An Investigation of Linking a State Assessment to the 2003 National Achievement of Educational Progress (NAEP) for 4th and 8th Grade Reading

by

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Background

Over a decade researchers have investigated the feasibility of linking distinct assessments and related psychometric issues. Various types of linkages have been defined and discussed in the literature (Mislevy, 1992; Linn, 1993). Perhaps the most enduring and frequently cited example of linking is the "concordance" relationships between the two college entrance examinations, ACT and SAT (Dorans et al, 1997; Dorans, 1999; Pommerich et al, 2000; Hanson et al, 2001; Kolen and Brennan, 2004). Another well known example of linking relationship is between NAEP and the Third International Mathematics and Science Study (TIMSS) (Johnson et al, 1998a, 1998b, 2002). With the high-stakes accountability requirements under the *No Child Left Behind Act of 2001* (NCLB) and the declaration that progress on state assessments be confirmed by state results on NAEP for 4th and 8th grade students, an Ad Hoc Committee was established by the National Assessment Governing Board (NGAB) in 2001 to explore the new role of NAEP. Through careful review, the Committee report (2002) concludes that NAEP can serve as a source of confirmatory evidence effectively for state test results. This effort reflects a broad, underlying interest by federal and state policymakers and many Americans to know how each state is performing in relation to high national or international benchmarks of student academic achievement.

Linking test scores from distinct tests through statistical procedures, such as calibration, projection, and moderation, must satisfy certain requirements to support interpretable and valid comparisons (Mislevy, 1992; Linn, 1993; Ercikan, 1997). Many point out that the accuracy of such kind of linkage strongly depends on the context of the assessments, the groups used for calculating statistics, and the time of administering the tests (Linn, 1993; Kolen and Brennan, 2004). Most importantly, the two linked tests must measure similar constructs and share overlapping content domains for a quality linkage (Dorans et al, 1997, Ercikan, 1998; Johnson et al, 1998, 2002). Through a careful review of two studies of linking state assessments to NAEP by Linn and Kiplinger (1994) and by Ercikan (1998), the Committee on Equivalency and Linkage of Educational Tests (1998) advises, when a distribution-matching method is used, the two tests should have the same format and content, and students taking the tests should be randomly assigned from a single population at the same time under the same conditions. Kolen and Brennan (2004) indicate thinking about linking in terms of degree of similarity of inferences, constructs, populations, and measurement characteristics and conditions. Perhaps the most distinct feature of the four degrees of similarity is its explicit incorporation of inferences, such as intended testing purpose, score reporting, and the 'stakes' associated with a test. They suggest that all important topics must be addressed in conducting a linking study, from data collection design, statistical methods employed, to related assumptions. The most enduring and frequently cited example is the linkage between two college entrance examinations, ACT and SAT (Dorans et al, 1997; Dorans, 1999;

Pommerich et al, 2000; Hanson et al, 2001; Kolen and Brennan, 2004). A common-group design was applied for data collection with a large sample of 100,000 students who took both tests. The study involved eight circles of linkages and differentiated three classes of statistical correspondence: equivalence, concordance, and prediction, depending on rational content considerations and empirical statistical relationships of scores on sub-tests (e.g., ACT Reading, SAT-I Verbal) and the composite scores. Dorans et al (1997, 1999) point out that the two linked tests must measure similar constructs; otherwise, scaling is merely a mathematical operation applied to two sets of data to match test score distributions.

Among a range of perspectives and statistical methods, equipercentile is the commonly used procedure in practice. Kolen and Brennan (1995, 2004) denote four advantages of the equipercentile method over the mean, linear, and parallel-linear methods for linking: (1) equipercentile equivalents are within the range of observed scores to avoid the out-of-range problem that can occur with other methods; (2) the relationships between linked tests are not assumed to be linear; (3) the cumulative distribution function of *X*-scores is approximated by the cumulative distribution function of *Y*-scores; and (4) the moments for transformed scores are approximately the same as that for *Y.*

Methods of the Study

Purpose of the Study

The present study is an investigation to link 2003 test scores on the Delaware Student Testing Program (DSTP) to the 2003 National Achievement of Educational Progress (NAEP) in 4^{th} and 8^{th} grade reading to facilitate interpretable comparisons of test results and assemble external validity evidence for student performance on the state assessment. The accuracy of linking and the property of invariance are examined across subgroups. Measurement issues of using NAEP data to validate state test results through linking procedures are discussed.

Assessments

The DSTP reading is a statewide assessment that is administered annually to students of grades 2 through 10. Test scores are reported on a developmental scale, ranging approximately from 150 to 800 across grades. In 2003, five performance levels: *Well Below the Standard, Below the Standard, Meets the Standard, Exceeds the Standard*, and *Distinguished*, were used for grade 8 to report student progress toward the standards. The test results served as the primary indicator for high-stakes accountability at the student (e.g., promotion, summer school, Individual Instructional Plan), and district and school levels (e.g., sanction). For grade 4, student performance was reported in three categories: *Unsatisfactory* and *Satisfactory* with a narrow error band for *Warning*, for instructional improvement (Table 1).

The 2003 NAEP state assessment was the first administration under the NCLB with all 50 states participating. To allow maximum coverage of reading abilities, while minimizing the time burden for individual student, NAEP uses matrix sampling of items and a procedure for distributing blocks across test booklets that control for position and context effects. Test scores are weighted to accurately reflect the student demographics for reporting at the state level. Five plausible values (PV) are generated to estimate student performance on a scale ranging from 0 to 500. Four achievement levels: *Below Basic, Basic, Proficient*, and *Advanced*, are reported for both grades 4 and 8 (Table 1).

Test Administration

The NAEP reading was administered during a 6-week testing window from late January to early March. A random sample of Delaware students was selected to participate in the 2003 NAEP administration. "NAEP is a timed assessment administered in English to groups of students. Timing is a critical component of standardizing an assessment across the country" (NAEP 2003 AA Manual). The 2003 NAEP reading has ten 25-minute blocks with one or two reading passages accompanied by a set of comprehension questions per block. Each student's test booklet contains two blocks and one 20-minute background section on content related questions and family background.

The DSTP reading was given by the end of March in 2003 to all public school students of grades 4 and 8. The assessment had four sessions in two days of testing. The DSTP reading is untimed. Even though testing time for each session is recommended to manage the administration, extended time is permitted as needed.

Samples of Students

Two NAEP data files were received from the National Center of Educational Statistics (NCES) for Delaware public schools. The grade 4 NAEP sample includes 2,959 Delaware public school students and the grade 8 NAEP sample includes 2,496 students. In the case of NAEP sampling procedure, Delaware public schools were stratified first on the school location and second on minority characteristics of the student population. To inspect possible sampling errors, two DSTP data files were generated per grade: the first DSTP file includes the population of 7,000-9,000 students of each grade; the second DSTP file includes all students from the NAEP sample schools since individual identification is not available from the NAEP data files. Students who did not earn a valid score were excluded from the corresponding data file in this study. In addition, students who were tested with accommodations that change the test construct, such as reading the passages to the student, are excluded from the DSTP data.

Table 2 presents the percentage of schools and subgroups of students in the population and in the sample by grade. The NAEP sample includes 83% of the Delaware schools in grade 4 and 49% of the schools in grade 8. For grade 4, the proportions of male and female students in the NAEP sample are the same as in the population. However, the NAEP sample seems to over-represent black students by 3% (34% vs. 31%), but under-represent white students by 5% (55% vs. 60%). In addition, the NAEP

sample has 2% more English Language Learner (ELL) students than in the population, but slightly less students with disabilities (SD). For grade 8, NAEP includes more male students (53% vs. 51%), but less female students (47% vs. 49%) in the sample. Conversely, the NAEP sample seems under-represent black students (28% vs. 32%), but over-represent white students (63% vs. 60%) compared with the student population. Similarly, slightly more ELL students are included in the NAEP sample; but 4% less SD students than the population.

Methods and Process for Analysis

This study utilizes the common group design to link the DSTP scale scores to the NAEP plausible values using the equipercentile procedure. Since student identification is not available from the NAEP data files, the Delaware sample matched the NAEP sample at the school level under the assumption of an equivalent group of students who took both NAEP and DSTP.

The analysis is comprised of three phases: Content Link, Comparison of Testing Conditions, and Statistical Link.

(1) Content Link: The similarity of test construct is essential in linking district tests to support the interpretable and valid comparisons. In this study the *Three-Level Content Link Model* (Zhang, et al, 2003, 2007; Zhang, 2008) is used for collecting validity evidence to determine the similarity of test construct between the NAEP and the DSTP reading tests. The content link involves the comparison of the NAEP Reading Framework and the Delaware Content Standards of English language arts for alignment, the comparison of test specifications for overlapping content, and the comparison of sample questions from each test for similarity of internal structure.

(2) Comparison of Testing Conditions: Test administration is an important component in educational testing. Standardized procedures ensure the accuracy and comparability of score interpretations and provide equal opportunity for all students (Standards for Educational and Psychological Testing, 1999). In this study, test administration conditions are compared between NAEP and DSTP, such as testing time and accommodations.

(3) Statistical Link: The statistical link is performed using unsmoothed equipercentile procedures described by Kolen and Brennan (1995, 2004). To examine the property of invariance, independent linking is conducted for gender (male and female) and for race/ethnicity (black and white). The process for statistical linkage is described below:

- Link the distribution of the DSTP scale scores to the distribution of the average of five PVs of NAEP.

- To inspect the possible sampling errors, the correspondences of separate linking functions obtained from the NAEP sample schools are compared with the linking functions from the population.

- To examine the property of invariance, independent linking functions obtained from the subgroup, such as male and female, are compared with the linking functions from the whole group**.**

- The standard error of linking is estimated by utilizing the formula below by Petersen, Kolen & Hoover (1993, p.251); where ϕ is the ordinate of the standard normal density at the unit-normal score of *z*, below which *p* of the cases fall.

$$\text{SE}\,[e_y(y_x)] = \sqrt{\delta_y^2\left(\frac{pq}{\phi^2}\right)\left[\frac{1}{n_x}+\frac{1}{n_y}\right]}$$

- Two statistics, Root Mean Square Difference (*RMSD*) and Root Expected Mean Square Difference (*REMSD*) by Dorans and Holland (2000) are calculated to summarize the differences between the transformation functions obtained from the total group and from subgroups.

$$RMSD(x) = \frac{\sqrt{\sum_j w_j[e_{p_j}(x) - e_p(x)]^2}}{\delta_{yp}} \qquad (1)$$

$$REMSD(x) = \frac{\sqrt{\sum_j w_j \sum_x p_p(x)[e_{p_j}(x) - e_p(x)]^2}}{\delta_{yp}} \qquad (2)$$

Where

$e_p(y)$ represents scores of test Y to the scale of test X for the total group
e_p represents scores of test Y to the scale of test X
e_{pj} represents scores of test Y to the scale of test X for subgroup p_j
w_j is the ratio of the subgroup to the total group
δ_{xp} is the standard deviation of test X

- To examine the accuracy of established relationships between NAEP and DSTP reading scores and to what extent such relationships can be used to confirm student achievement on the state assessment with the results of NAEP, a validation is conducted. The three years (2003, 2005, and 2007) NAEP state reading scores are estimated with the corresponding year's DSTP mean scores using the concordance table for all subgroups. The accuracy of estimation and the size of residuals are compared by subgroups and across grades.

Results and Discussion

Content Link

The NAEP Framework of Reading sets forth a broad definition of "reading literacy" that includes developing a general understanding of written text, thinking about it, and using various texts for different purposes. In addition, the framework views reading as an interactive and dynamic process involving the reader, the text, and the context of the reading experience. The "Contexts for Reading" dimension provides guidance for the types of texts: (1) Reading for Literary experience, (2) Reading for Information, and (3) Reading to Perform a Task (for grade 8 only). The "Aspects of Reading" dimension provides guidance for the types of comprehension questions for cognitive levels: (1) Forming a General Understanding, (2) Developing Interpretation, (3) Making Reader/Text Connections, and (4) Examining Content and Structure.

The two reading standards of the Delaware Content Standards in English Language Arts state that "students will construct, examine, and extend the meaning of literary, informative, and technical texts through reading" and that "students will use literary knowledge accessed through print and visual media to connect self to society and culture." The DSTP reading test is designed to measure these two standards. Three types of reading passages, (1) Literary, (2) Informative, and (3) Technical, are used in the assessment. The depth of reading comprehension is measured by three stances: (1) Determining Meaning, requiring the reader to demonstrate an overall understanding of the text, (2) Interpreting Meaning, requiring the reader to go beyond the initial understanding to develop an interpretation of the text, and (3) Extending Meaning, requiring the reader to stand apart from the text and critically consider it. This includes critical examination, evaluation, and analysis; and demonstration of a more complete understanding of the text based on the reader's personal experience and focus on how the reader personally connects to the text.

The content link at the standards level shows great similarities between the NAEP Framework and the Delaware Content Standards in Reading. Both NAEP and DSTP target three types of texts: Literary, Informative (or Informational), and Technical (or Reading for a Task) and measure student understanding of the texts in three levels of comprehension. However, the technical passages are only given to 8th graders on NAEP.

Tables 3a and 3b display the distributions of reading passages by text type and the distributions of test questions by stance for the DSTP; Tables 3c and 3d present the distributions of context for reading and aspect of reading for NAEP by grade. In grade 4, 51% of the 2003 NAEP reading texts are Literary and 49% are Informational; while the 2003 DSTP contains 11 reading passages, 4 Informative (36%), 4 Literary (36%) and 3 Technical (27%). In grade 8, 40% of the 2003 NAEP reading texts are Informational, 29% are Literary, and 31% are To Perform a Task; while the 2003 DSTP contains 11 reading passages, 5 passages are Informative (44%), 4 are Literary (35%), and 2 are Technical (21%). NAEP combines the first two types of comprehensive questions in its test specifications: Forming a General Understanding and Developing Interpretation; the

DSTP combines the last two types of comprehensive questions: Extended Meaning and Connecting Meaning. It is found that the majority of NAEP questions require Forming a General Understanding and Developing Interpretation (68% for grade 4; 59% for grade 8); while the majority of the DSTP questions at the level of Interpreting Meaning (41% for grade 4; 50% for grade 8).

The item-level link provides detailed information about the features of reading texts, the context of test questions, and scoring rubrics for constructed-response questions. One reading passage per grade and selected attached questions from NAEP and DSTP are presented in the Appendix A-1 and A-2 for grade 4 and 8, respectively. The sample passages selected from each test are the same type of text, Informational passage for grade 4; Literary passage for grade 8. The sample questions measure various comprehension levels and in different formats. The context and structure of test questions are also similar when they measure the same comprehension level. Both NAEP and DSTP use multiple–choice and constructed-response questions. However, discrepancies in scoring rubrics for constructed-response questions are observed. Constructed-response questions are of two types for NAEP: short, requiring a one or two sentence answer; and extended, requiring a paragraph or full-page response. Scoring rubrics are of three scales: dichotomous (acceptable and unacceptable); three points (evidence of full comprehension, evidence of partial or surface comprehension, and evidence of little or no comprehension), and four points (extensive, essential, partial, and unsatisfactory). Constructed-response questions are of two types for DSTP: short answer (0-2) and extended constructed-response (0-4). Unlike the DSTP, some NAEP reading passages and questions are given to students at more than one grade or age level. These passages and questions are referred to as, for example, between grade 4 and grade 8 (NAEP Cross Grade Questions Information, NAEP Questions Tool Help, 2007).

Comparison of Testing Conditions

Within a 6-week testing window of January through March 2003, a random sample of Delaware students was selected to participate in the 2003 NAEP reading. "NAEP is a timed assessment administered in English to groups of students. Timing is a critical component of standardizing an assessment across the country" (NAEP 2003 AA Manual). The 2003 NAEP reading has ten 25-minute blocks with one or two reading passages accompanied by a set of comprehension questions per block. Each student's test booklet contains two blocks or one 50-minute block and one 20-minute background section on content related questions and family background. In 2003, only samples of students where accommodations were permitted according to the NAEP inclusion rules because of student disabilities or identified as being a limited-English-proficient student (LEP) and/or was normally offered accommodations in other assessment situations.

The DSTP was given to all Delaware public school students of grades 4 and 8 at the end of March of 2003. The reading assessment contained four sessions which were administered in two days. Every student took the same full-length test form, except the field test items. The DSTP is untimed. Although testing time is recommended for each session due to management reasons, extended time is permitted when it is needed. To

improve the accessibility with at least 95% of participation to the statewide assessment, accommodations are provided for students with disabilities (SD) and for students as an English Language Leaner (ELL). For instance, individual test administration and special test forms, such as Large-Print, Braille, and translated Spanish version, are available to meet the special needs. If the accommodation changes the test construct, for example, reading the reading passages to a student for the reading test, test scores are considered invalid for aggregation.

Statistical Link

The statistical linkage was performed using the equipercentile procedure. The linking function is an equipercentile linking function if the score distribution on *X*-test converted to the *Y*-test scale is equal to the score distribution on *Y*-test in the population (Kolen & Brennan, 1994). In this study, the equipercentile linking functions were developed by identifying the scale score on the DSTP that had the same percentile rank as the average plausible value on the NAEP scale. In case no student earned a particular score on a distribution and the corresponding percentile rank might not be unique, the median was chosen. The primary linking procedure was conducted using the DSTP scale scores based on the sample that matched the NAEP sampling schools. The primary linking relationships were compared with the linking relationships based on the grade population to inspect possible sampling errors and compared with the linking relationships for subgroups to examine the population invariance of linking. Two indices, standardized Root of Mean Square Difference (RMSD) and the standardized Root of Expected Mean Square Difference (REMSD), were also used to examine the population invariance of linking for all subgroups. The RMSD is associated with a particular score; while the REMSD summarizes the overall difference for the entire group.

(1) Descriptive Statistics: Table 4a presents the descriptive statistics of the DSTP reading scores for the population and the sample that matched the NAEP sampling schools by grade. Table 4b shows the descriptive statistics of the NAEP five plausible values and the average plausible values by grade. The descriptive statistics for subgroups are presented in Table 5 by test and grade. The standard mean difference (SMD) indicates that female students scored higher than male students on the DSTP by 6 and 12 score points, respectively for grade 4 and grade 8. Similarly, females performed higher than their counterparts on NAEP by 4 and 10 score points for grades 4 and 8, respectively. White students scored over 20 score points higher than black students across grades on both DSTP and NAEP. Descriptive statistics (Tables 4a and 4b) and the relative frequency distributions of test scores (Charts 1 to 4) suggest that the DSTP scale scores and the NAEP plausible values are both slightly negatively skewed. The plots in Charts 5 to 8 illustrate a nearly straight line between the NAEP plausible values and the DSTP scale scores, indicating a strong relationship between the two scores.

(2) Statistical Link for Grade 4: Table 6a shows the results of linking the DSTP scale scores, based on the sample from the NAEP sampling schools and based on the grade population, to the average plausible values of NAEP at selected percentile ranks.

The three NAEP cut scores are located at the percentile rank (PR) of 27 (cut score=208) for *Basic*, PR-68 (cut score=238) for *Proficient*, and PR-95 (cut score=268) for the *Advanced* level. The corresponding linking functions are 448.5, 485.5, and 519 on the DSTP scale. The linking equivalents (Table 6a and Appendix B-1) derived from the sample are consistent with the equivalents from the population with slight discrepancies (0-1 score point) between the PR-5 and PR-90. The results also suggest that the linking functions for the sample are consistently, but slightly higher than the linking functions for the population, particularly between the PR-1 to the PR-70.

Independent linking was conducted for gender groups. The linking results for males at selected percentile ranks are presented in Table 6b as well as in the Appendix B-1 (Concordance Table for Grade 4 Reading by Gender). The linking relationships based on male students from the NAEP sample schools are compared with the linking relationships based on the subgroup of males. The results suggest that the linking functions are consistent with each other with the discrepancies of 0-3 score points except PR-1. The results also show that the linking functions for the sample are constantly, but slightly higher than the population. Comparing the linking relationships with the total group, it is found that that the linking functions for males are consistently lower than the linking functions for the total group with the discrepancies up to 4 score points between the PR-5 to PR-96. The difference of linking functions is 3 score points at the PR-50 and at the first quartile (PR-25), and 3.5 points at the third quartile (PR-75). Using the NAEP achievement levels as references, the cut score is located at the percentile rank of 29 for *Basic*, based on the linking relationships for males, instead of PR-27 for the total group, at the PR-71 (instead of PR-68) for *Proficient*, and at the PR-96 (instead of PR-95) for *Advanced*. The corresponding linking functions are 446.5 (in a range of 446-447), 484.5, and 519, respectively, for the three NAEP achievement levels.

The linking results for females at selected percentile ranks are presented in Table 6c as well as in the Appendix B-1 (Concordance Table for Grade 4 Reading by Gender). The linking functions based on the sample of females from the NAEP schools are nearly identical to the linking functions for the female subgroup from the population, particularly between the PR of 1 and 80 with the maximum discrepancy of 1 score point. Compared with the whole group, the linking functions for females are consistently higher than the linking functions for the whole group with discrepancies up to 2.5 score points between the PR-10 and PR-90. The discrepancies increase to up to 5 points at the extreme ends of the scale. The difference of linking functions is 2 score points at the PR-50 and at the first quartile (PR-25), and 2.5 points at the third quartile (PR-75). Using the NAEP achievement levels as reference, it is found that the cut score is located at the percentile rank of 26 for *Basic,* based on the linking relationships for females, instead of PR-27 for the total group, at the PR-65 (instead of PR-68) for *Proficient*, and at the same PR-95 as the total group for *Advanced*. The corresponding linking functions for females are 449.5 (in the range of 449-450), 484.5, and 524, for the three NAEP achievement levels.

