7C, FallFP3Q8C, FallFP3Q9C, FallFP3Q10C, FallFP3Q12C, FallFP3Q13C, FallFP3Q15C, FallFP3Q16C.

Winter Reliability

Table 34
Case Processing Summary

		N	%
Cases	Valid	1899	68.8
	Excluded[a]	861	31.2
	Total	2760	100.0

a. Listwise deletion based on all variables in the procedure.

Table 35
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.863	.867	45

Table 36
Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	.636	.280	.922	.642	3.291	.033	45
Item Variances	.199	.072	.250	.178	3.479	.003	45
Inter-Item Covariances	.024	-.005	.076	.081	-15.650	.000	45

Table 37
Scale Statistics

Mean	Variance	Std. Deviation	N of Items
28.63	57.285	7.569	45

Split-half Reliability: Winter

Table 38
Case Processing Summary

		N	%
Cases	Valid	1899	68.8
	Excluded[a]	861	31.2
	Total	2760	100.0

a. Listwise deletion based on all variables in the procedure.

Table 39
Reliability Statistics

Cronbach's Alpha	Part 1	Value	.798
		N of Items	23[a]
	Part 2	Value	.755
		N of Items	22[b]
	Total N of Items		45
Correlation Between Forms			.657
Spearman-Brown Coefficient	Equal Length		.793
	Unequal Length		.793
Guttman Split-Half Coefficient			.793

a. The items are: WintFP1Q1C, WintFP1Q2C, WintFP1Q3C, WintFP1Q4C, WintFP1Q5C, WintFP1Q6C, WintFP1Q7C, WintFP1Q8C, WintFP1Q9C, WintFP1Q10C, WintFP1Q11C, WintFP1Q12C, WintFP1Q13C, WintFP1Q14C, WintFP1Q15C, WintFP1Q16C, WintFP2Q1C, WintFP2Q2C, WintFP2Q3C, WintFP2Q4C, WintFP2Q5C, WintFP2Q6C, WintFP2Q7C.

b. The items are: WintFP2Q8C, WintFP2Q9C, WintFP2Q11C, WintFP2Q12C, WintFP2Q13C, WintFP2Q14C, WintFP2Q16C, WintFP3Q1C, WintFP3Q2C, WintFP3Q3C, WintFP3Q4C, WintFP3Q6C, WintFP3Q7C, WintFP3Q8C, WintFP3Q9C, WintFP3Q10C, WintFP3Q11C, WintFP3Q12C, WintFP3Q13C, WintFP3Q14C, WintFP3Q15C, WintFP3Q16C.

Table 40
Summary Item Statistics

		Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	Part 1	.734	.403	.922	.519	2.286	.024	23[a]
	Part 2	.534	.280	.758	.478	2.707	.024	22[b]
	Both Parts	.636	.280	.922	.642	3.291	.033	45
Item Variances	Part 1	.173	.072	.249	.177	3.465	.004	23[a]
	Part 2	.227	.183	.250	.067	1.364	.000	22[b]
	Both Parts	.199	.072	.250	.178	3.479	.003	45
Inter-Item Covariances	Part 1	.025	.004	.065	.061	16.994	.000	23[a]
	Part 2	.028	-.001	.076	.078	-56.048	.000	22[b]
	Both Parts	.024	-.005	.076	.081	-15.650	.000	45

a. The items are: WintFP1Q1C, WintFP1Q2C, WintFP1Q3C, WintFP1Q4C, WintFP1Q5C, WintFP1Q6C, WintFP1Q7C, WintFP1Q8C, WintFP1Q9C, WintFP1Q10C, WintFP1Q11C, WintFP1Q12C, WintFP1Q13C, WintFP1Q14C, WintFP1Q15C, WintFP1Q16C, WintFP2Q1C, WintFP2Q2C, WintFP2Q3C, WintFP2Q4C, WintFP2Q5C, WintFP2Q6C, WintFP2Q7C.

b. The items are: WintFP2Q8C, WintFP2Q9C, WintFP2Q11C, WintFP2Q12C, WintFP2Q13C, WintFP2Q14C, WintFP2Q16C, WintFP3Q1C, WintFP3Q2C, WintFP3Q3C, WintFP3Q4C, WintFP3Q6C, WintFP3Q7C, WintFP3Q8C, WintFP3Q9C, WintFP3Q10C, WintFP3Q11C, WintFP3Q12C, WintFP3Q13C, WintFP3Q14C, WintFP3Q15C, WintFP3Q16C.

Table 41
Scale Statistics

	Mean	Variance	Std. Deviation	N of Items
Part 1	16.89	16.758	4.094	23[a]
Part 2	11.75	17.821	4.221	22[b]
Both Parts	28.63	57.285	7.569	45

a. The items are: WintFP1Q1C, WintFP1Q2C, WintFP1Q3C, WintFP1Q4C, WintFP1Q5C, WintFP1Q6C, WintFP1Q7C, WintFP1Q8C, WintFP1Q9C, WintFP1Q10C, WintFP1Q11C, WintFP1Q12C, WintFP1Q13C, WintFP1Q14C, WintFP1Q15C, WintFP1Q16C, WintFP2Q1C, WintFP2Q2C, WintFP2Q3C, WintFP2Q4C, WintFP2Q5C, WintFP2Q6C, WintFP2Q7C.

b. The items are: WintFP2Q8C, WintFP2Q9C, WintFP2Q11C, WintFP2Q12C, WintFP2Q13C, WintFP2Q14C, WintFP2Q16C, WintFP3Q1C, WintFP3Q2C, WintFP3Q3C, WintFP3Q4C, WintFP3Q6C, WintFP3Q7C, WintFP3Q8C, WintFP3Q9C, WintFP3Q10C, WintFP3Q11C, WintFP3Q12C, WintFP3Q13C, WintFP3Q14C, WintFP3Q15C, WintFP3Q16C.

Spring Reliability

Table 42
Case Processing Summary

		N	%
Cases	Valid	2425	87.9
	Excluded[a]	335	12.1
	Total	2760	100.0

a. Listwise deletion based on all variables in the procedure.

Table 43
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.886	.892	45

Table 44
Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	.748	.393	.955	.561	2.427	.024	45
Item Variances	.165	.043	.250	.207	5.769	.004	45
Inter-Item Covariances	.024	.002	.101	.098	44.881	.000	45

Table 45
Scale Statistics

Mean	Variance	Std. Deviation	N of Items
33.65	55.810	7.471	45

Split-half Reliability: Spring

Table 46
Case Processing Summary

		N	%
Cases	Valid	2425	87.9
	Excluded[a]	335	12.1
	Total	2760	100.0

a. Listwise deletion based on all variables in the procedure.

Table 47
Reliability Statistics

Cronbach's Alpha	Part 1	Value	.823
		N of Items	23[a]
	Part 2	Value	.789
		N of Items	22[b]
	Total N of Items		45
Correlation Between Forms			.744
Spearman-Brown Coefficient	Equal Length		.853
	Unequal Length		.853
Guttman Split-Half Coefficient			.850

a. The items are: SprFP1Q1C, SprFP1Q2C, SprFP1Q3C, SprFP1Q4C, SprFP1Q5C, SprFP1Q6C, SprFP1Q7C, SprFP1Q8C, SprFP1Q9C, SprFP1Q10C, SprFP1Q11C, SprFP1Q12C, SprFP1Q13C, SprFP1Q14C, SprFP1Q15C, SprFP1Q16C, SprFP2Q3C, SprFP2Q4C, SprFP2Q6C, SprFP2Q7C, SprFP2Q8C, SprFP2Q9C, SprFP2Q10C.

b. The items are: SprFP2Q11C, SprFP2Q12C, SprFP2Q14C, SprFP2Q13C, SprFP2Q15C, SprFP2Q16C, SprFP3Q1C, SprFP3Q2C, SprFP3Q3C, SprFP3Q4C, SprFP3Q5C, SprFP3Q6C, SprFP3Q7C, SprFP3Q8C, SprFP3Q9C, SprFP3Q10C, SprFP3Q11C, SprFP3Q12C, SprFP3Q13C, SprFP3Q14C, SprFP3Q15C, SprFP3Q16C.

Table 48
Summary Item Statistics

		Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	Part 1	.826	.584	.955	.371	1.635	.011	23[a]
	Part 2	.666	.393	.904	.510	2.297	.025	22[b]
	Both Parts	.748	.393	.955	.561	2.427	.024	45
Item Variances	Part 1	.133	.043	.243	.200	5.611	.004	23[a]
	Part 2	.199	.087	.250	.163	2.865	.002	22[b]
	Both Parts	.165	.043	.250	.207	5.769	.004	45
Inter-Item Covariances	Part 1	.022	.005	.101	.095	19.356	.000	23[a]
	Part 2	.029	.005	.077	.072	14.882	.000	22[b]
	Both Parts	.024	.002	.101	.098	44.881	.000	45

a. The items are: SprFP1Q1C, SprFP1Q2C, SprFP1Q3C, SprFP1Q4C, SprFP1Q5C, SprFP1Q6C, SprFP1Q7C, SprFP1Q8C, SprFP1Q9C, SprFP1Q10C, SprFP1Q11C, SprFP1Q12C, SprFP1Q13C, SprFP1Q14C, SprFP1Q15C, SprFP1Q16C, SprFP2Q3C, SprFP2Q4C, SprFP2Q6C, SprFP2Q7C, SprFP2Q8C, SprFP2Q9C, SprFP2Q10C.

b. The items are: SprFP2Q11C, SprFP2Q12C, SprFP2Q14C, SprFP2Q13C, SprFP2Q15C, SprFP2Q16C, SprFP3Q1C, SprFP3Q2C, SprFP3Q3C, SprFP3Q4C, SprFP3Q5C, SprFP3Q6C, SprFP3Q7C, SprFP3Q8C, SprFP3Q9C, SprFP3Q10C, SprFP3Q11C, SprFP3Q12C, SprFP3Q13C, SprFP3Q14C, SprFP3Q15C, SprFP3Q16C.

Table 49
Scale Statistics

	Mean	Variance	Std. Deviation	N of Items
Part 1	19.00	14.368	3.790	23[a]
Part 2	14.66	17.712	4.209	22[b]
Both Parts	33.65	55.810	7.471	45

a. The items are: SprFP1Q1C, SprFP1Q2C, SprFP1Q3C, SprFP1Q4C, SprFP1Q5C, SprFP1Q6C, SprFP1Q7C, SprFP1Q8C, SprFP1Q9C, SprFP1Q10C, SprFP1Q11C, SprFP1Q12C, SprFP1Q13C, SprFP1Q14C, SprFP1Q15C, SprFP1Q16C, SprFP2Q3C, SprFP2Q4C, SprFP2Q6C, SprFP2Q7C, SprFP2Q8C, SprFP2Q9C, SprFP2Q10C.

b. The items are: SprFP2Q11C, SprFP2Q12C, SprFP2Q14C, SprFP2Q13C, SprFP2Q15C, SprFP2Q16C, SprFP3Q1C, SprFP3Q2C, SprFP3Q3C, SprFP3Q4C, SprFP3Q5C, SprFP3Q6C, SprFP3Q7C, SprFP3Q8C, SprFP3Q9C, SprFP3Q10C, SprFP3Q11C, SprFP3Q12C, SprFP3Q13C, SprFP3Q14C, SprFP3Q15C, SprFP3Q16C.

Grade 2

Fall Reliability

Table 50
Case Processing Summary

		N	%
Cases	Valid	395	10.8
	Excluded[a]	3277	89.2
	Total	3672	100.0

a. Listwise deletion based on all variables in the procedure.

Table 51
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.804	.809	48

Table 52
Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	.576	.180	.942	.762	5.239	.042	48
Item Variances	.204	.055	.251	.196	4.559	.003	48
Inter-Item Covariances	.016	-.033	.069	.102	-2.086	.000	48

Table 53
Scale Statistics

Mean	Variance	Std. Deviation	N of Items
27.66	46.033	6.785	48

Split-half Reliability: Fall

Table 54
Case Processing Summary

		N	%
Cases	Valid	395	10.8
	Excluded[a]	3277	89.2
	Total	3672	100.0

a. Listwise deletion based on all variables in the procedure.

Table 55
Reliability Statistics

Cronbach's Alpha	Part 1	Value	.656
		N of Items	24[a]
	Part 2	Value	.718
		N of Items	24[b]
	Total N of Items		48
Correlation Between Forms			.595
Spearman-Brown Coefficient	Equal Length		.746
	Unequal Length		.746
Guttman Split-Half Coefficient			.740

a. The items are: FallFP1Q1C, FallFP1Q2C, FallFP1Q3C, FallFP1Q4C, FallFP1Q5C, FallFP1Q6C, FallFP1Q7C, FallFP1Q8C, FallFP1Q9C, FallFP1Q10C, FallFP1Q11C, FallFP1Q12C, FallFP1Q13C, FallFP1Q14C, FallFP1Q15C, FallFP1Q16C, FallFP2Q1C, FallFP2Q2C, FallFP2Q3C, FallFP2Q4C, FallFP2Q5C, FallFP2Q6C, FallFP2Q7C, FallFP2Q8C.

b. The items are: FallFP2Q9C, FallFP2Q10C, FallFP2Q11C, FallFP2Q12C, FallFP2Q13C, FallFP2Q14C, FallFP2Q15C, FallFP2Q16C, FallFP3Q1C, FallFP3Q2C, FallFP3Q3C, FallFP3Q4C, FallFP3Q5C, FallFP3Q6C, FallFP3Q7C, FallFP3Q8C, FallFP3Q9C, FallFP3Q10C, FallFP3Q11C, FallFP3Q12C, FallFP3Q13C, FallFP3Q14C, FallFP3Q15C, FallFP3Q16C.

Table 56
Summary Item Statistics

		Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	Part 1	.612	.180	.942	.762	5.239	.052	24[a]
	Part 2	.540	.248	.901	.653	3.633	.031	24[b]
	Both Parts	.576	.180	.942	.762	5.239	.042	48
Item Variances	Part 1	.188	.055	.251	.196	4.559	.003	24[a]
	Part 2	.219	.089	.251	.161	2.809	.001	24[b]
	Both Parts	.204	.055	.251	.196	4.559	.003	48
Inter-Item Covariances	Part 1	.014	-.022	.057	.079	-2.581	.000	24[a]
	Part 2	.021	-.026	.069	.094	-2.680	.000	24[b]
	Both Parts	.016	-.033	.069	.102	-2.086	.000	48

a. The items are: FallFP1Q1C, FallFP1Q2C, FallFP1Q3C, FallFP1Q4C, FallFP1Q5C, FallFP1Q6C, FallFP1Q7C, FallFP1Q8C, FallFP1Q9C, FallFP1Q10C, FallFP1Q11C, FallFP1Q12C, FallFP1Q13C, FallFP1Q14C, FallFP1Q15C, FallFP1Q16C, FallFP2Q1C, FallFP2Q2C, FallFP2Q3C, FallFP2Q4C, FallFP2Q5C, FallFP2Q6C, FallFP2Q7C, FallFP2Q8C.

b. The items are: FallFP2Q9C, FallFP2Q10C, FallFP2Q11C, FallFP2Q12C, FallFP2Q13C, FallFP2Q14C, FallFP2Q15C, FallFP2Q16C, FallFP3Q1C, FallFP3Q2C, FallFP3Q3C, FallFP3Q4C, FallFP3Q5C, FallFP3Q6C, FallFP3Q7C, FallFP3Q8C, FallFP3Q9C, FallFP3Q10C, FallFP3Q11C, FallFP3Q12C, FallFP3Q13C, FallFP3Q14C, FallFP3Q15C, FallFP3Q16C.

Table 57
Scale Statistics

	Mean	Variance	Std. Deviation	N of Items
Part 1	14.69	12.154	3.486	24[a]
Part 2	12.97	16.847	4.104	24[b]
Both Parts	27.66	46.033	6.785	48

a. The items are: FallFP1Q1C, FallFP1Q2C, FallFP1Q3C, FallFP1Q4C, FallFP1Q5C, FallFP1Q6C, FallFP1Q7C, FallFP1Q8C, FallFP1Q9C, FallFP1Q10C, FallFP1Q11C, FallFP1Q12C, FallFP1Q13C, FallFP1Q14C, FallFP1Q15C, FallFP1Q16C, FallFP2Q1C, FallFP2Q2C, FallFP2Q3C, FallFP2Q4C, FallFP2Q5C, FallFP2Q6C, FallFP2Q7C, FallFP2Q8C.

b. The items are: FallFP2Q9C, FallFP2Q10C, FallFP2Q11C, FallFP2Q12C, FallFP2Q13C, FallFP2Q14C, FallFP2Q15C, FallFP2Q16C, FallFP3Q1C, FallFP3Q2C, FallFP3Q3C, FallFP3Q4C, FallFP3Q5C, FallFP3Q6C, FallFP3Q7C, FallFP3Q8C, FallFP3Q9C, FallFP3Q10C, FallFP3Q11C, FallFP3Q12C, FallFP3Q13C, FallFP3Q14C, FallFP3Q15C, FallFP3Q16C.

Winter Reliability

Table 58
Case Processing Summary

		N	%
Cases	Valid	74	2.0
	Excluded[a]	3598	98.0
	Total	3672	100.0

a. Listwise deletion based on all variables in the procedure.

Table 59
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.850	.845	48

Table 60
Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	.617	.095	.932	.838	9.857	.048	48
Item Variances	.192	.064	.253	.190	3.968	.004	48
Inter-Item Covariances	.020	-.075	.105	.180	-1.406	.001	48

Table 61
Scale Statistics

Mean	Variance	Std. Deviation	N of Items
29.64	54.892	7.409	48

Split-half Reliability: Winter

Table 62
Case Processing Summary

		N	%
Cases	Valid	74	2.0
	Excluded[a]	3598	98.0
	Total	3672	100.0

a. Listwise deletion based on all variables in the procedure.

Table 63
Reliability Statistics

Cronbach's Alpha	Part 1	Value	.690
		N of Items	24[a]
	Part 2	Value	.773
		N of Items	24[b]
	Total N of Items		48
Correlation Between Forms			.750
Spearman-Brown Coefficient	Equal Length		.857
	Unequal Length		.857
Guttman Split-Half Coefficient			.846

a. The items are: WintFP1Q1C, WintFP1Q2C, WintFP1Q3C, WintFP1Q4C, WintFP1Q5C, WintFP1Q6C, WintFP1Q7C, WintFP1Q8C, WintFP1Q9C, WintFP1Q10C, WintFP1Q11C, WintFP1Q12C, WintFP1Q13C, WintFP1Q14C, WintFP1Q15C, WintFP1Q16C, WintFP2Q1C, WintFP2Q2C, WintFP2Q3C, WintFP2Q4C, WintFP2Q5C, WintFP2Q6C, WintFP2Q7C, WintFP2Q8C.

b. The items are: WintFP2Q9C, WintFP2Q10C, WintFP2Q11C, WintFP2Q12C, WintFP2Q13C, WintFP2Q14C, WintFP2Q15C, WintFP2Q16C, WintFP3Q1C, WintFP3Q2C, WintFP3Q3C, WintFP3Q4C, WintFP3Q5C, WintFP3Q6C, WintFP3Q7C, WintFP3Q8C, WintFP3Q9C, WintFP3Q10C, WintFP3Q11C, WintFP3Q12C, WintFP3Q13C, WintFP3Q14C, WintFP3Q15C, WintFP3Q16C.

Table 64
Summary Item Statistics

		Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	Part 1	.649	.095	.932	.838	9.857	.056	24[a]
	Part 2	.586	.270	.932	.662	3.450	.040	24[b]
	Both Parts	.617	.095	.932	.838	9.857	.048	48
Item Variances	Part 1	.177	.064	.253	.190	3.968	.004	24[a]
	Part 2	.207	.064	.252	.188	3.942	.003	24[b]
	Both Parts	.192	.064	.253	.190	3.968	.004	48
Inter-Item Covariances	Part 1	.015	-.060	.090	.150	-1.516	.001	24[a]
	Part 2	.026	-.041	.100	.142	-2.420	.001	24[b]
	Both Parts	.020	-.075	.105	.180	-1.406	.001	48

a. The items are: WintFP1Q1C, WintFP1Q2C, WintFP1Q3C, WintFP1Q4C, WintFP1Q5C, WintFP1Q6C, WintFP1Q7C, WintFP1Q8C, WintFP1Q9C, WintFP1Q10C, WintFP1Q11C, WintFP1Q12C, WintFP1Q13C, WintFP1Q14C, WintFP1Q15C, WintFP1Q16C, WintFP2Q1C, WintFP2Q2C, WintFP2Q3C, WintFP2Q4C, WintFP2Q5C, WintFP2Q6C, WintFP2Q7C, WintFP2Q8C.

b. The items are: WintFP2Q9C, WintFP2Q10C, WintFP2Q11C, WintFP2Q12C, WintFP2Q13C, WintFP2Q14C, WintFP2Q15C, WintFP2Q16C, WintFP3Q1C, WintFP3Q2C, WintFP3Q3C, WintFP3Q4C, WintFP3Q5C, WintFP3Q6C, WintFP3Q7C, WintFP3Q8C, WintFP3Q9C, WintFP3Q10C, WintFP3Q11C, WintFP3Q12C, WintFP3Q13C, WintFP3Q14C, WintFP3Q15C, WintFP3Q16C.

Table 65
Scale Statistics

	Mean	Variance	Std. Deviation	N of Items
Part 1	15.58	12.521	3.538	24[a]
Part 2	14.05	19.148	4.376	24[b]
Both Parts	29.64	54.892	7.409	48

a. The items are: WintFP1Q1C, WintFP1Q2C, WintFP1Q3C, WintFP1Q4C, WintFP1Q5C, WintFP1Q6C, WintFP1Q7C, WintFP1Q8C, WintFP1Q9C, WintFP1Q10C, WintFP1Q11C, WintFP1Q12C, WintFP1Q13C, WintFP1Q14C, WintFP1Q15C, WintFP1Q16C, WintFP2Q1C, WintFP2Q2C, WintFP2Q3C, WintFP2Q4C, WintFP2Q5C, WintFP2Q6C, WintFP2Q7C, WintFP2Q8C.

b. The items are: WintFP2Q9C, WintFP2Q10C, WintFP2Q11C, WintFP2Q12C, WintFP2Q13C, WintFP2Q14C, WintFP2Q15C, WintFP2Q16C, WintFP3Q1C, WintFP3Q2C, WintFP3Q3C, WintFP3Q4C, WintFP3Q5C, WintFP3Q6C, WintFP3Q7C, WintFP3Q8C, WintFP3Q9C, WintFP3Q10C, WintFP3Q11C, WintFP3Q12C, WintFP3Q13C, WintFP3Q14C, WintFP3Q15C, WintFP3Q16C.

Spring Reliability

Table 66
Case Processing Summary

		N	%
Cases	Valid	283	7.7
	Excluded[a]	3389	92.3
	Total	3672	100.0

a. Listwise deletion based on all variables in the procedure.

Table 67
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.817	.825	48

Table 68
Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	.694	.170	.982	.813	5.792	.056	48
Item Variances	.158	.017	.250	.233	14.353	.004	48
Inter-Item Covariances	.013	-.032	.207	.239	-6.378	.000	48

Table 69
Scale Statistics

Mean	Variance	Std. Deviation	N of Items
33.29	38.022	6.166	48

Split-half Reliability: Spring

Table 70
Case Processing Summary

		N	%
Cases	Valid	283	7.7
	Excluded[a]	3389	92.3
	Total	3672	100.0

a. Listwise deletion based on all variables in the procedure.

Table 71
Reliability Statistics

Cronbach's Alpha	Part 1	Value	.706
		N of Items	24[a]
	Part 2	Value	.694
		N of Items	24[b]
	Total N of Items		48
Correlation Between Forms			.648
Spearman-Brown Coefficient	Equal Length		.786
	Unequal Length		.786
Guttman Split-Half Coefficient			.786

a. The items are: SprFP1Q1C, SprFP1Q2C, SprFP1Q3C, SprFP1Q4C, SprFP1Q5C, SprFP1Q6C, SprFP1Q7C, SprFP1Q8C, SprFP1Q9C, SprFP1Q10C, SprFP1Q11C, SprFP1Q12C, SprFP1Q13C, SprFP1Q14C, SprFP1Q15C, SprFP1Q16C, SprFP2Q1C, SprFP2Q2C, SprFP2Q3C, SprFP2Q4C, SprFP2Q5C, SprFP2Q6C, SprFP2Q7C, SprFP2Q8C.

b. The items are: SprFP2Q9C, SprFP2Q10C, SprFP2Q11C, SprFP2Q12C, SprFP2Q13C, SprFP2Q14C, SprFP2Q15C, SprFP2Q16C, SprFP3Q1C, SprFP3Q2C, SprFP3Q3C, SprFP3Q4C, SprFP3Q4C, SprFP3Q6C, SprFP3Q7C, SprFP3Q8C, SprFP3Q9C, SprFP3Q10C, SprFP3Q11C, SprFP3Q12C, SprFP3Q13C, SprFP3Q14C, SprFP3Q15C, SprFP3Q16C.

Table 72
Summary Item Statistics

		Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	Part 1	.696	.170	.982	.813	5.792	.062	24[a]
	Part 2	.691	.201	.936	.735	4.649	.052	24[b]
	Both Parts	.694	.170	.982	.813	5.792	.056	48
Item Variances	Part 1	.152	.017	.250	.233	14.353	.005	24[a]
	Part 2	.164	.060	.243	.183	4.061	.003	24[b]
	Both Parts	.158	.017	.250	.233	14.353	.004	48
Inter-Item Covariances	Part 1	.014	-.016	.095	.111	-5.945	.000	24[a]
	Part 2	.014	-.032	.207	.239	-6.378	.000	24[b]
	Both Parts	.013	-.032	.207	.239	-6.378	.000	48

a. The items are: SprFP1Q1C, SprFP1Q2C, SprFP1Q3C, SprFP1Q4C, SprFP1Q5C, SprFP1Q6C, SprFP1Q7C, SprFP1Q8C, SprFP1Q9C, SprFP1Q10C, SprFP1Q11C, SprFP1Q12C, SprFP1Q13C, SprFP1Q14C, SprFP1Q15C, SprFP1Q16C, SprFP2Q1C, SprFP2Q2C, SprFP2Q3C, SprFP2Q4C, SprFP2Q5C, SprFP2Q6C, SprFP2Q7C, SprFP2Q8C.

b. The items are: SprFP2Q9C, SprFP2Q10C, SprFP2Q11C, SprFP2Q12C, SprFP2Q13C, SprFP2Q14C, SprFP2Q15C, SprFP2Q16C, SprFP3Q1C, SprFP3Q2C, SprFP3Q3C, SprFP3Q4C, SprFP3Q4C, SprFP3Q6C, SprFP3Q7C, SprFP3Q8C, SprFP3Q9C, SprFP3Q10C, SprFP3Q11C, SprFP3Q12C, SprFP3Q13C, SprFP3Q14C, SprFP3Q15C, SprFP3Q16C.