Comparing the separate linking relationships across genders; the linking functions for males are constantly lower than the linking functions for females with the

discrepancies of 4-6 score points between the PR-10 to PR-90. Chart 9 provides a visualized view of the linking functions from independent linkage for the total group and for genders. The three plots show a very similar shape with the plot for the total group in the middle; the one for males on the left and the one for females on the right. A DSTP score of 467.5 near the mean is converted to the NAEP plausible value of 224 for both male and female as for the total group, but the score is located at different percentile ranks, 48 for the total group, 51 for male, and 45 for female. A DSTP score of 444 near the first quartile is converted to the NAEP score of 204.5 for the total group, 205 for male, and 206 for female. Similarly, a DSTP score of 491 near the 75 quartile is converted to 243.5 for the total group, 245 for male, and 244 for female on the NAEP scale.

Independent linking was also conducted for racial/ethnicity groups. The linking results for black students at selected percentile ranks are presented in Table 6d as well as in the Appendix B-1 (Concordance Table for Grade 4 Reading by Race). The linking functions obtained based on black students from the NAEP sample schools are consistent with the linking functions based on the subgroup of black from the population. The slight (no more than 1 score point), but constantly lower linking functions are found for the sample than the linking functions for the population. Compared with the total group, the linking functions for blacks are consistently and considerably lower with the maximum discrepancy of 20.5 score point at the PR-65. The differences of linking functions increase gradually from the lower end to near the third quartile and then decrease. Based on the linking relationships for blacks, the cut scores for the NAEP achievement levels are located at the percentile rank of 46 (instead of PR-27) for *Basic* with the corresponding linking equivalent of 448 and at the PR of 86 (instead of PR-68) for *Proficient* with the corresponding linking equivalent of 486.5. The cut score for the NAEP *Advanced* level (cut score=268) is beyond the highest score earned by black students in 2003.

The linking results for white students at selected percentile ranks are presented in Table 6e as well as in the Appendix B-1 (Concordance Table for Grade 4 Reading by Race). Similar to the other subgroup, the linking functions obtained based on white students from the NAEP sample schools are consistent, but slightly lower (no more than 1 score point) than the linking functions obtained based on the subgroup of white from the population. Compared with the total group, the linking functions for whites are consistently and noticeably higher than with the discrepancies up to 12.5 score points. These differences are in a range of 10-15 score points between the PR-1 and the PR-40. According to the linking relationships for white, the three cut scores for the NAEP achievement levels are located at the percentile rank of 15 for *Basic* instead of 27 for the total group, at the PR-56 (instead of PR-68) for *Proficient*, and at the PR-93 for *Advanced*. The three corresponding linking functions are 444, 483.5, and 519.

Comparing the separate linking relationships between the racial groups; it is found that the linking functions are consistently and significantly lower for black students than for white students across the scale. Chart 10 provides a visualized view of the linking functions from independent linkage for the total group and the racial/ethnicity

groups. The three plots show a very similar shape with the plot for the total group in the middle. The plot for white students is closer to the total group with more distance shown between the PR-1 and the PR-40; the plot for blacks is to the very left from the plot for the total group with more distance between the PR-45 and the PR-75. A given DSTP score of 467.5 near the mean is converted to the NAEP plausible value of 224 for the blacks at the PR-70 and 225 for the whites at the PR-36. A DSTP score of 444 near the first quartile is converted to the NAEP score of 204.5 for the total group, 205 for black, but 208 for white. Similarly, a DSTP score of 491 near the 75 quartile is converted 243.5 for the total group, 242.5 for blacks (in the range of 242-243), and 244 for whites.

The standard errors of linking were estimated for grade 4 and the results at selected percentile ranks are presented in Table 7. For example, the linking error is 0.77 for the NAEP and 0.99 for the DSTP at the cut point for the NAEP *Basic*, 0.78 and 0.98, respectively, for *Proficient*, and 1.33 and 1.43, respectively, for *Advanced.* The property of population invariance of linking was examined by using the standardized Root Mean Square Difference (RMSD) for the individual scores and the standardized Root Expected Mean Square Difference (REMSD) for the overall test. The RMSD is of a range of 0.0208 to 0.1560 for males; 0.0104 to 0.1040 for females; 0.1146 to 0.34439 for blacks; and 0.0525 to 0.2941 for whites. The RMSD of 0.0728 indicates that the standard difference of linking functions is about 7% out of a standard deviation between the whole group and males at the cut point for the NAEP *Proficient*. Similarly, the standard difference of linking functions is about 3% between the total group and female (RMSD=0.0312), but 33% (RMSD=0.3275) between the total group and black students, and 14% (RMSD=0.1365) between the total group and white students. The REMSD provides an overall index of the population invariance of linking relationships for the test, which is about 7% out of a standard deviation between the whole group and males and 4% between the whole group and females. Such difference increased to 27% between the whole group and blacks and 18% between the whole group and whites. When combining the subgroups, the REMSD is 0.0595, indicating the overall difference of linking relationships is about 6% out of a standard deviation for gender; the REMSD is 0.2320, indicating the overall difference of linking relationships increased to 23% for the subgroups of black and white students.

(3) Statistical Link for Grade 8: Table 8a shows the results of linking the DSTP scale scores, based on the sample from the NAEP sample schools and based on the grade population, to the average plausible values of NAEP at selected percentile ranks. The three NAEP cut scores are located at the percentile rank (PR) of 21 (cut score=243) for *Basic*, PR-68 (cut score=281) for *Proficient*, and PR-98/99 (cut score=323) for *Advanced* with the corresponding linking functions of 489, 535.5, and 590 (in the range of 586.5-598.5) on the DSTP scale. The linking functions (Table 8a and Appendix B-2) derived from the sample are consistent, but slightly higher than the linking functions obtained from the population with the maximum discrepancy of 1.5 score points between the PR-5 and PR-99.

Independent linking was conducted for gender groups. The linking results for males at selected percentile ranks are presented in Table 8b and in the Appendix B-2

(Concordance Table for Grade 8 Reading by Gender). First, the linking relationships based on the male students from the NAEP sample schools are compared with the linking relationships based on the subgroup of males from the grade population. The linking functions for the sample are consistent, but slightly higher than the linking functions for the male subgroup with the maximum discrepancy of 2 score points. Compared with the total group, the results show that the linking functions for males are consistently lower than the linking functions for the total group with the discrepancies of 4-6.5 score points. The difference of linking functions is 4.5 points at the percentile rank of 50, and 5.5 points at the first quartile (PR-25), and only 1 point at the third quartile (PR-75). Using the NAEP achievement levels as references, the cut score is located at the percentile rank of 25 for *Basic*, based on the linking relationships for males instead of PR-21 for the total group, at the PR-74 (instead of PR-68) for *Proficient*, and at the PR-99 (instead of PR-98/99) for *Advanced*. The corresponding linking functions are 498, 536.5 with the range of 536-537, and 592 with the range of 585-599 for the three achievement levels.

The linking results for females at selected percentile ranks are presented in Table 8c as well as in the Appendix B-2 (Concordance Table for Grade 8 Reading by Gender). The linking relationships based on the female students from the NAEP sample schools are first compared with the linking relationships based on the female subgroup of the grade population. The results suggest that the linking functions for the sample are lower for females than the linking functions for the population between the PR-1 and PR-13 and are higher for the female sample from the PR-21 through the PR-99. Compared with the total group, it is found that the linking functions for females are consistently higher with the discrepancies of 4-6.5 score points between the PR-10 and PR-99. The difference of linking functions is 6 points at the percentile rank of 50, 5 points at the first quartile (PR-25), and 4.5 points at the third quartile (PR-75). Using the NAEP achievement levels as references, the cut score is located at the percentile rank of 16 for *Basic,* based on the linking results for females instead of PR-21 for the total group, at the PR-62 (instead of PR-68) for *Proficient*, and at the PR-98 for *Advanced*. The corresponding linking function is 486.5, 535 with the range of 536-537, and 592 (in the range of 589-595) on the DSTP scale.

Comparing the separate linking relationships between genders; it is found that the linking functions are constantly lower for males than for females, as shown in Tables 8b and 8c, with the discrepancies of 9.5-13 score points cross the scale. Chart 11 provides a visualized view of the linking functions from independent linkage for the total group and for genders. Similarly to grade 4, the three plots show a very similar shape with the plot for the total group in the middle; the one for males on the left and the one for females on the right. A given DSTP score of 517 near the mean is converted to the NAEP plausible value of 266.5 for males and 267 for females as for the total group, but located at different percentile ranks, PR-48 for the total group, PR-53 for male, and PR-42 for female. A DSTP score of 493 near the first quartile is converted to the NAEP score of 246 for the total group, 245.5 for male, but 248 for female. Similarly, a DSTP score of 545 near the third quartile is converted 287 for the total group, 286 for male, and 288 for female.

Independent linking was also conducted for the subgroups of black and white students. The linking results for black students at selected percentile ranks are presented in Table 8d as well as in the Appendix B-2 (Concordance Table for Grade 8 Reading by Race). Compared with the total group, the linking functions for blacks are consistently and considerably lower with the maximum discrepancy of 18.5 score point between the PR-1 to PR-95. Using the NAEP achievement levels as references, the cut score is located at the percentile rank of 38 for *Basic,* based on the linking relationships for blacks instead of PR-21 based on the total group and at the PR-89 (instead of PR-68) for *Proficient.* The NAEP cut score (323) for the *Advanced* level is beyond the highest earned score for black students in 2003. The linking results for white students are presented at selected percentile ranks in Table 8e as well as in the Appendix B-2 (Concordance Table for Grade 8 Reading by Race). Compared with the total group, the linking functions for whites are consistently higher with the discrepancies ranging of 5.5 to 11 between the PR-20 and the PR-99. These differences are even higher in the lower end of the scale. Using the NAEP achievement levels as references, the cut score is at the PR-12 for *Basic,* based on the linking relationships for white instead of PR-21 based on the total group, at the PR-59 (instead of PR-68) for *Proficient*, and the PR-98 (instead of PR-98/99) for *Advanced*. The corresponding linking functions are 486.5, 535.5, and 321.5.

Comparing the separate linking relationships for the racial groups; the results show that the linking functions are consistently and significantly lower for blacks than for whites across the scale as shown in Tables 8d and 8e. Chart 12 provides a visualized view of the linking functions from independent linkage for the total group and for the blacks and whites. Similarly to grade 4, the three plots show a very similar shape with the plot for the total group in the middle. The plot for white is on the right and closer to the total group with more distance in the lower end between the PR-1 to the PR-20; the plot for black is to the very left from the plot for the total group with more distance on the higher end between the PR-70 and the PR-99. A given DSTP score of 517 near the mean is converted to the NAEP plausible value of 261.5 for blacks at the PR-65 and 268 for whites at the PR-37. A DSTP score of 493 near the first quartile is converted to the NAEP score of 246 for the total group, 243 for blacks, but 248 for whites. Similarly, a DSTP score of 545 near the third quartile is converted to 287 for the total group, 287 for white, but only 282.5 for black (in a range of 282-283) on the NAEP scale.

The standard errors of linking were estimated for grade 8 and the results at selected percentile ranks are presented in Table 9. For example, the linking error is 0.93 for the NAEP and 1.22 for the DSTP at the cut point for the NAEP *Basic*, 0.90 and 1.25, respectively, for *Proficient*, and 1.60-1.95 and 1.89-2.11, respectively, for *Advanced*. The property of population invariance of linking was examined by using the standardized Root Mean Square Difference (RMSD) for the individual scores and the standardized Root Expected Mean Square Difference (REMSD) for the overall test. The RMSD is of a range of 0.0682 to 0.1462 for males; 0.0749 to 0.1685 for females; 0.1682 to 0.3134 for blacks; and 0.0830 to 0.3010 for whites. The RMSD of 0.0974 at the cut point of the NAEP *Proficiency* indicates that the standard difference of linking functions is about 10% out of a standard deviation between the whole group and males. Similarly, such

difference is about 11% (RMSD=0.1123) out of a standard deviation between the total group and females, 22% (RMSD=0.2217) between the total group and blacks, and 22% (RMSD=0.2180) between the total group and whites (Table 9). The REMSD provides an overall index of the population invariance of linking relationships, which is about 10% out of a standard deviation between the total group and males and 10% between the total group and females. However, such differences increase to 23% between the whole group and the blacks and 19% between the whole group and the whites. When combining the subgroups, the REMSD is 0.0970, indicating the overall difference of linking relationships is about 10% out of a standard deviation for gender; the REMSD is 0.2067, indicating the overall difference of linking relationships is about 21% out of a standard deviation for the subgroups of black and white.

(4) Validation

A validation was conducted to exam to what extent the linking relationships established in this study can be used to estimate the state performance on NAEP for 4th and 8th grade reading. The NAEP state reading scores were estimated for 2003, 2005 and 2007 by the average DSTP scores of the same year using the corresponding concordance table for all groups. The locations of the NAEP cut scores on the DSTP scale were compared from year to year for progress.

Table 10 presents the DSTP scores, estimated and actual NAEP state scores, and residuals between the two scores by grade and year for all groups. In general, the negative residuals suggest a slightly underestimated NAEP scores in grade 4 and the positive residuals suggest a consistently overestimated NAEP scores in grade 8. The residuals for grade 4 range from 0.0 to 4.0 score points by using the concordance table established based on the matched sample of students; while the residuals decrease to 0-2 score points, especially for white students of 2005, by using the corresponding linking relationships for subgroups. According to NAEP Report Card, the standard error of measurement of the mean scores ranges from 0.7 to 1.0 except for males of 2003 (SEM=1.2) and for blacks of three years (SEM=1.7 in 2003, 1.2 in 2005, and 1.1 in 2007). Taking the standard error of measurement into account, the estimated grade 4 NAEP scores fall into a range of -1.96 to +1.96 with 95% confidence interval across groups and years. In grade 8, the results show a slightly overestimated NAEP score in 2003 with the residuals ranging of 0-1 score point for all groups. However, the residuals become unexpected higher in 2005 and 2007 than the other cases, ranging from 4 to 8 score points in 2005 and from 4.5 to 9 score points in 2007 based on the separate concordance tables for the subgroups. To explore the possible reasons for the inaccurate estimation, student progress on both NAEP and DSTP during 2003 to 2007 was reviewed (Table 11). It is found that students of grade 4 made compatible progress on both tests during the 3-year period. From 2003 to 2005 the average reading score increased by 0-5 score points on the DSTP and 1-3 score points on NAEP; from 2003 to 2007 the average score increased 1-4 points on the DSTP and 0-2 points on NAEP. Students of grade 8, however, made significantly larger progress on the DSTP during the three-year period. From 2003 to 2005, the average score increased by 7-9 score points on the DSTP; whereas, the NAEP score remained the same for the state, except for black students

(increased 3 points). From 2003 to 2007 the average score increased by 4-9 points on the DSTP, but the state NAEP score dropped 1-2 score points for both males and females on NAEP during the same time. To examine the trend of student progress in grade 8, the DSTP scores from 2003 through 2007 were compared with the NAEP state scores from three administrations (Table 12). Overall, a similar trend of steady progress from year to year is observed from year to year on both tests with slight discrepancies; however, a significant increase of reading scores occurred in 2005 on the DSTP by 7 scale score points at the state level. Perhaps, the use of the grade 8 reading scores, not grade 4, for high-stakes decisions for individual students (e.g., promotion, retention, summer school, and retesting) highly motivated students. Although the investigation of the substantial improvement is beyond the scope of the current study; it seems obvious that the linking relationships established based on the 2003 test scores cannot be used to confirm student achievement on the DSTP in 2005 and 2007 by the NAEP state results for grade 8 reading.

Summary of Findings

There has been considerable interest in the confirmation of student achievement on state assessments with the results of NAEP, particularly for the high-stakes accountability requirements under the NCLB. The current study investigates the feasibility of linking state test scores to NAEP in reading and the linking accuracy for grades 4 and 8. As indicated in the Standards for Educational and Psychological Testing that "analyses of the relationship of test scores to variables external to the test provide another important source of validity evidence" (1999, p.13).

First, the content link provides validity evidence to support the statistical procedures to link the DSTP scores to the NAEP plausible values. The results of the three-level content linkage revealed a considerable overlap between the State reading standards and the NAEP Framework of Reading. The similarities were also found between the NAEP and DSTP tests in the reading passages by text type, item formats, and the comprehensive levels of test questions. However, the discrepancies were observed between the two testing programs in scoring rubrics for constructed-response questions. Although the NAEP and the DSTP reading tests were administered consecutively, testing conditions, such as testing time, available accommodations, and inclusion rate, are considerably different. Most importantly, the consequences of testing and the intended use of test results have great impacts on the test design, reporting, and student motivation.

To examine the possible sampling errors in linking, the linking relationships were compared from separate linking procedures based on the sample of students of the NAEP sampling schools and based on the corresponding population. The results suggest that the linking functions are consistently, but slightly higher for the sample than the linking functions for the population across grades and subgroups, with the exception of grade 8 for females. Comparing the linking relationships across subgroups, it is found that the linking functions are consistently lower for males, but higher for females than the linking

functions for the total group in both grades. It should be noted that the linking functions for black students were considerably lower than the linking functions for white students and for the total group. The property of population invariance was further examined by using the standardized Root Mean Square Difference (REMSD) and the standardized Root Expected Mean Square Difference (RMSD). The results show that the population of invariance is reasonably achieved for gender in grade 4 (REMSD=0.0595), but seems to be slightly higher in grade 8 for gender (REMSD=0.097). The REMSD of 0.201 to 0.230 for the racial/ethnicity groups suggests a large overall difference of linking functions (20-23% of a standard deviation) between black and white students in both grades. Compared with the total group, the difference of linking functions is about 3% of a standard deviation for grade 4 females at the cut score for the NAEP *Proficient,* but 7% for males in both grades. The RMSD unexpectedly increases to 11% for grade 8 females. Similarly, the differences of linking functions range from 14% to 33% of a standard deviation for black and white students, indicating a biased linking result at the cut score for the NAEP *Proficient* in both grades.

The results of validation provided supporting evidence to the relationships established for grade 4 between DSTP and NAEP scores through a linking procedure. The residuals between estimated and actual NAEP scores are in an acceptable range across groups by using the concordance table for the total group. The estimation is improved with the residuals in a range of 0-2 score point, particularly for blacks and whites, by using the corresponding concordance tables for subgroups. The inaccurate results for grade 8 challenged the linking relationships based on the 2003 test scores. Further analyses revealed a substantial improvement of reading scores on the state assessment in 2005; this seems to be responsible for the large residuals between estimated and actual NAEP scores and overestimated NAEP scores in 2005 and 2007 by using the corresponding DSTP scores. It is reasonable to conclude that student achievement on the DSTP grade 4 reading is confirmed by the results of state NAEP according to the present study. However, the linking relationships for grade 8 established based on the 2003 test scores cannot be used to confirm student achievement on the DSTP by the NAEP results for 2005 and 2007.

One of the challenges experienced in the linking process of the present study is that no student earned a particular score on a distribution, so that the corresponding percentile rank is no longer unique. In some cases, the score range became relatively wide especially in the two ends of the distribution. The use of middle score for this issue was a subjective choice; which might contribute to the inaccuracy of the linking results. In addition, rounding might contribute to the linking errors as well. More measurement issues need to be explored in linking distinct tests, including the smoothing procedures, in future studies.

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Table 1. Achievement Levels and Cut Scores by Grade

Assessment	Achievement Level		Achievement Level	
	Grade 4	Cut Score	Grade 8	Cut Score
DSTP	Warning[1]	425	Below the Standard	475
	Satisfactory	433	Meets the Standard	500
			Exceeds the Standard	564
			Distinguished	584
NAEP	Basic	208	Basic	243
	Proficient	238	Proficient	281
	Advanced	268	Advanced	323

1. In 2003 DSTP scores for grade 4 were used for instructional improvement. The achievement levels were primarily set as *Satisfactory* and *Unsatisfactory* with a narrow error-band for *Warning.*

Table 2. Percentage of Schools and Subgroups of Students

Subgroup	DSTP		NAEP[2]
	Population	***Sample[1]***	
Grade 4			
School	106 *(n)*	0.83	0.83
Female	0.50	0.50	0.50
Male	0.50	0.50	0.50
Black	0.31	0.31	0.34
White	0.60	0.59	0.55
ELL[3]	0.01	0.01	0.03
SPED (IEP)[4]	0.09	0.09	0.08 (0.17)
Grade 8			
School	75 *(n)*	0.49	0.49
Female	0.49	0.48	0.47
Male	0.51	0.52	0.53
Black	0.32	0.32	0.28
White	0.60	0.59	0.63
ELL	0.01	0.01	0.02
SPED (IEP)	0.12	0.12	0.08 (0.16)

[1.] The DSTP sample includes all students from the NAEP sample schools.
[2.] The NAEP sample includes students who were randomly selected using stratification sampling procedures that are briefly described in the proposal.
[3.] ELL – Limited English Proficiency students
[4.] SPED – Special education; IEP – Individualized education plan (the category used by NAEP)

Table 3a. DSTP Reading Test Specifications by Grade and Passage Type

Grade	Literary		Informative		Technical		Total	
	%	*Max. Points*	*%*	*Max. Points*	*%*	*Max. Points*	*%*	*Max. Points*
4	36	29	36	32	27	22	100	83
Actual	22	18	53	44	25	21	100	83
8	35	29	46	39	19	16	100	84
Actual	35	29	44	37	21	18	100	84

Table 3b. DSTP Reading Test Specifications by Grade and Stance of Item

Grade	Determining Meaning		Interpreting Meaning		Extending Meaning		Total	
	N. of Items	*%*	*N. of Items*	*%*	*N. of Items*	*%*	*N. of Items*	*Max. Point*
4	20	32	26	41	17	27	63	83
8	18	28	32	50	14	22	64	84

Table 3c. Percentage of NAEP Reading Items by Grade and Context for Reading

Grade	Context for Reading		
	For Literary Experience	For Information	To Perform a Task
4	55	45	No Scale
Actual	51	49	
8	40	40	20
Actual	29	40	31

Table 3d. Projected Distribution of Student Time by Grade and Aspect for Reading

Grade	**Aspect of Reading**		
	Forming a General Understanding and Developing Interpretation (%)	Making Reader/Text Connections (%)	Examining Content and Structure (%)
4	60	15	25
Actual	68	14	17
8	55	15	30
Actual	59	17	24

Source: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Reading.

Table 4a. Descriptive Statistics for DSTP by Grade

Grade	Descriptive Statistics								
	N.	*Range*	*Min.*	*Max*	*Mean*	*SD*	*Variance*	*Skewness*	*Kurtosis*
Grade 4									
Population	7279	280	330	610	467.7497	33.87009	1147.183	-0.24791	0.159155
*Sample**	6704	280	330	610	467.383	33.8036	1142.68	-0.2477	0.17127
Grade 8									
Population	9124	369	331	700	516.8109	36.70141	1346.994	-0.23947	0.321627
Sample	7532	330	370	700	517.537	37.2872	1390.33	-0.2775	0.2733

* The DSTP sample includes all students from the NAEP sample schools.

Table 4b. Descriptive Statistics for NAEP by Grade

Grade	Descriptive Statistics								
	N.	*Range*	*Min.*	*Max*	*Mean*	*SD*	*Variance*	*Skewness*	*Kurtosis*
Grade 4									
Plausible Value1	2959	258.51	69.98	328.49	224.281	29.2521	855.685	-0.2066	0.19384
Plausible Value2	2959	188.75	128.65	317.4	223.848	29.476	868.833	-0.0842	-0.1973
Plausible Value3	2959	230.57	95.27	325.84	224.285	29.7142	882.933	-0.1764	0.07607
Plausible Value4	2959	204.36	114.17	318.53	224.651	29.6075	876.607	-0.1805	-0.01
Plausible Value5	2959	209.34	124.54	333.88	224.633	29.4477	867.167	-0.1279	-0.0098
Average PV	2959	184.806	120.268	305.074	224.34	26.861	721.514	-0.1737	-0.1624
Grade 8									
Plausible Value1	2496	233.46	135.7	369.16	265.278	32.3718	1047.93	-0.4188	0.61856
Plausible Value2	2496	221.41	140.48	361.89	265.441	31.6345	1000.74	-0.4524	0.52171
Plausible Value3	2496	229.92	122.01	351.93	265.92	31.8377	1013.64	-0.4712	0.61046
Plausible Value4	2496	238.65	118.36	357.01	265.84	32.3284	1045.13	-0.5063	0.6818
Plausible Value5	2496	232.22	129.51	361.73	265.014	32.2168	1037.92	-0.431	0.51823
Average PV	2496	198.908	149.856	348.764	265.499	29.5588	873.721	-0.5591	0.60858

Table 5. Descriptive Statistics by Test, Grade and Subgroup

Statistics	DSTP					NAEP[1]				
	Total	*Female*	*Male*	*Black*	*White*	*Total*	*Female*	*Male*	*Black*	*White*
Grade 4										
N.	7279	3371	3333	2087	3985	2959	1513	1446	999	1655
Mean	467.75	470.21	464.53	450.81	476.73	224.34	226.43	222.17	210.86	233.29
Std. Deviation	33.87	33.55	33.82	32.22	31.04	26.86	27.18	26.35	24.10	24.03
SMD[2]		0.17		-0.82			0.16		-0.93	
Grade 8										
N.	9124	3645	3887	2386	4473	2496	1193	1303	659	1614
Mean	516.81	523.17	512.25	501.95	526.47	265.50	270.46	260.98	248.80	273.33
Std. Deviation	36.70	36.81	36.97	35.59	34.71	29.56	28.70	29.61	27.91	26.28
SMD		0.30		-0.70			0.32		-0.92	

1. The descriptive statistics for NAEP are based on the average of the five plausible values.
2. SMD: Standard Mean Difference

Chart 1. Relative Frequency Distributions for DSTP GR 4

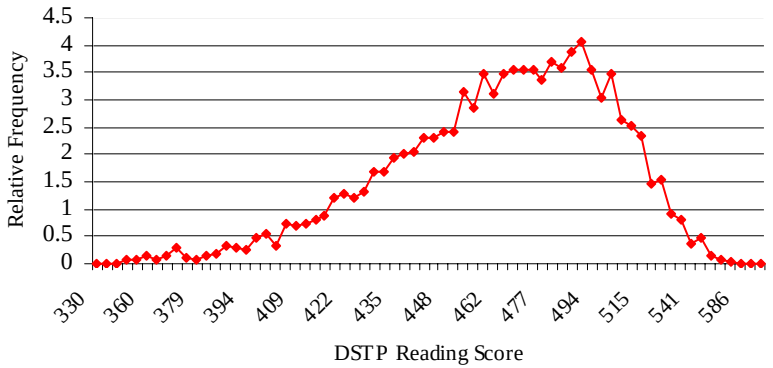


Chart 2. Relative Frequency Distributions for NAEP GR 4

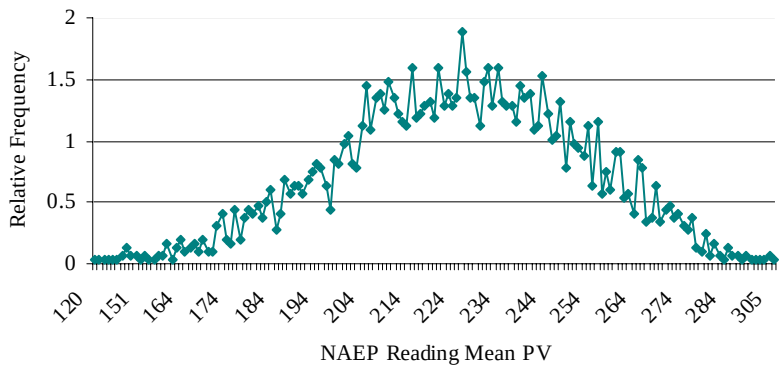


Chart 3. Relative Frequency Distribution for DSTP GR 8

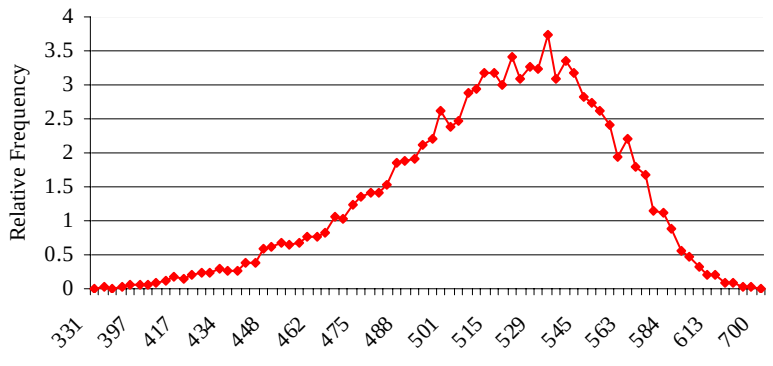
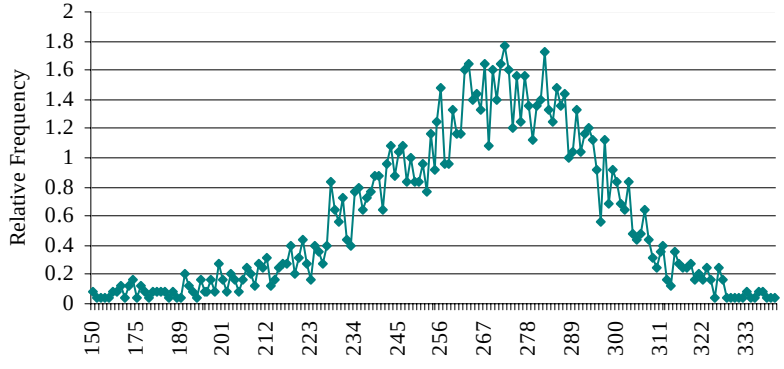


Chart 4. Relative Frequency Distributions for NAEP GR 8



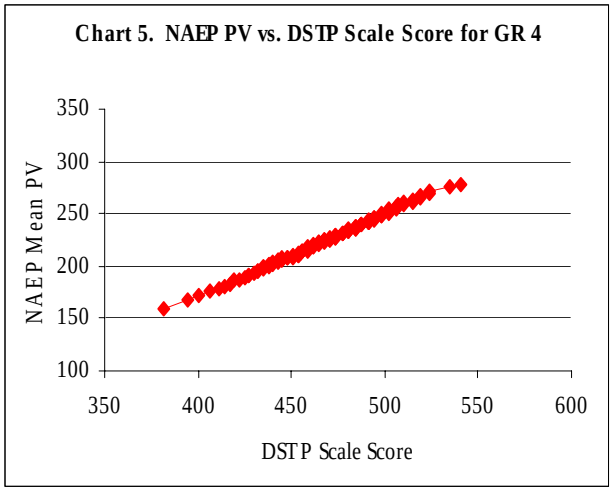


Chart 5. NAEP PV vs. DSTP Scale Score for GR 4
NAEP Mean PV
350
300
250
200
150
100
350
400
450
500
550
600
DSTP Scale Score

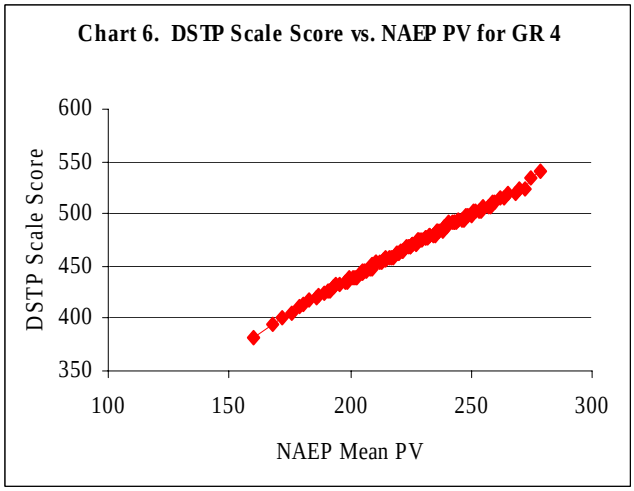


Chart 6. DSTP Scale Score vs. NAEP PV for GR 4
DSTP Scale Score
600
550
500
450
400
350
100
150
200
250
300
NAEP Mean PV

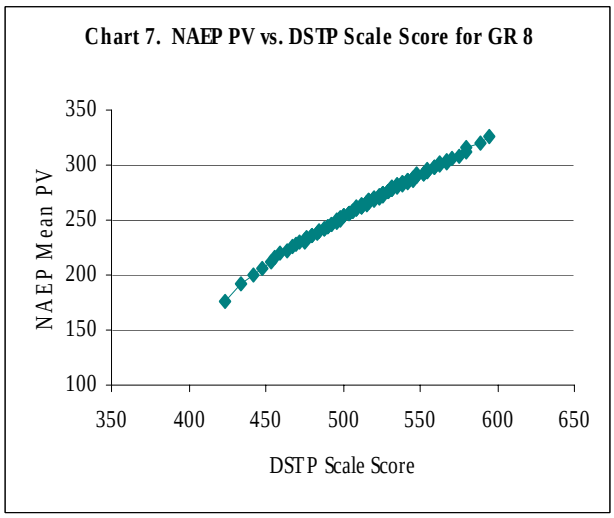


Chart 7. NAEP PV vs. DSTP Scale Score for GR 8
NAEP Mean PV
350
300
250
200
150
100
350
400
450
500
550
600
650
DSTP Scale Score

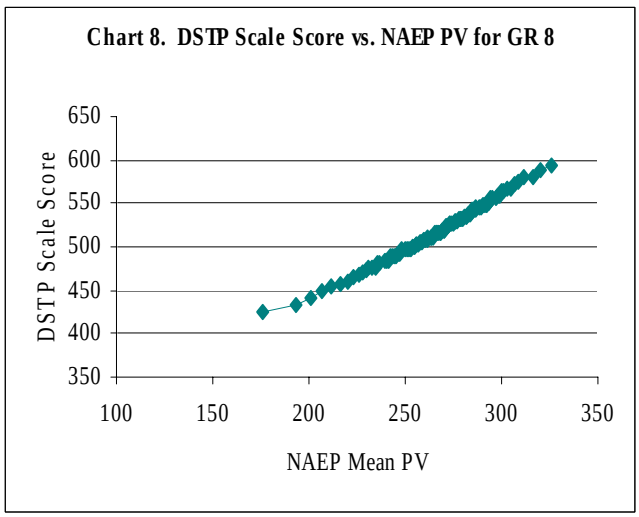


Chart 8. DSTP Scale Score vs. NAEP PV for GR 8
DSTP Scale Score
650
600
550
500
450
400
350
100
150
200
250
300
350
NAEP Mean PV

Table 6a. Scores Corresponding to Selected Percentile Ranks for Grade 4

Selected Percentile Rank	NAEP	DSTP Population	DSTP Sample
1	157.5	383.5	379
5	178.5	410	411
10	189	424	424.5
11	190.5	426	426.5
15	196	432	433
16	197.5	433.5	434.5
20	202	439	440
25	206	445	446
27	208	448	448.5
30	210	451	452
35	214	456	456.5
40	218	460.5	460.5
45	221.5	465	465.5
50	225	469	469.5
55	228.5	473.5	474.5
60	232	477.5	478
65	236	482	483
68	238	485.5	485.5
70	239.5	487	487.5
75	243.5	491.5	491
80	248	496	496
85	253	502	502
90	259	510	509.5
95	267.5	521	519
96	269.5	524	522
99	280	541.5	541.5

The red indicates the location of the cut score for NAEP.

Table 6b. Scores Corresponding to Selected Percentile Ranks for Grade 4 Male Students

Selected PR	NAEP	DSTP		Selected PR	NAEP Male	DSTP Male	
		Population	Sample			Population	Sample
1	157.5	383.5	379	1	155.5	374	371.5
5	178.5	410	411	5	178.5	407.5	407
10	189	424	424.5	10	187.5	420.5	420.5
11	190.5	426	426.5	11	189	423	423
15	196	432	433	15	195	430	430
16	197.5	433.5	434.5	16	196	431	431
20	202	439	440	20	201	438	436
25	206	445	446	25	205	443	443
27	208	448	448.5	27	206.5	445	444.5
30	210	451	452	30	208.5	448.5	448
35	214	456	456.5	35	212	454	453.5
40	218	460.5	460.5	40	215.5	458.5	457.5
45	221.5	465	465.5	45	219	462.5	462
50	225	469	469.5	50	223	466.5	466.5
55	228.5	473.5	474.5	55	226	471	470.5
60	232	477.5	478	60	230	474.5	474
65	236	482	483	65	233	479.5	478.5
68	238	485.5	485.5	68	235.5	483.5	482
70	239.5	487	487.5	70	237	484.5	484
75	243.5	491.5	491	75	241	489	487.5
80	248	496	496	80	244.5	494	493.5
85	253	502	502	85	249	500	500
90	259	510	509.5	90	256.5	506.5	506
95	267.5	521	519	95	266	517	517
96	269.5	524	522	96	268.5	519	519
99	280	541.5	541.5	99	277	536	536

The red indicates the location of the cut score for NAEP.

Table 6c. Scores Corresponding to Selected Percentile Ranks for Grade 4 Female Students

Selected PR	NAEP	DSTP		Selected PR	NAEP	DSTP Female	
		Population	Sample		Female	Population	Sample
1	157.5	383.5	379	1	158	381.5	382
5	178.5	410	411	5	180	414	414
10	189	424	424.5	10	190	426.5	426.5
11	190.5	426	426.5	11	191.5	428.5	428.5
15	196	432	433	15	197.5	435	435
16	197.5	433.5	434.5	16	199	436.5	436.5
20	202	439	440	20	203	441.5	441.5
25	206	445	446	25	207.5	448	448
27	208	448	448.5	27	209	449.5	450.5
30	210	451	452	30	212	454	454
35	214	456	456.5	35	216	458.5	457.5
40	218	460.5	460.5	40	220.5	462	462
45	221.5	465	465.5	45	224	467.5	467.5
50	225	469	469.5	50	227	471.5	471.5
55	228.5	473.5	474.5	55	230.5	475.5	475.5
60	232	477.5	478	60	234	480	480
65	236	482	483	65	238	485.5	484.5
68	238	485.5	485.5	68	240.5	487.5	487
70	239.5	487	487.5	70	242	490.5	490
75	243.5	491.5	491	75	247	494	493.5
80	248	496	496	80	251	498.5	498.5
85	253	502	502	85	255	505.5	504
90	259	510	509.5	90	261	512.5	510.5
95	267.5	521	519	95	269	524	524
96	269.5	524	522	96	271.5	527	527
99	280	541.5	541.5	99	283	547	544

The red indicates the location of the cut score for NAEP.

Table 6d. Scores Corresponding to Selected Percentile Ranks for Grade 4 Black Students

Selected PR	NAEP	DSTP		Selected PR	NAEP Black	DSTP Black	
		Population	Sample			Population	Sample
1	157.5	383.5	379	1	152.5	365.5	365.5
5	178.5	410	411	5	171.5	397	396
10	189	424	424.5	10	179.5	410	410
11	190.5	426	426.5	11	181	412	412
15	196	432	433	15	186	418.5	418
16	197.5	433.5	434.5	16	187	420.5	420
20	202	439	440	20	191	426	425
25	206	445	446	25	194	430.5	430
27	208	448	448.5	27	196	432	431.5
30	210	451	452	30	198.5	435	434.5
35	214	456	456.5	35	202	439.5	439
40	218	460.5	460.5	40	205	444	444
45	221.5	465	465.5	45	207.5	448	447.5
50	225	469	469.5	50	210	451.5	451
55	228.5	473.5	474.5	55	213	455.5	455.5
60	232	477.5	478	60	216	459.5	459
65	236	482	483	65	220	463.5	462.5
68	238	485.5	485.5	68	222.5	466.5	465.5
70	239.5	487	487.5	70	224	468	467.5
75	243.5	491.5	491	75	227	472.5	472.5
80	248	496	496	80	232	478.5	478.5
85	253	502	502	85	237	485.5	485.5
90	259	510	509.5	90	242.5	491.5	491
95	267.5	521	519	95	250	502	502
96	269.5	524	522	96	251.5	504.5	504.5
99	280	541.5	541.5	99	264.5	524.5	524.5

The red indicates the cut score or the next existed point to the cut score for NAEP.

Table 6e. Scores Corresponding to Selected Percentile Ranks for Grade 4 White Students

Selected PR	NAEP	DSTP		Selected PR	NAEP White	DSTP White	
		Population	Sample			Population	Sample
1	157.5	383.5	379	1	174.5	392.5	394
5	178.5	410	411	5	191	423.5	423.5
10	189	424	424.5	10	202.5	436.5	436.5
11	190.5	426	426.5	11	204	438	438
15	196	432	433	15	208	444	444
16	197.5	433.5	434.5	16	209	445	445
20	202	439	440	20	213	452.5	452.5
25	206	445	446	25	217	457.5	456.5
27	208	448	448.5	27	218.5	459	459
30	210	451	452	30	221	462	462
35	214	456	456.5	35	224.5	466.5	466.5
40	218	460.5	460.5	40	227.5	471	470.5
45	221.5	465	465.5	45	231	474.5	474
50	225	469	469.5	50	234	478.5	477.5
55	228.5	473.5	474.5	55	237	483.5	482
60	232	477.5	478	60	240	486.5	486.5
65	236	482	483	65	243	491	490.5
68	238	485.5	485.5	68	245	493	492
70	239.5	487	487.5	70	247	494	493.5
75	243.5	491.5	491	75	251	498.5	498
80	248	496	496	80	254.5	503	502.5
85	253	502	502	85	259	508	508
90	259	510	509.5	90	264	515	515
95	267.5	521	519	95	271	524	524
96	269.5	524	522	96	272.5	527	527
99	280	541.5	541.5	99	283	544	544

The red indicates the cut score or the next existed point to the cut score for NAEP.