Table 73
Scale Statistics

	Mean	Variance	Std. Deviation	N of Items
Part 1	16.70	11.310	3.363	24[a]
Part 2	16.59	11.768	3.430	24[b]
Both Parts	33.29	38.022	6.166	48

a. The items are: SprFP1Q1C, SprFP1Q2C, SprFP1Q3C, SprFP1Q4C, SprFP1Q5C, SprFP1Q6C, SprFP1Q7C, SprFP1Q8C, SprFP1Q9C, SprFP1Q10C, SprFP1Q11C, SprFP1Q12C, SprFP1Q13C, SprFP1Q14C, SprFP1Q15C, SprFP1Q16C, SprFP2Q1C, SprFP2Q2C, SprFP2Q3C, SprFP2Q4C, SprFP2Q5C, SprFP2Q6C, SprFP2Q7C, SprFP2Q8C.

b. The items are: SprFP2Q9C, SprFP2Q10C, SprFP2Q11C, SprFP2Q12C, SprFP2Q13C, SprFP2Q14C, SprFP2Q15C, SprFP2Q16C, SprFP3Q1C, SprFP3Q2C, SprFP3Q3C, SprFP3Q4C, SprFP3Q4C, SprFP3Q6C, SprFP3Q7C, SprFP3Q8C, SprFP3Q9C, SprFP3Q10C, SprFP3Q11C, SprFP3Q12C, SprFP3Q13C, SprFP3Q14C, SprFP3Q15C, SprFP3Q16C.

Table 74

Kindergarten, Reliability of easyCBM® Math Growth Slopes

Quartile	*n*	Fixed effect Intercept	*SE*	Reliability Intercept	Level-1 residual variance	Fixed effect slope	*SE*	Variance slope	Reliability Slope
1	446	19.549	0.196	0.185	20.405	6.609	0.194	6.072	0.454
2	374	25.903	0.155	0	11.934	4.99	0.185	6.813	0.619
3	383	30.93	0.137	0.207	8.555	3.509	0.142	3.249	0.521
4	367	37.97	0.151	0.309	9.176	1.292	0.124	0.977	0.236

Table 75

Grade 1, Reliability of easyCBM® Math Growth Slopes

Quartile	*n*	Fixed effect Intercept	*SE*	Reliability Intercept	Level-1 residual variance	Fixed effect slope	*SE*	Variance slope	Reliability Slope
1	351	17.483	0.149	0.183	9.217	5.129	0.193	8.092	0.704
2	441	22.973	0.123	0	8.413	4.644	0.182	10.179	0.767
3	304	27.348	0.135	0	7.078	4.271	0.197	8.198	0.761
4	317	33.618	0.202	0.526	11.34	2.862	0.148	1.116	0.211

Table 76

Grade 2, Reliability of easyCBM® Math Growth Slopes

Quartile	*n*	Fixed effect Intercept	*SE*	Reliability Intercept	Level-1 residual variance	Fixed effect slope	*SE*	Variance slope	Reliability Slope
1	603	21.124	0.125	0.293	10.564	4.351	0.123	2.778	0.417
2	519	27.137	0.095	0	6.103	2.994	0.114	3.336	0.605
3	517	31.737	0.094	0.161	5.434	1.58	0.097	1.731	0.471
4	453	37.592	0.127	0.491	6.614	0.059	0.097	0.555	0.191

Table 77

Schools Included in Criterion Validity

Locale	Number of Schools
City, Large	5
City, Mid-size	4
City, Small	8
Suburb, Large	7
Suburb, Mid-size	5
Town, Fringe	2
Town, Distant	3
Town, Remote	13
Rural, Fringe	13
Rural, Distant	9
Rural, Remote	7
Total	76

Table 78

Kindergarten School level Demographics: Criterion Validity

Demographic	Minimum	Maximum	Mean	Std. Deviation
Total	0	144	69.42	34.23
Am. Indian/Alaskan Native - Male	0	22	0.95	3.13
Am. Indian/Alaskan Native - Female	0	16	0.78	2.15
Asian/Pacific Islander -Male	0	10	1.57	2.37
Asian/Pacific Islander - Female	0	7	1.38	1.97
Hispanic -Male	0	41	8.49	9.90
Hispanic -Female	0	49	8.06	9.45
Black -Male	0	27	4.18	6.30
Black -Female	0	22	3.65	5.32
White -Male	0	78	21.45	17.64
White -Female	0	67	18.74	14.68

Table 79

Grade 1 School level Demographics: Criterion Validity

Demographic	Minimum	Maximum	Mean	Std. Deviation
Total	0	145	68.41	33.74
Am. Indian/Alaskan Native - Male	0	15	0.64	2.04
Am. Indian/Alaskan Native - Female	0	15	0.71	2.25
Asian/Pacific Islander -Male	0	10	1.50	2.33
Asian/Pacific Islander - Female	0	10	1.71	2.52
Hispanic -Male	0	34	7.45	9.09
Hispanic -Female	0	37	7.45	8.70
Black -Male	0	36	4.24	7.21
Black -Female	0	30	3.85	6.00
White -Male	0	76	21.14	16.32
White -Female	0	65	19.56	15.78

Table 80

Grade 2 School level Demographics: Criterion Validity

Demographic	Minimum	Maximum	Mean	Std. Deviation
Total	0	145	68.00	33.37
Am. Indian/Alaskan Native - Male	0	12	0.62	1.75
Am. Indian/Alaskan Native - Female	0	10	0.68	1.68
Asian/Pacific Islander -Male	0	10	1.46	2.56
Asian/Pacific Islander - Female	0	15	1.37	2.69
Hispanic -Male	0	29	6.52	7.59
Hispanic -Female	0	41	6.89	8.65
Black -Male	0	30	4.72	7.31
Black -Female	0	24	4.31	5.82
White -Male	0	60	20.08	14.54
White -Female	0	75	21.14	16.15

Grade K

Full Model

Table 81
Descriptive Statistics

	Mean	Std. Deviation	N
TerraNova3 Math Scale Score	503.44	42.581	153
Fall09Tot	27.0131	7.28462	153
Wint10Tot	34.8039	6.92066	153
Sprng10Tot	37.3399	5.76190	153

Table 82
Correlations

		TerraNova3 Math Scale Score	Fall09Tot	Wint10Tot	Sprng10Tot
Pearson Correlation	TerraNova3 Math Scale Score	1.000	.594	.509	.653
	Fall09Tot	.594	1.000	.529	.478
	Wint10Tot	.509	.529	1.000	.661
	Sprng10Tot	.653	.478	.661	1.000
Sig. (1-tailed)	TerraNova3 Math Scale Score	.	.000	.000	.000
	Fall09Tot	.000	.	.000	.000
	Wint10Tot	.000	.000	.	.000
	Sprng10Tot	.000	.000	.000	.
N	TerraNova3 Math Scale Score	153	153	153	153
	Fall09Tot	153	153	153	153
	Wint10Tot	153	153	153	153
	Sprng10Tot	153	153	153	153

Table 83
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.727[a]	.529	.520	29.509

a. Predictors: (Constant), Sprng10Tot, Fall09Tot, Wint10Tot

Table 84
ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	145850.023	3	48616.674	55.831	.000[a]
	Residual	129745.637	149	870.776		
	Total	275595.660	152			

a. Predictors: (Constant), Sprng10Tot, Fall09Tot, Wint10Tot
b. Dependent Variable: TerraNova3 Math Scale Score

Table 85
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	T	Sig.	Zero-order	Partial	Semi-partial	Tolerance	VIF
1	(Constant)	313.773	15.901		19.733	.000					
	Fall09Tot	2.137	.395	.366	5.406	.000	.594	.405	.304	.691	1.447
	Wint10Tot	-.006	.487	-.001	-.012	.991	.509	-.001	-.001	.504	1.983
	Sprng10Tot	3.539	.565	.479	6.263	.000	.653	.456	.352	.540	1.851

a. Dependent Variable: TerraNova3 Math Scale Score

Table 86
Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Fall09Tot	Wint10Tot	Sprng10Tot
1	1	3.936	1.000	.00	.00	.00	.00
	2	.038	10.203	.13	.87	.01	.02
	3	.018	14.877	.49	.13	.60	.01
	4	.009	21.322	.38	.00	.39	.97

a. Dependent Variable: TerraNova3 Math Scale Score

Fall Model

Table 87
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.627[a]	.393	.391	36.997

a. Predictors: (Constant), Fall09Tot

Table 88
ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	190893.292	1	190893.292	139.461	.000[a]
	Residual	294291.417	215	1368.797		
	Total	485184.710	216			

a. Predictors: (Constant), Fall09Tot
b. Dependent Variable: TerraNova3 Math Scale Score

Table 89
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	385.136	9.170		41.998	.000
	Fall09Tot	4.112	.348	.627	11.809	.000

a. Dependent Variable: TerraNova3 Math Scale Score

Winter Model

Table 90
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.524[a]	.274	.270	37.050

a. Predictors: (Constant), Wint10Tot

Table 91
ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	84483.276	1	84483.276	61.544	.000[a]
	Residual	223754.518	163	1372.727		
	Total	308237.794	164			

a. Predictors: (Constant), Wint10Tot
b. Dependent Variable: TerraNova3 Math Scale Score

Table 92
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	390.369	14.468		26.981	.000
	Wint10Tot	3.215	.410	.524	7.845	.000

a. Dependent Variable: TerraNova3 Math Scale Score

Spring Model

Table 93
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.720[a]	.518	.516	34.293

a. Predictors: (Constant), Sprng10Tot

Table 94
ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	284216.453	1	284216.453	241.676	.000[a]
	Residual	264605.036	225	1176.022		
	Total	548821.489	226			

a. Predictors: (Constant), Sprng10Tot
b. Dependent Variable: TerraNova3 Math Scale Score

Table 95
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	301.061	12.247		24.582	.000
	Sprng10Tot	5.321	.342	.720	15.546	.000

a. Dependent Variable: TerraNova3 Math Scale Score

Grade 1

Table 96
Descriptive Statistics

	Mean	Std. Deviation	N
TerraNova3 Math Scale Score	552.25	44.331	146
Fall09Tot	26.25	6.268	146
Wint10Tot	33.32	6.448	146
Sprng10Tot	36.90	5.083	146

Table 97
Correlations

		TerraNova3 Math Scale Score	Fall09Tot	Wint10Tot	Sprng10Tot
Pearson Correlation	TerraNova3 Math Scale Score	1.000	.599	.703	.691
	Fall09Tot	.599	1.000	.680	.574
	Wint10Tot	.703	.680	1.000	.684
	Sprng10Tot	.691	.574	.684	1.000
Sig. (1-tailed)	TerraNova3 Math Scale Score	.	.000	.000	.000
	Fall09Tot	.000	.	.000	.000
	Wint10Tot	.000	.000	.	.000
	Sprng10Tot	.000	.000	.000	.
N	TerraNova3 Math Scale Score	146	146	146	146
	Fall09Tot	146	146	146	146
	Wint10Tot	146	146	146	146
	Sprng10Tot	146	146	146	146

Table 98
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.767[a]	.589	.580	28.733

a. Predictors: (Constant), Sprng10Tot, Fall09Tot, Wint10Tot

Table 99
ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	167717.429	3	55905.810	67.715	.000[a]
	Residual	117235.695	142	825.603		
	Total	284953.123	145			

a. Predictors: (Constant), Sprng10Tot, Fall09Tot, Wint10Tot
b. Dependent Variable: TerraNova3 Math Scale Score

Table 100
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Semi-Partial	Tolerance	VIF
1	(Constant)	326.641	17.500		18.665	.000					
	Fall09Tot	1.072	.530	.152	2.021	.045	.599	.167	.109	.515	1.941
	Wint10Tot	2.408	.579	.350	4.158	.000	.703	.329	.224	.408	2.448
	Sprng10Tot	3.177	.657	.364	4.834	.000	.691	.376	.260	.510	1.961

a. Dependent Variable: TerraNova3 Math Scale Score

Table 101
Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Fall09Tot	Wint10Tot	Sprng10Tot
1	1	3.951	1.000	.00	.00	.00	.00
	2	.029	11.647	.26	.48	.01	.02
	3	.013	17.481	.24	.51	.65	.01
	4	.007	24.566	.50	.00	.34	.97

a. Dependent Variable: TerraNova3 Math Scale Score

Fall Model

Table 102
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.628[a]	.394	.392	33.892

a. Predictors: (Constant), Fall09Tot

Table 103
ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	160149.492	1	160149.492	139.422	.000[a]
	Residual	245815.156	214	1148.669		
	Total	405964.648	215			

a. Predictors: (Constant), Fall09Tot
b. Dependent Variable: TerraNova3 Math Scale Score

Table 104
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	428.937	9.754		43.976	.000
	Fall09Tot	4.430	.375	.628	11.808	.000

a. Dependent Variable: TerraNova3 Math Scale Score

Winter Model

Table 105
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.687[a]	.472	.469	31.595

a. Predictors: (Constant), Wint10Tot

Table 106
ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	140202.629	1	140202.629	140.447	.000[a]
	Residual	156726.930	157	998.261		
	Total	296929.560	158			

a. Predictors: (Constant), Wint10Tot
b. Dependent Variable: TerraNova3 Math Scale Score

Table 107
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	397.935	13.284		29.957	.000
	Wint10Tot	4.651	.392	.687	11.851	.000

a. Dependent Variable: TerraNova3 Math Scale Score

Spring Model

Table 108
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.730[a]	.534	.532	28.908

a. Predictors: (Constant), Sprng10Tot

Table 109
ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	229389.963	1	229389.963	274.500	.000[a]
	Residual	200559.442	240	835.664		
	Total	429949.405	241			

a. Predictors: (Constant), Sprng10Tot
b. Dependent Variable: TerraNova3 Math Scale Score

Table 110
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	370.386	10.526		35.186	.000
	Sprng10Tot	4.845	.292	.730	16.568	.000

a. Dependent Variable: TerraNova3 Math Scale Score

Grade 2

Table 111
Descriptive Statistics

	Mean	Std. Deviation	N
TerraNova3 Math Scale Score	568.99	38.070	149
Fall09Tot	27.61	6.584	149
Wint10Tot	30.91	5.493	149
Sprng10Tot	33.29	5.774	149

Table 112
Correlations

		TerraNova3 Math Scale Score	Fall09Tot	Wint10Tot	Sprng10Tot
Pearson Correlation	TerraNova3 Math Scale Score	1.000	.734	.736	.715
	Fall09Tot	.734	1.000	.685	.711
	Wint10Tot	.736	.685	1.000	.696
	Sprng10Tot	.715	.711	.696	1.000
Sig. (1-tailed)	TerraNova3 Math Scale Score	.	.000	.000	.000
	Fall09Tot	.000	.	.000	.000
	Wint10Tot	.000	.000	.	.000
	Sprng10Tot	.000	.000	.000	.
N	TerraNova3 Math Scale Score	149	149	149	149
	Fall09Tot	149	149	149	149
	Wint10Tot	149	149	149	149
	Sprng10Tot	149	149	149	149

Table 113
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.816[a]	.666	.659	22.224

a. Predictors: (Constant), Sprng10Tot, Wint10Tot, Fall09Tot

Table 114
ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	142883.796	3	47627.932	96.431	.000[a]
	Residual	71616.177	145	493.905		
	Total	214499.973	148			

a. Predictors: (Constant), Sprng10Tot, Wint10Tot, Fall09Tot
b. Dependent Variable: TerraNova3 Math Scale Score

Table 115
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	389.907	11.537		33.795	.000					
	Fall09Tot	1.886	.426	.326	4.429	.000	.734	.345	.213	.424	2.356
	Wint10Tot	2.369	.500	.342	4.741	.000	.736	.366	.227	.443	2.257
	Sprng10Tot	1.615	.493	.245	3.279	.001	.715	.263	.157	.412	2.425

a. Dependent Variable: TerraNova3 Math Scale Score

Table 116
Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Fall	Winter	Spring
1	1	3.953	1.000	.00	.00	.00	.00
	2	.027	12.070	.49	.39	.00	.00
	3	.011	19.032	.45	.53	.61	.06
	4	.009	21.164	.06	.08	.39	.94

a. Dependent Variable: TerraNova3 Math Scale Score

Fall Model

Table 117
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.732[a]	.536	.533	25.646

a. Predictors: (Constant), Fall09Tot

Table 118
ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	116057.369	1	116057.369	176.448	.000[a]
	Residual	100634.398	153	657.741		
	Total	216691.768	154			

a. Predictors: (Constant), Fall09Tot
b. Dependent Variable: TerraNova3 Math Scale Score

Table 119
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	453.499	8.889		51.018	.000
	Fall09Tot	4.179	.315	.732	13.283	.000

a. Dependent Variable: TerraNova3 Math Scale Score

Winter Model

Table 120
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.734[a]	.539	.536	25.376

a. Predictors: (Constant), Wint10Tot

Table 121
ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	129306.705	1	129306.705	200.812	.000[a]
	Residual	110753.847	172	643.918		
	Total	240060.552	173			

a. Predictors: (Constant), Wint10Tot
b. Dependent Variable: TerraNova3 Math Scale Score

Table 122
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	418.715	10.695		39.152	.000
	Wint10Tot	4.851	.342	.734	14.171	.000

a. Dependent Variable: TerraNova3 Math Scale Score

Spring Model

Table 123
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.718[a]	.515	.512	26.299

a. Predictors: (Constant), Sprng10Tot

Table 124
ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	123514.213	1	123514.213	178.577	.000[a]
	Residual	116198.281	168	691.656		
	Total	239712.494	169			

a. Predictors: (Constant), Sprng10Tot
b. Dependent Variable: TerraNova3 Math Scale Score

Table 125
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	416.652	11.511		36.197	.000
	Sprng10Tot	4.579	.343	.718	13.363	.000

a. Dependent Variable: TerraNova3 Math Scale Score

Figure 1

Theoretical Measurement Model – Administered Seasonally

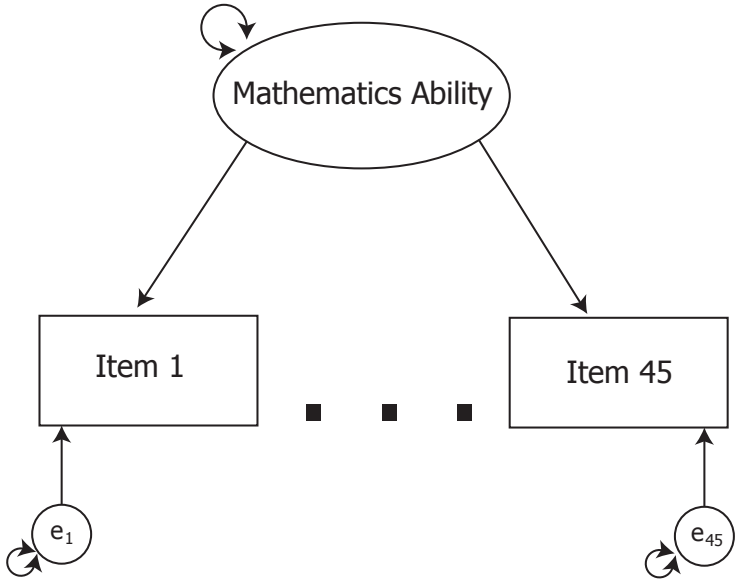
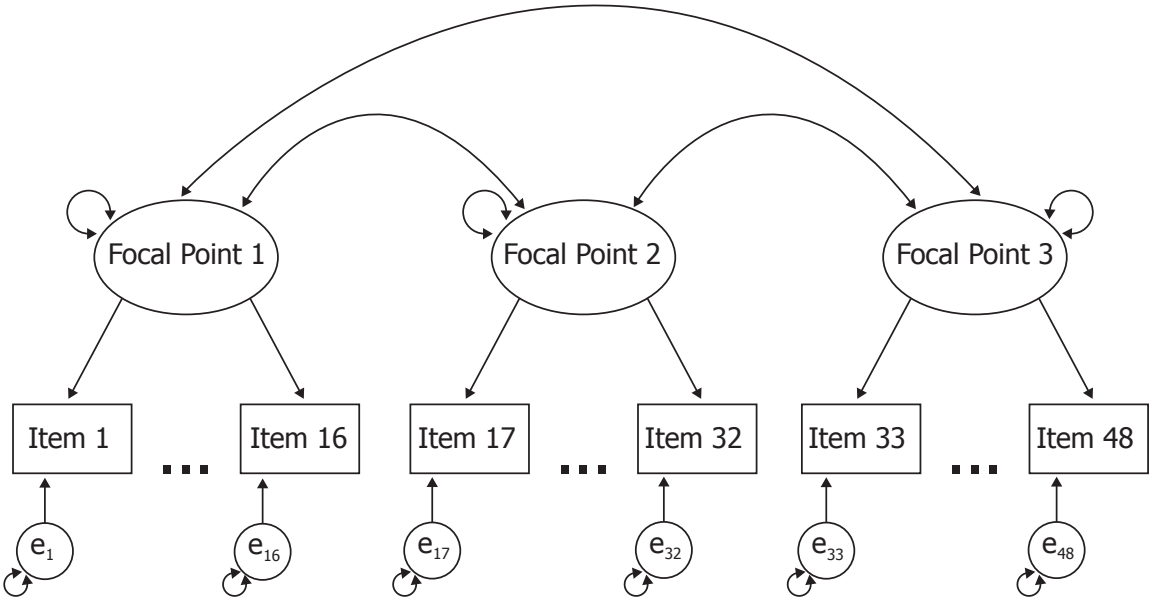


Figure 2

Rival Hypothesis Measurement Model



Fall

Figure 3

Item fit – Grade K Fall Focal Point 1

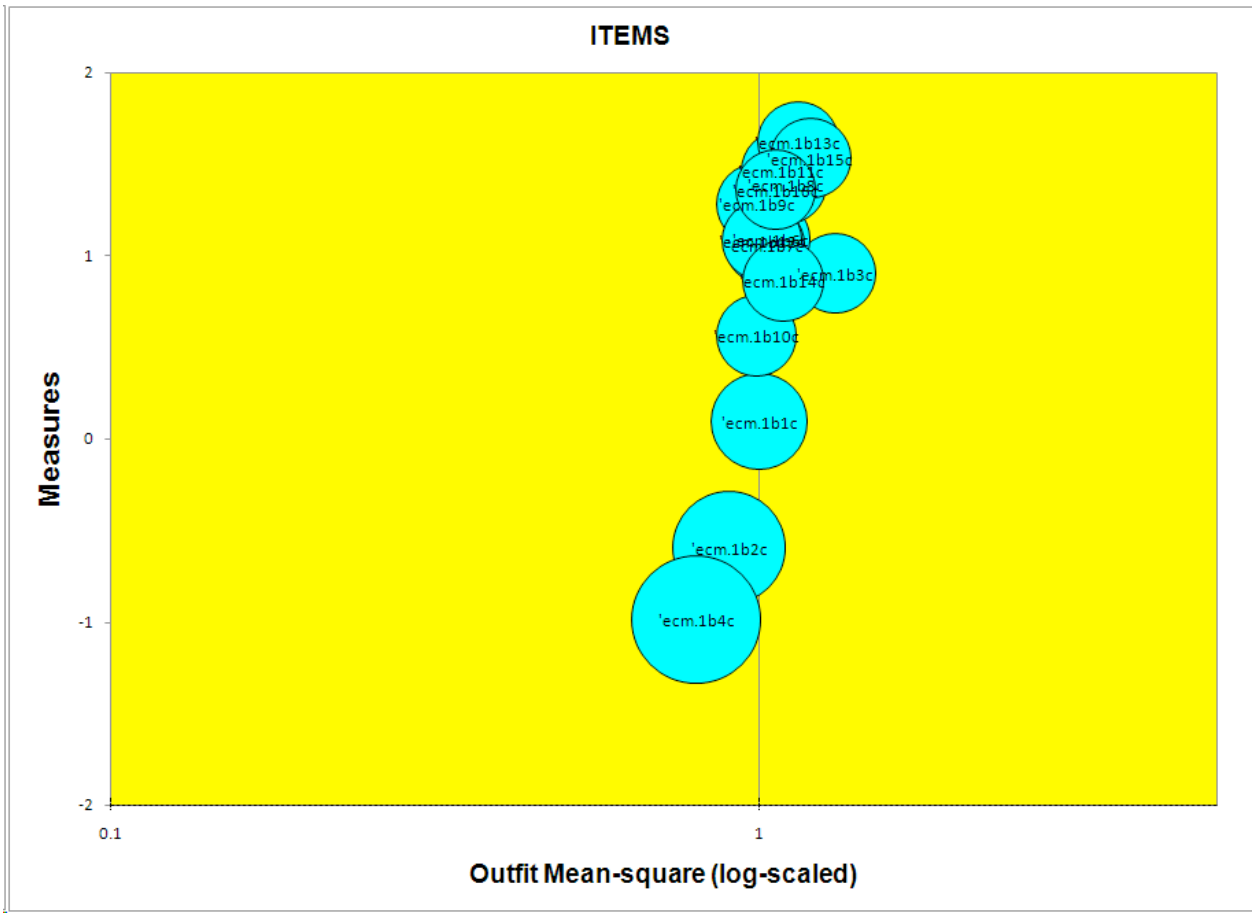


Table 126

Item Fit Order – Grade K Fall Focal Point 1

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM
3	1046	1809	.90	.05	1.22	9.9	1.31	9.9	A .12	.37	55.8	66.6	ecm.1b3c
14	806	1805	1.53	.05	1.15	7.8	1.20	7.6	B .22	.38	60.7	66.7	ecm.1b15c
12	770	1804	1.62	.05	1.11	5.7	1.15	5.7	C .26	.38	64.0	67.3	ecm.1b13c
7	858	1806	1.39	.05	1.09	5.3	1.10	4.2	D .28	.38	60.6	66.1	ecm.1b8c
13	1063	1805	.86	.05	1.05	2.8	1.09	3.2	E .31	.37	64.7	66.9	ecm.1b14c
10	830	1804	1.46	.05	1.06	3.3	1.08	3.4	F .31	.38	64.1	66.4	ecm.1b11c
15	870	1805	1.36	.05	1.06	3.3	1.06	2.5	G .32	.38	63.4	66.0	ecm.1b16c
5	975	1808	1.09	.05	1.06	3.3	1.04	1.6	H .32	.37	62.1	65.9	ecm.1b6c
6	986	1808	1.06	.05	1.04	2.0	1.02	1.0	g .34	.37	63.2	66.0	ecm.1b7c
11	977	1804	1.08	.05	1.02	1.2	1.01	.2	f .36	.37	64.3	66.0	ecm.1b12c
1	1332	1810	.09	.06	1.01	.3	1.00	.1	e .31	.32	73.7	74.7	ecm.1b1c
8	899	1805	1.28	.05	1.00	.3	.99	-.2	d .38	.38	65.4	65.9	ecm.1b9c
9	1170	1805	.56	.05	.98	-.8	.99	-.3	c .37	.35	69.3	69.1	ecm.1b10c
2	1518	1810	-.60	.07	.95	-1.2	.90	-1.4	b .33	.27	84.1	83.9	ecm.1b2c
4	1596	1809	-.99	.08	.93	-1.3	.80	-2.4	a .32	.23	88.3	88.2	ecm.1b4c
MEAN	1046.4	1806.5	.85	.05	1.05	2.8	1.05	2.3			66.9	69.7	
S.D.	245.6	2.1	.75	.01	.07	3.2	.12	3.3			8.5	6.8	