Table 7. Statistics for Linking Error and Population Invariance of Linking for Grade 4

	Estimated Standard Error of Linking			RMSD			
Selected	NAEP	DSTP	**Selected**	DSTP			
PR	Mean PL	Sample	**PR**	Male	Female	Black	White
5	1.25	1.64	5				
10	1.01	1.25	10				
25	0.81	1.00	25				
27	0.77	0.99	27	0.0832	0.0416	0.2784	0.2205
50	0.74	0.94	50				
68	0.78	0.98	68	0.0728	0.0312	0.3275	0.1365
75	0.82	1.02	75				
90	1.03	1.27	90				
95	1.33	1.43	95	0.0416	0.104	0.2784	0.105
REMSD				0.0721	0.0434	0.2716	0.1841
				Gender	0.0595	Race	0.2320

RMSD: Standardized Root of Mean Standard Difference
REMSD: Standardized Root of Expected Mean Standard Difference
PR-27: NAEP Basic
PR-68: NAEP Proficient
PR-95: NAEP Advanced

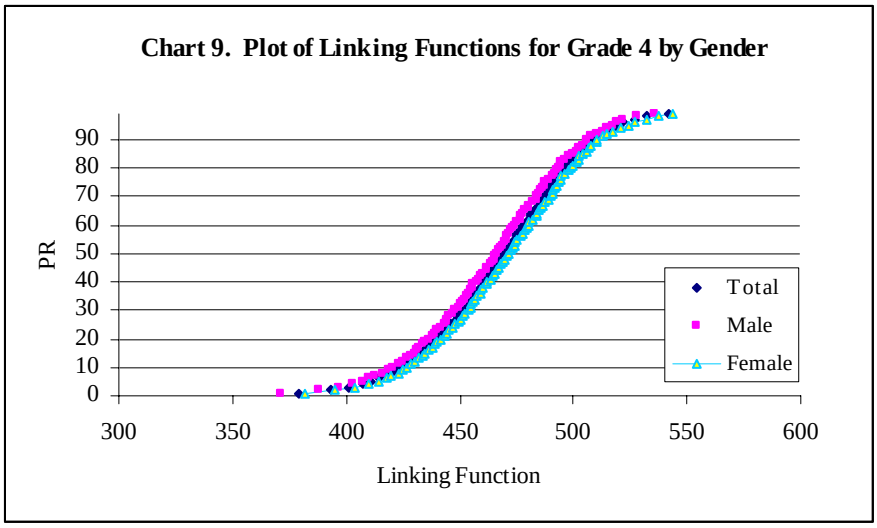


Chart 9. Plot of Linking Functions for Grade 4 by Gender
PR
90
80
70
60
50
40
30
20
10
0
300
350
400
450
500
550
600
Linking Function
Total
Male
Female

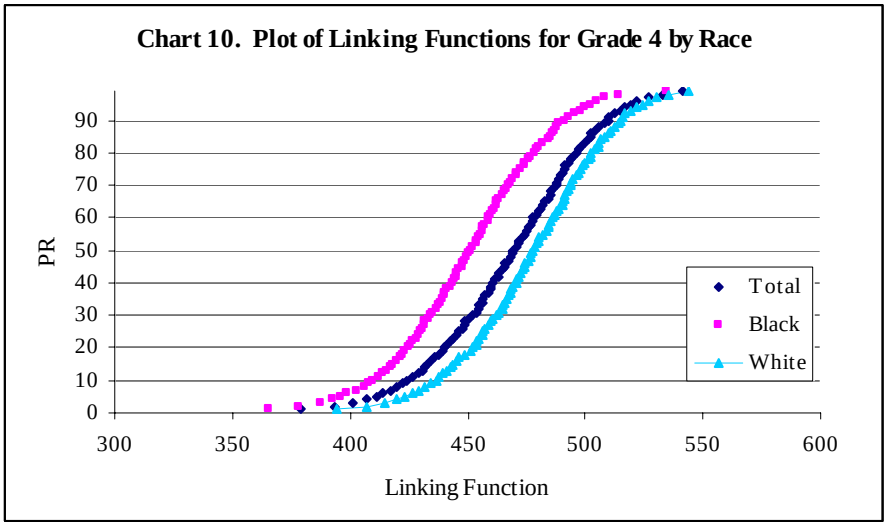


Chart 10. Plot of Linking Functions for Grade 4 by Race
PR
90
80
70
60
50
40
30
20
10
0
300
350
400
450
500
550
600
Linking Function
Total
Black
White

Table 8a. Scores Corresponding to Selected Percentile Ranks for Grade 8

Selected Percentile Rank	NAEP	DSTP Population	DSTP Sample
1	178	421.5	418
5	212	452.5	452
6	216	456.5	455
10	228	469	469
13	232.5	475.5	475.5
15	236	479	478.5
20	242	486.5	488
21	243	488.5	489
25	247	494.5	494.5
30	253	499.5	499.5
31	254	500.5	501
35	257	505	505.5
40	261.5	509	510.5
45	265	514.5	515
50	268	518.5	519.5
55	271.5	523	524.5
60	275	527.5	529
65	278.5	532	532.5
68	281	534.5	535.5
70	282	536.5	538
75	286	542	543.5
80	290	546.5	548
85	294	553.5	555
90	300	563	563
91	301.5	565	565
95	309	573.5	573.5
98	320*	586.5	586.5
99	326	598	598.5

The red indicates the location of the cut score for NAEP.
* The cut score for the NAEP Advanced level is located between PR 98 and PR 99.

Table 8b. Scores Corresponding to Selected Percentile Ranks for Grade 8 Male Students

Selected PR	NAEP	DSTP Population	DSTP Sample	Selected PR	NAEP Male	DSTP Male Population	DSTP Male Sample
1	178	421.5	418	1	155.5	415.5	414.5
5	212	452.5	452	5	178.5	447	446.5
6	216	456.5	455	6	180.5	451	450
10	228	469	469	10	187.5	463	463
13	232.5	475.5	475.5	13	192	470.5	470.5
15	236	479	478.5	15	195	473.5	474
20	242	486.5	488	20	201	483	483
21	243	488.5	489	21	202	484	484
25	247	494.5	494.5	25	205	489	489
30	253	499.5	499.5	30	208.5	494.5	495.5
31	254	500.5	501	31	209	496	496
35	257	505	505.5	35	212	499.5	499.5
40	261.5	509	510.5	40	215	505	505.5
45	265	514.5	515	45	219	509	510.5
50	268	518.5	519.5	50	223	513.5	515
55	271.5	523	524.5	55	226	518.5	519.5
60	275	527.5	529	60	230	522.5	523.5
65	278.5	532	532.5	65	233	527.5	528.5
68	281	534.5	535.5	68	235.5	529.5	531.5
70	282	536.5	538	70	237	532	532.5
75	286	542	543.5	75	241	536.5	537.5
80	290	546.5	548	80	244.5	542	543.5
85	294	553.5	555	85	249	548	550
90	300	563	563	90	256.5	555	557
91	301.5	565	565	91	258	557	559
95	309	573.5	573.5	95	266	567	569
98	320*	586.5	586.5	98	272.5	582	582
99	326	598	598.5	99	276.5	592	592

The red indicates the location of the cut score for NAEP.

* The cut score for the NAEP Advanced level is located between PR98 and PR99.

Table 8c. Scores Corresponding to Selected Percentile Ranks for Grade 8 Female Students

Selected PR	NAEP	DSTP		Selected PR	NAEP Female	DSTP Female	
		Population	Sample			Population	Sample
1	178	421.5	418	1	157	427	426.5
5	212	452.5	452	5	180	460.5	459
6	216	456.5	455	6	182.5	464.5	463
10	228	469	469	10	190	475.5	474
13	232.5	475.5	475.5	13	194	482	481
15	236	479	478.5	15	197.5	485	485
20	242	486.5	488	20	203	493	493
21	243	488.5	489	21	204	494.5	495
25	247	494.5	494.5	25	207	499.5	499.5
30	253	499.5	499.5	30	212	505	506
31	254	500.5	501	31	213	506	507.5
35	257	505	505.5	35	216	510.5	511.5
40	261.5	509	510.5	40	220.5	515	516
45	265	514.5	515	45	224	518.5	520
50	268	518.5	519.5	50	227	523	525.5
55	271.5	523	524.5	55	230.5	527.5	529.5
60	275	527.5	529	60	234	532	533.5
65	278.5	532	532.5	65	238	536.5	538
68	281	534.5	535.5	68	240.5	540	541.5
70	282	536.5	538	70	242	542	542.5
75	286	542	543.5	75	247	546	548
80	290	546.5	548	80	251	552.5	554.5
85	294	553.5	555	85	255	559	561
90	300	563	563	90	260.5	567	569
91	301.5	565	565	91	262.5	569	570.5
95	309	573.5	573.5	95	269	578	580
98	320*	586.5	586.5	98	276.5	592	592
99	326	598	598.5	99	283	598	604

The red indicates the location of the cut score for NAEP.

* The cut score for the NAEP Advanced level is located between PR98 and PR99.

Table 8d. Scores Corresponding to Selected Percentile Ranks for Grade 8 Black Students

Selected PR	NAEP	DSTP Population	DSTP Sample	Selected PR	NAEP Black	DSTP Black
1	178	421.5	418	1	170	407
5	212	452.5	452	5	198	441
6	216	456.5	455	6	201.5	444
10	228	469	469	10	211.5	454
13	232.5	475.5	475.5	13	218.5	462.5
15	236	479	478.5	15	222	465.5
20	242	486.5	488	20	228	473.5
21	243	488.5	489	21	229	474.5
25	247	494.5	494.5	25	234	478.5
30	253	499.5	499.5	30	237	484
31	254	500.5	501	31	237.5	485
35	257	505	505.5	35	240	490
40	261.5	509	510.5	40	244	495.5
45	265	514.5	515	45	247	499.5
50	268	518.5	519.5	50	251	504
55	271.5	523	524.5	55	254.5	508.5
60	275	527.5	529	60	258.5	513.5
65	278.5	532	532.5	65	261.5	517
68	281	534.5	535.5	68	263	519.5
70	282	536.5	538	70	264	521.5
75	286	542	543.5	75	267.5	526.5
80	290	546.5	548	80	271.5	532
85	294	553.5	555	85	276	537.5
90	300	563	563	90	282.5	545
91	301.5	565	565	91	284	546.5
95	309	573.5	573.5	95	291.5	556.5
98	320*	586.5	586.5	98	298	569.5
99	326	598	598.5	99	304	578

The red indicates the location of cut scores for NAEP.

* The cut score for the NAEP Advance level is located between PR98 and PR99.

Table 8e. Scores Corresponding to Selected Percentile Ranks for Grade 8 White Students

Selected PR	NAEP	DSTP Population	DSTP Sample	Selected PR	NAEP White	DSTP White
1	178	421.5	418	1	193	431.5
5	212	452.5	452	5	227.5	465
6	216	456.5	455	6	229.5	469.5
10	228	469	469	10	239.5	482
13	232.5	475.5	475.5	13	244	488
15	236	479	478.5	15	246.5	491.5
20	242	486.5	488	20	253	498
21	243	488.5	489	21	254	499.5
25	247	494.5	494.5	25	258	505.5
30	253	499.5	499.5	30	262.5	510.5
31	254	500.5	501	31	263	512
35	257	505	505.5	35	266	515.5
40	261.5	509	510.5	40	269.5	520
45	265	514.5	515	45	272.5	524.5
50	268	518.5	519.5	50	276	528.5
55	271.5	523	524.5	55	279	532.5
60	275	527.5	529	60	282	536.5
65	278.5	532	532.5	65	284.5	541.5
68	281	534.5	535.5	68	286	543.5
70	282	536.5	538	70	287	545
75	286	542	543.5	75	291	550
80	290	546.5	548	80	294.5	555
85	294	553.5	555	85	299	562.5
90	300	563	563	90	304	569
91	301.5	565	565	91	305.5	570.5
95	309	573.5	573.5	95	313	580
98	320*	586.5	586.5	98	321.5	592
99	326	598	598.5	99	327.5	604

The red indicates the location of cut score for NAEP.

* The cut score for the NAEP Advance level is located between PR98 and PR99.

Table 9. Statistics for Linking Error and Population Invariance of Linking for Grade 8

	Estimated Standard Error of Linking			RMSD			
Selected	NAEP	DSTP	**Selected**	DSTP			
PR	Mean PL	Sample	**PR**	Male	Female	Black	White
5	1.73	1.84	5				
10	1.15	.1.40	10				
21	0.95	1.22	21	0.0974	0.1123	0.2217	0.218
25	0.91	1.08	25				
50	0.86	1.00	50				
68	0.90	1.05	68	0.078	0.1123	0.2446	0.1661
75	0.94	1.09	75				
90	1.10	1.32	90				
95	1.29	1.58	95				
98	1.60	1.89	98	0.877	0.103	0.26	0.1141
99	1.95	2.11	99	0.1267	0.103	0.3134	0.1141
REMSD				0.0982	0.0957	0.2263	0.1850
				Gender	0.0970	*Race*	0.2067

RMSD: Standardized Root of Mean Standard Difference
REMSD: Standardized Root of Expected Mean Standard Difference
PR-21: NAEP Basic
PR-68: NAEP Proficient
PR-98/99: NAEP Advanced

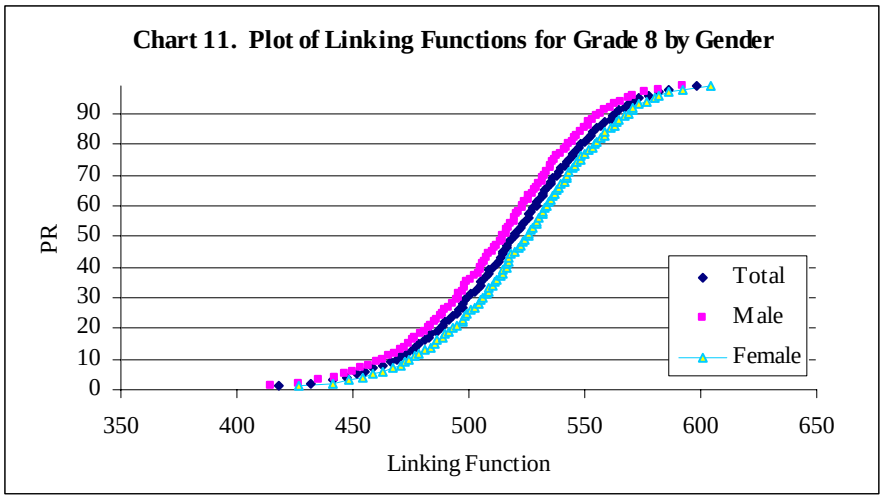


Chart 11. Plot of Linking Functions for Grade 8 by Gender
PR
90
80
70
60
50
40
30
20
10
0
350
400
450
500
550
600
650
Linking Function
Total
Male
Female

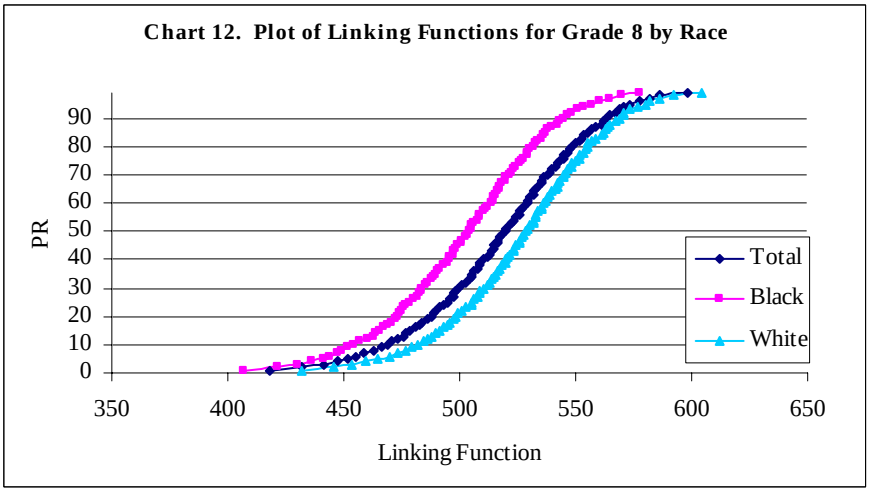


Chart 12. Plot of Linking Functions for Grade 8 by Race
PR
90
80
70
60
50
40
30
20
10
0
350
400
450
500
550
600
650
Linking Function
Total
Black
White

Table 10. Estimated NAEP Average Scores by Grade and Subgroup

	2003 Grade 4				2003 Grade 8			
Group	DSTP[1]	Estimated NAEP[2]	Actual NAEP	Difference	DSTP	Estimated NAEP	Actual NAEP	Difference
Total	468	223	224	-1	517	267	266	-1
Male	465	221 (221)	222	-1	512	262	261	1
Female	470	225 (225.5)	226	-1 (-0.5)	523	271	271	0
Black	451	209 (210)	211	-2 (-1)	502	255 (249)	249	3 (0)
White	477	230.5 (233)	233	-2.5 (0)	526	273 (274)	273	0 (1)
	2005 Grade 4				**2005 Grade 8**			
Group	DSTP	Estimated NAEP	Actual NAEP	Difference	DSTP	Estimated NAEP	Actual NAEP	Difference
Total	470	225	226	-1	525	271.5	266	5.5
Male	467	223	223	0	520	269	261	8
Female	473	228 (227.5)	229	-1 (-1.5)	530	276	271	5
Black	456	213 (213.5)	212	1 (1.5)	511	261.5 (256)	252	9.5 (4)
White	477	231 (233)	235	-4 (-2)	534	279 (280)	274	5 (6)
	2007 Grade 4				**2007 Grade 8**			
Group	DSTP	Estimated NAEP	Actual NAEP	Difference	DSTP	Estimated NAEP	Actual NAEP	Difference
Total	469	224.5	225	-.5	524	271.5	265	5.5
Male	466	222	222	0	520	269	260	9
Female	473	228 (227.5)	228	0 (-.5)	527	273.5	269	4.5
Black	455	212	213	-1	509	261 (254.5)	250	11 (4.5)
White	478	232 (234)	233	-1 (1)	534	279 (280)	274	5 (6)

[1] The DSTP data is based on the grade population.

[2] The estimated NAEP score in parenthesis is based on the concordance table for the subgroup whenever there is a difference.

Table 11. Comparison of Student Academic Progress

	DSTP			Progress		NAEP			Progress	
	2003	2005	2007	2003-2005	2003-2007	2003	2005	2007	2003-2005	2003-2007
Grade 4										
Total	468	470	469	2	1	224	226	225	2	1
Male	465	467	466	2	1	222	223	222	1	0
Female	470	473	473	3	3	226	229	228	3	2
Black	451	456	455	5	4	211	212	213	1	2
White	477	477	478	0	1	233	235	233	2	0
Grade 8										
Total	517	525	524	8	7	266	266	265	0	-1
Male	512	520	520	8	8	261	261	260	0	-1
Female	523	530	527	7	4	271	271	269	0	-2
Black	502	511	509	9	7	249	252	250	3	1
White	526	534	534	8	8	273	274	274	1	1

Appendix A-1

Reading Passages and Sample Items for Grade 4

NAEP Sample Passage and Items

I magine shivering on a cold winter's night. The tip of your nose tingles in the frosty air. Finally, you climb into bed and find the toasty treat you have been waiting for—your very own hot brick. If you had lived in colonial days, that would not sound as strange as it does today. Winters were hard in this New World, and the colonists had to think of clever ways to fight the cold. At bedtime, they heated soapstones, or bricks, in the fireplaces. They wrapped the bricks in cloths and tucked them into their beds. The brick kept them warm at night, at least for as long as its heat lasted.

Before the colonists slipped into bed, they rubbed their icy sheets with a bed warmer. This was a metal pan with a long wooden handle. The pan held hot embers from the fireplace. It warmed the bedding so well that sleepy bodies had to wait until the sheets cooled before climbing in.

Staying warm wasn't just a bedtime problem. On winter rides, colonial travelers covered themselves with animal skins and warm blankets. Tucked under the blankets, near their feet, were small tin boxes called foot stoves. A foot stove held burning coals. Hot smoke puffed from small holes in the stove's lid, soothing freezing feet and legs. When the colonists went to Sunday services, their foot stoves, furs, and blankets went with them. The meeting houses had no heat of their own until the 1800s.

At home, colonial families huddled close to the fireplace, or hearth. The fireplace was wide and high enough to hold a large fire, but its chimney was large, too. That caused a problem: Gusts of cold air blew into the house. The area near the fire was warm, but in the rest of the room it might still be cold enough to see your breath.

Reading or needlework was done by candlelight or by the light of the fire. During the winter, animal skins sealed the drafty windows of some cabins and blocked out the daylight. The living area inside was gloomy, except in the circle of light at the hearth.

Early Americans did not bathe as often as we do. When they did, their "bathroom" was the kitchen, in that toasty space by the hearth. They partially filled a tub of cold water, then warmed it up with water heated in the fireplace. A blanket draped from chairs for privacy also let the fire's warmth surround the bather.

The household cooks spent hours at the hearth. They stirred the kettle of corn pudding or checked the baking bread while the rest of the family carried on their own fireside activities. So you can see why the fireplace was the center of a colonial home. The only time the fire was allowed to die down was at bedtime. Ashes would be piled over the fire, reducing it to embers that might glow until morning.

By sunrise, the hot brick had become a cold stone once more. An early riser might get dressed under the covers, then hurry to the hearth to warm up.

Maybe you'd enjoy hearing someone who kept warm in these ways tell you what it was like. You wouldn't need to look for someone who has been living for two hundred years. In many parts of the country, the modern ways didn't take over from the old ones until recently. Your own

grandparents or other older people might remember the warmth of a hearthside and the joy of having a brick to cuddle up to.

1. You would probably read this article if you wanted to know how the colonists

A. cooked their food
B. traveled in the winter
C. washed their clothes
D. kept warm in cold weather

[General understanding]

2. Some of the ways that colonists kept warm during the winter were different from the ways that people keep warm today. Tell about two of these differences.

[Reader/text connections]

Score and Description
Evidence of Full Comprehension These responses give an opinion using clear and substantive information from the article and displaying an ability to make a personal connection with the text information. The supporting information is explicitly from the article and is used appropriately in support of their opinion.
Evidence of Partial or Surface Comprehension These responses support an opinion of colonial life with unclear information or information related to colonial life that is not clearly from the article. Or, they use evidence from the article to describe colonial life without explicitly stating an opinion.
Evidence of Little or No Comprehension These responses contain inappropriate information from the article or personal opinions about the article but do not demonstrate an understanding of what it was like to live during colonial times as described in the article. They may answer the question, but provide no substantive explanation.

3. Do you think "A Brick to Cuddle Up To" is a good title for this article? Using information from the article, tell why or why not.

[Aspect, Developing interpretation]

Score and Description
Evidence of Full Comprehension These responses support an opinion with a clear explanation of the relationship between the title and the article. They summarize or articulate information from the article and tell whether it does or does not relate to the title.
Evidence of Partial or Surface Comprehension These responses support an opinion with a vague explanation that does not demonstrate a clear understanding of how the title applies to the article. Or, they use evidence from the article to assess the title's appropriateness without explicitly stating or implying an opinion.
Evidence of Little or No Comprehension These responses contain inappropriate information from the article or personal opinions about the article and/or do not demonstrate any understanding of the title. They may answer the question, but they provide no substantive explanation from the article.

4. In writing this article, the author mostly made use of

A. broad ideas
B. specific details
C. important questions
D. interesting characters

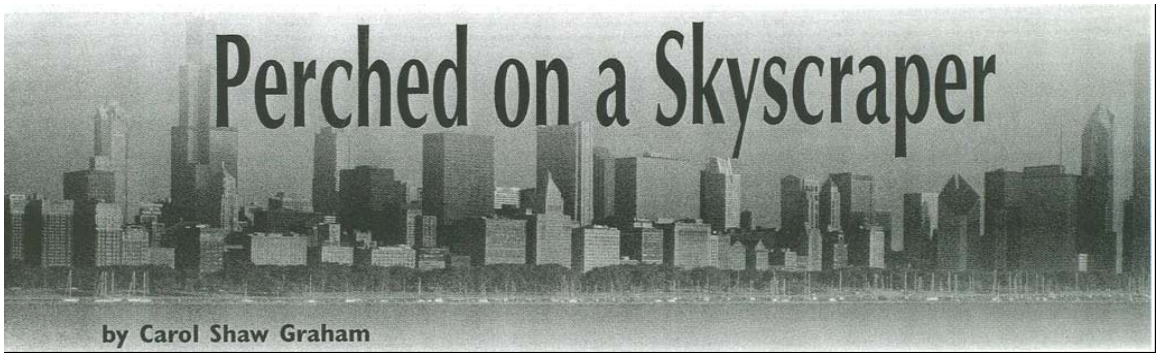
[Examining content and structure]

5. Pretend that you are an early American colonist. Describe at least three activities you might do during a cold winter evening. Be specific. Use details from the article to help you write your description.

[Developing interpretation]

Score and Description
Extensive These responses demonstrate an overall understanding of how staying warm was a central concern for colonists on a cold winter evening. They present three or more evening activities, three of which involve the need to stay warm as described in the article.
Essential These responses demonstrate an understanding of the colonial lifestyle portrayed in the article. They present at least three text-based evening activities, one or two of which involve the need to stay warm as described in the article.
Partial These responses begin to discuss a typical evening in the colonies. They use details that are based on superficial information from the article and describe one or two activities unrelated to the need to stay warm (which was the major focus of the article). Or, they mention one or two activities from the article that involve staying warm. Or, they generalize about the need to stay warm without specifying any activity.
Unsatisfactory These responses contain inappropriate information from the article or personal opinions about the article but do not discuss a typical colonial evening. They demonstrate no understanding of the colonists' lifestyle as portrayed in the passage.

DSTP Sample Passage and Items



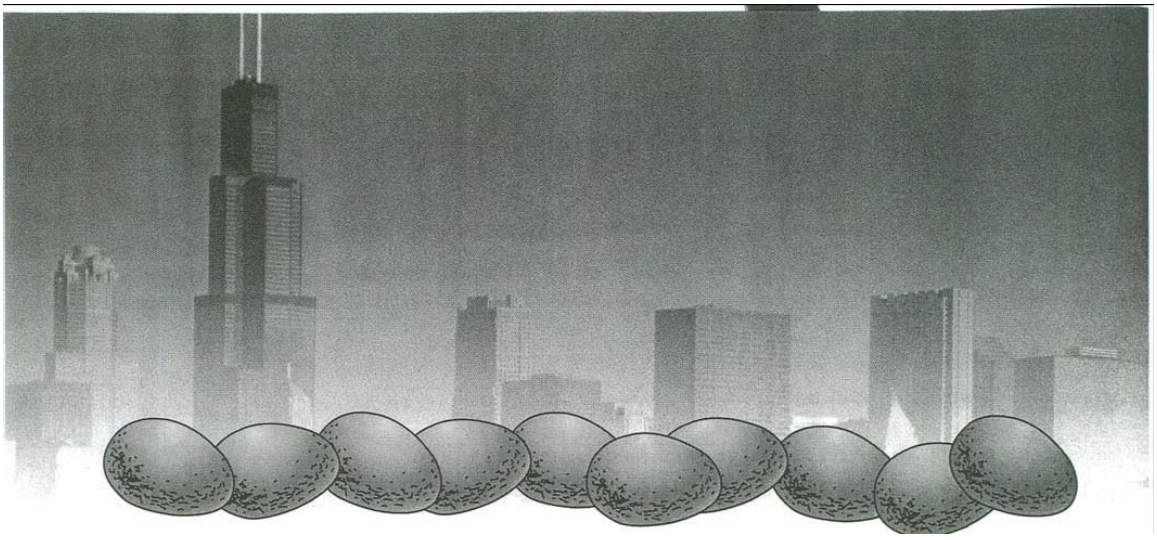
The peregrine falcon is a large, wild bird. Usually its home is a high, rocky cliff. The bird flies high above the ground, using its keen eyes to look for smaller birds to eat. When the falcon sees its prey, it dives quickly toward it. Zoom! The falcon has breakfast.

Many years ago, ornithologists learned that peregrine falcons were slowly dying out. Why? The scientists looked closely at the falcons. They studied the places where the falcons lived. They looked at what the falcons ate. They watched how the falcons behaved. The scientists learned that the shells of the falcon eggs were very soft. They were sometimes so soft that a mother bird crushed the eggs as she tried to keep them warm. This was not good. Something was not right.

The scientists studied more. They learned that, at that time, farmers used a spray called DDT. The spray killed insects that hurt the crops. When falcons ate birds that ate insects covered with DDT, the DDT caused a change in the falcons' bodies. The DDT made the falcons' eggshells weak.

When people learned what DDT was doing, they stopped using it. Was it too late for the peregrine falcon? People had to wait and see.

In the United States and Canada, people hurried to save peregrine falcons. They collected eggs and helped them hatch. They fed the young birds and taught them to get along in the wild.



In big cities, scientists help falcons nest on tall buildings called skyscrapers. The scientists place special nesting boxes high on the outside of the building. The falcons don't mind living on the buildings. The skyscrapers are a lot like cliffs. When a falcon pair chooses a box as their nest, it is exciting. In Montreal, Canada, scientists placed a camera near a nesting box on the Stock Exchange Tower. People can watch the falcons on a TV screen in the lobby of the building.

Today the peregrine falcon is doing much better than it was a few years ago. Young, healthy falcons can be found in the wild. There are still nesting falcons in more than 25 cities.

Do you live in a big city? Look up! You just might see a falcon!

Carol Shaw Graham writes stories for children's magazines, including *Cricket, Jack and Jill,* and *Hopscotch.*

1. Ornithologists are —
   A. Scientists
   B. Farmers
   C. Insects
   D. Birds

   [Determining Meaning]

2. The author's main purpose for writing this article was to explain —
   A. how birds behave
   B. how falcons help farmers
   C. why scientists rescue birds
   D. why falcons need help

   [Interpreting Meaning]

3. Explain how scientists discovered what caused the problem for the falcons. Use details from the article in your answer.

   [Determining Meaning]

Score	Description
2	Response is a thorough explanation of how the scientists discovered what caused the problem for the falcons, supported with relevant details from the article.
1	Response is a limited explanation of how the scientists discovered what caused the problem for the falcons, with mostly general references to the article.
0	Response is irrelevant or incorrect for this question.
Exemplar	The scientists observed where the falcons lived, what they ate, and how they behaved to discover that they were living near farms with DDT and eating birds that were poisoned.

4. Was moving the falcons to the city a good idea? Why or why not? Use information from the article to support your opinion.

[Extending Meaning]

Score	Description
4	Response is a thorough explanation of whether or not moving the falcons to the city was a good idea supported with sufficient, specific, and relevant information from the article.
3	Response is an adequate explanation of whether or not moving the falcons to the city was a good idea supported with some relevant information from the article.
2	Response is a limited explanation of whether or not moving the falcons to the city was a good idea with mostly general references to the article.
1	Response is an attempted explanation of whether or not moving the falcons to the city was a good idea with mostly vague references to the article.
0	Response is irrelevant or incorrect for this question.
Exemplar	**YES:** Falcons can be studied. There is an opportunity for others to observe nature and this will make people have more respect for nature. As a result, the falcon population is increasing and is no longer endangered (in 25 cities, young seen in the wild now). **NO:** DDT is no longer used so the problem should take care of itself without interference. People shouldn't interfere with the life cycle of falcons – wild animals may become tame with cameras trained on them and people all about them. It is not natural for scientists to make the nests, etc.

Appendix A-2

Reading Passages and Sample Items for Grade 8

THANK YOU, M'AM
by Langston Hughes

She was a large woman with a large purse that had everything in it but a hammer and nails. It had a long strap, and she carried it slung across her shoulder. It was about eleven o'clock at night, dark, and she was walking alone, when a boy ran up behind her and tried to snatch her purse. The strap broke with a sudden single tug the boy gave it from behind. But the boy's weight and the weight of the purse combined caused him to lose his balance. Instead of taking off full blast as he had hoped, the boy fell on his back on the sidewalk and his legs flew up. The large woman simply turned around and kicked him right square in his blue-jeaned sitter. Then she reached down, picked the boy up by his shirtfront, and shook him until his teeth rattled.

After that the woman said, "Pick up my pocketbook, boy, and give it here."

She still held him tightly. But she bent down enough to permit him to stoop and pick up her purse. Then she said, "Now ain't you ashamed of yourself?"

Firmly gripped by his shirtfront, the boy said, "Yes'm."

The woman said, "What did you want to do it for?"

The boy said, "I didn't aim to."

She said, "You a lie!"

By that time two or three people passed, stopped, turned to look, and some stood watching.

"If I turn you loose, will you run?" asked the woman.

"Yes'm," said the boy.

"Then I won't turn you loose," said the woman. She did not release him.

"Lady, I'm sorry," whispered the boy.

"Um-hum! Your face is dirty. I got a great mind to wash your face for you. Ain't you got nobody home to tell you to wash your face?"

"No'm," said the boy.

"Then it will get washed this evening," said the large woman, starting up the street, dragging the frightened boy behind her.

He looked as if he were fourteen or fifteen, frail and willow-wild, in tennis shoes and blue jeans.

The woman said, "You ought to be my son. I would teach you right from wrong. Least I can do right now is to wash your face. Are you hungry?"

"No'm," said the being-dragged boy. "I just want you to turn me loose."

"Was I bothering *you* when I turned that corner?" asked the woman.

"No'm."

"But you put yourself in contact with *me*," said the woman. "If you think that contact is not going to last awhile, you got another thought coming. When I get through with you, sir, you are going to remember Mrs. Luella Bates Washington Jones."

Sweat popped out on the boy's face and he began to struggle. Mrs. Jones stopped, jerked him around in front of her, put a half nelson about his neck, and continued to drag him up the street. When she got to her door, she dragged the boy inside, down a hall, and into a large kitchenette-furnished room at the rear of the house. She switched on the light and left the door open. The boy could hear other roomers laughing and talking in the large house. Some of their doors were open, too, so he knew he and the woman were not alone. The woman still had him by the neck in the middle of her room.

She said, "What is your name?"

"Roger," answered the boy.

"Then, Roger, you go to that sink and wash your face," said the woman, whereupon she turned him loose—at last. Roger looked at the door—looked at the woman—looked at the door—*and went to the sink*.

"Let the water run until it gets warm," she said. "Here's a clean towel."

"You gonna take me to jail?" asked the boy, bending over the sink.

"Not with that face, I would not take you nowhere," said the woman. "Here I am trying to get home to cook me a bite to eat, and you snatch my pocketbook! Maybe you ain't been to your supper either, late as it be. Have you?"

"There's nobody home at my house," said the boy.

"Then we'll eat," said the woman. "I believe you're hungry—or been hungry—to try to snatch my pocketbook!"

"I want a pair of blue suede shoes," said the boy.

"Well, you didn't have to snatch *my* pocketbook to get some suede shoes," said Mrs. Luella Bates Washington Jones. "You could've asked me."

"M'am?"

The water dripping from his face, the boy looked at her. There was a long pause. A very long pause. After he had dried his face and not knowing what else to do, dried it again, the boy turned around, wondering what next. The door was open. He could make a dash for it down the hall. He could run, run, run, *run*!

The woman was sitting on the daybed. After a while she said, "I were young once and I wanted things I could not get."

There was another long pause. The boy's mouth opened. Then he frowned, not knowing he frowned.

The woman said, "Um-hum! You thought I was going to say *but* didn't you? You thought I was going to say, *but I didn't snatch people's pocketbooks*. Well, I wasn't going to say that." Pause. Silence. "I have done things, too, which I would not tell you, son. Everybody's got something in common. So you set down while I fix us something to eat. You might run that comb through your hair so you will look presentable."

In another corner of the room behind a screen was a gas plate and an icebox. Mrs. Jones got up and went behind the screen. The woman did not watch the boy to see if he was going to run now, nor did she watch her purse, which she left behind her on the daybed. But the boy took care to sit on the far side of the room, away from the purse, where he thought she could easily see him out of the corner of her eye if she wanted to. He did not trust the woman not to trust him. And he did not want to be mistrusted now.

"Do you need somebody to go to the store," asked the boy, "maybe to get some milk or something?"

"Don't believe I do," said the woman, "unless you just want sweet milk yourself. I was going to make cocoa out of this canned milk I got here."

"That will be fine," said the boy.

She heated some lima beans and ham she had in the icebox, made the cocoa, and set the table. The woman did not ask the boy anything about where he lived, or his folks, or anything else that would embarrass him. Instead, as they ate, she told him about her job in a hotel beauty shop that stayed open late, what the work was like, and how all kinds of women came in and out, blondes, redheads, and Spanish. Then she cut him a half of her ten-cent cake.

"Eat some more, son," she said.

When they were finished eating, she got up and said, "Now here, take this ten dollars and buy yourself some blue suede shoes. And next time, do not make the mistake of latching onto *my* pocketbook *nor nobody else's*. I got to get my rest now. But from here on in, son, I hope you will behave yourself."

She led him down the hall to the front door and opened it. "Good night! Behave yourself, boy!" she said, looking out into the street as he went down the steps.

The boy wanted to say something other than, "Thank you, m'am," to Mrs. Luella Bates Washington Jones, but although his lips moved, he couldn't even say that as he turned at the foot of the barren stoop and looked up at the large woman in the door. Then she shut the door.

10. Which of the following best describes the boy's feelings in the story?

A. Frightened then trusting
B. Angry then hungry
C. Greedy then generous
D. Curious then nervous

[Developing Interpretation]

13. When they arrived at the woman's house, what did the boy do?

A. He felt immediately at home.
B. He tried to steal her purse again.
C. He thought about running away.
D. He apologized for what he had done.

[Developing Interpretation]

14. Why did the boy sit on the far side of the room while Mrs. Jones was making their dinner?

A. He wanted to sit close to Mrs. Jones.
B. He wanted to show Mrs. Jones he could be trusted.
C. He wanted to help Mrs. Jones prepare the food.
D. He wanted to keep an eye on Mrs. Jones.

[Developing Interpretation]

15. Why did the boy offer to go to the store? Support your opinion with information from the story.

[Developing Interpretation]

Score & Description
Evidence of full comprehension These responses provide an appropriate opinion as to why the boy offers to go to the store that demonstrates understanding of the boy's character at this point in the story. Responses may refer to the ambiguity of the boy's offer; however, the opinion supports an understanding of the boy's offer to go to the store. Responses at this level may embed support in answering why the boy makes his offer (e.g., to gain trust).
Evidence of partial or surface comprehension These responses provide a general reason why the boy offers to go to the store; however, responses at this level do not provide evidence from the story as support, or the evidence does not support the opinion. Or, responses at this level provide a reason for the boy's offer that demonstrates an incomplete understanding of his character at the point when he offers (e.g., he wants to run away).
Evidence of little or no comprehension These responses provide inappropriate information from the story unrelated to why the boy offers to go to the store or personal opinions about the character, but they do not provide a text-based reason why the boy offers to go to the store.

18. Do you think this story is believable? Use details from the story to explain why or why not.

Score & Description
Acceptable These responses provide an opinion about the portrayal of the characters or the credibility of events, and use details from the story to support that opinion.
Unacceptable These responses may provide an opinion about the credibility of the story, but provide no support for that opinion.

[Examining Content and Structure]

16. What do you think is the theme of the story? Support your answer with details from the story.

Score & Description
Extensive These responses provide a theme of the story that demonstrates an interpretive reading and use specific support from the story to explain the theme. Responses at this level provide support that is clearly linked in terms of the theme.
Essential These responses provide a theme of the story that demonstrates an interpretive reading. However, the explanation supporting the theme is either not clearly linked and explained in terms of the theme, or no explanation is presented at all.
Partial These responses provide generalizations based on actions or dialogue (e.g. you should not steal, or you should have asked for the money), but do not interpret a theme of the story. Responses at this level demonstrate only a surface reading of the story.
Unsatisfactory These responses may provide plot summaries or statements that are unsupported, opinions that are inappropriate, or provide random events unrelated to a theme of the story. Responses at this level may provide accurate information, but do not attempt to discuss a main idea or theme of the story.

[Examining Content and Structure]

DSTP Sample Passage and Items

A Bright Idea

When I was in high school, I worked in our small, family store. We sold everything from chopsticks to soy sauce. Our customers came from all parts of the city to get the ingredients they needed for a perfect Chinese meal. On weekends I helped by cleaning the stocking shelves.

The only thing I didn't like about my job was having to go to the storeroom to get things. I didn't mind the work or being in the brightly-lit room full of supplies. It was the trip getting there that I didn't like. The hallway was long, narrow, and so dark that I often bumped into the green-colored walls, especially when I was carrying something big. My greatest fear, though, was running into a mouse, or spider, or some other scary creature.

My grandfather knew I didn't like going to the storeroom, so he often went with me. It was those times when he walked ahead of me that I learned most to respect his position as elder in our family.

One Saturday morning, my job was to clean the storeroom. Grandfather was busy, so I had to brave the journey alone. As I carefully felt my way down the dark passageway, I tripped and fell against the wall. As I rubbed the bruise on my arm, I wondered what I could do to remedy our hallway hazard.

A light on the ceiling would be the best way, but that would be expensive. A floor lamp might work, but it would certainly get in the way in the narrow hall. Suddenly, I thought of a perfect solution!

I looked around the storeroom and found a gallon of bright white paint and a wide brush. Instead of cleaning, I painted the green walls. The new white color made a huge difference. It was now much easier to see the way down the long corridor. I couldn't wait to surprise my family with my bright idea.

I showed the hallway to my grandfather first because his opinion was most important to me. However, he was not very gracious.

"It looks all right, but it is not very interesting," he said with playful honesty before he walked away. Grandfather was partially teasing, but he was also being honest. What can I do to make the bland white walls look better? I asked myself. What does he want? Polka dots? That's it! I thought as my imagination soared. Do I dare? The question boomed in my head. No one but the family ever sees the storeroom, I answered myself. Besides, it will please grandfather that I know something about our family's heritage, I reasoned.

After a few more rounds of debate, I convinced myself that it was a good idea. I found some red and yellow paint and made several large drawings on the wall. First, I painted Yin and Yang, the symbol for an ancient Chinese teaching that all things and events come from two elements, forces, or principles. Yin is negative, passive, and weak. Yang is positive, active, and strong. Around it I painted the Chinese symbols for the five elements associated with this theory: metal, wood, water, fire, and earth. After admiring my work, I walked casually down the hallway and into the store. Instead of telling grandfather what I had done, I waited for him to discover it himself.