Figure 4

Item fit – Grade K Fall Focal Point 2

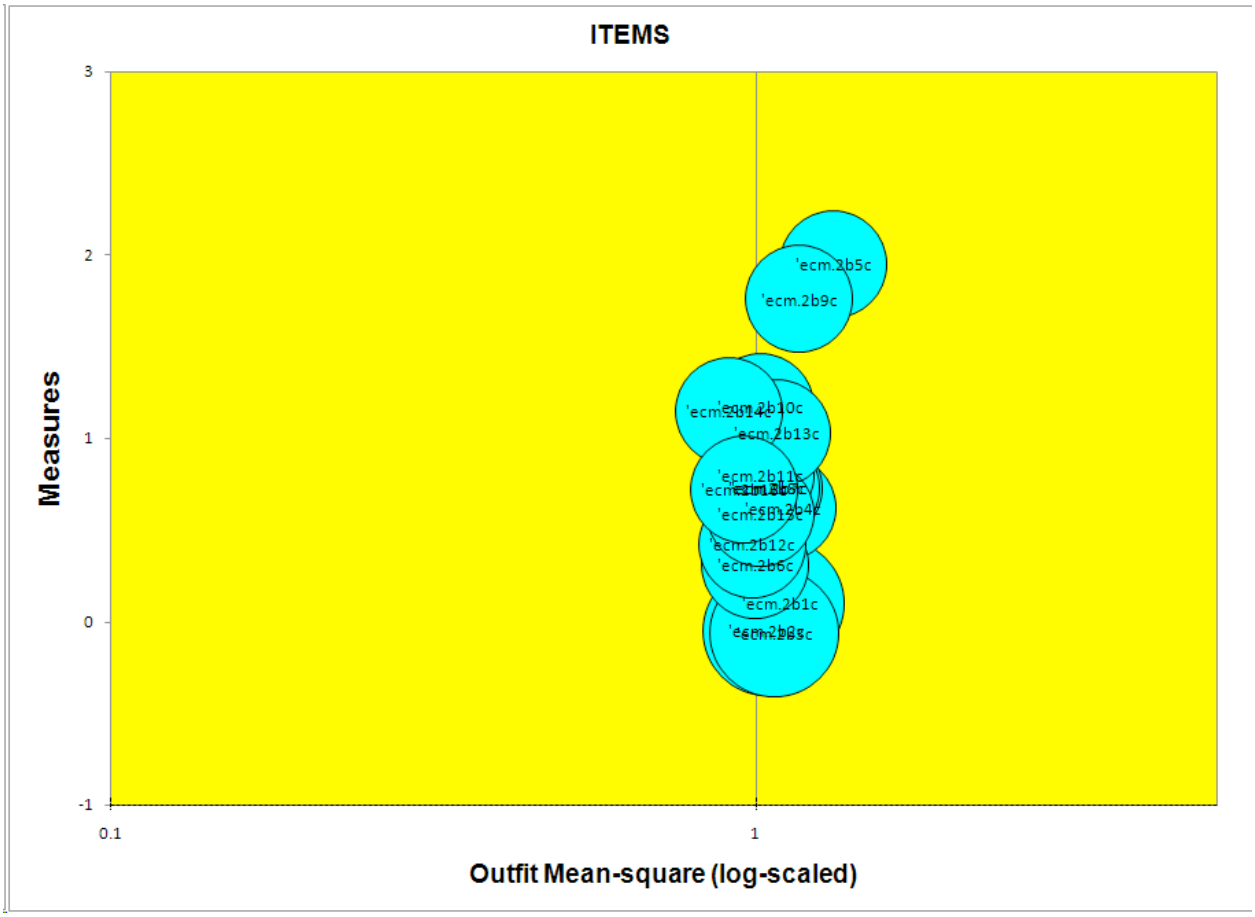


Table 127

Item Fit Order – Grade K Fall Focal Point 2

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
20	673	1879	1.95	.05	1.22	9.6	1.32	9.9	A .14	.38	62.4	70.1	ecm.2b5c	0
24	746	1877	1.76	.05	1.11	5.4	1.17	6.3	B .26	.38	65.4	68.3	ecm.2b9c	0
19	1197	1882	.62	.05	1.07	3.7	1.10	3.2	C .28	.36	65.6	68.5	ecm.2b4c	0
16	1386	1888	.10	.06	1.07	2.6	1.09	2.0	D .25	.32	72.9	74.6	ecm.2b1c	0
28	1035	1877	1.03	.05	1.07	3.9	1.08	3.2	E .30	.37	62.2	66.1	ecm.2b13c	0
18	1432	1883	-.06	.06	1.04	1.4	1.07	1.5	F .27	.31	76.0	76.7	ecm.2b3c	0
22	1152	1878	.73	.05	1.05	2.8	1.05	1.6	G .31	.36	65.7	67.6	ecm.2b7c	0
30	1203	1876	.59	.05	1.04	2.2	1.02	.6	H .31	.35	66.2	68.8	ecm.2b15c	0
23	1154	1877	.73	.05	1.04	2.2	1.04	1.3	h .32	.36	65.3	67.7	ecm.2b8c	0
26	1122	1874	.80	.05	1.04	2.3	1.02	.7	g .33	.36	63.7	67.1	ecm.2b11c	0
17	1432	1886	-.05	.06	1.02	.8	1.04	.8	f .29	.31	75.7	76.6	ecm.2b2c	0
21	1308	1878	.31	.05	1.03	1.3	1.00	.1	e .31	.34	70.9	71.9	ecm.2b6c	0
27	1269	1877	.42	.05	1.03	1.3	.99	-.2	d .32	.34	68.0	70.6	ecm.2b12c	0
25	978	1877	1.17	.05	1.03	1.6	1.02	.9	c .35	.38	64.7	65.8	ecm.2b10c	0
31	1156	1876	.72	.05	.99	-.6	.96	-1.5	b .38	.36	68.0	67.7	ecm.2b16c	0
29	984	1876	1.15	.05	.94	-3.9	.91	-3.9	a .45	.38	70.0	65.8	ecm.2b14c	0
MEAN	1139.2	1878.8	.75	.05	1.05	2.3	1.06	1.6			67.7	69.6		
S.D.	212.0	3.7	.56	.00	.06	2.7	.09	3.0			4.2	3.5		

Figure 5

Item fit – Grade K Fall Focal Point 3

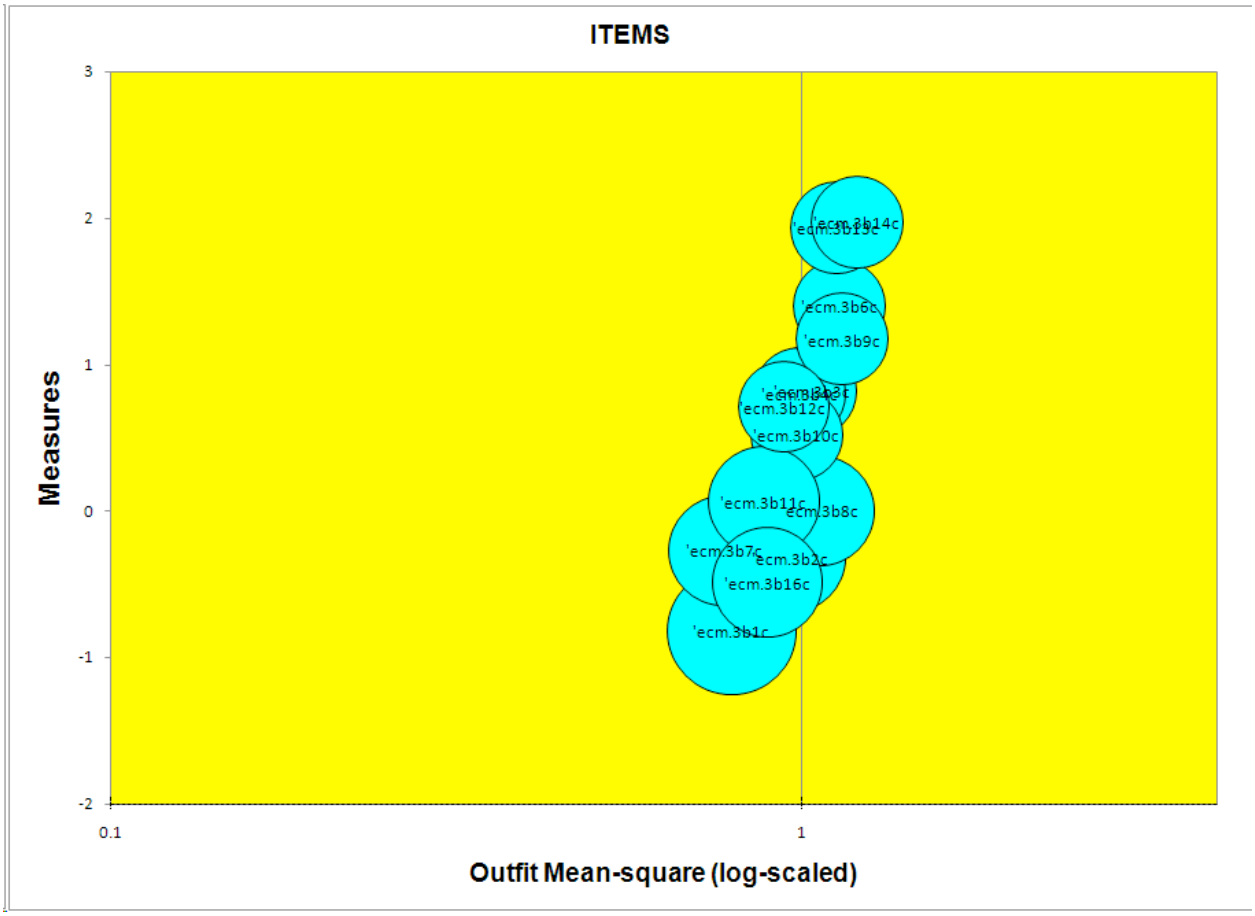


Table 128

Item Fit Order – Grade K Fall Focal Point 3

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
44	647	1819	1.97	.05	1.09	4.0	1.20	6.2	A .27	.38	68.3	70.3	ecm.3b14c	0
39	953	1821	1.17	.05	1.12	6.7	1.14	5.3	B .25	.38	58.6	65.8	ecm.3b9c	0
36	863	1823	1.40	.05	1.09	5.0	1.13	5.2	C .28	.38	62.8	66.1	ecm.3b6c	0
43	664	1820	1.93	.05	1.05	2.2	1.12	4.0	D .32	.38	68.5	69.8	ecm.3b13c	0
38	1369	1822	.00	.06	1.03	1.2	1.06	1.1	E .28	.31	74.9	75.9	ecm.3b8c	0
34	1089	1824	.82	.05	1.03	1.9	1.03	1.0	F .33	.36	65.3	67.1	ecm.3b3c	0
33	1463	1826	-.32	.06	1.00	.1	.96	-.6	G .30	.29	80.0	80.3	ecm.3b2c	0
40	1196	1820	.52	.05	.99	-.4	.98	-.6	g .36	.35	69.5	69.5	ecm.3b10c	0
35	1094	1824	.80	.05	.99	-.6	.99	-.3	f .38	.36	66.6	67.1	ecm.3b4c	0
42	1126	1819	.71	.05	.97	-1.7	.94	-1.8	e .40	.36	68.2	67.8	ecm.3b12c	0
41	1351	1820	.06	.06	.95	-1.8	.88	-2.6	d .38	.32	75.3	75.2	ecm.3b11c	0
45	1499	1817	-.49	.06	.95	-1.3	.89	-1.8	c .34	.28	82.7	82.6	ecm.3b16c	0
32	1579	1826	-.82	.07	.94	-1.4	.79	-2.8	b .33	.25	86.6	86.5	ecm.3b1c	0
37	1447	1822	-.27	.06	.90	-3.1	.77	-4.3	a .42	.29	80.1	79.7	ecm.3b7c	0
MEAN	1167.1	1821.6	.53	.06	1.01	.8	.99	.6			72.0	73.1		
S.D.	292.3	2.8	.85	.01	.06	2.8	.13	3.3			7.8	6.6		

Winter

Figure 6

Item fit – Grade K Winter Focal Point 1

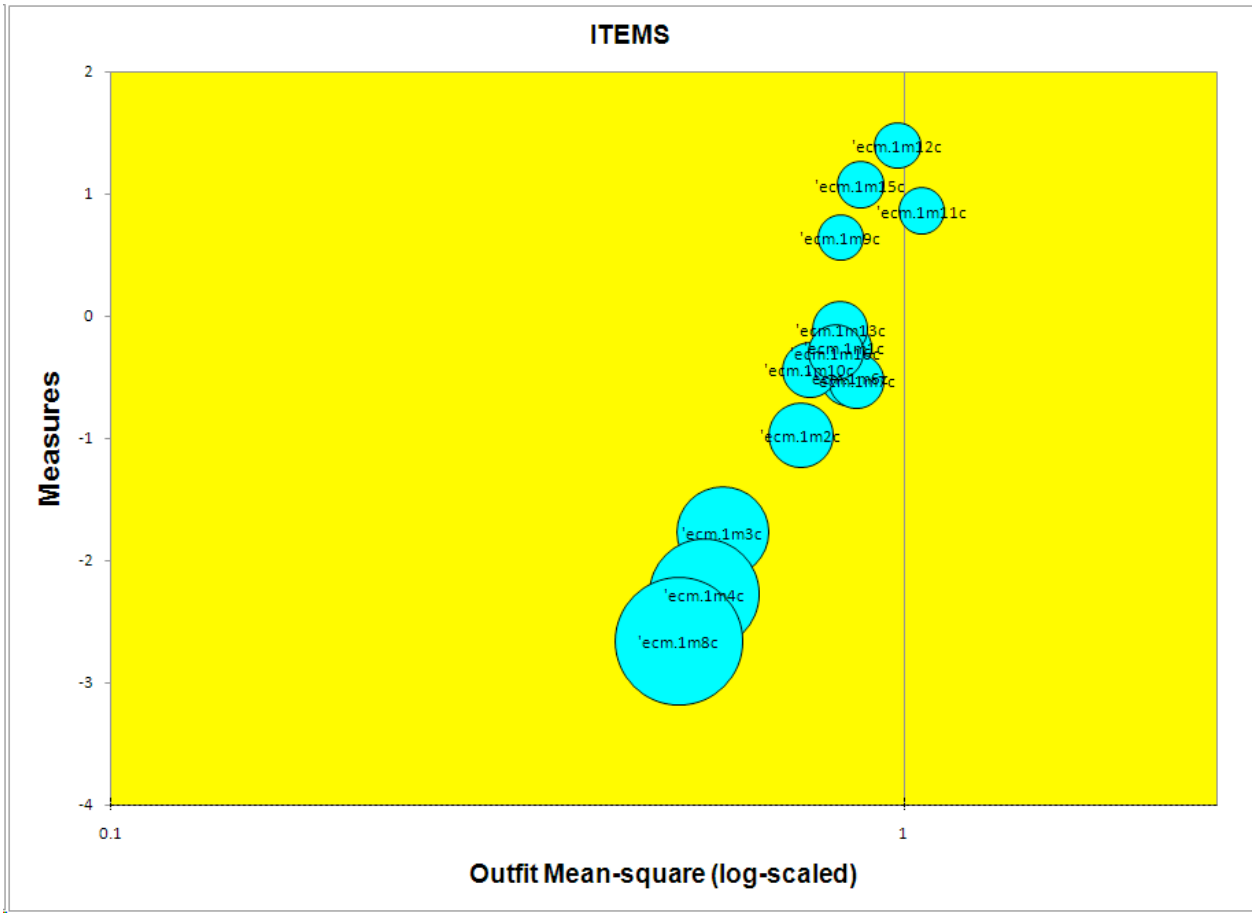


Table 129

Item Fit Order – Grade K Winter Focal Point 1

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
55	1131	1940	.86	.05	1.03	1.9	1.05	1.8	A .34	.38	64.6	67.1	ecm.1m11c	0
56	914	1940	1.39	.05	.97	-1.9	.98	-.7	B .41	.39	69.9	66.4	ecm.1m12c	0
50	1599	1942	-.51	.06	.95	-1.3	.85	-2.5	C .35	.29	82.3	82.5	ecm.1m6c	0
52	1889	1942	-2.66	.14	.95	-.4	.52	-3.1	D .23	.13	97.3	97.3	ecm.1m8c	0
51	1603	1942	-.53	.06	.94	-1.6	.87	-2.1	E .36	.29	82.6	82.7	ecm.1m7c	0
46	1531	1943	-.26	.06	.93	-2.2	.84	-3.1	F .39	.31	79.5	79.2	ecm.1m1c	0
49	1867	1943	-2.28	.12	.92	-.8	.56	-3.3	G .27	.15	96.1	96.1	ecm.1m4c	0
57	1483	1940	-.11	.06	.92	-2.8	.83	-3.6	g .41	.32	77.7	77.3	ecm.1m13c	0
47	1704	1942	-.98	.07	.91	-1.8	.74	-3.4	f .36	.25	87.9	87.8	ecm.1m2c	0
59	1541	1939	-.30	.06	.91	-2.8	.82	-3.4	e .41	.31	80.4	79.8	ecm.1m16c	0
48	1822	1943	-1.77	.10	.90	-1.3	.59	-3.8	d .32	.19	93.8	93.8	ecm.1m3c	0
58	1046	1940	1.07	.05	.90	-6.1	.88	-4.9	c .48	.38	72.5	66.3	ecm.1m15c	0
54	1581	1942	-.44	.06	.89	-3.1	.76	-4.3	b .42	.30	82.3	81.6	ecm.1m10c	0
53	1219	1942	.64	.05	.89	-6.1	.83	-5.9	a .49	.37	71.1	68.6	ecm.1m9c	0
MEAN	1495.0	1941.4	-.42	.07	.93	-2.2	.79	-3.0			81.3	80.5		
S.D.	295.9	1.0	1.17	.03	.04	2.0	.15	1.8			9.6	10.3		

Figure 7

Item fit – Grade K Winter Focal Point 2

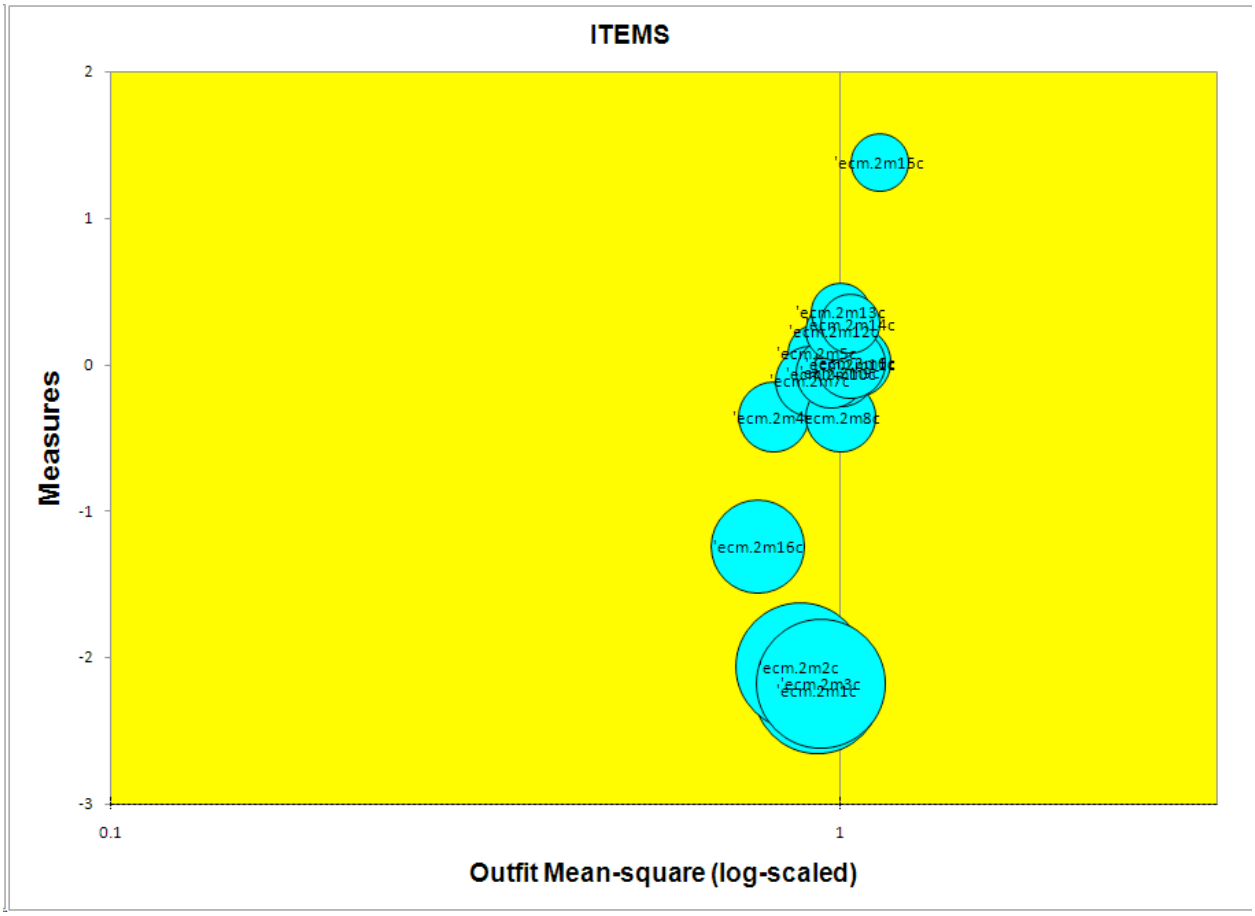


Table 130

Item Fit Order – Grade K Winter Focal Point 2

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
74	929	1963	1.38	.05	1.10	5.7	1.13	5.2	A .28	.39	61.5	66.4	ecm.2m15c	0
65	1457	1963	.02	.06	.98	-.9	1.05	1.1	B .35	.33	76.2	75.5	ecm.2m6c	0
70	1460	1963	.01	.06	1.03	1.3	1.03	.6	C .30	.33	75.4	75.6	ecm.2m11c	0
73	1368	1963	.28	.05	1.01	.6	1.03	.7	D .33	.35	72.0	72.4	ecm.2m14c	0
71	1385	1963	.23	.05	1.00	.1	.98	-.5	E .35	.35	73.2	72.9	ecm.2m12c	0
69	1482	1962	-.06	.06	1.00	.1	.97	-.6	F .33	.33	76.1	76.5	ecm.2m10c	0
72	1340	1963	.36	.05	.98	-.7	1.00	.0	G .37	.35	72.4	71.5	ecm.2m13c	0
67	1572	1962	-.36	.06	.99	-.3	1.00	.0	H .32	.30	80.4	80.4	ecm.2m8c	0
68	1480	1963	-.05	.06	.98	-.7	1.00	-.1	h .34	.33	77.2	76.4	ecm.2m9c	0
62	1878	1963	-2.18	.11	.99	.0	.94	-.3	g .17	.16	95.7	95.7	ecm.2m3c	0
60	1881	1963	-2.22	.11	.99	.0	.93	-.4	f .17	.16	95.8	95.8	ecm.2m1c	0
64	1436	1962	.08	.05	.98	-.7	.93	-1.6	e .36	.34	74.6	74.8	ecm.2m5c	0
61	1868	1963	-2.06	.11	.98	-.2	.88	-.9	d .20	.17	95.2	95.2	ecm.2m2c	0
66	1498	1962	-.11	.06	.95	-1.7	.91	-1.9	c .37	.32	78.4	77.2	ecm.2m7c	0
75	1767	1962	-1.24	.08	.95	-.9	.77	-2.6	b .30	.23	90.1	90.1	ecm.2m16c	0
63	1574	1963	-.36	.06	.93	-2.2	.81	-3.5	a .39	.30	81.1	80.5	ecm.2m4c	0
MEAN	1523.4	1962.7	-.39	.07	.99	.0	.96	-.3			79.7	79.8		
S.D.	235.5	.2	.98	.02	.04	1.7	.09	1.9			9.4	9.0		