The next day, when I was working in the store, grandfather called to me. "This shelf is almost empty," he said. "Will you please go back through "the universe of dynamic forces" and get a box of rice flour?"

He had seen my artwork! He must have liked it because he gave it a name. In fact, it was a name that stuck. I had not only made the trip back to the storeroom safer, but I had also added some character to the hallway. The entire family called the hallway the "universe" from that day forward.

1. In paragraph 8, the word bland means —

A. long
B. dirty
C. plain
D. dark

[Determining Meaning]

2. Why is this story classified as a personal narrative?

A. The story is told from the first person point of view
B. The story has a small, family store as its setting
C. The story deals with the problems of a teenager
D. The story uses dialogue to develop the characters

[Interpreting Meaning]

3. Explain why the title is appropriate for this story. Use information from the story in your explanation.

[Interpreting Meaning]

Score	Description
2	Response is a thorough explanation of why the title is appropriate for the story supported with relevant information from the story.
1	Response is a limited explanation of why the title is appropriate for the story with mostly vague references to the story.
0	Response is totally irrelevant or incorrect for this question.

NOTE: The words "bright" and "idea" are not in the question; therefore, any accurate reference to bright and idea is scoreable. The biggest "problem" among students seemed to be that students wanted to define "bright" by using the word "bright" and "idea" using the word "idea." Hence, the most common answer – "the title is good because the main character had a bright idea" – gets a "1." Answers that included a better definition of either "bright" or "idea" usually moved into the 2 scoring category. Also, many students identified the narrator of the story as a "boy;" this was not necessarily a problem in terms of scoring for either question.

4. What conclusions can readers draw about the importance of cultural heritage after reading this story? Use information from the story in your explanation.

[Extending Meaning]

Score	Description
4	Response is a thorough and insightful explanation of the importance of cultural heritage supported by sufficient, specific, and relevant information from the story.
3	Response is an adequate explanation of the importance of cultural heritage supported by some relevant information from the story.
2	Response is a limited explanation of the importance of cultural heritage with mostly general references to the story.
1	Response is an attempted explanation of the importance of cultural heritage with mostly vague references to the story.
0	Response is totally incorrect or irrelevant for this question.

NOTE: The question asks about cultural heritage in general, but many students made only story-specific references to culture in this story. Although few students generalized across cultures, to get a high score, students needed to at least acknowledge the issue of the power or influence of culture, not just identify the cultural elements in the story. In addition, some students translated "religion" to mean "cultural heritage." If one regards "religion" as beliefs (what's important to people) instead of institutional religion, this interpretation did not interfere with obtaining a good score.

Appendix B-1

Concordance Table for Grade 4

Concordance Table for Grade 4 Reading

	NAEP		Delaware Population		Delaware Sample	
PR	Score	Score Range	Score	Score Range	Score	Score Range
1	157.5	151-164	377.5	368-387	379	370-388
2	167.5	165-170	392	388-397	393.5	389-398
3	172.5	171-174	400.5	398-403	401.5	399-404
4	176	175-177	406	404-408	407	405-409
5	178.5	178-179	410	409-411	411	410-412
6	181	180-182	414	412-416	414	413-415
7	183.5	183-184	417.5	417-418	417.5	416-419
8	185.5	185-186	419	419	420	420
9	187.5	187-188	421	420-422	422	421-423
10	189	189	424	423-425	424.5	424-425
11	190.5	190-191	426	426	426.5	426-427
12	192	192	428	427-429	429	428-430
13	193	193	430	430	431	431
14	194.5	194-195	431	431	432	432
15	196	196	432	432	433	433
16	197.5	197-198	433.5	433-434	434.5	434-435
17	199	199	435	435	436	436
18	200	200	436.5	436-437	437.5	437-438
19	201	201	438	438	439	439
20	202	202	439	439	440	440
21	203	203	440	440	441	441
22	204	204	441.5	441-442	442.5	442-443
23	204.5	204.5	443	443	444	444
24	205	205	444	444	445	445
25	206	206	445	445	446	446
26	207	207	446.5	446-447	447.5	447-448
27	208	208	448	448	448.5	448.5
28	208.5	208.5	449.5	449-450	449	449
29	209	209	450.5	450.5	450.5	450-451
30	210	210	451	451	452	452
31	211	211	452.5	452-453	453.5	453-454
32	211.5	211.5	454	454	454.5	454.5
33	212	212	454.5	454.5	455	455
34	213	213	455	455	456	456
35	214	214	456	456	456.5	456.5
36	214.5	214.5	456.5	456.5	457	457
37	215	215	457.5	457-458	458.5	458-459
38	216	216	458.5	458.5	459.5	459.5
39	217	217	459	459	460	460
40	218	218	460.5	460.5	460.5	460.5
41	218.5	218.5	461.5	461.5	461.5	461-462
42	219	219	462	462	463	463
43	220	220	463.5	463-464	463.5	463.5
44	221	221	464.5	464.5	464.5	464-465
45	221.5	221.5	465	465	465.5	465.5
46	222	222	465.5	465.5	466	466

Concordance Table for Grade 4 Reading (continue)

	NAEP		Delaware Population		Delaware Sample	
PR	Score	Score Range	Score	Score Range	Score	Score Range
47	223	223	466.5	466-467	467.5	467.5
48	224	224	467.5	467.5	468.5	468.5
49	224.5	224.5	468	468	469	469
50	225	225	469	469	469.5	469.5
51	225.5	225.5	470	470	470.5	470-471
52	226	226	471	471	471.5	471.5
53	227	227	471.5	471.5	472	472
54	228	228	472.5	472-473	473.5	473-474
55	228.5	228.5	473.5	473.5	474.5	474.5
56	229	229	474	474	475	475
57	230	230	474.5	474.5	475.5	475.5
58	230.5	230.5	475.5	475-476	476.5	476-477
59	231	231	477	477	477.5	477.5
60	232	232	477.5	477.5	478	478
61	233	233	478.5	478-479	479.5	479-480
62	233.5	233.5	479.5	479.5	480.5	480.5
63	234	234	480	480	481	481
64	235	235	480.5	480.5	481.5	481.5
65	236	236	482	481-483	483	482-484
66	236.5	236.5	484	484	484.5	484.5
67	237	237	484.5	484.5	485	485
68	238	238	485.5	485-486	485.5	485.5
69	239	239	486.5	486.5	486.5	486-487
70	239.5	239.5	487	487	487.5	487.5
71	240	240	487.5	487.5	488	488
72	241	241	489	488-490	488.5	488.5
73	242	242	490.5	490.5	489.5	489-490
74	243	243	491	491	490.5	490.5
75	243.5	243.5	491.5	491.5	491	491
76	244	244	492.5	492-493	491.5	491.5
77	245	245	493.5	493.5	492.5	492-493
78	246	246	494	494	494	494
79	247	247	494.5	494.5	494.5	494.5
80	248	248	496	495-497	496	495-497
81	249	249	498	498	497.5	497.5
82	250	250	498.5	498.5	498	498
83	251	251	500	499-501	500	494-501
84	252	252	501.5	501.5	501.5	501.5
85	253	253	502	502	502	502
86	254	254	504	503-505	502.5	502.5
87	255	255	505.5	505.5	504	503-505
88	256.5	256-257	506	506	506	506
89	258	258	508	507-509	508	507-509
90	259	259	510	510	509.5	509.5
91	260.5	260-261	510.5	510.5	510	510
92	262.5	262-263	512.5	511-514	512.5	511-514

Concordance Table for Grade 4 Reading (continue)

	NAEP		Delaware Population		Delaware Sample	
PR	Score	Score Range	Score	Score Range	Score	Score Range
93	264	264	515	515	515	515
94	265.5	265-266	517	516-518	517	516-518
95	267.5	267-268	521	519-523	519	519
96	269.5	269-270	524	524	522	520-524
97	272	271-273	527	525-529	527	525-529
98	275	274-276	532.5	530-535	532.5	530-535
99	280	277-283	541.5	536-547	541.5	536-547

Concordance Table for Grade 4 Reading by Gender

	NAEP Male		Delaware Male		NAEP Female		Delaware Female	
PR	Score	Score Range	Score	Score Range	Score	Score Range	Score	Score Range
1	155.5	149-162	371.5	361-382	158	150-166	382	273-391
2	165.5	163-168	388	383-393	169	167-171	395	292-399
3	171	169-172	396.5	394-399	173.5	172-175	404	400-408
4	175	173-177	402.5	400-405	177	176-178	410	409-411
5	178.5	178-179	407	406-408	180	179-181	414	412-416
6	180.5	180-181	410	409-411	182.5	182-183	417.5	417-418
7	182	182	413	412-414	184.5	184-185	420	419-421
8	183.5	183-184	416	415-417	186.5	186-187	423	422-424
9	185.5	185-186	418.5	418-419	188.5	188-189	425	425
10	187.5	187-188	420.5	420-421	190	190	426.5	426-427
11	189	189	423	422-424	191.5	191-192	428.5	428-429
12	190.5	190-191	425	425	193	193	430.5	430-431
13	192	192	426.5	426-427	194	194	432	432
14	193.5	193-194	428.5	428-429	195.5	195-196	433.5	433-434
15	195	195	430	430	197.5	197-198	435	435
16	196	196	431	431	199	199	436.5	436-437
17	197.5	197-198	432	432	200	200	438	438
18	199	199	433.5	433-434	201	201	439	439
19	200	200	435	435	202	202	440	440
20	201	201	436.5	436-427	203	203	441.5	441-442
21	202	202	438	438	204	204	443	443
22	203	203	439	439	205	205	444	444
23	203.5	203.5	440	440	206	206	445	445
24	204	204	441.5	441-442	206.5	206.5	446.5	446-447
25	205	205	443	443	207	207	448	448
26	206	206	444	444	208	208	449.5	449-450
27	206.5	206.5	444.5	444.5	209	209	450.5	450.5
28	207	207	445	445	210	210	451	451
29	208	208	446.5	446-447	211	211	452.5	452-453
30	208.5	208.5	448	448	212	212	454	454
31	209	209	449.5	449-450	213	213	454.5	454.5
32	210	210	450.5	450.5	213.5	213.5	455	455
33	210.5	210.5	451	451	214	214	456	456
34	211	211	452.5	452-453	215	215	456.5	456.5
35	212	212	453.5	453.5	216	216	457.5	457-458
36	213	213	454	454	217	217	459	459
37	213.5	213.5	455	455	218	218	459.5	459.5
38	214	214	455.5	455.5	219	219	460.5	460-461
39	215	215	456	456	220	220	461.5	461.5
40	215.5	215.5	457.5	457-458	220.5	220.5	462	462
41	216	216	458.5	458.5	221	221	463.5	463-464
42	217	217	459	459	222	222	464.5	464.5
43	217.5	217.5	460.5	460-461	222.5	222.5	465	465
44	218	218	461.5	461.5	223	223	466.5	466-467
45	219	219	462	462	224	224	467.5	467.5
46	219.5	219.5	463.5	463-464	224.5	224.5	468	468

Concordance Table for Grade 4 Reading by Gender (continue)

	NAEP Male		Delaware Male		NAEP Female		Delaware Female	
PR	Score	Score Range	Score	Score Range	Score	Score Range	Score	Score Range
47	220	220	464.5	464.5	225	225	468.5	468.5
48	221	221	465	465	225.5	225.5	469.5	469-470
49	222	222	465.5	465.5	226	226	471	471
50	223	223	466.5	466-467	227	227	471.5	471.5
51	224	224	467.5	467.5	227.5	227.5	472.5	472-473
52	224.5	224.5	468	468	228	228	473.5	473.5
53	225	225	468.5	468.5	229	229	474	474
54	225.5	225.5	469.5	469-470	230	230	474.5	474.5
55	226	226	470.5	470.5	230.5	230.5	475.5	475-476
56	227	227	471	471	231	231	477	477
57	228	228	471.5	471.5	232	232	477.5	477.5
58	228.5	228.5	472.5	472-473	233	233	478.5	478-479
59	229	229	473.5	473.5	233.5	233.5	479.5	479.5
60	230	230	474	474	234	234	480	480
61	230.5	230.5	475.5	475-476	235	235	480.5	480.5
62	231	231	476.5	476.5	236	236	482	481-483
63	232	232	477	477	236.5	236.5	483.5	483.5
64	232.5	232.5	477.5	477.5	237	237	484	484
65	233	233	478.5	478-479	238	238	484.5	484.5
66	234	234	480	480	239	239	485.5	485-486
67	235	235	480.5	480.5	240	240	486.5	486.5
68	235.5	235.5	482	481-483	240.5	240.5	487	487
69	236	236	483.5	483.5	241	241	489	488-490
70	237	237	484	484	242	242	490	490
71	238	238	484.5	484.5	243	243	490.5	490.5
72	238.5	238.5	485.5	485-486	244	244	491	491
73	239	239	486.5	586.5	245	245	491.5	491.5
74	240	240	487	487	246	246	492.5	492-493
75	241	241	487.5	487.5	247	247	493.5	493.5
76	241.5	241.5	489	488-490	247.5	247.5	494	494
77	242	242	491	491	248	248	494.5	494.5
78	243	243	491.5	491.5	249	249	496	495-497
79	244	244	492.5	492-493	250	250	498	498
80	244.5	244.5	493.5	493.5	251	251	498.5	498.5
81	245	245	494	494	252	252	500	499-501
82	246	246	494.5	494.5	253	253	501.5	501.5
83	247	247	496	495-497	254	254	502	502
84	248	248	498	494	254.5	254.5	502.5	502.5
85	249	249	500	499-501	255	255	504	503-505
86	250	250	501.5	501.5	256.5	256-257	506	506
87	251.5	251-252	502	502	258	258	506.5	506.5
88	253	253	504	503-505	259	259	508	507-509
89	254.5	254-255	505.5	505.5	260	260	510	510
90	256.5	256-257	506	506	261	261	510.5	510.5
91	258	258	508	507-509	262.5	262-263	512.5	511-514
92	259	259	510	510	264	264	515	515

Concordance Table for Grade 4 Reading by Gender (continue)

	NAEP Male		Delaware Male		NAEP Female		Delaware Female	
PR	Score	Score Range	Score	Score Range	Score	Score Range	Score	Score Range
93	261	260-262	512.5	511-514	265	265	517	516-518
94	263.5	263-264	515	515	266.5	266-267	521	519-523
95	266	265-267	517	516-518	269	268-270	524	524
96	268.5	268-269	519	519	271.5	271-272	527	525-529
97	270.5	270-271	522	522	273.5	273-274	532	530-534
98	272.5	272-273	527.5	525-530	276.5	275-278	537.5	535-539
99	277	274-279	536	531-541	283	279-287	544	541-547

Concordance Table for Grade 4 Reading by Race

	NAEP Black		Delaware Black		NAEP White		Delaware White	
PR	Score	Score Range	Score	Score Range	Score	Score Range	Score	Score Range
1	152.5	148-159	365.5	360-371	174.5	171-178	394	385-403
2	161.5	160-163	378	372-384	180.5	179-182	407.5	404-411
3	165.5	164-167	387.5	385-390	185	183-187	415	412-418
4	169	168-170	392.5	391-394	188.5	188-189	420	419-421
5	171.5	171-172	396	395-397	191	190-192	423.5	422-425
6	173.5	173-174	399	398-400	194.5	193-196	426.5	426-427
7	175.5	175-176	403	401-405	197.5	197-198	429.5	428-431
8	177	177	406	406	199	199	432	432
9	178	178	408	407-409	200.5	200-201	434	433-435
10	179.5	179-180	410	410	202.5	202-203	436.5	436-437
11	181	181	412	411-413	204	204	438	438
12	182	182	414	414	205	205	439	439
13	183	183	415.5	415-416	206	206	441	440-442
14	184.5	184-185	417	417	207	207	443	443
15	186	186	418	418	208	208	444	444
16	187	187	420	419-421	209	209	445	445
17	188	188	421.5	421.5	210	210	446.5	446-447
18	189	189	422	422	211	211	449	448-450
19	190	190	423.5	423-424	212	212	451	451
20	191	191	425	425	213	213	452.5	452-453
21	192	192	426	426	214	214	453.5	453.5
22	192.5	192.5	427	427	215	215	454	454
23	193	193	428.5	428-429	216	216	455	455
24	193.5	193.5	429.5	429.5	216.5	216.5	456	456
25	194	194	430	430	217	217	456.5	456.5
26	195	195	431	431	218	218	457.5	457-458
27	196	196	431.5	431.5	218.5	218.5	459	459
28	197	197	432	432	219	219	459.5	459.5
29	198	198	433.5	433-434	220	220	460.5	460-461
30	198.5	198.5	434.5	434.5	221	221	462	462
31	199	199	435	435	221.5	221.5	463.5	463-464
32	200	200	436.5	436-437	222	222	464.5	464.5
33	200.5	200.5	438	438	223	223	465	465
34	201	201	438.5	438.5	224	224	465.5	465.5
35	202	202	439	439	224.5	224.5	466.5	466-467
36	202.5	202.5	440	440	225	225	467.5	467.5
37	203	203	440.5	440.5	226	226	468	468
38	203.5	203.5	441.5	441-442	226.5	226.5	468.5	468.5
39	204	204	443	443	227	227	469.5	469-470
40	205	205	444	444	227.5	227.5	470.5	470.5
41	205.5	205.5	444.5	444.5	228	228	471	471
42	206	206	445	445	229	229	471.5	471.5
43	206.5	206.5	445.5	445.5	230	230	472.5	472-473
44	207	207	446.5	446-447	230.5	230.5	473.5	473.5
45	207.5	207.5	447.5	447.5	231	231	474	474
46	208	208	448	448	231.5	231.5	474.5	474.5

Concordance Table for Grade 4 Reading by Race (continue)

	NAEP Black		Delaware Black		NAEP White		Delaware White	
PR	Score	Score Range	Score	Score Range	Score	Score Range	Score	Score Range
47	208.5	208.5	448.5	448.5	232	232	475.5	475-476
48	209	209	449.5	449-450	232.5	232.5	476.5	476.5
49	209.5	209.5	450.5	450.5	233	233	477	477
50	210	210	451	451	234	234	477.5	477.5
51	210.5	210.5	452.5	452-453	234.5	234.5	478.5	478-479
52	211	211	453.5	453.5	235	235	479.5	479.5
53	211.5	211.5	454	454	236	236	480	480
54	212	212	455	455	236.5	236.5	480.5	480.5
55	213	213	455.5	455.5	237	237	482	481-483
56	213.5	213.5	456	456	238	238	483.5	483.5
57	214	214	456.5	456.5	238.5	238.5	484	484
58	215	215	457.5	457-458	239	239	484.5	484.5
59	215.5	215.5	458.5	458.5	239.5	239.5	485.5	485-486
60	216	216	459	459	240	240	486.5	486.5
61	217	217	459.5	459.5	241	241	487	487
62	218	218	460.5	460-461	241.5	241.5	487.5	487.5
63	219	219	461.5	461.5	242	242	489	488-489
64	219.5	219.5	462	462	242.5	242.5	490	490
65	220	220	462.5	462.5	243	243	490.5	490.5
66	221	221	463.5	463-464	244	244	491	491
67	222	222	465	465	244.5	244.5	491.5	491.5
68	222.5	222.5	465.5	465.5	245	245	492	492
69	223	223	466.5	466-467	246	246	493	493
70	224	224	467.5	467.5	247	247	493.5	493.5
71	224.5	224.5	468	468	247.5	247.5	494	494
72	225	225	469.5	468-470	248	248	494.5	494.5
73	225.5	225.5	470.5	470.5	249	249	496	495-497
74	226	226	471	471	250	250	497.5	497.5
75	227	227	472.5	472-473	251	251	498	498
76	228	228	474	474	251.5	251.5	498.5	498.5
77	229	229	474.5	474.5	252	252	500	499-501
78	230	230	475.5	475-476	253	253	501.5	501.5
79	231	231	477	477	254	254	502	502
80	232	232	478.5	478-479	254.5	254.5	502.5	502.5
81	233	233	479.5	479.5	255	255	504	503-505
82	234	234	480	480	256	256	505.5	505.5
83	235	235	482	481-483	257	257	506	506
84	236	236	484	484	258	258	506.5	506.5
85	237	237	485.5	485-486	259	259	508	507-509
86	238	238	486.5	486.5	260	260	509.5	509.5
87	239	239	487	487	261	261	511	511
88	240	240	487.5	487.5	262	262	512.5	511-514
89	241	241	489	488-490	263	263	514.5	514.5
90	242.5	141-143	491	491	264	264	515	512-514
91	244	244	492.5	492-493	265	265	515.5	515.5
92	245.5	145-146	495.5	494-497	266.5	266-267	517	517

Concordance Table for Grade 4 Reading by Race (continue)

	NAEP Black		Delaware Black		NAEP White		Delaware White	
PR	Score	Score Range	Score	Score Range	Score	Score Range	Score	Score Range
93	247.5	147-148	498	498	268	268	519	519
94	249	249	500	499-501	269.5	269-270	521.5	521.5
95	250	250	502	502	271	271	524	524
96	251.5	151-152	504.5	503-506	272.5	272-273	527	525-529
97	254	153-155	508.5	507-510	274.5	274-275	530	530
98	258	156-160	514.5	511-518	277	276-278	535.5	531-540
99	264.5	161-168	534.5	519-530	283	279-287	544	541-547