Figure 8

Item fit – Grade K Winter Focal Point 3

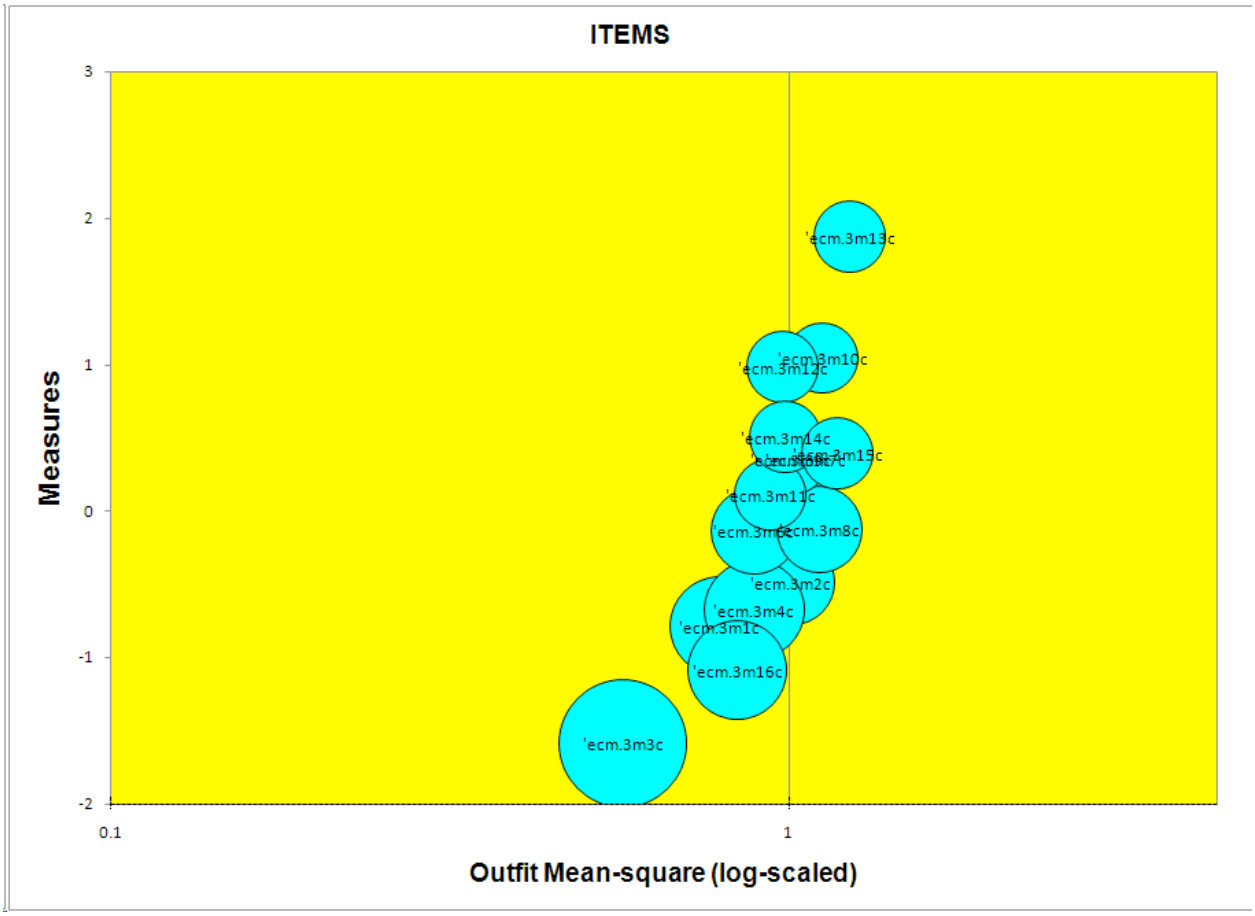


Table 131

Item Fit Order – Grade K Winter Focal Point 3

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
87	725	1953	1.87	.05	1.12	5.9	1.23	7.4	A .24	.38	65.5	69.5	ecm.3m13c	0
89	1323	1953	.39	.05	1.07	3.3	1.18	4.7	B .26	.35	69.6	71.1	ecm.3m15c	0
84	1065	1953	1.04	.05	1.11	6.1	1.12	4.8	C .27	.38	60.5	66.4	ecm.3m10c	0
82	1499	1955	-.13	.06	1.04	1.3	1.11	2.2	D .27	.32	76.8	77.5	ecm.3m8c	0
81	1339	1955	.35	.05	1.06	2.8	1.06	1.6	E .29	.35	68.5	71.6	ecm.3m7c	0
77	1602	1955	-.49	.06	1.04	1.2	1.01	.2	F .26	.29	81.4	82.1	ecm.3m2c	0
83	1336	1954	.35	.05	1.01	.7	1.01	.4	G .34	.35	70.5	71.5	ecm.3m9c	0
85	1422	1953	.11	.05	1.00	.0	.94	-1.5	H .35	.34	72.4	74.5	ecm.3m11c	0
86	1090	1953	.98	.05	.99	-.6	.98	-.6	g .39	.38	67.5	66.6	ecm.3m12c	0
88	1282	1953	.50	.05	.99	-.6	.99	-.4	f .37	.36	70.3	70.0	ecm.3m14c	0
80	1503	1954	-.14	.06	.97	-1.1	.89	-2.3	e .36	.32	77.8	77.7	ecm.3m6c	0
79	1651	1955	-.68	.07	.95	-1.2	.89	-1.6	d .33	.28	84.5	84.5	ecm.3m4c	0
90	1733	1953	-1.09	.07	.95	-1.0	.84	-1.9	c .31	.24	88.8	88.8	ecm.3m16c	0
78	1809	1953	-1.59	.09	.92	-1.1	.57	-4.5	b .33	.20	92.6	92.6	ecm.3m3c	0
76	1674	1954	-.79	.07	.92	-1.8	.79	-3.0	a .36	.27	85.9	85.7	ecm.3m1c	0
MEAN	1403.5	1953.7	.05	.06	1.01	.9	.97	.4			75.5	76.7		
S.D.	279.2	.9	.87	.01	.06	2.5	.16	3.2			9.1	8.0		

Spring

Figure 9

Item fit – Grade K Spring Focal Point 1

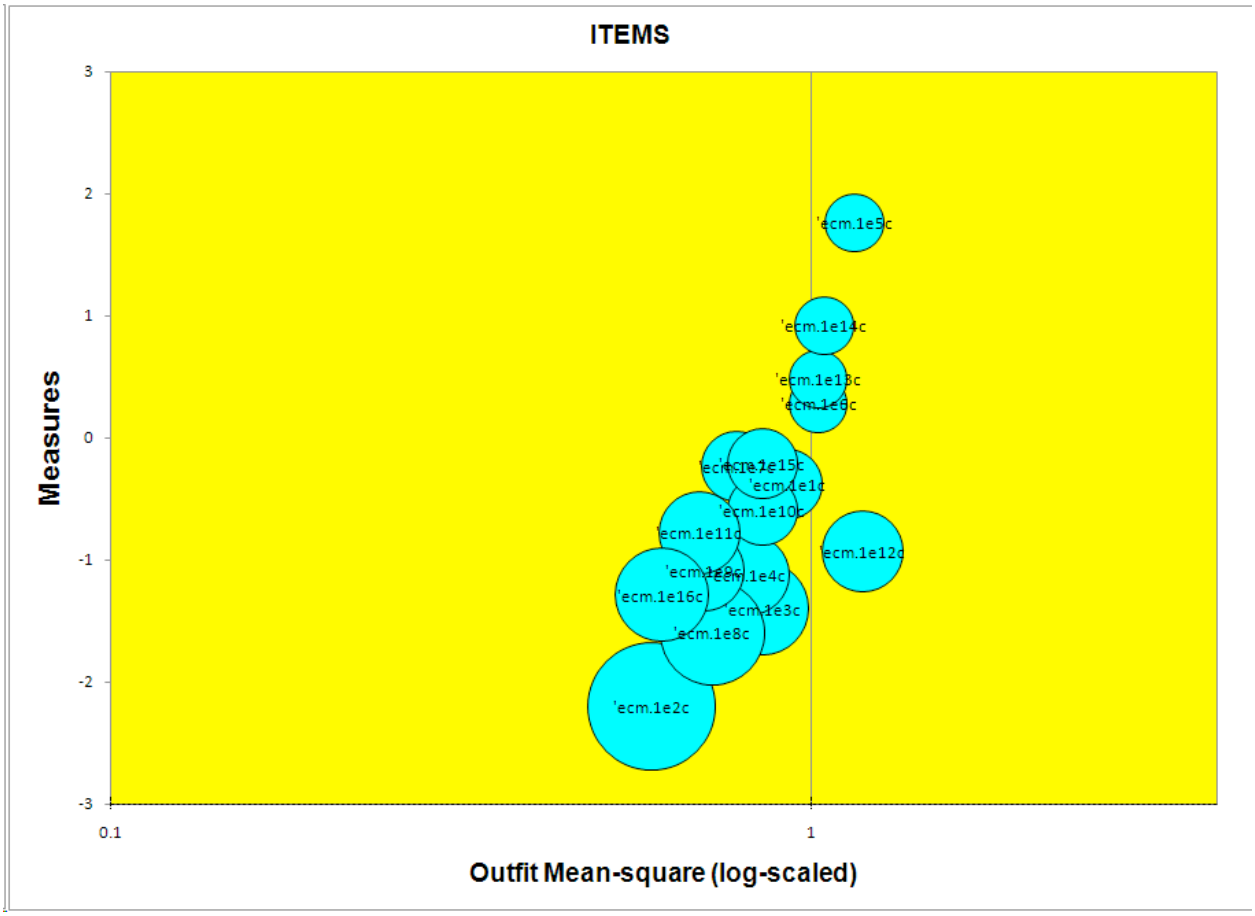


Table 132

Item Fit Order – Grade K Spring Focal Point 1

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
102	1739	2004	-.93	.07	1.00	-.1	1.18	2.2	A .25	.26	87.0	86.8	ecm.1e12c	0
95	781	2006	1.76	.05	1.08	4.1	1.15	5.2	B .30	.39	66.5	68.9	ecm.1e5c	0
104	1132	2004	.92	.05	1.05	2.7	1.04	1.6	C .34	.38	64.7	66.9	ecm.1e14c	0
96	1388	2006	.28	.05	1.00	.2	1.02	.6	D .35	.35	70.2	72.1	ecm.1e6c	0
103	1311	2004	.48	.05	.99	-.7	1.02	.7	E .37	.36	72.2	69.9	ecm.1e13c	0
93	1828	2008	-1.40	.08	.96	-.7	.85	-1.6	F .28	.23	91.1	91.1	ecm.1e3c	0
94	1779	2006	-1.12	.07	.95	-.9	.81	-2.3	G .31	.25	88.9	88.7	ecm.1e4c	0
100	1661	2004	-.59	.06	.95	-1.4	.85	-2.5	H .35	.29	83.3	83.1	ecm.1e10c	0
91	1606	2008	-.38	.06	.95	-1.6	.92	-1.5	h .36	.31	81.0	80.4	ecm.1e1c	0
98	1853	2004	-1.60	.09	.94	-.8	.72	-2.7	g .29	.21	92.5	92.5	ecm.1e8c	0
105	1554	2004	-.21	.06	.92	-2.8	.85	-3.1	f .41	.32	78.5	78.2	ecm.1e15c	0
92	1920	2008	-2.20	.11	.92	-.9	.59	-3.2	e .28	.16	95.6	95.6	ecm.1e2c	0
97	1561	2005	-.23	.06	.90	-3.3	.78	-4.6	d .43	.32	79.1	78.5	ecm.1e7c	0
99	1772	2004	-1.09	.07	.89	-2.2	.70	-3.9	c .38	.25	88.6	88.5	ecm.1e9c	0
106	1806	2002	-1.29	.08	.89	-1.9	.61	-4.8	b .38	.23	90.3	90.2	ecm.1e16c	0
101	1706	2004	-.78	.07	.88	-3.0	.69	-4.8	a .42	.28	85.7	85.2	ecm.1e11c	0
MEAN	1587.3	2005.1	-.52	.07	.95	-.8	.86	-1.5			82.2	82.3		
S.D.	293.3	1.7	.98	.02	.05	1.9	.18	2.8			9.3	8.8		

Figure 10

Item fit – Grade K Spring Focal Point 2

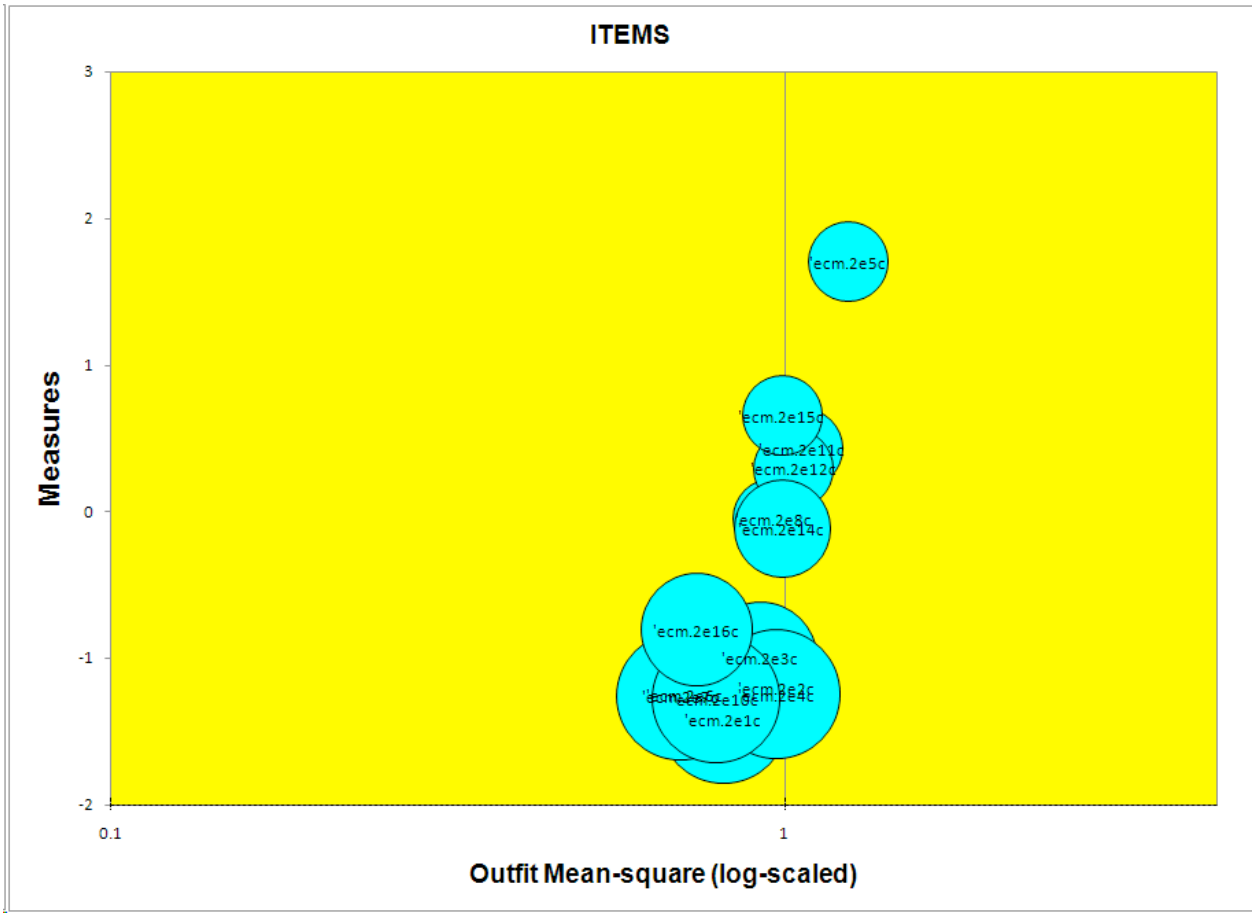


Table 133

Item Fit Order – Grade K Spring Focal Point 2

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
111	810	2025	1.70	.05	1.16	8.3	1.24	8.4	A .22	.39	61.8	68.6	ecm.2e5c	0
116	1338	2024	.43	.05	1.01	.7	1.06	1.8	B .34	.36	70.8	70.3	ecm.2e11c	0
117	1394	2024	.29	.05	1.03	1.5	1.03	.7	C .33	.36	70.3	71.9	ecm.2e12c	0
118	1538	2024	-.12	.06	1.01	.5	.99	-.1	D .32	.33	75.9	76.9	ecm.2e14c	0
119	1251	2024	.65	.05	1.01	.4	.99	-.3	E .37	.37	67.9	68.4	ecm.2e15c	0
114	1515	2024	-.05	.05	.99	-.3	.96	-.8	F .35	.33	75.5	76.0	ecm.2e8c	0
110	1817	2025	-1.25	.08	.99	-.2	.97	-.3	G .25	.24	89.8	89.8	ecm.2e4c	0
107	1845	2025	-1.42	.08	.98	-.3	.81	-2.0	g .27	.22	91.1	91.1	ecm.2e1c	0
109	1771	2025	-1.00	.07	.98	-.5	.92	-1.0	f .29	.26	87.3	87.5	ecm.2e3c	0
108	1809	2025	-1.20	.07	.98	-.4	.97	-.3	e .27	.24	89.5	89.4	ecm.2e2c	0
115	1822	2024	-1.28	.08	.96	-.8	.79	-2.4	d .30	.24	90.1	90.0	ecm.2e10c	0
112	1817	2025	-1.25	.08	.92	-1.4	.71	-3.5	c .34	.24	89.8	89.8	ecm.2e6c	0
113	1820	2025	-1.26	.08	.90	-1.8	.70	-3.6	b .35	.24	90.1	89.9	ecm.2e7c	0
120	1729	2024	-.81	.07	.89	-2.7	.74	-3.9	a .40	.27	85.9	85.5	ecm.2e16c	0
MEAN	1591.1	2024.5	-.47	.06	.99	.2	.92	-.5			81.1	81.8		
S.D.	293.8	.0	.92	.01	.06	2.5	.15	3.0			9.9	8.8		

Figure 11

Item fit – Grade K Spring Focal Point 3

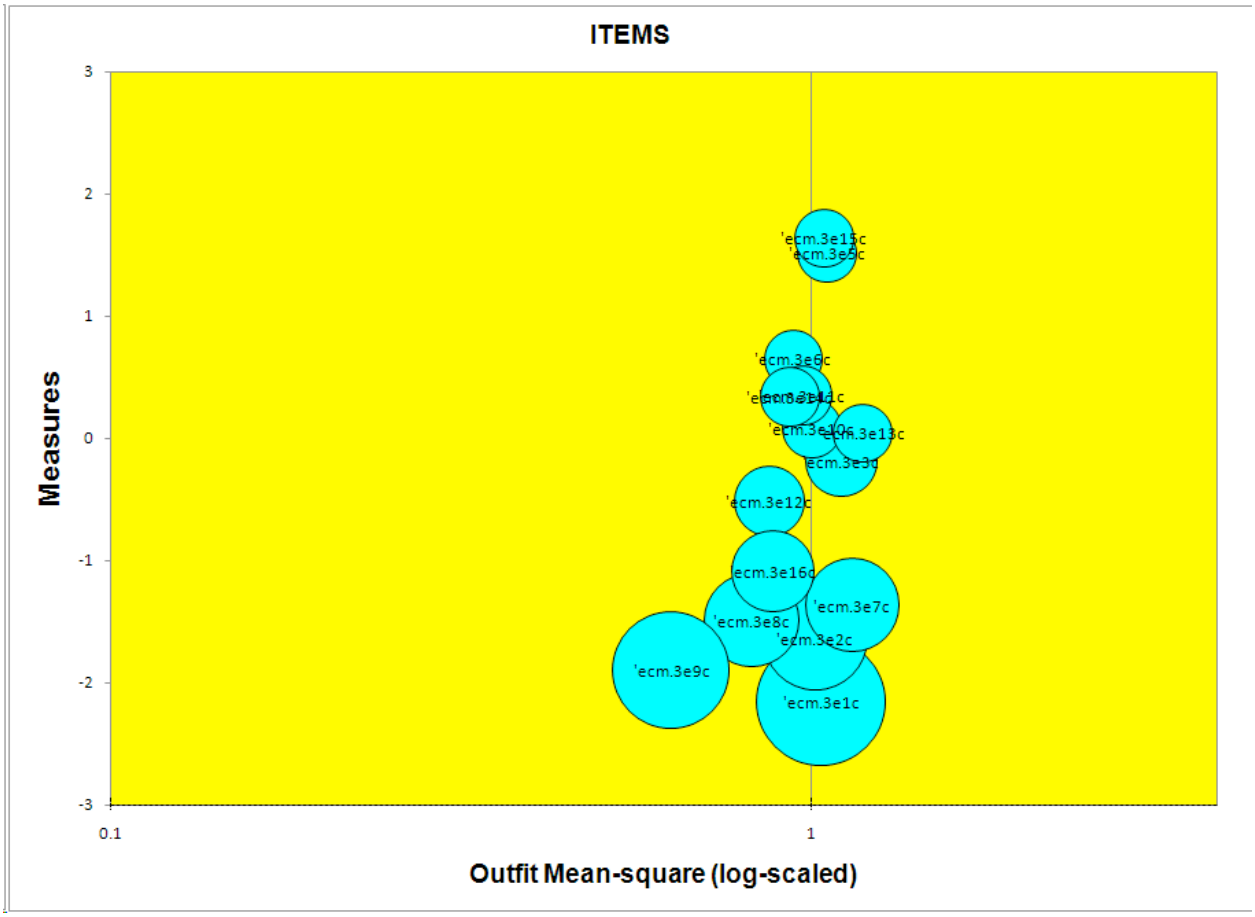


Table 134

Item Fit Order – Grade K Spring Focal Point 3

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
132	1480	2021	.04	.05	1.06	2.2	1.18	3.9	A .27	.34	73.9	74.8	ecm.3e13c	0
126	1834	2021	-1.37	.08	1.03	.6	1.14	1.4	B .18	.23	90.6	90.8	ecm.3e7c	0
123	1558	2021	-.19	.06	1.07	2.3	1.10	1.9	C .25	.32	76.0	77.8	ecm.3e3c	0
124	885	2021	1.52	.05	1.02	1.0	1.05	2.0	D .37	.39	67.0	67.3	ecm.3e5c	0
134	831	2021	1.64	.05	1.03	1.4	1.04	1.5	E .36	.39	67.0	68.1	ecm.3e15c	0
121	1929	2022	-2.16	.11	.99	-.1	1.03	.3	F .18	.17	95.4	95.4	ecm.3e1c	0
122	1874	2022	-1.64	.09	.99	-.1	1.01	.2	G .22	.21	92.7	92.7	ecm.3e2c	0
129	1467	2021	.08	.05	1.01	.3	1.00	.1	H .34	.34	74.2	74.3	ecm.3e10c	0
130	1368	2021	.35	.05	.96	-2.0	.97	-.8	g .40	.36	73.4	71.2	ecm.3e11c	0
125	1251	2021	.65	.05	.97	-1.7	.94	-2.0	f .41	.37	69.0	68.4	ecm.3e6c	0
131	1654	2021	-.52	.06	.96	-1.0	.87	-2.3	e .35	.30	82.3	82.1	ecm.3e12c	0
127	1853	2021	-1.49	.08	.95	-.7	.82	-1.8	d .28	.22	91.7	91.7	ecm.3e8c	0
133	1374	2021	.34	.05	.94	-2.8	.93	-2.0	c .42	.36	72.4	71.4	ecm.3e14c	0
135	1785	2021	-1.09	.07	.94	-1.3	.88	-1.5	b .33	.25	88.3	88.4	ecm.3e16c	0
128	1904	2021	-1.90	.10	.93	-.9	.63	-3.3	a .29	.19	94.3	94.2	ecm.3e9c	0
MEAN	1536.5	2021.1	-.38	.07	.99	-.2	.97	-.2			80.5	80.6		
S.D.	340.0	.7	1.15	.02	.04	1.5	.13	2.0			10.2	10.2		

Fall

Figure 12

Item fit – Grade 1 Fall Focal Point 1

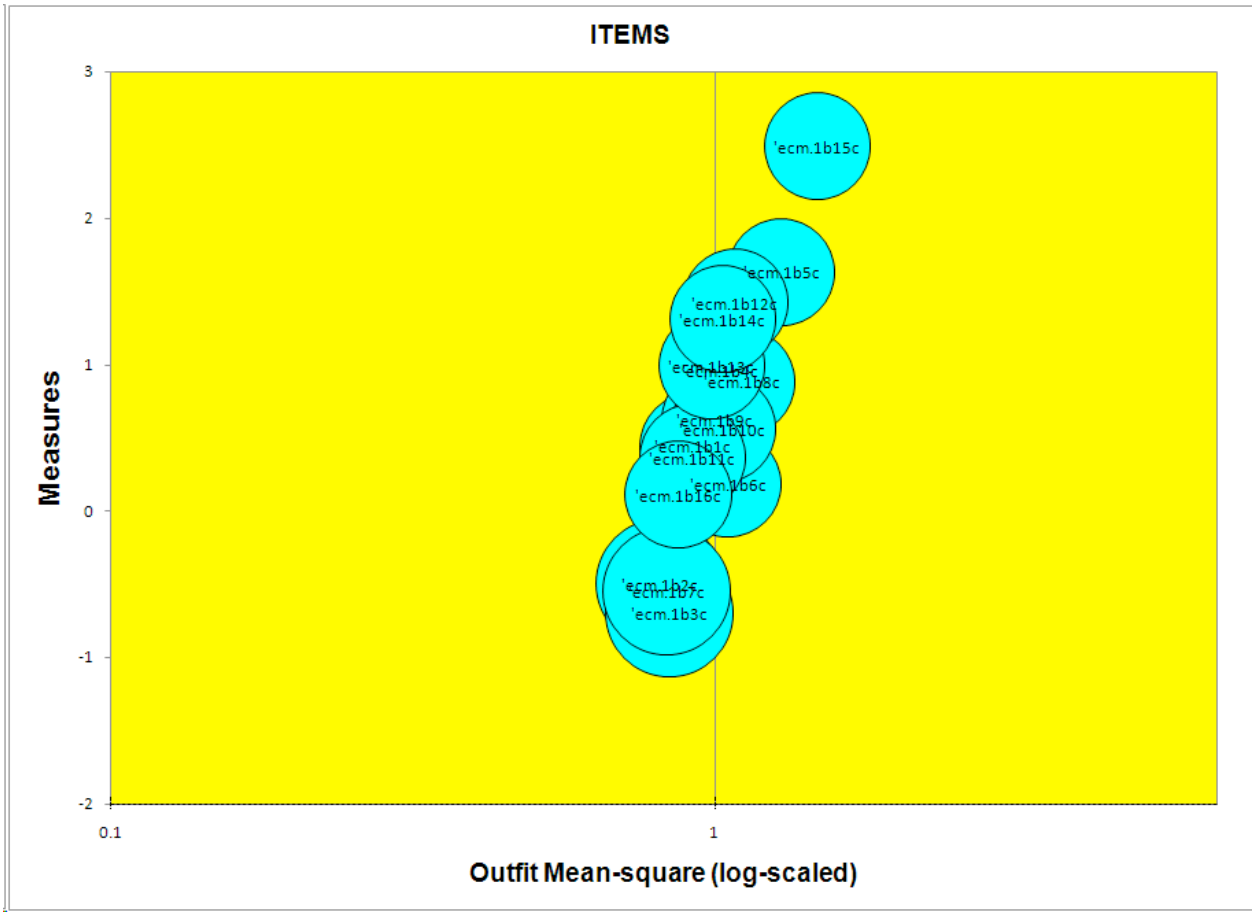


Table 135

Item Fit Order – Grade 1 Fall Focal Point 1

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
15	476	2177	2.49	.05	1.21	6.6	1.48	9.7	A .03	.32	76.4	79.0	ecm.1b15c	0
5	821	2184	1.63	.05	1.20	9.9	1.29	9.9	B .10	.35	61.4	68.3	ecm.1b5c	0
8	1167	2182	.88	.05	1.09	6.2	1.11	5.3	C .24	.35	59.1	65.0	ecm.1b8c	0
12	915	2181	1.42	.05	1.05	2.9	1.08	3.8	D .30	.36	64.9	66.5	ecm.1b12c	0
6	1488	2185	.18	.05	1.02	1.2	1.05	1.8	E .29	.33	69.8	70.5	ecm.1b6c	0
14	964	2179	1.31	.05	1.02	1.1	1.03	1.7	F .33	.36	66.0	65.8	ecm.1b14c	0
10	1320	2183	.56	.05	1.03	2.1	1.03	1.3	G .31	.34	64.5	66.6	ecm.1b10c	0
4	1131	2187	.96	.05	1.03	1.8	1.02	1.3	H .33	.36	63.5	64.9	ecm.1b4c	0
9	1291	2183	.62	.05	1.01	.6	1.00	-.1	h .34	.35	65.5	66.1	ecm.1b9c	0
13	1113	2180	.99	.05	1.00	-.1	.99	-.4	g .36	.36	64.8	64.9	ecm.1b13c	0
11	1407	2182	.36	.05	.96	-2.2	.92	-3.1	f .39	.34	68.7	68.3	ecm.1b11c	0
1	1375	2188	.44	.05	.96	-2.4	.92	-3.1	e .39	.34	67.9	67.5	ecm.1b1c	0
7	1758	2185	-.55	.06	.94	-2.1	.83	-3.7	d .37	.28	80.6	80.6	ecm.1b7c	0
3	1807	2188	-.70	.06	.93	-2.0	.84	-3.1	c .36	.27	82.9	82.6	ecm.1b3c	0
16	1514	2178	.11	.05	.93	-3.5	.87	-4.3	b .42	.32	73.3	71.4	ecm.1b16c	0
2	1746	2187	-.50	.06	.92	-2.7	.81	-4.2	a .39	.28	80.2	80.0	ecm.1b2c	0
MEAN	1268.3	2183.1	.64	.05	1.02	1.1	1.02	.8			69.3	70.5		
S.D.	353.5	3.3	.82	.00	.09	3.7	.17	4.4			7.0	6.1		

Figure 13

Item fit – Grade 1 Fall Focal Point 2

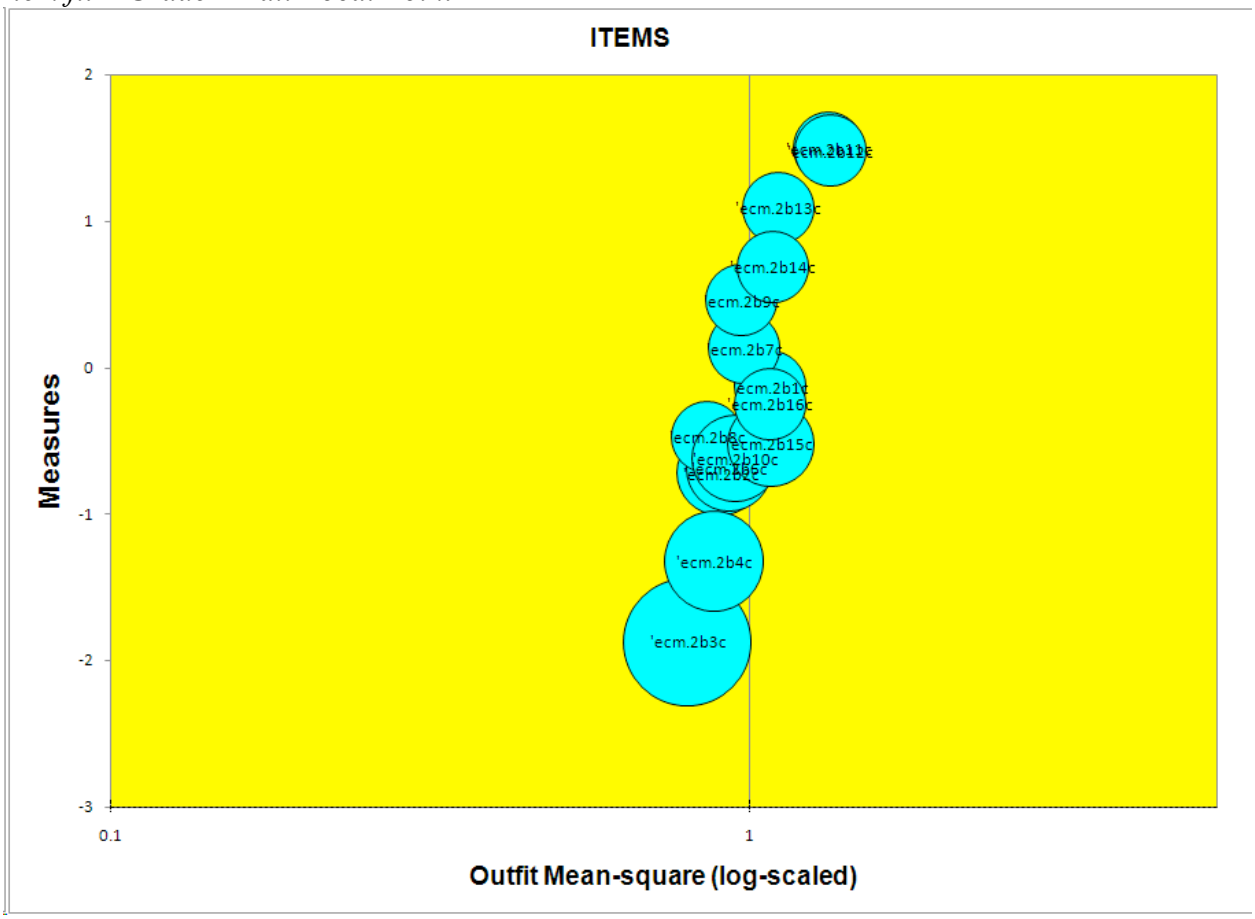


Table 136

Item Fit Order – Grade 1 Fall Focal Point 2

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
27	895	2209	1.48	.05	1.25	9.9	1.34	9.9	A .05	.36	55.9	67.0	ecm.2b12c	0
26	890	2209	1.50	.05	1.24	9.9	1.33	9.9	B .06	.36	56.7	67.1	ecm.2b11c	0
28	1081	2207	1.09	.05	1.09	5.8	1.11	5.9	C .25	.36	61.0	64.9	ecm.2b13c	0
29	1274	2207	.69	.05	1.07	4.3	1.09	4.0	D .27	.35	62.2	65.7	ecm.2b14c	0
30	1766	2206	-.52	.06	1.02	.6	1.08	1.7	E .25	.28	79.8	80.2	ecm.2b15c	0
17	1636	2216	-.13	.05	1.05	1.9	1.08	2.1	F .25	.31	73.8	74.7	ecm.2b1c	0
31	1674	2205	-.25	.05	1.03	1.1	1.08	1.9	G .26	.30	76.1	76.4	ecm.2b16c	0
25	1801	2209	-.62	.06	.99	-.2	.95	-.9	H .29	.27	81.2	81.6	ecm.2b10c	0
18	1834	2213	-.72	.06	.99	-.3	.90	-1.8	g .29	.26	82.7	82.9	ecm.2b2c	0
21	1821	2209	-.69	.06	.99	-.3	.93	-1.3	f .29	.27	82.4	82.5	ecm.2b6c	0
22	1526	2209	.13	.05	.99	-.7	.98	-.8	e .34	.32	71.5	71.1	ecm.2b7c	0
24	1382	2209	.46	.05	.99	-.8	.97	-1.3	d .36	.34	67.8	67.4	ecm.2b9c	0
20	1979	2212	-1.32	.07	.97	-.6	.88	-1.6	c .27	.22	89.5	89.5	ecm.2b4c	0
19	2068	2212	-1.87	.09	.96	-.5	.80	-1.9	b .24	.17	93.5	93.5	ecm.2b3c	0
23	1752	2209	-.47	.05	.95	-1.5	.86	-3.1	a .35	.28	79.7	79.5	ecm.2b8c	0
MEAN	1558.6	2209.4	-.08	.06	1.04	1.9	1.03	1.5			74.2	76.3		
S.D.	362.2	2.6	.95	.01	.09	3.7	.15	4.1			11.2	8.7		

Figure 14

Item fit – Grade 1 Fall Focal Point 3

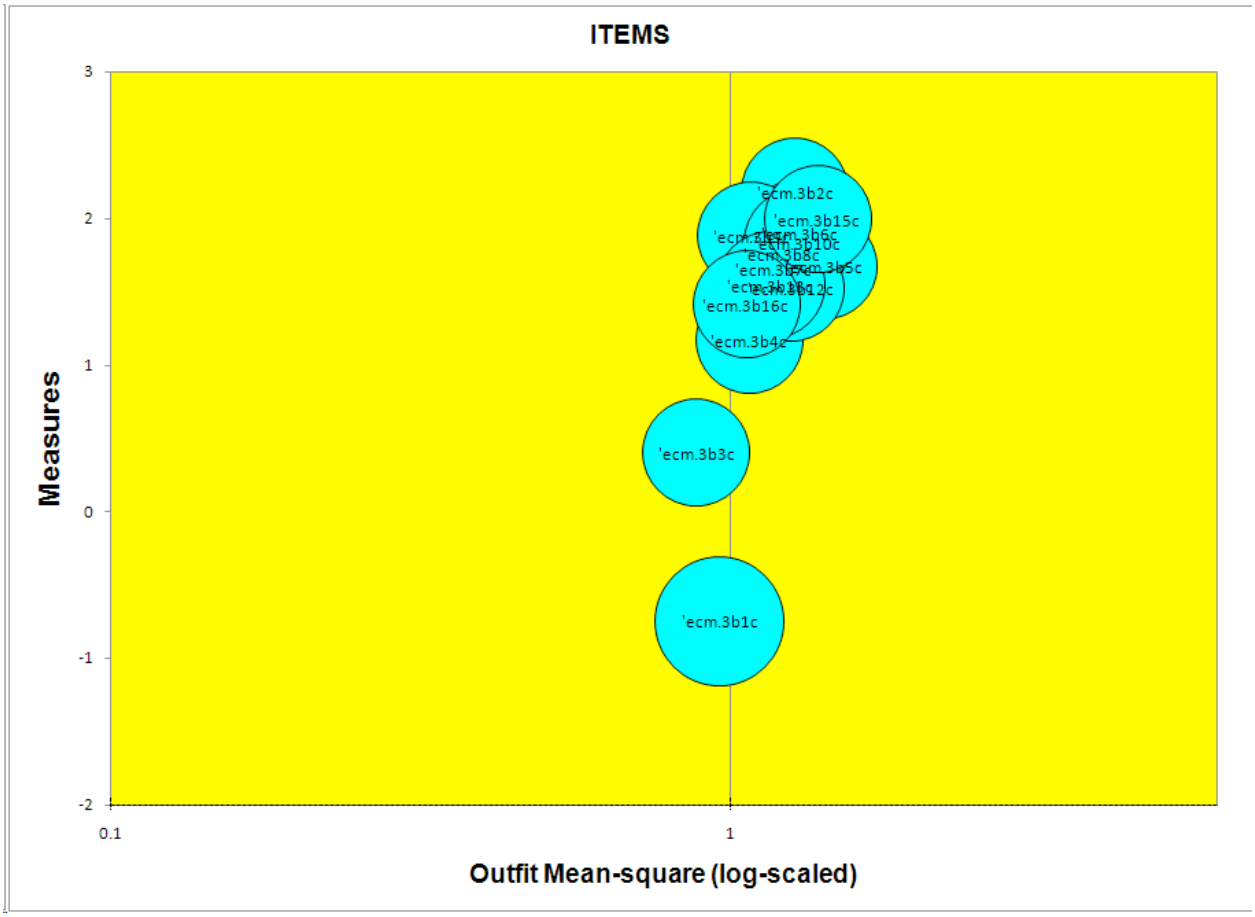


Table 137

Item Fit Order – Grade 1 Fall Focal Point 3

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
36	796	2166	1.67	.05	1.29	9.9	1.41	9.9	A .00	.35	57.0	68.7	ecm.3b5c	0
44	658	2159	1.99	.05	1.25	9.9	1.38	9.9	B .03	.34	65.4	72.4	ecm.3b15c	0
37	697	2165	1.90	.05	1.17	7.9	1.29	9.2	C .13	.35	66.9	71.3	ecm.3b6c	0
41	727	2164	1.83	.05	1.16	7.6	1.28	9.4	D .14	.35	66.8	70.4	ecm.3b10c	0
33	585	2169	2.18	.05	1.10	4.1	1.27	7.0	E .18	.34	74.8	74.9	ecm.3b2c	0
42	863	2163	1.52	.05	1.19	9.9	1.25	9.9	F .13	.36	58.7	67.2	ecm.3b12c	0
39	757	2167	1.76	.05	1.11	5.7	1.21	7.6	G .20	.35	67.1	69.7	ecm.3b8c	0
38	804	2166	1.65	.05	1.12	6.2	1.17	6.8	g .21	.35	65.0	68.5	ecm.3b7c	0
43	852	2162	1.54	.05	1.11	6.2	1.16	6.8	f .22	.36	63.2	67.4	ecm.3b13c	0
40	706	2165	1.88	.05	1.00	-.2	1.08	2.6	e .33	.35	73.3	71.0	ecm.3b9c	0
35	1024	2163	1.17	.05	1.05	3.3	1.07	3.4	d .30	.36	63.1	65.2	ecm.3b4c	0
45	910	2159	1.41	.05	1.04	2.6	1.06	2.9	c .30	.36	65.3	66.4	ecm.3b16c	0
32	1805	2168	-.75	.06	.99	-.3	.96	-.7	b .28	.26	83.3	83.3	ecm.3b1c	0
34	1382	2169	.40	.05	.93	-3.8	.88	-4.7	a .42	.34	69.2	67.9	ecm.3b3c	0
MEAN	897.6	2164.6	1.44	.05	1.11	4.9	1.18	5.7			67.1	70.3		
S.D.	313.7	3.2	.74	.00	.10	4.1	.15	4.3			6.4	4.4		

Winter

Figure 15

Item fit – Grade 1 Winter Focal Point 1

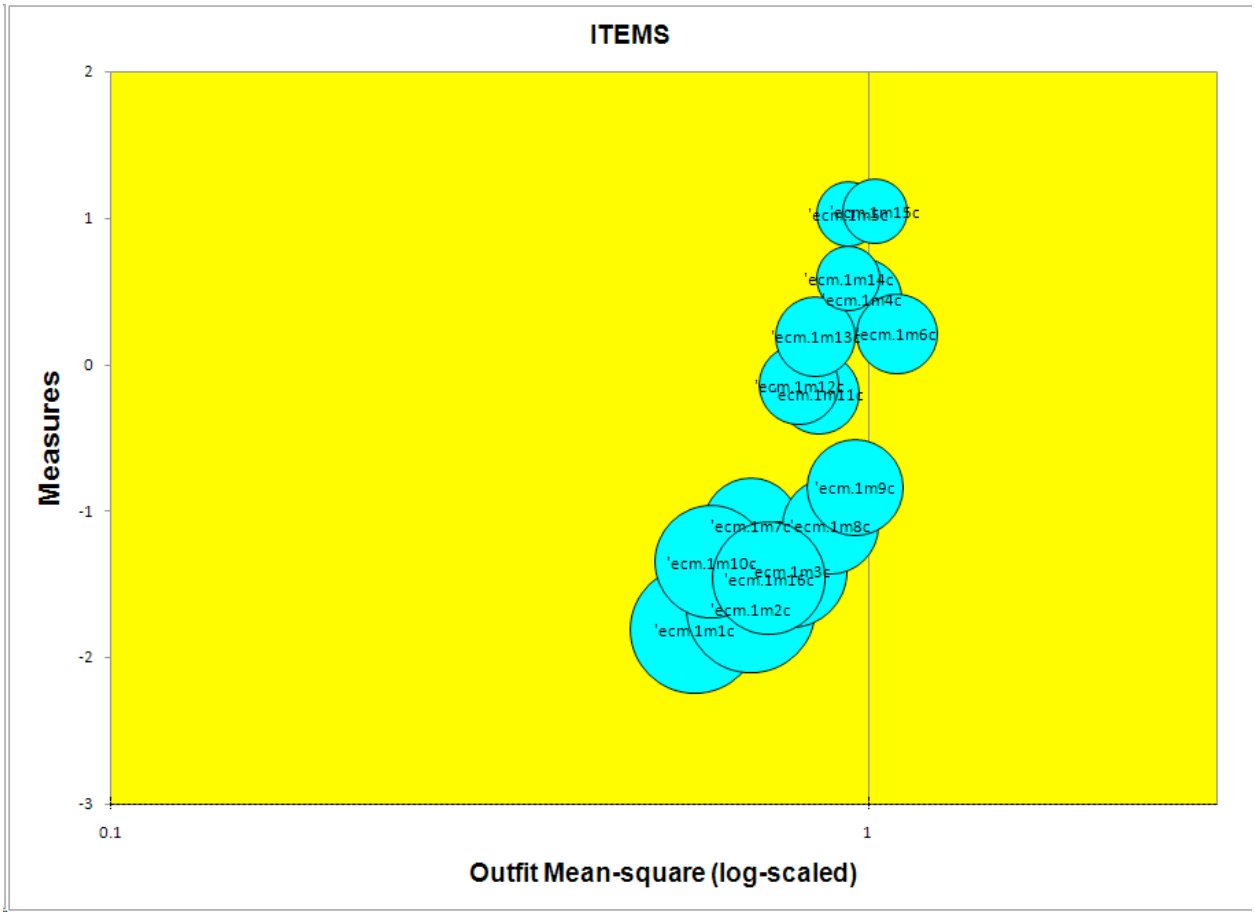


Table 138

Item Fit Order – Grade 1 Winter Focal Point 1

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
51	1606	2370	.21	.05	1.07	3.5	1.09	2.9	A .26	.34	68.6	70.6	ecm.1m6c	0
60	1186	2366	1.05	.04	1.01	.9	1.02	.9	B .35	.37	65.0	65.4	ecm.1m15c	0
49	1493	2371	.45	.05	.99	-.8	.98	-.6	C .36	.35	68.5	68.0	ecm.1m4c	0
59	1420	2366	.59	.04	.98	-1.2	.94	-2.7	D .39	.36	66.1	66.8	ecm.1m14c	0
54	1998	2368	-.84	.06	.97	-.9	.96	-.6	E .30	.26	84.2	84.4	ecm.1m9c	0
53	2067	2368	-1.10	.06	.95	-1.2	.89	-1.7	F .30	.24	87.4	87.3	ecm.1m8c	0
50	1201	2368	1.03	.04	.95	-3.7	.94	-3.4	G .43	.37	67.7	65.3	ecm.1m5c	0
56	1781	2369	-.20	.05	.94	-2.6	.86	-3.7	H .39	.31	76.9	76.0	ecm.1m11c	0
48	2138	2371	-1.41	.07	.93	-1.4	.79	-2.7	h .32	.22	90.2	90.2	ecm.1m3c	0
47	2186	2372	-1.67	.08	.92	-1.3	.70	-3.6	g .31	.20	92.2	92.2	ecm.1m2c	0
58	1613	2368	.19	.05	.92	-4.3	.85	-5.1	f .44	.34	72.8	70.8	ecm.1m13c	0
61	2144	2366	-1.46	.07	.91	-1.6	.74	-3.4	e .33	.21	90.6	90.6	ecm.1m16c	0
46	2206	2371	-1.81	.08	.91	-1.4	.59	-4.8	d .33	.19	93.0	93.0	ecm.1m1c	0
57	1756	2369	-.14	.05	.90	-4.3	.81	-5.4	c .44	.32	76.7	75.1	ecm.1m12c	0
52	2069	2370	-1.10	.06	.90	-2.4	.70	-4.9	b .38	.24	87.4	87.3	ecm.1m7c	0
55	2124	2369	-1.35	.07	.88	-2.4	.62	-5.6	a .39	.22	89.7	89.6	ecm.1m10c	0
MEAN	1811.8	2368.9	-.47	.06	.94	-1.6	.84	-2.8			79.8	79.5		
S.D.	342.9	1.4	.95	.01	.05	1.9	.14	2.3			10.2	10.3		

Figure 16

Item fit – Grade 1 Winter Focal Point 2

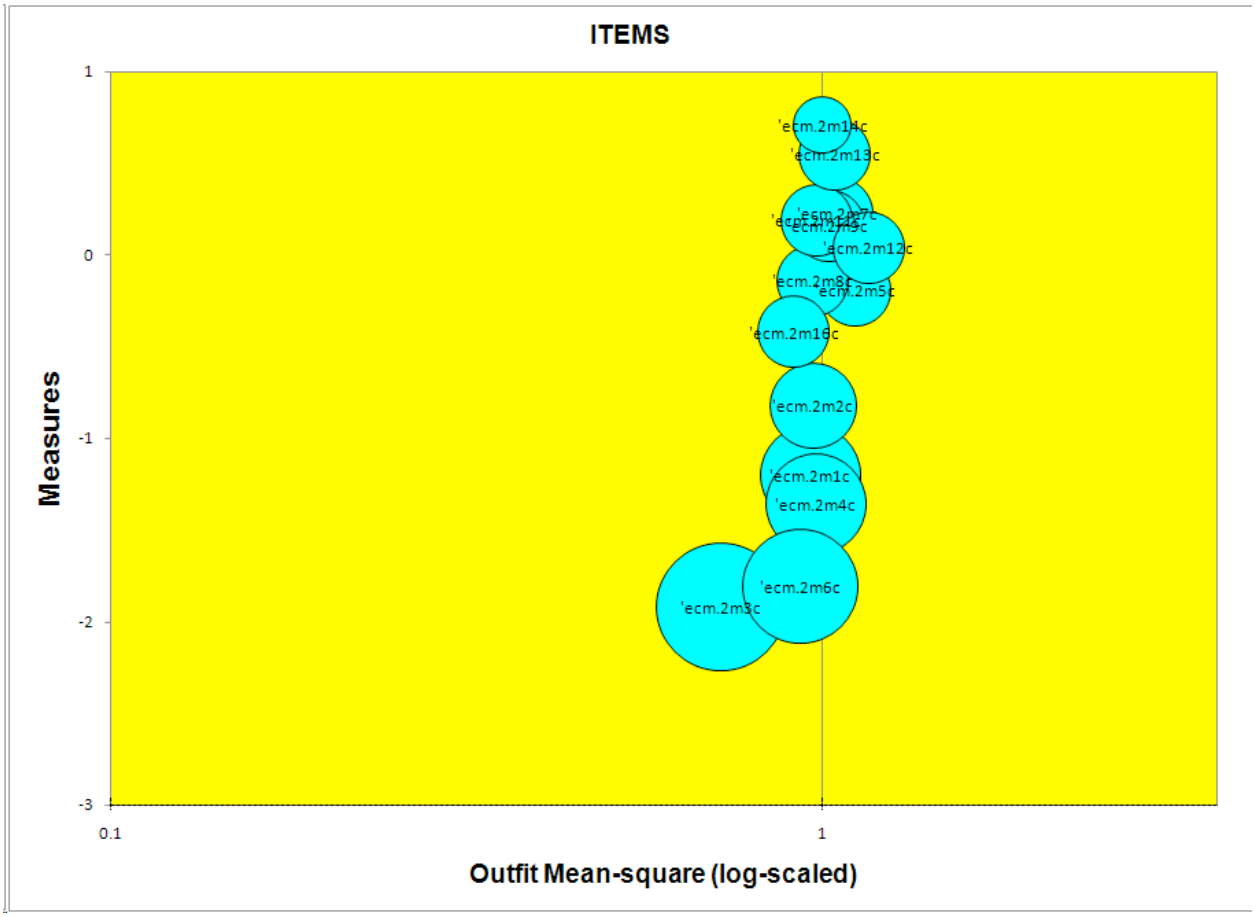


Table 139

Item Fit Order – Grade 1 Winter Focal Point 2

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
72	1686	2380	.04	.05	1.06	2.8	1.16	4.4	A .25	.33	71.6	72.6	ecm.2m12c	0
66	1784	2380	-.19	.05	1.05	1.9	1.11	2.7	B .25	.31	75.0	75.8	ecm.2m5c	0
68	1604	2380	.23	.05	1.02	1.3	1.05	1.7	C .31	.34	69.2	70.3	ecm.2m7c	0
73	1451	2380	.55	.05	1.02	1.4	1.04	1.6	D .33	.35	66.4	67.2	ecm.2m13c	0
70	1634	2380	.16	.05	1.01	.6	1.02	.7	E .32	.34	71.0	71.1	ecm.2m9c	0
74	1367	2380	.71	.04	1.00	.2	1.00	.2	F .36	.36	65.8	66.1	ecm.2m14c	0
71	1621	2380	.19	.05	1.00	-.2	.98	-.6	G .34	.34	70.2	70.8	ecm.2m11c	0
67	2216	2381	-1.81	.08	1.00	.0	.93	-.6	g .19	.19	93.1	93.1	ecm.2m6c	0
65	2136	2381	-1.36	.07	.98	-.5	.98	-.2	f .24	.22	89.7	89.7	ecm.2m4c	0
69	1763	2380	-.14	.05	.98	-.8	.97	-.9	e .34	.32	75.0	75.1	ecm.2m8c	0
62	2101	2381	-1.20	.07	.98	-.5	.96	-.6	d .26	.24	88.2	88.2	ecm.2m1c	0
63	2001	2380	-.82	.06	.98	-.7	.97	-.5	c .29	.27	84.2	84.1	ecm.2m2c	0
75	1870	2380	-.42	.05	.95	-1.8	.91	-2.0	b .36	.30	78.9	79.0	ecm.2m16c	0
64	2230	2380	-1.92	.09	.94	-.9	.72	-2.9	a .28	.18	93.7	93.7	ecm.2m3c	0
MEAN	1818.9	2380.2	-.43	.06	1.00	.2	.99	.2			78.0	78.3		
S.D.	270.4	1.1	.82	.01	.03	1.2	.10	1.8			9.6	9.3		