Appendix B-2

Concordance Table for Grade 8

Concordance Table for Grade 8 Reading

	NAEP		Delaware Population		Delaware Sample	
PR	Score	Score Range	Score	Score Range	Score	Score Range
1	178	171-185	421.5	414-429	418	411-426
2	191.5	186-197	434.5	430-439	432	427-440
3	201	198-204	442.5	440-445	441	438-444
4	207	205-209	448	446-450	447.5	445-450
5	212	20-214	452.5	451-454	452	451-453
6	216	215-217	456.5	455-458	455	454-456
7	219.5	218-220	460.5	459-462	459	457-461
8	223	222-224	463.5	463-464	463	462-464
9	226	225-227	466	465-467	466	465-467
10	228	228	469	468-470	469	468-470
11	229.5	229-230	471.5	471-472	471	471
12	231	231	473.5	473-474	473	472-474
13	232.5	232-233	475.5	475-476	475.5	475-476
14	234.5	234-235	477	477	477	477
15	236	236	479	478-480	478.5	478-479
16	237.5	237-238	481.5	481-482	481	480-482
17	239	239	483	483	483	483
18	240	240	484	484	484	484
19	241	241	485	485	486	485-487
20	242	242	486.5	486-487	488	488
21	243	243	488.5	488-489	489	489
22	244	244	490	490	490	490
23	245	245	491.5	491-492	491.5	491-492
24	246	246	493	493	493	493
25	247	247	494.5	494-495	494.5	494-495
26	248	248	495.5	495.5	496	496
27	249.5	249.5	496	496	497	497
28	251	251	497	497	497.5	497.5
29	252	252	498	498	498	498
30	253	253	499.5	499-500	499.5	499-500
31	254	254	500.5	500.5	501	501
32	255	255	501	501	502.5	502-503
33	255.5	255.5	502.5	502-503	504	504
34	256	256	504	504	505	505
35	257	257	505	505	505.5	505.5
36	258	258	505.5	505.5	506	506
37	259	259	506	506	507.5	507-508
38	260	260	507.5	507-508	508.5	508.5
39	261	261	508.5	508.5	509	509
40	261.5	261.5	509	509	510.5	510-511
41	262	262	510.5	510-511	512	512
42	263	263	511.5	511.5	512.5	512.5
43	263.5	263.5	512	512	513.5	513-514
44	264	264	513.5	513-514	514.5	514.5
45	265	265	514.5	514.5	515	515
46	265.5	265.5	515	515	516	516

Concordance Table for Grade 8 Reading (continue)

	NAEP		Delaware Population		Delaware Sample	
PR	Score	Score Range	Score	Score Range	Score	Score Range
47	266	266	516	516	516.5	516.5
48	267	267	516.5	516.5	517	517
49	267.5	267.5	517	517	518.5	518-519
50	268	268	518.5	518-519	519.5	519.5
51	269	269	519.5	519.5	520	520
52	270	270	520	520	521.5	521-522
53	270.5	270.5	520.5	520.5	522.5	522.5
54	271	271	521.5	521-522	523	523
55	271.5	271.5	523	523	524.5	524-525
56	272	272	523.5	523.5	525.5	525.5
57	273	273	524.5	524-525	526	526
58	273.5	273.5	526	526	526.5	526.5
59	274	274	526.5	526.5	527.5	527-528
60	275	275	527.5	527-528	529	529
61	276	276	528.5	528.5	529.5	529.5
62	276.5	276.5	529	529	530.5	530-531
63	277	277	530.5	530-531	531.5	531.5
64	278	278	531.5	531.5	532	532
65	278.5	278.5	532	532	532.5	532.5
66	279	279	532.5	532.5	533.5	533-534
67	280	280	533.5	533-534	535	535
68	281	281	534.5	534.5	535.5	535.5
69	281.5	281.5	535	535	536.5	536-537
70	282	282	536.5	536-537	538	538
71	283	283	537.5	537.5	538.5	538.5
72	283.5	283.5	538	538	540	539-541
73	284	284	538.5	538.5	541.5	541.5
74	285	285	540	539-541	542	542
75	286	286	542	542	543.5	543-544
76	286.5	286.5	542.5	542.5	544.5	544.5
77	287	287	543.5	543-544	545	545
78	288	288	545	545	546.5	546-547
79	289	289	545.5	545.5	547.5	547.5
80	290	290	546.5	546-547	548	548
81	291	291	548	548	550	549-551
82	292	292	550	549-551	552	552
83	292.5	292.5	551.5	551.5	552.5	552.5
84	293	293	552	552	553.5	553-554
85	294	294	553.5	553-554	555	556
86	295	295	555	555	557	556-558
87	296.5	296-297	557	556-558	559	559
88	298	298	559	559	561	560-562
89	299	299	561	560-562	562.5	562.5
90	300	300	563	563	563	563
91	301.5	301-302	565	564-566	565	564-566
92	303	303	567	567	567	567

Concordance Table for Grade 8 Reading (continue)

	NAEP		Delaware Population		Delaware Sample	
PR	Score	Score Range	Score	Score Range	Score	Score Range
93	304.5	304-305	569	568-570	569	568-570
94	306.5	306-307	571	571	571	571
95	309	308-310	573.5	572-575	573.5	572-575
96	312	311-313	577.5	576-579	578	576-580
97	315.5	314-317	581.5	580-583	582	581-583
98	320	318-322	586.5	584-589	586.5	584-589
99	326	323-329	598	590-606	598.5	590-607

Concordance Table for Grade 8 Reading by Gender

	NAEP Male		Delaware Male		NAEP Female		Delaware Female	
PR	Score	Score Range	Score	Score Range	Score	Score Range	Score	Score Range
1	174	169-179	414.5	406-423	182	174-190	426.5	417-436
2	186	180-192	427	524-530	197	191-203	441	437-445
3	196	293-299	435	431-439	208	204-212	448.5	446-451
4	202	200-204	442	440-444	215.5	213-218	454	452-456
5	206.5	205-208	446.5	445-448	221	219-223	459	457-461
6	210.5	209-212	450	449-451	225.5	224-227	463	462-464
7	214	213-215	453.5	452-455	228	228	467	465-469
8	217	216-218	457	456-458	229.5	229-230	470.5	470-471
9	219.5	219-220	460	459-461	231.5	213-232	472	472
10	222	221-223	463	462-464	233.5	233-234	474	473-475
11	225	224-226	465.5	465-466	235.5	235-236	476.5	476-477
12	227	227	468	467-469	237.5	237-238	478.5	478-479
13	228	228	470.5	470-471	239	239	481	480-482
14	229.5	229-230	472	472	240	240	483.5	483-484
15	231.5	231-232	474	473-475	241.5	241-242	485	485
16	233	233	476	476	243	243	486.5	486.5
17	234	234	477	477	244	244	488.5	488-489
18	235.5	235-236	479	478-480	245.5	245-246	490	490
19	237	237	481	481	247	247	491.5	491-492
20	238	238	483	483	248	248	493	493
21	239	239	484	484	249.5	249-250	495	494-496
22	240	240	485	485	251	251	497	497
23	241	241	486.5	486-487	252	252	497.5	497.5
24	242	242	488	488	253	253	498	498
25	243	243	489	489	254	254	499.5	499-500
26	244	244	490	490	255	255	501	501
27	245	245	491.5	491-492	255.5	255.5	502.5	502-503
28	245.5	245.5	493	493	256	256	504	504
29	246	246	494.5	494-495	257	257	505	505
30	247	247	495.5	495.5	258	258	506	506
31	248	248	496	496	259	259	507.5	507-508
32	249	249	497	497	260	260	508.5	508.5
33	250	250	498	498	261	261	509	509
34	251	251	498.5	498.5	262	262	510.5	510-511
35	252	252	499.5	499-500	262.5	262.5	511.5	511.5
36	253	253	501	501	263	263	512	512
37	254	254	502.5	512-503	264	264	513.5	513-514
38	255	255	504	504	264.5	264.5	514.5	514.5
39	256	256	505	505	265	265	515	515
40	257	257	505.5	505.5	266	266	516	516
41	258	258	506	506	266.5	266.5	516.5	516.5
42	259	259	506.5	506.5	267	267	517	517
43	259.5	259.5	507.5	507-508	268	268	517.5	517.5
44	260	260	509	509	268.5	268.5	518.5	518-519
45	261	261	510.5	510-511	269	269	520	520
46	261.5	261.5	511.5	511.5	270	270	521.5	521-522

Concordance Table for Grade 8 Reading by Gender (continue)

	NAEP Male		Delaware Male		NAEP Female		Delaware Female	
PR	Score	Score Range	Score	Score Range	Score	Score Range	Score	Score Range
47	262	262	512	512	270.5	270.5	522.5	522.5
48	263	263	513.5	513-514	271	271	523	523
49	263.5	263.5	514.5	514.5	272	272	524.5	524-525
50	264	264	515	515	272.5	272.5	525.5	525.5
51	265	265	516	516	273	273	526	526
52	266	266	516.5	516.5	273.5	273.5	526.5	526.5
53	266.5	266.5	517	517	274	274	527.5	527-528
54	267	267	518.5	518-519	275	275	529	529
55	268	268	519.5	519.5	276	276	529.5	529.5
56	269	269	520	520	276.5	276.5	530.5	530-531
57	269.5	269.5	520.5	520.5	277	277	531.5	531.5
58	270	270	521.5	521-522	278	278	532	532
59	271	271	523	523	279	279	532.5	532.5
60	271.5	271.5	523.5	523.5	280	280	533.5	533-534
61	272	272	524.5	524-525	280.5	280.5	534.5	534.5
62	272.5	272.5	525.5	525.5	281	281	535	535
63	273	273	526	526	282	282	536.5	536-537
64	274	274	527.5	527-528	282.5	282.5	537.5	537.5
65	274.5	274.5	528.5	528.5	283	283	538	538
66	275	275	529	529	284	284	538.5	538.5
67	276	276	530.5	530-531	284.5	284.5	540	539-541
68	276.5	276.5	531.5	531.5	285	285	541.5	541.5
69	277	277	532	532	286	286	542	542
70	278	278	532.5	532.5	287	287	542.5	542.5
71	279	279	533.5	533-534	287.5	287.5	543.5	543-544
72	279.5	279.5	535	535	288	288	545	545
73	280	280	535.5	535.5	289	289	545.5	545.5
74	281	281	536.5	536-537	290	290	546.5	546-547
75	282	282	537.5	537.5	290.5	290.5	548	548
76	282.5	282.5	538	538	291	291	548.5	548.5
77	283	283	540	539-541	292	292	550	549-551
78	284	284	541.5	541.5	292.5	292.5	552	552
79	284.5	284.5	542	542	293	293	553.5	553-554
80	285	285	543.5	543-544	294	294	554.5	554.5
81	286	286	545	545	294.5	294.5	555	555
82	286.5	286.5	545.5	545.5	295	295	557	556-558
83	287	287	546.5	546-547	296	296	558.5	83
84	288	288	548	548	297	297	559	84
85	289	289	550	549-551	298	298	561	560-562
86	290.5	290-291	551.5	551.5	299.5	299-300	563	563
87	292	292	552	552	301	301	563.5	563.5
88	293	293	553.5	553-554	302	302	565	564-566
89	294	294	555	555	303	303	567	567
90	295.5	295-296	557	556-558	304	304	569	568-570
91	297.5	297.5	559	559	305	305	570.5	570.5
92	299	299	561	560-562	306.5	306-307	571	571

Concordance Table for Grade 8 Reading by Gender (continue)

	NAEP Male		Delaware Male		NAEP Female		Delaware Female	
PR	Score	Score Range	Score	Score Range	Score	Score Range	Score	Score Range
93	300	300	563	563	308	308	573	572-574
94	301.5	301-302	565.5	564-567	310	309-311	577	575-579
95	303.5	303-304	569	568-570	313	312-314	580	580
96	306.5	305-308	571	571	316	315-317	582	581-583
97	310	309-311	575.5	572-579	319.5	318-321	586	584-588
98	315	312-318	582	580-584	323.5	322-325	592	589-595
99	321	319-323	592	585-599	329.5	326-333	604	596-612

Concordance Table for Grade 8 Reading by Race

	NAEP Black		Delaware Black		NAEP White		Delaware white	
PR	Score	Score Range	Score	Score Range	Score	Score Range	Score	Score Range
1	170	167-173	407	398-416	193	185-201	431.5	422-441
2	176	174-178	421.5	417-426	208.5	202-215	446	442-450
3	184	179-189	430	427-432	218	216-220	453.5	451-456
4	193	190-196	436.5	434-439	223.5	221-226	459.5	457-462
5	198	197-199	441	440-442	227.5	227-228	465	463-467
6	201.5	200-203	444	443-445	229.5	229-230	469.5	468-471
7	204.5	204-205	447	446-448	232	231-233	473.5	472-475
8	207	206-208	449.5	449-450	235	234-236	476.5	476-477
9	209.5	209-210	452	451-453	237.5	237-238	479	478-480
10	211.5	211-212	454	454-455	239.5	239-240	482	481-483
11	213.5	213-214	457	456-458	241	241	484.5	484-485
12	216	215-217	460	459-461	242.5	242-243	486.5	486-487
13	218.5	218-219	462.5	462-463	244	244	488	488
14	220.5	220-221	464	464	245	245	489.5	489-490
15	222	222	465.5	465-466	246.5	246-247	491.5	491-492
16	223.5	223-224	467	467	248	248	493	493
17	225	225	469	468-470	249	249	494.5	494-495
18	226	226	471	471	250.5	250-251	496	496
19	227	227	472	472	252	252	497	497
20	228	228	473.5	473-474	253	253	498	498
21	229	229	474.5	474.5	254	254	499.5	499-500
22	230	230	475	475	255	255	501	501
23	231	231	476	476	256	256	503	502-504
24	232.5	232-233	477	477	257	257	505	505
25	234	234	478.5	478-479	258	258	505.5	505.5
26	234.5	234.5	480	480	259	259	506	506
27	235	235	481.5	481-482	260	260	507.5	507-508
28	235.5	235.5	483	483	261	261	508.5	508.5
29	236	236	483.5	483.5	262	262	509	509
30	237	237	484	484	262.5	262.5	510.5	510-511
31	237.5	237.5	485	485	263	263	512	512
32	238	238	486.5	486-487	264	264	512.5	512.5
33	239	239	488	488	265	265	513.5	513-514
34	239.5	239.5	489	489	265.5	265.5	515	515
35	240	240	490	490	266	266	515.5	515.5
36	241	241	490.5	490.5	267	267	516	516
37	242	242	491.5	491-492	268	268	517	517
38	243	243	493	493	268.5	268.5	518.5	518-519
39	243.5	243.5	494.5	494-495	269	269	519.5	519.5
40	244	244	495.5	495.5	269.5	269.5	520	520
41	244.5	244.5	496	496	270	270	520.5	520.5
42	245	245	497	497	271	271	521.5	521-522
43	245.5	245.5	497.5	497.5	271.5	271.5	523	523
44	246	246	498	498	272	272	523.5	523.5
45	247	247	499.5	499-500	272.5	272.5	524.5	524-525
46	248	248	500.5	500.5	273	273	525.5	525.5

Concordance Table for Grade 8 Reading by Race (continue)

	NAEP Black		Delaware Black		NAEP White		Delaware white	
PR	Score	Score Range	Score	Score Range	Score	Score Range	Score	Score Range
47	248.5	248.5	501	501	274	274	526	526
48	249	249	502.5	502-503	274.5	274.5	526.5	526.5
49	250	250	503.5	503.5	275	275	527.5	527-528
50	251	251	504	504	276	276	528.5	528.5
51	252	252	505	505	276.5	276.5	529	529
52	252.5	252.5	505.5	505.5	277	277	530.5	530-531
53	253	253	506	506	277.5	277.5	531.5	531.5
54	254	254	507.5	507-508	278	278	532	532
55	254.5	254.5	508.5	508.5	279	279	532.5	532.5
56	255	255	509	509	279.5	279.5	533	533
57	256	256	510.5	510-511	280	280	534	534
58	257	257	511.5	511.5	280.5	280.5	535	535
59	258	258	512	512	281	281	535.5	535.5
60	258.5	258.5	513.5	513-514	282	282	536.5	536-537
61	259	259	514.5	514.5	282.5	282.5	537.5	537.5
62	259.5	259.5	515	515	283	283	538	538
63	260	260	515.5	515.5	283.5	283.5	538.5	538.5
64	261	261	516	516	284	284	540	539-541
65	261.5	261.5	517	517	284.5	284.5	541.5	541.5
66	262	262	517.5	517.5	285	285	542	542
67	262.5	262.5	518.5	518-519	285.5	285.5	542.5	542.5
68	263	263	519.5	519.5	286	286	543.5	543-544
69	263.5	263.5	520	520	286.5	286.5	544.5	544.5
70	264	264	521.5	521-522	287	287	545	545
71	264.5	264.5	522.5	522.5	288	288	545.5	545.5
72	265	265	523	523	289	289	546.5	546-547
73	266	266	524.5	524-525	289.5	289.5	548	548
74	267	267	526	526	290	290	548.5	548.5
75	267.5	267.5	526.5	526.5	291	291	550	549-551
76	268	268	527.5	527-528	291.5	291.5	551.5	551.5
77	269	269	529	529	292	292	552	552
78	270	270	529.5	529.5	293	293	553.5	553-554
79	271	271	530.5	530-531	294	294	554.5	554.5
80	271.5	271.5	532	532	294.5	294.5	555	555
81	272	272	532.5	532.5	295	295	555.5	555.5
82	273	273	533.5	533-534	296	296	557	556-558
83	274	274	535	535	297	297	559	559
84	275	275	536.5	536-537	298	298	561	560-562
85	276	276	537.5	537.5	299	299	562.5	562.5
86	277	277	538	538	300	300	563	563
87	278.5	278-279	540	539-541	301	301	563.5	563.5
88	280	280	542	542	302	302	565	564-566
89	281	281	543.5	543-544	303	303	567	567
90	282.5	282-283	545	545	304	304	569	568-570
91	284	284	546.5	546-547	305.5	305.5	570.5	570.5
92	286	285-287	548	548	307	307	571	571

Concordance Table for Grade 8 Reading by Race (continue)

	NAEP Black		Delaware Black		NAEP White		Delaware white	
PR	Score	Score Range	Score	Score Range	Score	Score Range	Score	Score Range
93	288.5	288-289	550.5	549-552	308	308	573	572-574
94	290	290	553.5	553-554	310	309-311	577	575-579
95	291.5	291-292	556.5	555-558	313	312-314	580	580
96	293	293	560.5	559-562	315.5	315-316	582	581-583
97	295	294-296	565	563-567	318	317-319	586	584-588
98	298	297-299	569.5	568-571	321.5	320-323	592	589-595
99	304	300-308	578	572-584	327.5	324-331	604	596-612