Figure 17

Item fit – Grade 1 Winter Focal Point 3

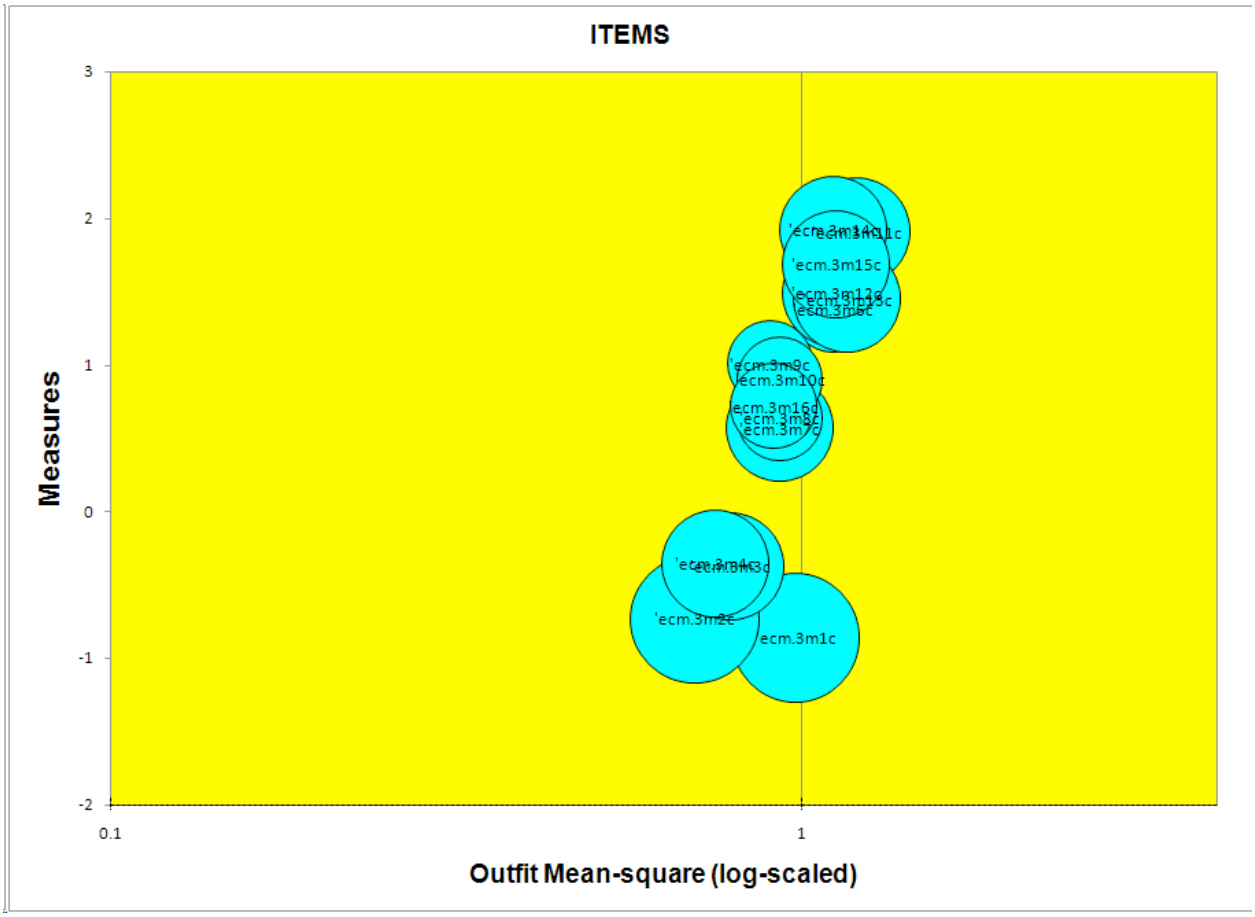


Table 140

Item Fit Order – Grade 1 Winter Focal Point 3

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
85	762	2345	1.91	.05	1.09	4.2	1.20	6.6	A .24	.36	69.3	71.4	ecm.3m11c	0
87	979	2344	1.45	.05	1.12	7.1	1.16	7.3	B .23	.37	61.4	67.0	ecm.3m13c	0
86	957	2345	1.49	.05	1.06	3.9	1.12	5.5	C .28	.37	67.4	67.3	ecm.3m12c	0
89	860	2343	1.69	.05	1.04	2.3	1.12	4.6	D .30	.36	69.9	69.1	ecm.3m15c	0
88	756	2344	1.92	.05	1.04	2.0	1.11	3.9	E .30	.36	71.3	71.6	ecm.3m14c	0
80	1017	2351	1.38	.04	1.06	3.5	1.11	5.0	F .30	.37	66.0	66.5	ecm.3m6c	0
76	1991	2354	-.86	.06	1.00	.1	.98	-.3	G .27	.26	84.2	84.6	ecm.3m1c	0
81	1423	2351	.57	.05	.96	-2.5	.93	-3.0	H .40	.35	67.9	67.0	ecm.3m7c	0
84	1256	2344	.90	.04	.95	-3.2	.93	-3.7	g .42	.36	68.0	65.5	ecm.3m10c	0
82	1386	2349	.64	.04	.95	-3.2	.93	-3.0	f .41	.36	68.9	66.5	ecm.3m8c	0
90	1343	2342	.72	.04	.94	-3.9	.91	-4.5	e .43	.36	68.5	66.1	ecm.3m16c	0
83	1200	2348	1.01	.04	.91	-6.1	.90	-5.2	d .46	.37	70.6	65.4	ecm.3m9c	0
78	1833	2353	-.37	.05	.91	-3.4	.79	-5.0	c .42	.30	78.6	78.4	ecm.3m3c	0
79	1825	2352	-.35	.05	.89	-4.1	.75	-6.1	b .44	.30	78.4	78.1	ecm.3m4c	0
77	1955	2354	-.73	.06	.88	-3.6	.70	-6.0	a .43	.27	83.6	83.1	ecm.3m2c	0
MEAN	1302.9	2347.9	.76	.05	.99	-.5	.98	-.3			71.6	71.2		
S.D.	414.9	4.1	.91	.00	.07	3.9	.15	4.9			6.3	6.4		

Spring

Figure 18

Item fit – Grade 1 Spring Focal Point 1

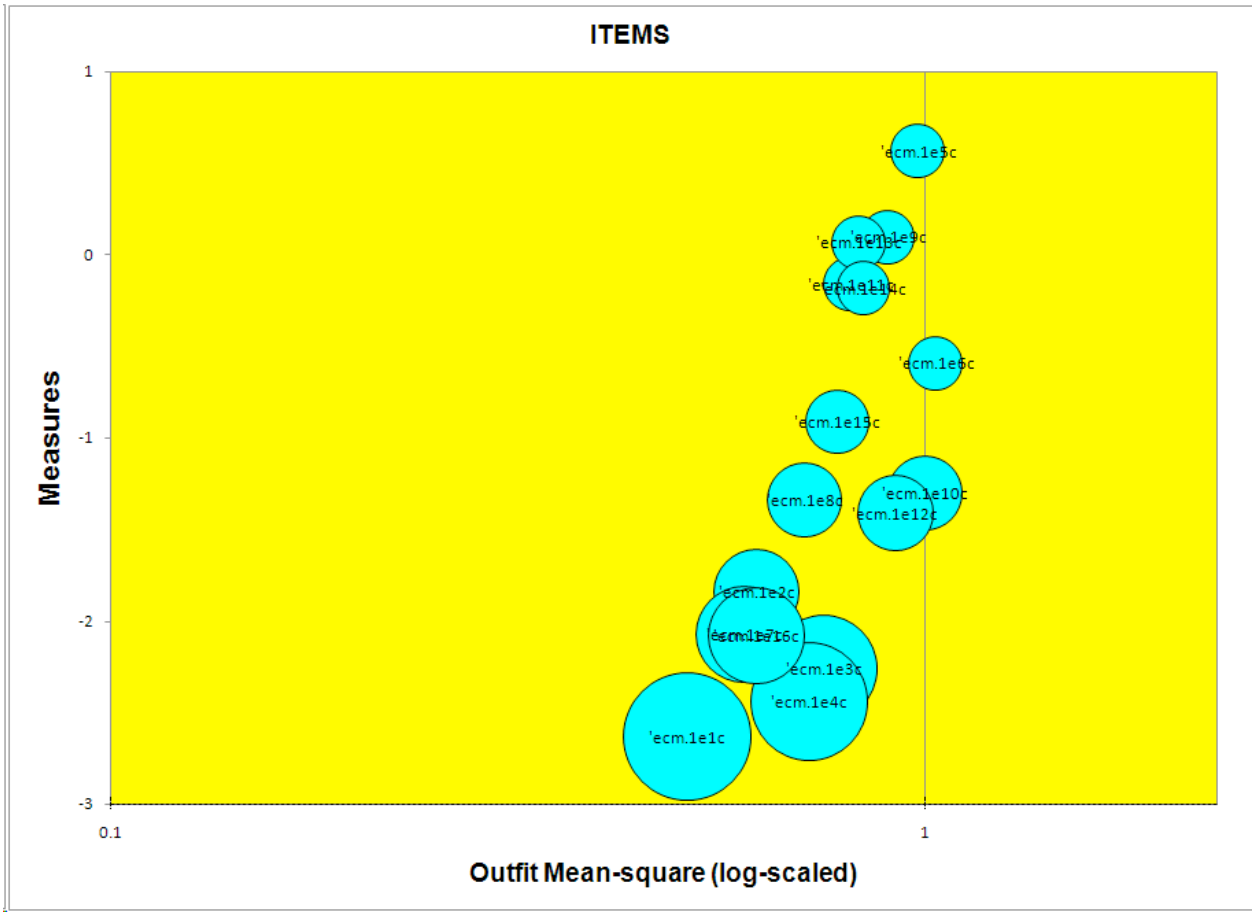


Table 141

Item Fit Order – Grade 1 Spring Focal Point 1

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
96	1913	2370	-.59	.05	.99	-.4	1.03	.6	A .30	.30	81.6	81.0	ecm.1e6c	0
100	2107	2370	-1.30	.07	.98	-.4	1.00	.0	B .26	.24	88.9	88.9	ecm.1e10c	0
95	1423	2370	.57	.05	.98	-.9	.98	-.8	C .38	.36	68.7	67.1	ecm.1e5c	0
93	2257	2370	-2.26	.10	.98	-.3	.75	-2.1	D .22	.17	95.2	95.2	ecm.1e3c	0
102	2131	2370	-1.41	.07	.96	-.8	.92	-1.0	E .29	.23	89.9	89.9	ecm.1e12c	0
99	1643	2370	.10	.05	.95	-2.5	.90	-3.3	F .40	.34	72.0	71.9	ecm.1e9c	0
104	1760	2369	-.18	.05	.94	-2.5	.84	-4.5	G .41	.32	75.7	75.5	ecm.1e14c	0
94	2274	2370	-2.44	.11	.94	-.7	.72	-2.2	H .25	.15	95.9	95.9	ecm.1e4c	0
105	2010	2369	-.91	.06	.93	-1.9	.78	-3.8	h .37	.27	84.9	84.9	ecm.1e15c	0
91	2290	2370	-2.63	.12	.92	-.8	.51	-3.9	g .28	.14	96.6	96.6	ecm.1e1c	0
98	2116	2370	-1.34	.07	.91	-1.8	.71	-4.1	f .36	.24	89.2	89.3	ecm.1e8c	0
101	1753	2370	-.16	.05	.91	-3.7	.81	-5.2	e .43	.33	75.9	75.3	ecm.1e11c	0
97	2235	2370	-2.07	.09	.91	-1.2	.60	-4.0	d .31	.18	94.3	94.3	ecm.1e7c	0
92	2205	2370	-1.84	.08	.91	-1.4	.62	-4.2	c .32	.20	93.0	93.0	ecm.1e2c	0
106	2236	2369	-2.08	.09	.91	-1.2	.62	-3.8	b .31	.18	94.4	94.4	ecm.1e16c	0
103	1655	2370	.07	.05	.91	-4.7	.83	-5.6	a .45	.34	74.0	72.2	ecm.1e13c	0
MEAN	2000.5	2369.8	-1.15	.07	.94	-1.6	.79	-3.0			85.6	85.3		
S.D.	265.3	1.2	.99	.02	.03	1.2	.15	1.8			9.3	9.7		

Figure 19

Item fit – Grade 1 Spring Focal Point 2

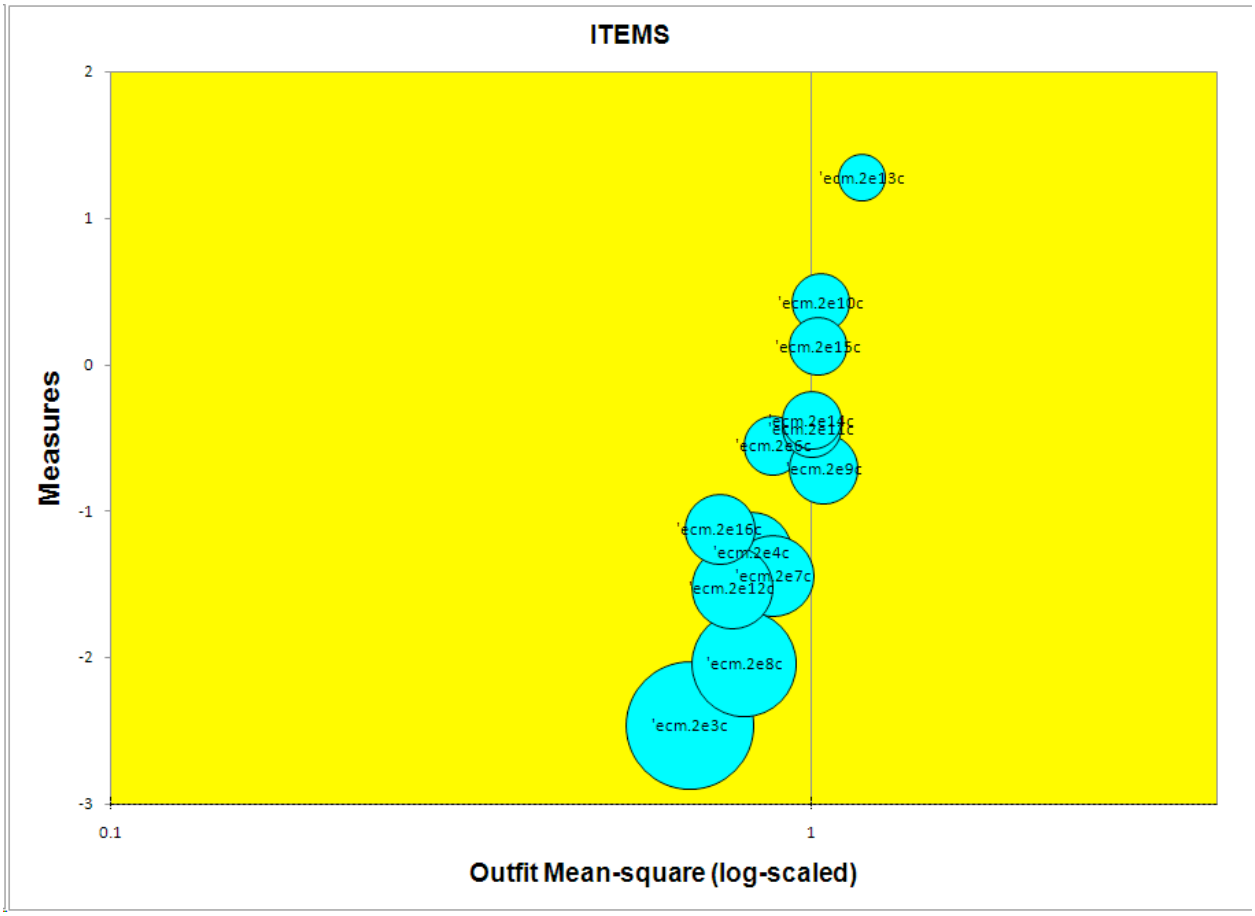


Table 142

Item Fit Order – Grade 1 Spring Focal Point 2

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
116	1065	2372	1.28	.04	1.13	8.4	1.18	8.1	A .23	.37	58.9	66.3	ecm.2e13c	0
112	1953	2372	-.71	.06	1.00	.1	1.04	.7	B .28	.29	82.6	82.5	ecm.2e9c	0
113	1491	2372	.43	.05	1.03	1.6	1.03	1.3	C .33	.36	66.8	68.2	ecm.2e10c	0
118	1633	2372	.13	.05	1.03	1.3	1.02	.8	D .32	.34	71.0	71.6	ecm.2e15c	0
117	1841	2372	-.38	.05	1.01	.5	1.00	.1	E .30	.31	78.7	78.3	ecm.2e14c	0
114	1859	2372	-.43	.05	.98	-.5	1.00	.0	F .32	.31	79.3	78.9	ecm.2e11c	0
110	2138	2373	-1.44	.07	.97	-.6	.88	-1.5	G .28	.23	90.3	90.1	ecm.2e7c	0
107	2278	2373	-2.46	.11	.96	-.4	.67	-2.6	f .23	.16	96.0	96.0	ecm.2e3c	0
111	2233	2372	-2.04	.09	.95	-.7	.80	-1.9	e .26	.18	94.1	94.1	ecm.2e8c	0
115	2154	2372	-1.52	.07	.94	-1.2	.77	-2.9	d .31	.22	90.8	90.8	ecm.2e12c	0
109	1901	2373	-.55	.05	.93	-2.3	.88	-2.5	c .38	.30	81.1	80.5	ecm.2e6c	0
108	2105	2373	-1.28	.07	.93	-1.5	.82	-2.6	b .34	.24	88.5	88.7	ecm.2e4c	0
119	2068	2372	-1.12	.06	.91	-2.1	.74	-4.1	a .37	.25	87.3	87.2	ecm.2e16c	0
MEAN	1901.5	2372.3	-.78	.06	.98	.2	.91	-.5			82.0	82.6		
S.D.	326.9	.8	.99	.02	.06	2.6	.14	3.0			10.6	9.3		

Figure 20

Item fit – Grade 1 Spring Focal Point 3

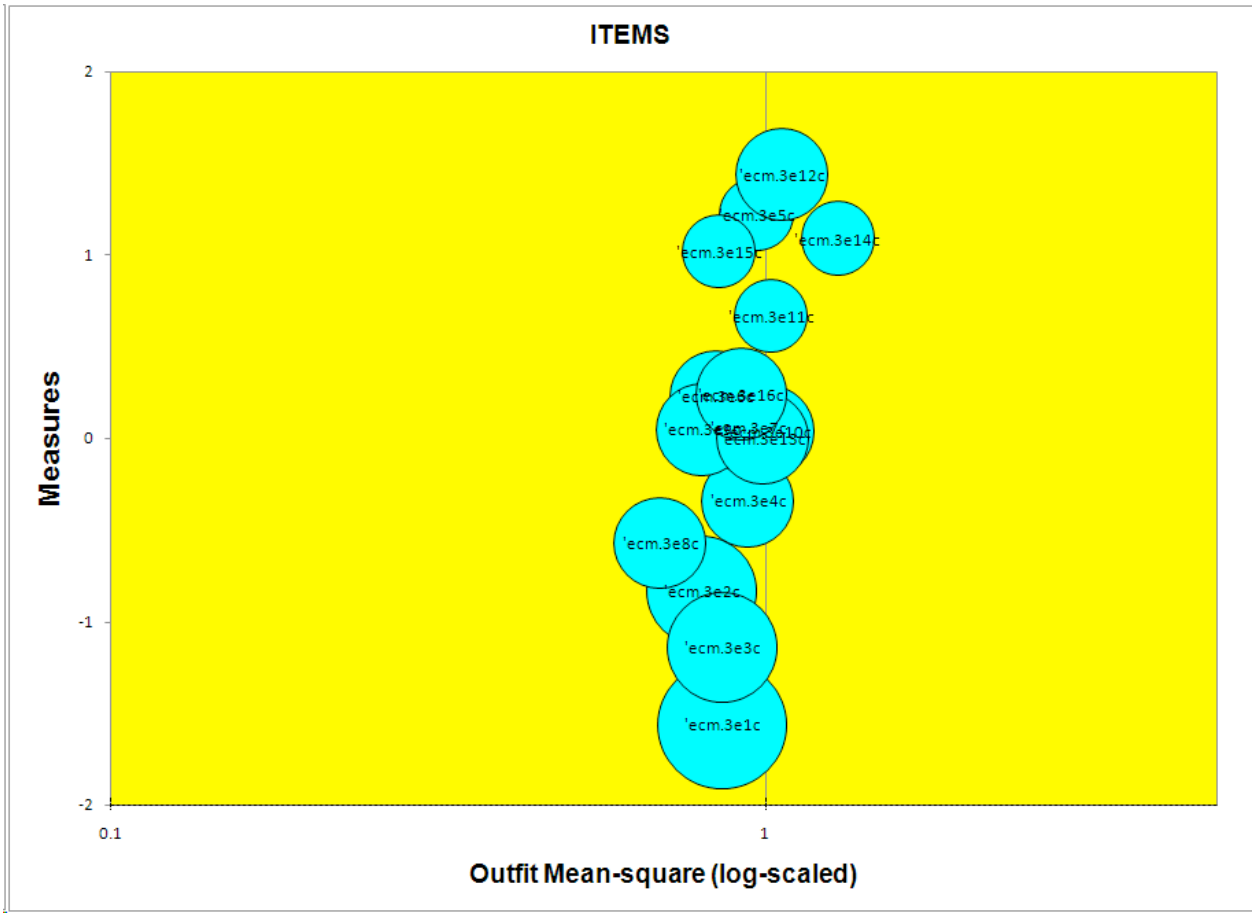


Table 143

Item Fit Order – Grade 1 Spring Focal Point 3

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
133	1156	2360	1.09	.04	1.22	9.9	1.29	9.9	A .13	.37	54.3	65.7	ecm.3e14c	0
131	980	2360	1.44	.05	1.02	1.0	1.06	2.6	B .35	.37	66.5	67.2	ecm.3e12c	0
130	1369	2362	.67	.04	1.02	1.2	1.02	.8	C .35	.37	64.6	66.5	ecm.3e11c	0
129	1667	2363	.04	.05	1.00	.1	1.01	.4	D .34	.34	72.6	72.7	ecm.3e10c	0
132	1682	2360	.00	.05	.95	-2.1	.99	-.3	E .38	.34	74.5	73.2	ecm.3e13c	0
126	1658	2364	.06	.05	.98	-.7	.94	-1.9	F .36	.34	72.6	72.4	ecm.3e7c	0
123	1820	2364	-.34	.05	.98	-.9	.94	-1.5	G .35	.31	77.9	77.7	ecm.3e4c	0
124	1092	2364	1.22	.04	.96	-2.9	.97	-1.3	H .41	.37	69.3	66.0	ecm.3e5c	0
135	1574	2360	.24	.05	.95	-2.9	.92	-2.9	h .41	.35	71.2	70.2	ecm.3e16c	0
122	2066	2365	-1.14	.06	.94	-1.5	.86	-2.1	g .33	.25	87.5	87.4	ecm.3e3c	0
120	2154	2365	-1.56	.07	.94	-1.2	.86	-1.7	f .29	.22	91.1	91.1	ecm.3e1c	0
121	1984	2365	-.83	.06	.91	-2.5	.80	-3.7	e .38	.28	84.1	84.0	ecm.3e2c	0
125	1581	2364	.23	.05	.89	-5.9	.84	-5.8	d .47	.35	73.8	70.4	ecm.3e6c	0
128	1661	2363	.05	.05	.87	-6.4	.80	-6.5	c .48	.34	76.2	72.5	ecm.3e9c	0
134	1193	2360	1.02	.04	.87	-9.4	.85	-8.0	b .51	.37	73.4	65.6	ecm.3e15c	0
127	1900	2364	-.57	.05	.86	-4.7	.69	-6.9	a .47	.30	81.5	80.7	ecm.3e8c	0
MEAN	1596.1	2362.7	.10	.05	.96	-1.8	.93	-1.8			74.4	74.0		
S.D.	343.5	2.1	.83	.01	.08	4.1	.13	4.2			8.7	7.8		

Fall

Figure 21

Item fit – Grade 2 Fall Focal Point 1

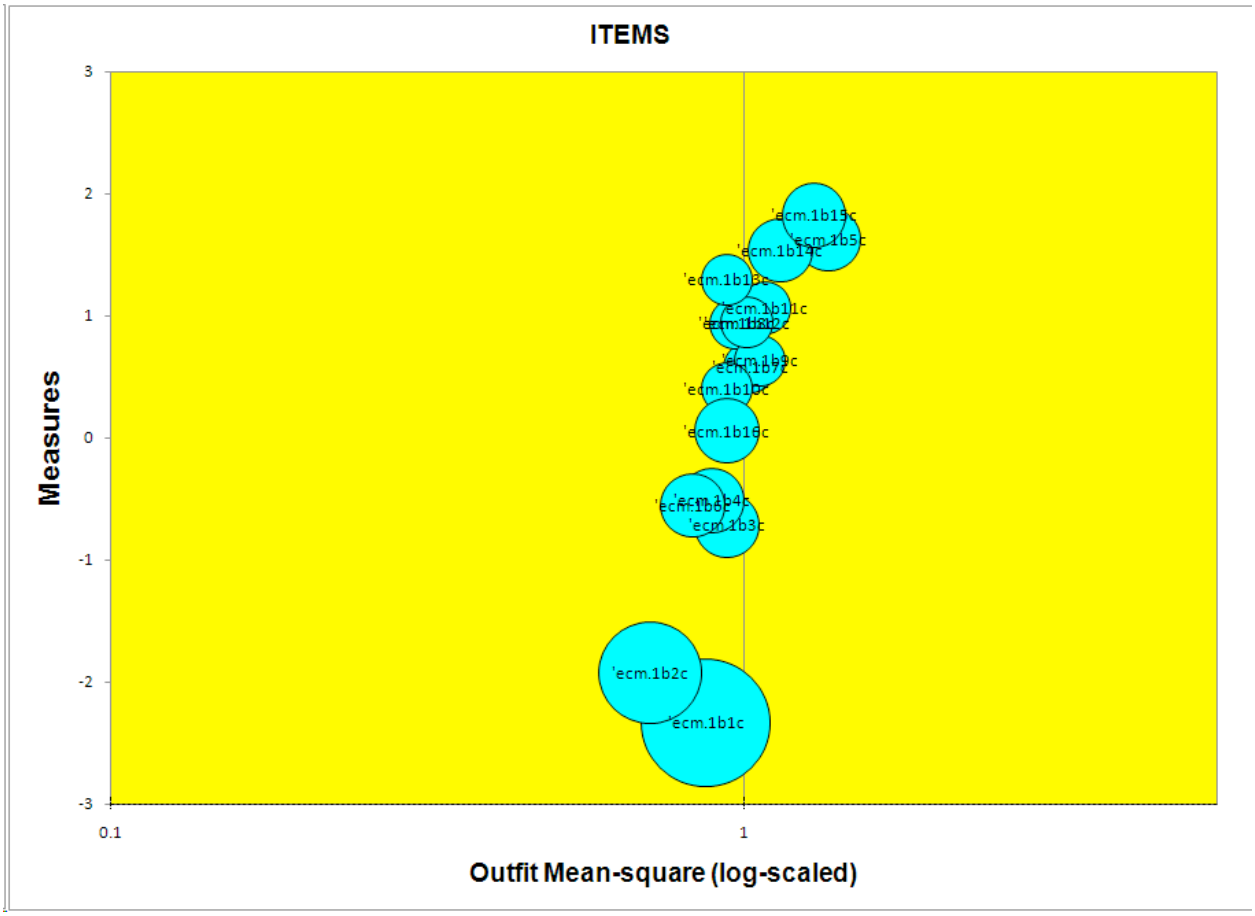


Table 144

Item Fit Order – Grade 2 Fall Focal Point 1

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
5	803	2389	1.63	.05	1.24	9.9	1.36	9.9	A-.04	.31	62.5	69.2	ecm.1b5c	0
15	713	2388	1.83	.05	1.17	8.0	1.29	9.8	B .05	.30	68.1	71.9	ecm.1b15c	0
14	848	2388	1.54	.05	1.08	4.5	1.14	6.2	C .19	.31	66.3	68.0	ecm.1b14c	0
11	1088	2385	1.07	.04	1.06	4.8	1.08	4.6	D .23	.32	60.2	63.6	ecm.1b11c	0
9	1321	2387	.64	.04	1.06	4.3	1.06	3.7	E .24	.32	60.1	63.6	ecm.1b9c	0
7	1351	2388	.58	.04	1.02	1.5	1.02	1.4	F .29	.31	62.6	64.0	ecm.1b7c	0
12	1155	2388	.95	.04	1.01	1.0	1.01	.9	G .30	.32	62.2	63.2	ecm.1b12c	0
3	1933	2390	-.71	.05	.98	-.7	.94	-1.4	H .29	.25	81.3	80.9	ecm.1b3c	0
8	1160	2389	.94	.04	.97	-2.6	.97	-2.1	h .36	.32	65.6	63.2	ecm.1b8c	0
1	2276	2390	-2.33	.10	.97	-.4	.87	-1.1	g .21	.14	95.2	95.2	ecm.1b1c	0
10	1441	2388	.41	.04	.96	-3.1	.94	-3.2	f .37	.31	67.5	65.3	ecm.1b10c	0
2	2224	2390	-1.92	.08	.95	-.8	.71	-3.6	e .28	.17	93.1	93.0	ecm.1b2c	0
16	1613	2387	.06	.05	.95	-3.1	.94	-2.2	d .37	.30	71.2	69.5	ecm.1b16c	0
13	968	2388	1.30	.04	.94	-4.1	.94	-3.4	c .39	.32	68.4	65.3	ecm.1b13c	0
6	1877	2390	-.55	.05	.92	-2.9	.83	-4.4	b .38	.26	79.2	78.7	ecm.1b6c	0
4	1860	2390	-.51	.05	.92	-3.1	.89	-3.1	a .38	.26	78.5	78.0	ecm.1b4c	0
MEAN	1414.4	2388.4	.31	.05	1.01	.8	1.00	.7			71.4	72.0		
S.D.	484.5	1.3	1.19	.01	.09	4.2	.16	4.6			10.7	10.1		

Figure 22

Item fit – Grade 2 Fall Focal Point 2

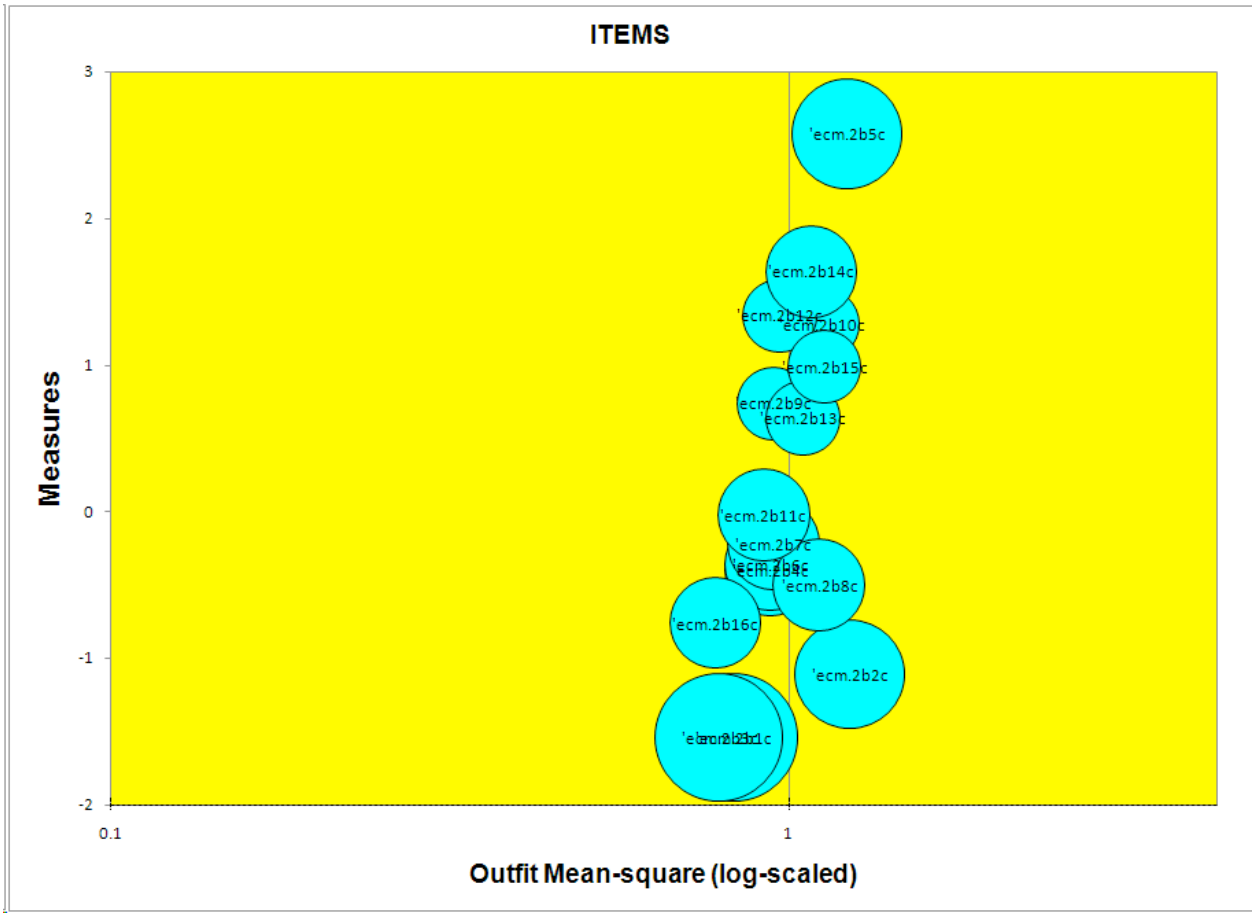


Table 145

Item Fit Order – Grade 2 Fall Focal Point 2

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
18	2070	2406	-1.11	.06	1.05	1.3	1.23	3.8	A .12	.22	86.1	86.0	ecm.2b2c	0
21	423	2404	2.58	.06	1.05	1.5	1.22	4.5	B .16	.26	82.3	82.6	ecm.2b5c	0
31	1141	2398	.99	.04	1.11	8.7	1.13	8.1	C .16	.32	56.0	63.3	ecm.2b15c	0
26	986	2400	1.28	.04	1.08	5.3	1.12	6.4	D .20	.32	62.1	65.1	ecm.2b10c	0
24	1868	2404	-.50	.05	1.04	1.5	1.11	2.7	E .19	.26	77.4	77.9	ecm.2b8c	0
30	806	2400	1.64	.05	1.03	1.5	1.08	3.2	F .26	.31	70.1	69.2	ecm.2b14c	0
29	1329	2400	.64	.04	1.03	2.5	1.05	3.0	G .27	.31	61.8	63.6	ecm.2b13c	0
28	954	2399	1.34	.04	.97	-2.1	.97	-1.4	H .35	.32	68.2	65.7	ecm.2b12c	0
23	1755	2404	-.22	.05	.97	-1.3	.95	-1.8	h .32	.28	73.8	73.7	ecm.2b7c	0
22	1812	2404	-.36	.05	.97	-1.3	.94	-1.8	g .32	.27	76.0	75.7	ecm.2b6c	0
17	2172	2406	-1.54	.07	.97	-.6	.83	-2.5	f .26	.19	90.3	90.3	ecm.2b1c	0
25	1274	2401	.74	.04	.96	-3.4	.95	-3.1	e .37	.32	65.7	63.2	ecm.2b9c	0
27	1662	2399	-.02	.05	.96	-2.3	.92	-2.9	d .36	.29	71.8	70.7	ecm.2b11c	0
20	1830	2406	-.40	.05	.94	-2.5	.94	-1.7	c .35	.27	77.6	76.4	ecm.2b4c	0
19	2172	2406	-1.54	.07	.93	-1.2	.79	-3.1	b .31	.19	90.3	90.3	ecm.2b3c	0
32	1958	2398	-.76	.05	.88	-3.8	.78	-5.1	a .42	.25	82.1	81.7	ecm.2b16c	0
MEAN	1513.3	2402.2	.17	.05	1.00	.2	1.00	.5			74.5	74.7		
S.D.	517.3	3.1	1.15	.01	.06	3.2	.14	3.8			9.9	9.2		

Figure 23

Item fit – Grade 2 Fall Focal Point 3

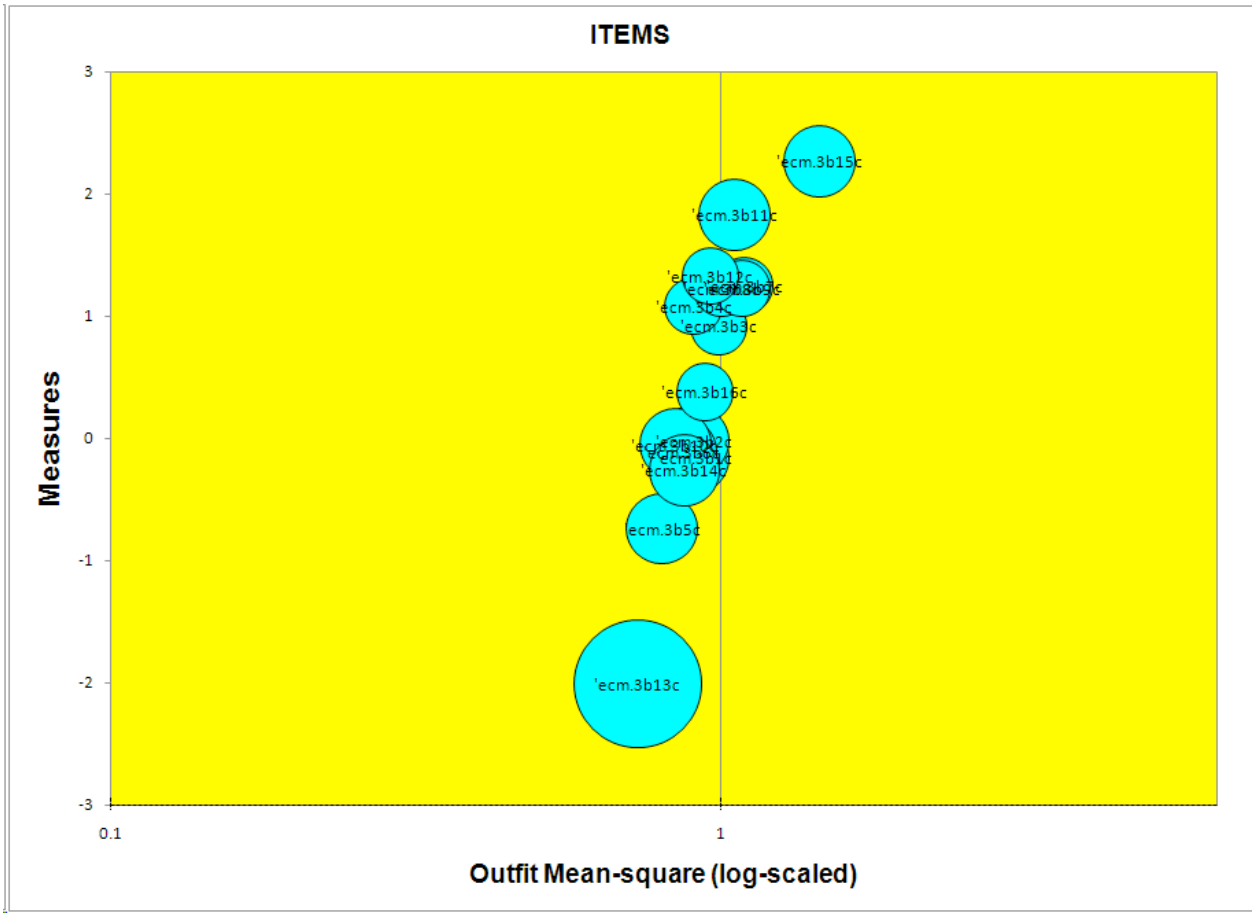


Table 146

Item Fit Order – Grade 2 Fall Focal Point 3

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
47	527	2372	2.27	.05	1.18	6.2	1.45	9.9	A	-.02	.28	76.8	78.3	ecm.3b15c	0
39	996	2377	1.25	.04	1.06	4.3	1.09	5.1	B	.23	.32	62.9	64.7	ecm.3b7c	0
41	1002	2376	1.23	.04	1.05	3.5	1.08	4.5	C	.24	.32	64.0	64.6	ecm.3b9c	0
43	710	2374	1.83	.05	1.01	.3	1.05	2.0	D	.28	.30	73.9	71.9	ecm.3b11c	0
40	1004	2375	1.23	.04	.98	-1.5	1.00	-.2	E	.34	.32	67.4	64.6	ecm.3b8c	0
35	1168	2382	.92	.04	.99	-.6	.99	-.6	F	.33	.32	65.0	63.1	ecm.3b3c	0
44	951	2373	1.33	.04	.96	-3.1	.96	-2.1	G	.37	.32	68.6	65.5	ecm.3b12c	0
48	1453	2373	.38	.04	.96	-3.1	.94	-3.0	H	.37	.31	67.6	65.7	ecm.3b16c	0
45	2223	2374	-2.01	.09	.95	-.7	.73	-3.1	h	.26	.16	93.6	93.6	ecm.3b13c	0
33	1713	2382	-.16	.05	.95	-2.4	.90	-3.2	g	.36	.28	73.6	72.8	ecm.3b1c	0
34	1651	2381	-.02	.05	.94	-2.9	.90	-3.7	f	.38	.29	71.9	70.7	ecm.3b2c	0
46	1750	2374	-.26	.05	.93	-3.0	.87	-4.1	e	.38	.28	74.8	74.3	ecm.3b14c	0
37	1940	2380	-.74	.05	.92	-2.5	.80	-4.8	d	.38	.25	81.6	81.6	ecm.3b5c	0
38	1690	2378	-.11	.05	.92	-4.2	.86	-4.9	c	.41	.29	73.9	72.1	ecm.3b6c	0
36	1082	2380	1.08	.04	.91	-6.8	.90	-6.4	b	.44	.32	68.6	63.6	ecm.3b4c	0
42	1661	2374	-.05	.05	.90	-5.2	.84	-6.1	a	.44	.29	73.3	71.2	ecm.3b10c	0
MEAN	1345.1	2376.6	.51	.05	.98	-1.4	.96	-1.3			72.3	71.1		
S.D.	463.2	3.3	1.05	.01	.07	3.4	.16	4.4			7.3	7.9		

Winter

Figure 24

Item fit – Grade 2 Winter Focal Point 1

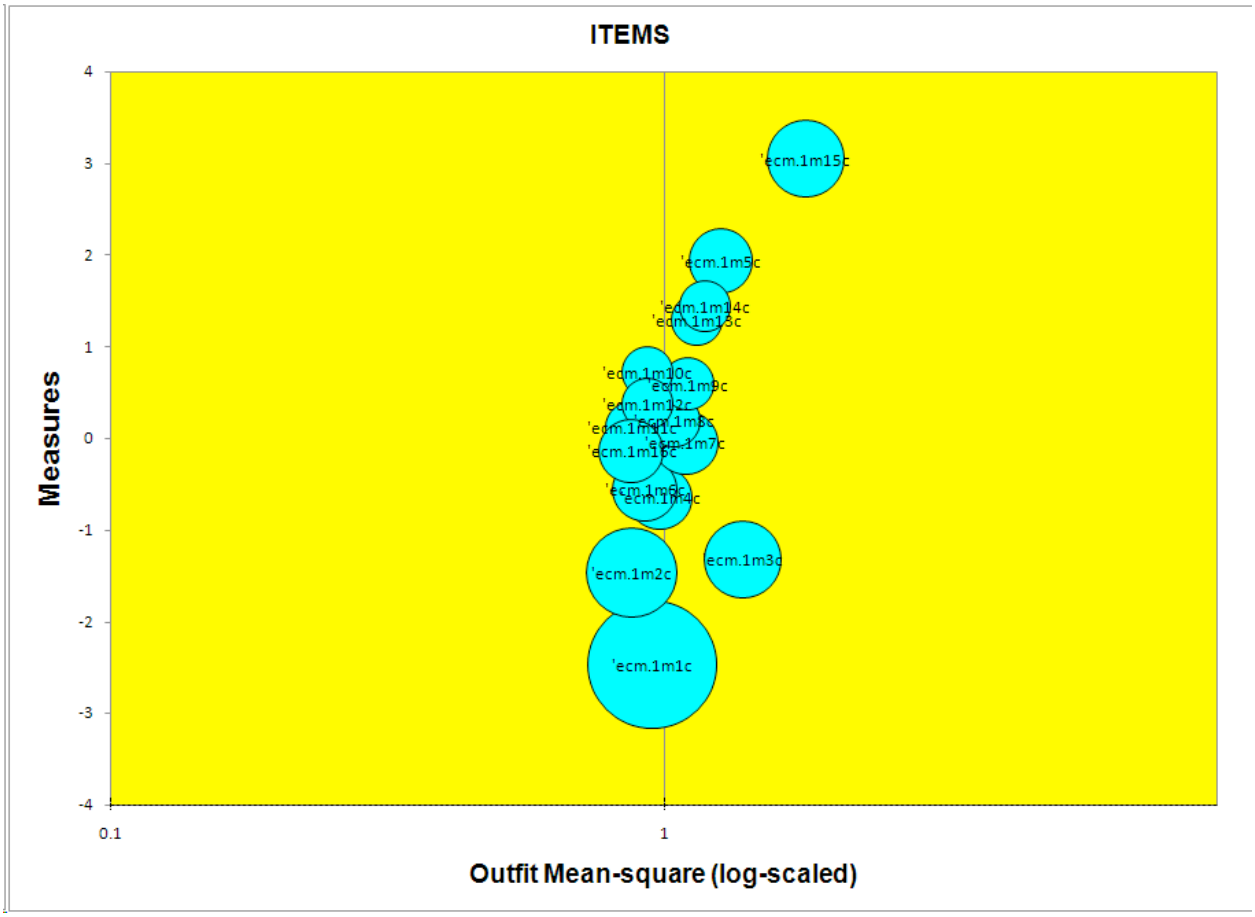


Table 147

Item Fit Order – Grade 2 Winter Focal Point 1

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
63	309	2545	3.05	.06	1.11	2.4	1.79	9.9	A -.05	.22	87.9	87.9	ecm.1m15c	0
51	2256	2550	-1.32	.06	1.05	1.2	1.38	5.4	B .07	.21	88.5	88.5	ecm.1m3c	0
53	716	2547	1.93	.05	1.12	5.7	1.26	8.4	C .09	.29	71.5	73.1	ecm.1m5c	0
62	966	2546	1.44	.04	1.13	8.6	1.18	8.8	D .12	.31	60.4	66.3	ecm.1m14c	0
61	1044	2546	1.29	.04	1.11	7.7	1.14	7.7	E .16	.31	59.7	64.8	ecm.1m13c	0
57	1442	2547	.59	.04	1.07	5.6	1.10	6.0	F .20	.31	60.0	63.9	ecm.1m9c	0
55	1783	2547	-.05	.05	1.06	3.2	1.09	3.4	G .20	.29	69.4	71.3	ecm.1m7c	0
56	1664	2547	.19	.04	1.04	2.3	1.04	2.0	H .25	.30	65.9	68.1	ecm.1m8c	0
52	2047	2550	-.65	.05	.97	-1.0	.98	-.5	h .29	.25	80.6	80.4	ecm.1m4c	0
49	2445	2550	-2.47	.10	.97	-.3	.95	-.4	g .18	.13	95.9	95.9	ecm.1m1c	0
54	2011	2548	-.56	.05	.96	-1.4	.92	-2.0	f .32	.26	79.7	79.1	ecm.1m6c	0
50	2291	2550	-1.47	.07	.96	-.8	.87	-2.0	e .27	.20	89.8	89.8	ecm.1m2c	0
60	1569	2547	.37	.04	.95	-3.5	.93	-3.6	d .38	.31	68.8	65.9	ecm.1m12c	0
58	1369	2547	.72	.04	.94	-4.9	.93	-4.6	c .39	.31	67.7	63.2	ecm.1m10c	0
64	1826	2545	-.14	.05	.93	-3.5	.87	-4.9	b .40	.28	73.1	72.7	ecm.1m16c	0
59	1701	2546	.12	.04	.91	-5.3	.87	-5.9	a .43	.30	71.9	69.0	ecm.1m11c	0
MEAN	1589.9	2547.4	.19	.05	1.02	1.0	1.08	1.7			74.4	75.0		
S.D.	577.0	1.8	1.32	.01	.07	4.2	.23	5.2			11.1	10.3		

Figure 25

Item fit – Grade 2 Winter Focal Point 2

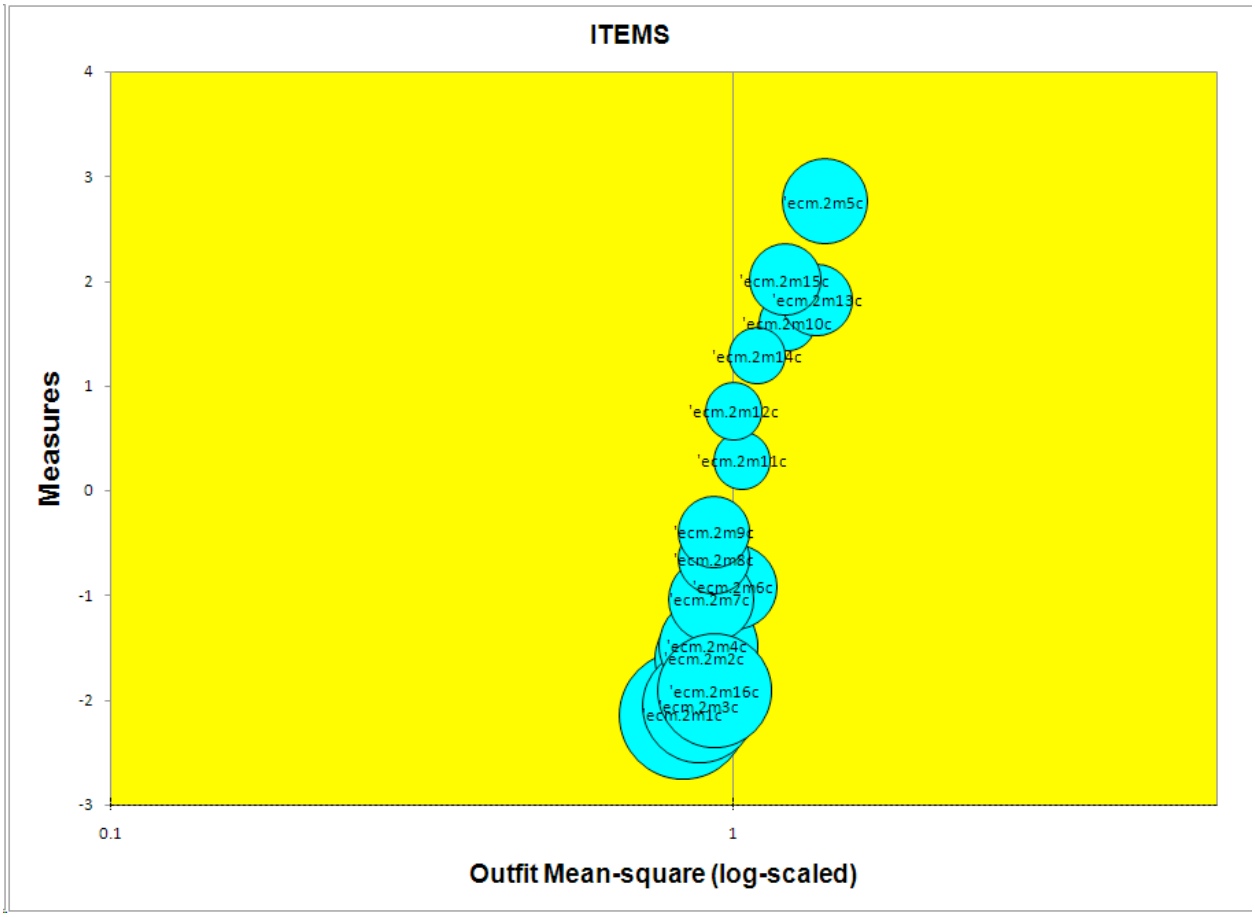


Table 148

Item Fit Order – Grade 2 Winter Focal Point 2

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
69	392	2558	2.76	.06	1.12	3.0	1.40	7.1	A .03	.24	84.5	84.8	ecm.2m5c	0
77	768	2555	1.82	.05	1.20	9.7	1.36	9.9	B-.01	.29	66.4	71.5	ecm.2m13c	0
74	882	2556	1.60	.04	1.14	8.1	1.22	9.4	C .09	.30	63.1	68.4	ecm.2m10c	0
79	681	2555	2.01	.05	1.11	4.9	1.21	6.7	D .11	.29	72.4	74.3	ecm.2m15c	0
78	1050	2555	1.29	.04	1.06	4.5	1.09	5.0	E .22	.31	62.7	64.8	ecm.2m14c	0
75	1618	2555	.29	.04	1.04	2.5	1.03	1.3	F .26	.30	63.8	66.8	ecm.2m11c	0
76	1354	2556	.76	.04	1.00	-.1	1.00	-.1	G .31	.31	63.7	63.1	ecm.2m12c	0
70	2147	2556	-.92	.06	.99	-.2	1.00	.0	H .25	.24	84.2	84.0	ecm.2m6c	0
67	2402	2558	-2.05	.08	.99	-.1	.88	-1.3	h .19	.16	93.9	93.9	ecm.2m3c	0
71	2185	2557	-1.04	.06	.98	-.4	.92	-1.5	g .26	.23	85.6	85.5	ecm.2m7c	0
68	2299	2558	-1.48	.07	.98	-.4	.91	-1.3	f .24	.20	90.0	89.9	ecm.2m4c	0
80	2379	2555	-1.91	.08	.97	-.4	.93	-.8	e .21	.17	93.1	93.1	ecm.2m16c	0
65	2415	2558	-2.14	.09	.97	-.4	.83	-1.8	d .22	.15	94.4	94.4	ecm.2m1c	0
73	1946	2556	-.39	.05	.97	-1.4	.93	-2.1	c .32	.27	77.5	76.5	ecm.2m9c	0
66	2324	2557	-1.60	.07	.96	-.7	.90	-1.4	b .25	.19	90.9	90.9	ecm.2m2c	0
72	2054	2557	-.65	.05	.96	-1.5	.93	-1.7	a .32	.25	80.5	80.4	ecm.2m8c	0
MEAN	1681.0	2556.4	-.10	.06	1.03	1.7	1.03	1.7			79.2	80.1		
S.D.	692.1	1.2	1.57	.01	.07	3.3	.17	4.2			11.7	10.6		

Figure 26

Item fit – Grade 2 Winter Focal Point 3

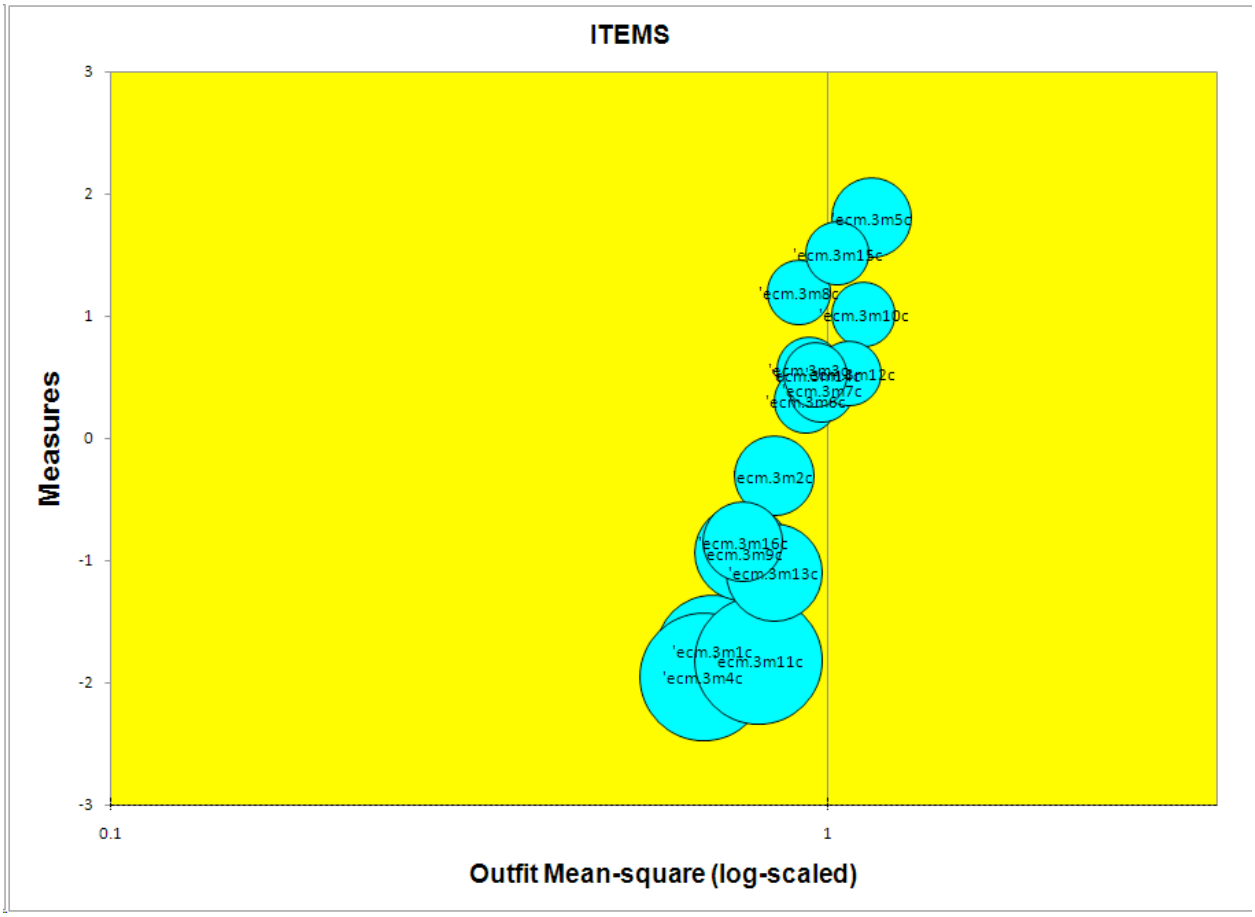


Table 149

Item Fit Order – Grade 2 Winter Focal Point 3

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
85	778	2540	1.80	.05	1.06	3.0	1.15	5.7	A .19	.30	71.3	71.1	ecm.3m5c	0
90	1200	2537	1.01	.04	1.09	7.3	1.12	7.7	B .18	.31	58.3	63.1	ecm.3m10c	0
92	1473	2533	.53	.04	1.07	5.0	1.07	3.8	C .22	.31	60.2	64.4	ecm.3m12c	0
95	922	2532	1.51	.04	1.01	.5	1.03	1.4	D .29	.31	68.1	67.2	ecm.3m15c	0
87	1549	2538	.39	.04	1.00	-.3	.98	-1.3	E .32	.31	64.7	65.6	ecm.3m7c	0
94	1477	2533	.52	.04	.96	-3.0	.96	-2.6	F .36	.31	66.8	64.5	ecm.3m14c	0
83	1456	2541	.56	.04	.95	-3.5	.94	-3.6	G .38	.31	66.6	64.1	ecm.3m3c	0
86	1602	2540	.30	.04	.95	-3.3	.93	-3.8	H .38	.30	68.9	66.7	ecm.3m6c	0
91	2347	2536	-1.82	.08	.95	-.8	.80	-2.5	h .27	.17	92.5	92.5	ecm.3m11c	0
84	2371	2540	-1.95	.08	.94	-.9	.67	-4.2	g .29	.17	93.3	93.3	ecm.3m4c	0
93	2181	2533	-1.10	.06	.94	-1.6	.84	-3.1	f .33	.22	86.1	86.1	ecm.3m13c	0
81	2336	2540	-1.74	.07	.93	-1.3	.69	-4.4	e .32	.18	92.0	92.0	ecm.3m1c	0
82	1903	2541	-.31	.05	.92	-3.6	.84	-5.0	d .40	.28	76.1	75.4	ecm.3m2c	0
88	1097	2537	1.19	.04	.91	-7.0	.91	-5.4	c .43	.31	70.5	64.0	ecm.3m8c	0
96	2104	2530	-.85	.05	.91	-2.7	.76	-5.5	b .39	.24	83.4	83.2	ecm.3m16c	0
89	2136	2537	-.94	.06	.90	-2.8	.76	-5.3	a .40	.24	84.3	84.2	ecm.3m9c	0
MEAN	1683.3	2536.8	-.06	.05	.97	-.9	.90	-1.8			75.2	74.8		
S.D.	509.7	3.3	1.17	.01	.06	3.4	.14	4.0			11.4	11.3		

Spring

Figure 27

Item fit – Grade 2 Spring Focal Point 1

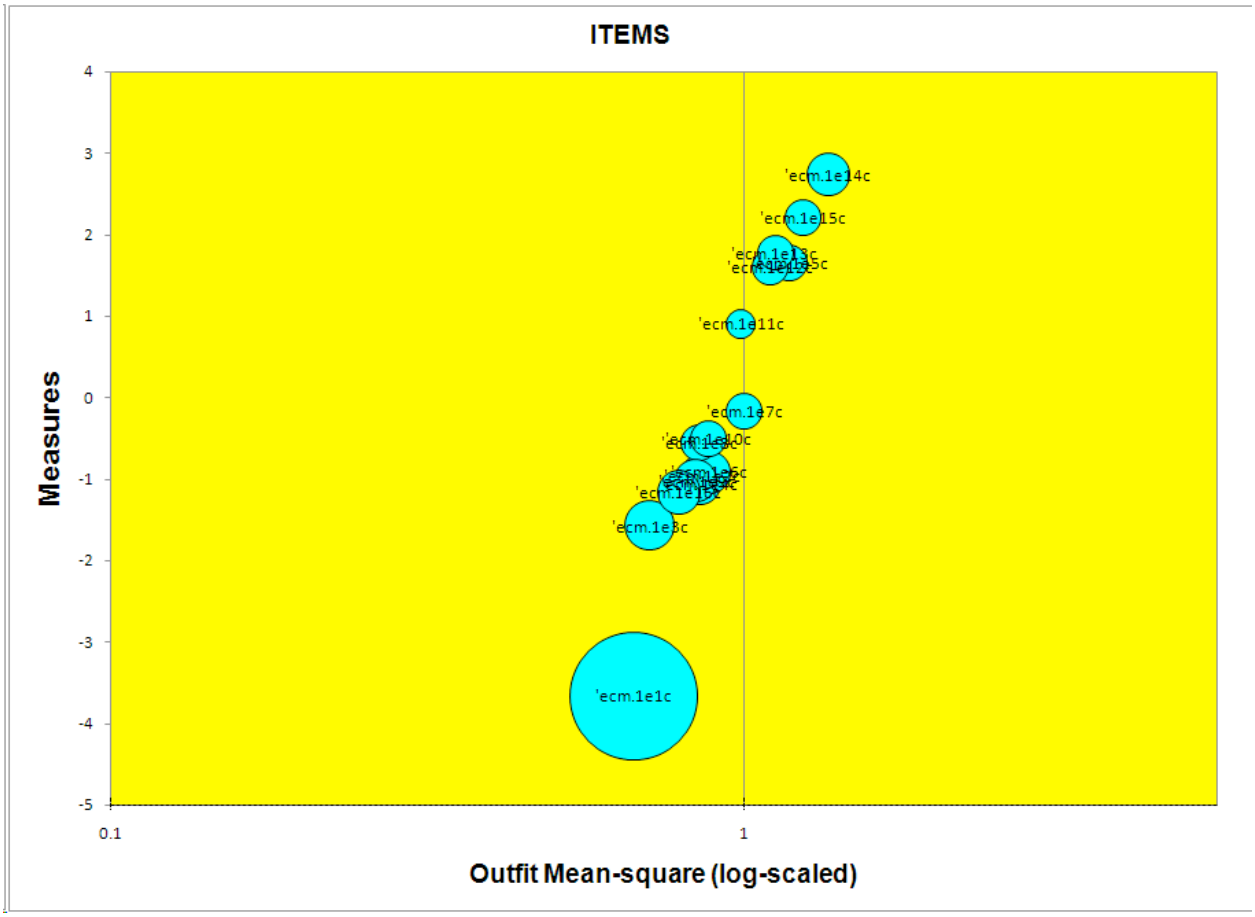


Table 150

Item Fit Order – Grade 2 Spring Focal Point 1

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
110	350	2260	2.74	.06	1.07	1.7	1.36	6.1	A .08	.24	84.9	84.6	ecm.1e14c	0
111	519	2260	2.21	.05	1.05	1.9	1.24	5.9	B .16	.27	77.7	77.5	ecm.1e15c	0
101	749	2262	1.66	.05	1.09	4.7	1.18	7.1	C .15	.30	68.5	69.2	ecm.1e5c	0
109	695	2260	1.78	.05	1.03	1.4	1.12	4.4	D .23	.29	71.3	70.9	ecm.1e13c	0
108	771	2260	1.61	.05	1.05	3.0	1.10	4.2	E .21	.30	67.9	68.5	ecm.1e12c	0
103	1627	2262	-.16	.05	.97	-1.5	1.00	-.1	F .32	.28	74.7	72.9	ecm.1e7c	0
107	1114	2260	.91	.04	.99	-.8	.99	-.4	G .33	.31	63.2	62.8	ecm.1e11c	0
97	2233	2263	-3.66	.18	.98	.0	.67	-1.6	H .14	.08	98.7	98.7	ecm.1e1c	0
100	1933	2262	-1.05	.06	.95	-1.4	.85	-2.7	h .32	.23	85.6	85.5	ecm.1e4c	0
98	1907	2263	-.95	.06	.94	-1.5	.86	-2.7	g .33	.24	84.4	84.3	ecm.1e2c	0
102	1894	2262	-.91	.06	.94	-1.7	.88	-2.5	f .33	.24	83.6	83.8	ecm.1e6c	0
106	1763	2262	-.50	.05	.94	-2.3	.88	-3.2	e .36	.27	78.9	78.2	ecm.1e10c	0
105	1926	2262	-1.02	.06	.93	-1.8	.84	-3.1	d .34	.23	85.1	85.1	ecm.1e9c	0
99	2050	2262	-1.57	.07	.93	-1.3	.71	-4.1	c .33	.19	90.6	90.6	ecm.1e3c	0
104	1780	2262	-.55	.05	.92	-2.8	.85	-4.0	b .39	.26	79.5	78.9	ecm.1e8c	0
112	1959	2260	-1.16	.06	.91	-2.1	.79	-3.9	a .36	.22	86.8	86.7	ecm.1e16c	0
MEAN	1454.4	2261.4	-.04	.06	.98	-.3	.96	.0			80.1	79.9		
S.D.	614.8	1.1	1.65	.03	.06	2.1	.19	4.0			9.0	9.0		

Figure 28

Item fit – Grade 2 Spring Focal Point 2

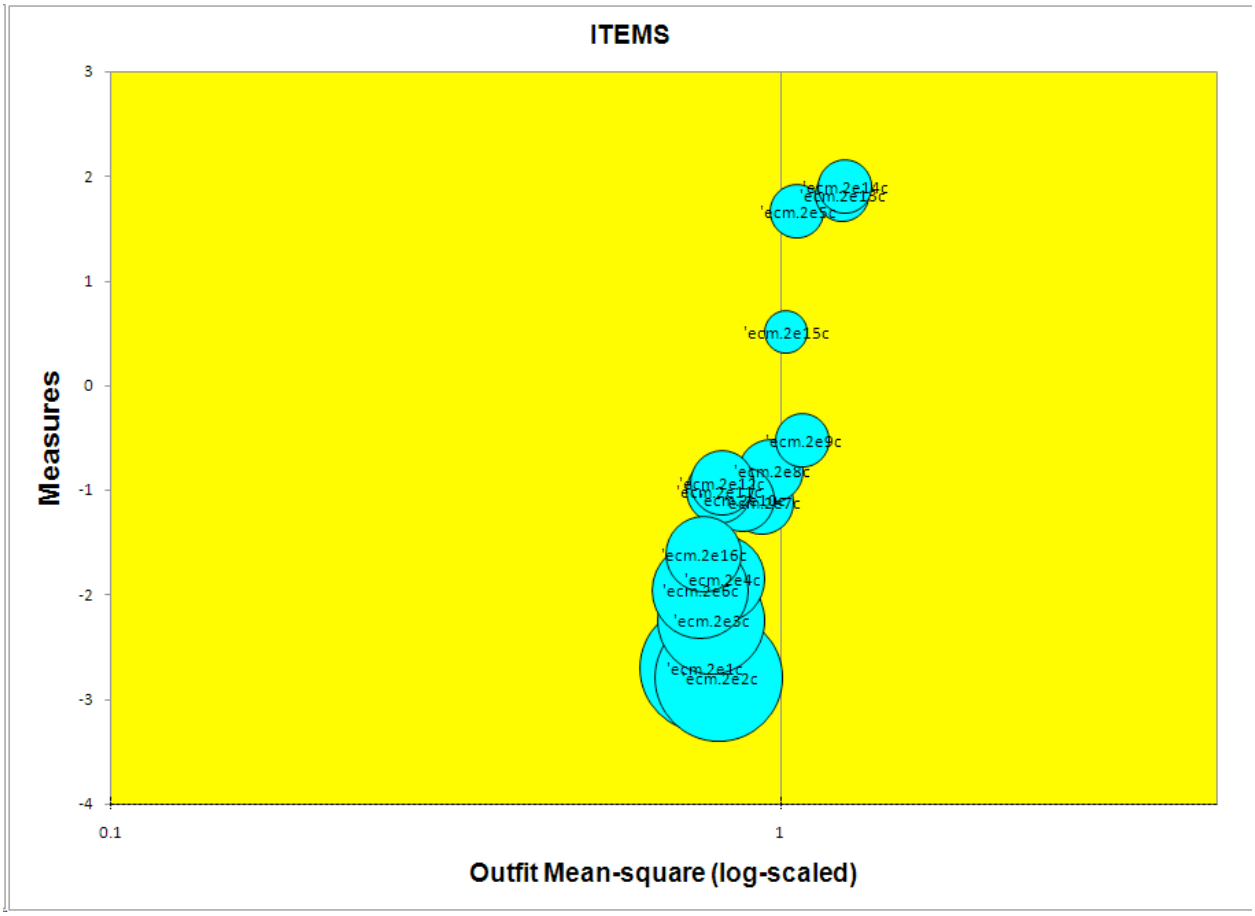


Table 151

Item Fit Order – Grade 2 Spring Focal Point 2

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
126	645	2268	1.90	.05	1.12	5.4	1.25	7.7	A .10	.29	70.1	72.7	ecm.2e14c	0
125	678	2268	1.82	.05	1.13	6.2	1.24	7.9	B .09	.29	68.3	71.6	ecm.2e13c	0
121	1776	2269	-.53	.05	1.03	.9	1.08	1.9	C .22	.26	77.9	78.5	ecm.2e9c	0
117	752	2269	1.66	.05	1.01	.5	1.06	2.6	D .27	.30	70.8	69.2	ecm.2e5c	0
127	1324	2268	.51	.04	1.02	1.1	1.02	1.4	E .29	.31	64.7	64.5	ecm.2e15c	0
120	1874	2269	-.82	.06	.99	-.3	.97	-.7	F .26	.25	82.6	82.6	ecm.2e8c	0
119	1956	2269	-1.12	.06	.98	-.5	.94	-1.0	G .26	.23	86.3	86.2	ecm.2e7c	0
114	2200	2270	-2.79	.12	.97	-.2	.81	-1.4	H .18	.12	96.9	96.9	ecm.2e2c	0
113	2194	2270	-2.70	.12	.97	-.3	.77	-1.7	h .20	.12	96.7	96.6	ecm.2e1c	0
122	1949	2268	-1.09	.06	.97	-.8	.88	-2.1	g .29	.23	85.9	85.9	ecm.2e10c	0
118	2118	2269	-1.96	.09	.95	-.6	.76	-2.7	f .26	.17	93.3	93.3	ecm.2e6c	0
115	2154	2270	-2.25	.10	.95	-.5	.79	-2.0	e .24	.15	94.9	94.9	ecm.2e3c	0
116	2103	2270	-1.85	.08	.95	-.8	.82	-2.2	d .26	.17	92.6	92.6	ecm.2e4c	0
124	1904	2268	-.93	.06	.93	-1.8	.82	-3.7	c .35	.24	84.2	84.0	ecm.2e12c	0
128	2061	2268	-1.61	.07	.93	-1.2	.77	-3.2	b .31	.19	90.9	90.9	ecm.2e16c	0
123	1927	2268	-1.01	.06	.92	-2.0	.81	-3.7	a .36	.23	85.2	85.0	ecm.2e11c	0
MEAN	1725.9	2268.8	-.80	.07	.99	.3	.92	-.2			83.8	84.1		
S.D.	536.8	1.2	1.48	.02	.06	2.2	.16	3.5			10.3	9.9		

Figure 29

Item fit – Grade 2 Spring Focal Point 3

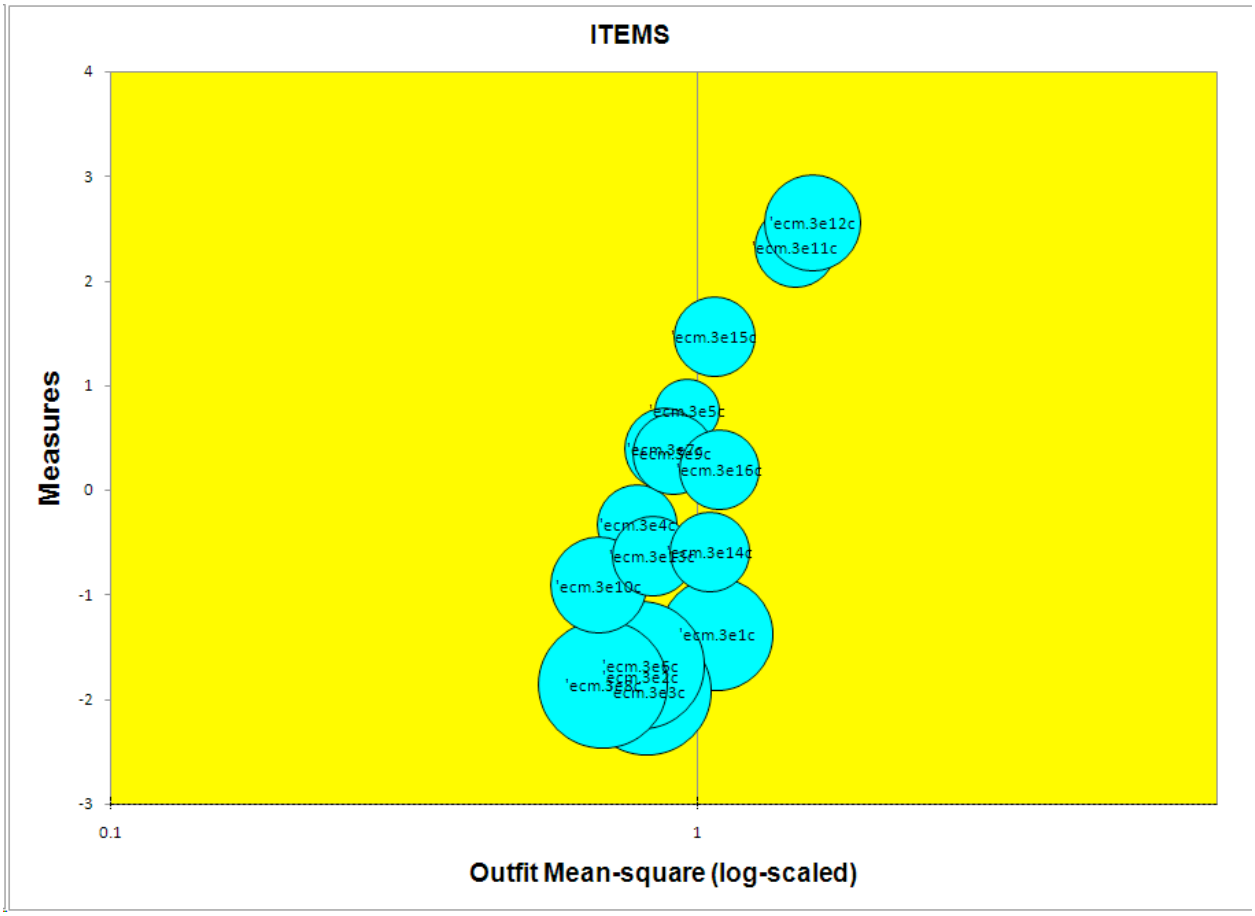


Table 152

Item Fit Order – Grade 2 Spring Focal Point 3

ENTRY NUMBER	TOTAL SCORE	COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM	G
140	396	2235	2.56	.06	1.11	3.2	1.57	9.9	A .00	.25	82.8	82.4	ecm.3e12c	0
139	470	2236	2.33	.05	1.14	4.4	1.47	9.9	B .01	.27	79.2	79.3	ecm.3e11c	0
144	1449	2231	.20	.05	1.06	3.1	1.09	3.9	C .21	.30	67.0	67.9	ecm.3e16c	0
129	1990	2239	-1.38	.07	1.02	.5	1.08	1.1	D .16	.21	88.9	88.9	ecm.3e1c	0
143	824	2232	1.47	.05	1.03	1.7	1.07	3.1	E .25	.30	66.7	66.7	ecm.3e15c	0
142	1769	2233	-.59	.05	1.00	.1	1.05	1.3	F .25	.26	79.2	79.4	ecm.3e14c	0
133	1182	2238	.76	.04	.97	-2.2	.96	-2.2	G .35	.31	65.5	63.0	ecm.3e5c	0
131	2083	2238	-1.92	.08	.96	-.6	.82	-2.1	H .25	.17	93.1	93.1	ecm.3e3c	0
134	2044	2237	-1.67	.08	.95	-.8	.80	-2.6	h .28	.19	91.4	91.4	ecm.3e6c	0
130	2063	2239	-1.78	.08	.95	-.8	.80	-2.4	g .27	.18	92.1	92.1	ecm.3e2c	0
137	1381	2237	.35	.05	.94	-4.0	.91	-4.5	f .40	.31	68.0	66.0	ecm.3e9c	0
141	1783	2235	-.63	.05	.93	-2.2	.84	-3.9	e .37	.26	80.6	79.9	ecm.3e13c	0
136	2074	2237	-1.86	.08	.93	-1.0	.69	-3.8	d .31	.17	92.7	92.7	ecm.3e8c	0
135	1357	2237	.40	.05	.90	-6.6	.88	-6.4	c .44	.31	71.1	65.5	ecm.3e7c	0
132	1679	2238	-.33	.05	.88	-5.2	.79	-6.4	b .46	.28	77.4	75.5	ecm.3e4c	0
138	1873	2236	-.91	.06	.87	-3.8	.68	-6.9	a .46	.24	83.9	83.8	ecm.3e10c	0
MEAN	1526.1	2236.1	-.19	.06	.98	-.9	.97	-.7			80.0	79.2		
S.D.	542.6	2.5	1.40	.01	.08	3.0	.24	5.1			9.7	10.4		

Table 153

Chi-square difference test

Grade/Season	Value	*df*	*p*
Kindergarten			
Fall	72.51	3	0.00
Winter	116.98	3	0.00
Spring	93.10	3	0.00
Grade 1			
Fall	232.31	3	0.00
Winter	273.29	3	0.00
Spring	181.31	3	0.00
Grade 2			
Fall	33.92	3	0.00
Winter	-	-	-
Spring	-	-	-

Table 154

Kindergarten Seasonal Focal Point Correlation Matrix

	Seasonal Focal Point	
Season/Focal Point	Focal Point 2	Focal Point 3
Fall		
Focal Point 1	.79	.85
Focal Point 2	.	.82
Winter		
Focal Point 1	.80	.85
Focal Point 2	.	.82
Spring		
Focal Point 1	.86	.84
Focal Point 2	.	.90

Table 155

Grade 1 Seasonal Focal Point Correlation Matrix

	Seasonal Focal Point	
Season/Focal Point	Focal Point 2	Focal Point 3
Fall		
Focal Point 1	.74	.78
Focal Point 2	.	.57
Winter		
Focal Point 1	.76	.82
Focal Point 2	.	.74
Spring		
Focal Point 1	.87	.91
Focal Point 2	.	.83

Table 156

Grade 2 Seasonal Focal Point Correlation Matrix

	Seasonal Focal Point	
Season/Focal Point	Focal Point 2	Focal Point 3
Fall		
Focal Point 1	.86	.78
Focal Point 2	.	.83
Winter		
Focal Point 1	-	-
Focal Point 2	-	-
Spring		
Focal Point 1	-	-
Focal Point 2	-	-

Table 157

Predictive Validity Results for All Students in Grade K

Quartile	N	Fixed effect point estimate of intercept	SE	Reliability of intercept	Level-1 residual variance	Random effect variance estimate of intercept	Predictive validity coefficient (TerraNova)
1	504	19.549	0.196	0.185	20.405	1.647	0.680
2	426	25.903	0.155	0	11.934	0	0.293
3	435	30.930	0.137	0.207	8.555	0.776	0.442
4	405	37.970	0.151	0.309	9.176	1.412	0.737

Table 158

Predictive Validity Results for All Students in Grade 1

Quartile	N	Fixed effect point estimate of intercept	SE	Reliability of intercept	Level-1 residual variance	Random effect variance estimate of intercept	Predictive validity coefficient (TerraNova)
1	396	17.483	0.149	0.183	9.217	0.748	0.576
2	481	22.973	0.123	0	8.413	0	0.510
3	336	27.348	0.135	0	7.078	0	0.735
4	358	33.618	0.202	0.526	11.34	4.672	0.813

Table 159

Predictive Validity Results for All Students in Grade 2

Quartile	N	Fixed effect point estimate of intercept	SE	Reliability of intercept	Level-1 residual variance	Random effect variance estimate of intercept	Predictive validity coefficient (TerraNova)
1	691	21.124	0.125	0.293	10.564	1.606	0.584
2	583	27.137	0.095	0	6.103	0	0.356
3	566	31.737	0.094	0.161	5.434	0.370	0.682
4	491	37.592	0.127	0.491	6.614	2.279	0.459