Appendix C

Frequency distributions of 2005 DSTP scores by Grade

Frequency Distributions of 2005 Grade 4 DSTP Reading Scores by Gender

		Population				Males				Females	
Score	N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
341	2	0.0279799	0.0279799	341	1	0.0280112	0.0280112	341	1	0.0279486	0.0279486
345	2	0.0279799	0.0559597	345	2	0.0560224	0.0840336	353	1	0.0279486	0.0558971
349	1	0.0139899	0.0699496	349	1	0.0280112	0.1120448	363	1	0.0279486	0.0838457
353	2	0.0279799	0.0979295	353	1	0.0280112	0.140056	366	2	0.0558971	0.1397429
356	2	0.0279799	0.1259093	356	2	0.0560224	0.1960784	369	1	0.0279486	0.1676914
363	1	0.0139899	0.1398993	366	5	0.140056	0.3361345	372	4	0.1117943	0.2794857
366	7	0.0979295	0.2378288	369	3	0.0840336	0.4201681	375	2	0.0558971	0.3353829
369	4	0.0559597	0.2937885	372	6	0.1680672	0.5882353	381	2	0.0558971	0.39128
372	10	0.1398993	0.4336877	375	2	0.0560224	0.6442577	383	5	0.1397429	0.5310229
375	4	0.0559597	0.4896475	378	7	0.1960784	0.8403361	386	4	0.1117943	0.6428172
378	7	0.0979295	0.5875769	381	4	0.1120448	0.952381	389	4	0.1117943	0.7546115
381	6	0.0839396	0.6715165	383	5	0.140056	1.092437	391	2	0.0558971	0.8105087
383	10	0.1398993	0.8114158	386	8	0.2240896	1.3165266	394	1	0.0279486	0.8384572
386	12	0.1678791	0.9792949	389	7	0.1960784	1.512605	396	6	0.1676914	1.0061487
389	11	0.1538892	1.1331841	391	5	0.140056	1.6526611	399	7	0.19564	1.2017887
391	7	0.0979295	1.2311136	394	13	0.3641457	2.0168067	401	7	0.19564	1.3974287
394	14	0.195859	1.4269726	396	11	0.3081232	2.32493	404	8	0.2235886	1.6210173
396	17	0.2378288	1.6648013	399	5	0.140056	2.464986	406	9	0.2515372	1.8725545
399	12	0.1678791	1.8326805	401	10	0.280112	2.745098	408	14	0.39128	2.2638345
401	17	0.2378288	2.0705092	404	14	0.3921569	3.1372549	411	25	0.6987144	2.9625489
404	22	0.3077784	2.3782876	406	19	0.5322129	3.6694678	413	21	0.5869201	3.549469
406	28	0.391718	2.7700056	408	16	0.4481793	4.1176471	416	28	0.7825601	4.3320291
408	30	0.4196978	3.1897034	411	19	0.5322129	4.6498599	418	23	0.6428172	4.9748463
411	44	0.6155568	3.8052602	413	27	0.7563025	5.4061625	420	21	0.5869201	5.5617663
413	48	0.6715165	4.4767767	416	36	1.0084034	6.4145658	423	30	0.8384572	6.4002236
416	64	0.8953553	5.3721321	418	39	1.092437	7.5070028	425	24	0.6707658	7.0709894
418	62	0.8673755	6.2395076	420	25	0.7002801	8.2072829	427	27	0.7546115	7.8256009
420	46	0.6435367	6.8830442	423	34	0.952381	9.1596639	430	43	1.2017887	9.0273896
423	64	0.8953553	7.7783996	425	41	1.1484594	10.308123	432	51	1.4253773	10.452767
425	65	0.9093453	8.6877448	427	37	1.0364146	11.344538	435	50	1.3974287	11.850196
427	64	0.8953553	9.5831002	430	45	1.2605042	12.605042	437	57	1.5930688	13.443264
430	88	1.2311136	10.814214	432	53	1.4845938	14.089636	440	53	1.4812745	14.924539
432	104	1.4549524	12.269166	435	50	1.4005602	15.490196	442	64	1.7887088	16.713248
435	100	1.3989927	13.668159	437	60	1.6806723	17.170868	445	87	2.431526	19.144774
437	117	1.6368215	15.30498	440	70	1.9607843	19.131653	447	78	2.1799888	21.324762
440	123	1.7207611	17.025741	442	65	1.8207283	20.952381	450	89	2.4874231	23.812186
442	129	1.8047006	18.830442	445	93	2.605042	23.557423	452	99	2.7669089	26.579094
445	180	2.5181869	21.348629	447	74	2.0728291	25.630252	455	101	2.822806	29.401901
447	152	2.1264689	23.475098	450	102	2.8571429	28.487395	458	94	2.627166	32.029067
450	191	2.6720761	26.147174	452	105	2.9411765	31.428571	461	117	3.2699832	35.29905
452	204	2.8539452	29.001119	455	120	3.3613445	34.789916	463	132	3.6892119	38.988262
455	221	3.0917739	32.092893	458	104	2.9131653	37.703081	466	121	3.3817775	42.370039
458	198	2.7700056	34.862899	461	135	3.7815126	41.484594	469	149	4.1643376	46.534377
461	252	3.5254617	38.38836	463	136	3.8095238	45.294118	472	144	4.0245947	50.558971
463	268	3.7493005	42.137661	466	155	4.3417367	49.635854	476	155	4.3320291	54.891001
466	276	3.8612199	45.998881	469	140	3.9215686	53.557423	479	143	3.9966462	58.887647

Population				Males				Females			
Score	N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
469	289	4.043089	50.04197	472	153	4.2857143	57.843137	482	148	4.136389	63.024036
472	297	4.1550084	54.196978	476	149	4.1736695	62.016807	486	145	4.0525433	67.076579
476	304	4.2529379	58.449916	479	150	4.2016807	66.218487	489	141	3.940749	71.017328
479	293	4.0990487	62.548965	482	163	4.5658263	70.784314	493	141	3.940749	74.958077
482	311	4.3508674	66.899832	486	131	3.6694678	74.453782	497	154	4.3040805	79.262158
486	276	3.8612199	70.761052	489	132	3.697479	78.151261	501	128	3.5774176	82.839575
489	273	3.8192501	74.580302	493	159	4.4537815	82.605042	505	143	3.9966462	86.836221
493	300	4.1969782	78.77728	497	118	3.3053221	85.910364	510	103	2.8787032	89.714925
497	272	3.8052602	82.582541	501	97	2.7170868	88.627451	514	98	2.7389603	92.453885
501	225	3.1477336	85.730274	505	99	2.7731092	91.40056	519	73	2.0402459	94.494131
505	242	3.3855624	89.115837	510	75	2.1008403	93.501401	525	68	1.9005031	96.394634
510	178	2.4902071	91.606044	514	56	1.5686275	95.070028	531	39	1.0899944	97.484628
514	154	2.1544488	93.760492	519	62	1.7366947	96.806723	537	22	0.6148686	98.099497
519	135	1.8886402	95.649133	525	34	0.952381	97.759104	543	30	0.8384572	98.937954
525	102	1.4269726	97.076105	531	28	0.7843137	98.543417	550	20	0.5589715	99.496926
531	67	0.9373251	98.01343	537	25	0.7002801	99.243697	558	12	0.3353829	99.832309
537	47	0.6575266	98.670957	543	12	0.3361345	99.579832	567	2	0.0558971	99.888206
543	42	0.5875769	99.258534	550	8	0.2240896	99.803922	576	2	0.0558971	99.944103
550	28	0.391718	99.650252	558	6	0.1680672	99.971989	587	2	0.0558971	100
558	18	0.2518187	99.902071	600	1	0.0280112	100	Total	3578	100	
567	2	0.0279799	99.93005	Total	3570	100					
576	2	0.0279799	99.95803								
587	2	0.0279799	99.98601								
600	1	0.0139899	100								
Total	7148	100									

Frequency Distributions of 2005 Grade 8 DSTP Reading Scores by Gender

		Population				Males				Females	
Score	N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
376	1	0.0105608	0.0105608	376	1	0.0208681	0.0208681	410	3	0.0641437	0.0641437
382	1	0.0105608	0.0211216	382	1	0.0208681	0.0417362	414	3	0.0641437	0.1282874
387	2	0.0211216	0.0422431	387	2	0.0417362	0.0834725	418	5	0.1069061	0.2351935
393	1	0.0105608	0.0528039	393	1	0.0208681	0.1043406	422	1	0.0213812	0.2565747
397	3	0.0316823	0.0844862	397	3	0.0626043	0.1669449	425	4	0.0855249	0.3420996
402	1	0.0105608	0.095047	402	1	0.0208681	0.187813	428	3	0.0641437	0.4062433
406	4	0.0422431	0.1372901	406	4	0.0834725	0.2712855	432	7	0.1496686	0.5559119
410	9	0.095047	0.2323371	410	6	0.1252087	0.3964942	435	8	0.1710498	0.7269617
414	6	0.0633647	0.2957018	414	3	0.0626043	0.4590985	438	8	0.1710498	0.8980115
418	12	0.1267293	0.4224311	418	7	0.1460768	0.6051753	441	6	0.1282874	1.0262989
422	7	0.0739254	0.4963565	422	6	0.1252087	0.730384	444	5	0.1069061	1.133205
425	14	0.1478509	0.6442074	425	10	0.2086811	0.9390651	447	7	0.1496686	1.2828736
428	15	0.1584117	0.8026191	428	12	0.2504174	1.1894825	449	15	0.3207184	1.603592
432	19	0.2006548	1.0032738	432	12	0.2504174	1.4398998	452	7	0.1496686	1.7532606
435	16	0.1689724	1.1722463	435	8	0.1669449	1.6068447	455	13	0.277956	2.0312166
438	24	0.2534587	1.4257049	438	16	0.3338898	1.9407346	458	17	0.3634809	2.3946975
441	20	0.2112155	1.6369205	441	14	0.2921536	2.2328881	460	13	0.277956	2.6726534
444	27	0.285141	1.9220615	444	22	0.4590985	2.6919866	463	11	0.2351935	2.9078469
447	36	0.380188	2.3022494	447	29	0.6051753	3.2971619	466	28	0.5986744	3.5065213
449	38	0.4013095	2.703559	449	23	0.4799666	3.7771285	468	28	0.5986744	4.1051956
452	33	0.3485057	3.0520646	452	26	0.542571	4.3196995	471	20	0.4276245	4.5328202
455	36	0.380188	3.4322526	455	23	0.4799666	4.7996661	474	26	0.5559119	5.0887321
458	45	0.475235	3.9074876	458	28	0.5843072	5.3839733	476	27	0.5772931	5.6660252
460	44	0.4646742	4.3721618	460	31	0.6469115	6.0308848	479	37	0.7911054	6.4571306
463	43	0.4541134	4.8262752	463	32	0.6677796	6.6986644	481	37	0.7911054	7.248236
466	56	0.5914035	5.4176787	466	28	0.5843072	7.2829716	484	41	0.8766303	8.1248664
468	74	0.7814975	6.1991763	468	46	0.9599332	8.2429048	486	51	1.0904426	9.215309
471	65	0.6864505	6.8856268	471	45	0.9390651	9.1819699	489	60	1.2828736	10.498183
474	79	0.8343014	7.7199282	474	53	1.10601	10.28798	491	54	1.1545863	11.652769
476	70	0.7392544	8.4591826	476	43	0.8973289	11.185309	494	64	1.3683985	13.021167
479	87	0.9187876	9.3779702	479	50	1.0434057	12.228715	497	98	2.0953603	15.116528
481	96	1.0138346	10.391805	481	59	1.2312187	13.459933	499	95	2.0312166	17.147744
484	106	1.1194424	11.511247	484	65	1.3564274	14.816361	502	90	1.9243105	19.072055
486	117	1.2356109	12.746858	486	66	1.3772955	16.193656	504	102	2.1808852	21.25294
489	139	1.467948	14.214806	489	79	1.648581	17.842237	507	118	2.5229848	23.775925
491	134	1.4151442	15.62995	491	80	1.6694491	19.511686	510	133	2.8437032	26.619628
494	147	1.5524343	17.182385	494	83	1.7320534	21.24374	512	135	2.8864657	29.506094
497	203	2.1438378	19.326222	497	105	2.1911519	23.434891	515	162	3.4637588	32.969852
499	212	2.2388848	21.565107	499	117	2.4415693	25.876461	518	177	3.7844772	36.75433
502	223	2.3550533	23.920161	502	133	2.7754591	28.65192	521	150	3.2071841	39.961514
504	222	2.3444926	26.264653	504	120	2.5041736	31.156093	524	173	3.6989523	43.660466
507	256	2.703559	28.968212	507	138	2.8797997	34.035893	527	156	3.3354715	46.995938
510	269	2.8408491	31.809061	510	136	2.8380634	36.873957	530	196	4.1907205	51.186658
512	286	3.0203823	34.829443	512	151	3.1510851	40.025042	533	213	4.5542014	55.74086
515	325	3.4322526	38.261696	515	163	3.4015025	43.426544	536	178	3.8058585	59.546718

	Population				Males				Females		
Score	N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
518	339	3.5801035	41.8418	518	162	3.3806344	46.807179	539	186	3.9769083	63.523626
521	319	3.368888	45.210688	521	169	3.5267112	50.33389	542	185	3.955527	67.479153
524	353	3.7279544	48.938642	524	180	3.7562604	54.09015	546	178	3.8058585	71.285012
527	339	3.5801035	52.518745	527	183	3.8188648	57.909015	549	165	3.5279025	74.812914
530	370	3.9074876	56.426233	530	174	3.6310518	61.540067	553	151	3.2285653	78.04148
533	383	4.0447777	60.471011	533	170	3.5475793	65.087646	556	169	3.6134274	81.654907
536	341	3.6012251	64.072236	536	163	3.4015025	68.489149	560	144	3.0788967	84.733804
539	357	3.7701975	67.842433	539	171	3.5684474	72.057596	564	116	2.4802224	87.214026
542	384	4.0553385	71.897772	542	199	4.1527546	76.210351	568	122	2.6085097	89.822536
546	339	3.5801035	75.477875	546	161	3.3597663	79.570117	573	98	2.0953603	91.917896
549	312	3.2949625	78.772838	549	147	3.0676127	82.63773	577	95	2.0312166	93.949113
553	293	3.0943077	81.867145	553	142	2.9632721	85.601002	582	72	1.5394484	95.488561
556	291	3.0731862	84.940332	556	122	2.5459098	88.146912	587	56	1.1973487	96.68591
560	256	2.703559	87.643891	560	112	2.3372287	90.48414	593	44	0.940774	97.626684
564	238	2.513465	90.157356	564	122	2.5459098	93.03005	598	38	0.8124866	98.43917
568	202	2.133277	92.290633	568	80	1.6694491	94.699499	605	27	0.5772931	99.016464
573	162	1.7108459	94.001479	573	64	1.3355593	96.035058	612	19	0.4062433	99.422707
577	147	1.5524343	95.553913	577	52	1.0851419	97.1202	619	9	0.192431	99.615138
582	107	1.1300032	96.683916	582	35	0.730384	97.850584	627	8	0.1710498	99.786188
587	89	0.9399092	97.623825	587	33	0.6886477	98.539232	637	4	0.0855249	99.871713
593	65	0.6864505	98.310276	593	21	0.4382304	98.977462	648	3	0.0641437	99.935856
598	60	0.6336466	98.943922	598	22	0.4590985	99.436561	681	2	0.0427625	99.978619
605	41	0.4329919	99.376914	605	14	0.2921536	99.728715	712	1	0.0213812	100
612	25	0.2640194	99.640934	612	6	0.1252087	99.853923	Total	4677	100	
619	13	0.1372901	99.778224	619	4	0.0834725	99.937396				
627	9	0.095047	99.873271	627	1	0.0208681	99.958264				
637	6	0.0633647	99.936635	637	2	0.0417362	100				
648	3	0.0316823	99.968318	Total	4792	100					
681	2	0.0211216	99.989439								
712	1	0.0105608	100								
Total	9469	100									

Frequency Distributions of 2005 DSTP Reading Scores by Grade and Race

Grade 4 Black				Grade 4 White				Grade 8 Black				Grade 8 White			
Score	N.	%	c%	Score	N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
345	2	0.0911162	0.0911162	341	2	0.0478011	0.0478011	376	1	0.0304785	0.0304785	397	1	0.0189789	0.0189789
349	1	0.0455581	0.1366743	366	1	0.0239006	0.0717017	382	1	0.0304785	0.060957	406	2	0.0379579	0.0569368
353	1	0.0455581	0.1822323	372	2	0.0478011	0.1195029	387	2	0.060957	0.1219141	410	2	0.0379579	0.0948947
356	1	0.0455581	0.2277904	378	3	0.0717017	0.1912046	393	1	0.0304785	0.1523926	418	1	0.0189789	0.1138736
363	1	0.0455581	0.2733485	383	3	0.0717017	0.2629063	397	2	0.060957	0.2133496	422	4	0.0759157	0.1897893
366	5	0.2277904	0.501139	386	5	0.1195029	0.3824092	402	1	0.0304785	0.2438281	425	2	0.0379579	0.2277472
369	4	0.1822323	0.6833713	389	1	0.0239006	0.4063098	406	2	0.060957	0.3047851	428	2	0.0379579	0.2657051
372	8	0.3644647	1.047836	391	1	0.0239006	0.4302103	410	5	0.1523926	0.4571777	432	3	0.0569368	0.3226419
375	3	0.1366743	1.1845103	394	3	0.0717017	0.501912	414	4	0.1219141	0.5790917	435	2	0.0379579	0.3605997
378	4	0.1822323	1.3667426	396	8	0.1912046	0.6931166	418	7	0.2133496	0.7924413	438	4	0.0759157	0.4365155
381	6	0.2733485	1.6400911	399	1	0.0239006	0.7170172	422	2	0.060957	0.8533984	441	4	0.0759157	0.5124312
383	5	0.2277904	1.8678815	401	7	0.167304	0.8843212	425	9	0.2743066	1.127705	444	6	0.1138736	0.6263048
386	7	0.3189066	2.1867882	404	5	0.1195029	1.0038241	428	10	0.3047851	1.4324901	447	10	0.1897893	0.8160941
389	9	0.4100228	2.5968109	406	10	0.2390057	1.2428298	432	13	0.3962207	1.8287108	449	14	0.2657051	1.0817992
391	6	0.2733485	2.8701595	408	7	0.167304	1.4101338	435	11	0.3352636	2.1639744	452	14	0.2657051	1.3475043
394	8	0.3644647	3.2346241	411	15	0.3585086	1.7686424	438	15	0.4571777	2.6211521	455	19	0.3605997	1.708104
396	9	0.4100228	3.6446469	413	21	0.501912	2.2705545	441	10	0.3047851	2.9259372	458	10	0.1897893	1.8978933
399	8	0.3644647	4.0091116	416	26	0.6214149	2.8919694	444	17	0.5181347	3.4440719	460	14	0.2657051	2.1635984
401	8	0.3644647	4.3735763	418	19	0.4541109	3.3460803	447	24	0.7314843	4.1755562	463	11	0.2087683	2.3723667
404	15	0.6833713	5.0569476	420	20	0.4780115	3.8240918	449	16	0.4876562	4.6632124	466	18	0.3416208	2.7139875
406	17	0.7744875	5.8314351	423	19	0.4541109	4.2782027	452	16	0.4876562	5.1508686	468	20	0.3795787	3.0935661
408	18	0.8200456	6.6514806	425	25	0.5975143	4.875717	455	14	0.4266992	5.5775678	471	27	0.5124312	3.6059973
411	23	1.047836	7.6993166	427	22	0.5258126	5.4015296	458	30	0.9143554	6.4919232	474	27	0.5124312	4.1184285
413	24	1.0933941	8.7927107	430	23	0.5497132	5.9512428	460	24	0.7314843	7.2234075	476	20	0.3795787	4.4980072
416	37	1.6856492	10.47836	432	49	1.1711281	7.1223709	463	26	0.7924413	8.0158488	479	43	0.8160941	5.3141013
418	32	1.4578588	11.936219	435	38	0.9082218	8.0305927	466	36	1.0972265	9.1130753	481	27	0.5124312	5.8265325
420	23	1.047836	12.984055	437	48	1.1472275	9.1778203	468	46	1.4020116	10.515087	484	39	0.7401784	6.566711
423	36	1.6400911	14.624146	440	52	1.2428298	10.42065	471	33	1.0057909	11.520878	486	38	0.7211995	7.2879104
425	35	1.594533	16.218679	442	51	1.2189293	11.639579	474	41	1.249619	12.770497	489	45	0.854052	8.1419624
427	35	1.594533	17.813212	445	72	1.7208413	13.360421	476	39	1.188662	13.959159	491	54	1.0248624	9.1668248
430	55	2.5056948	20.318907	447	69	1.6491396	15.00956	479	35	1.0667479	15.025907	494	59	1.1197571	10.286582
432	42	1.9134396	22.232346	450	90	2.1510516	17.160612	481	57	1.7372752	16.763182	497	86	1.6321883	11.91877
435	48	2.1867882	24.419134	452	100	2.3900574	19.550669	484	50	1.5239256	18.287108	499	78	1.4803568	13.399127

Grade 4 Black				Grade 4 White				Grade 8 Black				Grade 8 White			
Score	N.	%	c%	Score	N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
437	58	2.642369	27.061503	455	112	2.6768642	22.227533	486	69	2.1030174	20.390125	502	91	1.7270829	15.12621
440	50	2.2779043	29.339408	458	114	2.7246654	24.952199	489	76	2.316367	22.706492	504	93	1.7650408	16.891251
442	64	2.9157175	32.255125	461	123	2.9397706	27.891969	491	67	2.0420603	24.748552	507	122	2.3154299	19.206681
445	84	3.8268793	36.082005	463	158	3.7762906	31.66826	494	75	2.2858884	27.034441	510	132	2.5052192	21.7119
447	71	3.2346241	39.316629	466	179	4.2782027	35.946463	497	97	2.9564157	29.990856	512	139	2.6380717	24.349972
450	78	3.5535308	42.870159	469	180	4.3021033	40.248566	499	107	3.2612009	33.252057	515	156	2.9607136	27.310685
452	78	3.5535308	46.42369	472	184	4.3977055	44.646272	502	115	3.505029	36.757086	518	180	3.416208	30.726893
455	88	4.0091116	50.432802	476	199	4.7562141	49.402486	504	107	3.2612009	40.018287	521	172	3.2643765	33.99127
458	73	3.3257403	53.758542	479	181	4.3260038	53.728489	507	109	3.3221579	43.340445	524	188	3.5680395	37.559309
461	102	4.6469248	58.405467	482	199	4.7562141	58.484704	510	114	3.4745504	46.814995	527	190	3.6059973	41.165307
463	78	3.5535308	61.958998	486	186	4.4455067	62.93021	512	123	3.7488571	50.563852	530	204	3.8717024	45.037009
466	66	3.0068337	64.965831	489	185	4.4216061	67.351816	515	132	4.0231637	54.587016	533	236	4.4790283	49.516037
469	77	3.5079727	68.473804	493	216	5.1625239	72.51434	518	133	4.0536422	58.640658	536	217	4.1184285	53.634466
472	80	3.6446469	72.118451	497	208	4.9713193	77.48566	521	115	3.505029	62.145687	539	227	4.3082179	57.942684
476	68	3.0979499	75.216401	501	174	4.1586998	81.644359	524	122	3.7183785	65.864066	542	251	4.7637123	62.706396
479	83	3.7813212	78.997722	505	175	4.1826004	85.82696	527	116	3.5355075	69.399573	546	229	4.3461757	67.052572
482	80	3.6446469	82.642369	510	141	3.3699809	89.196941	530	127	3.8707711	73.270344	549	219	4.1563864	71.208958
486	56	2.5512528	85.193622	514	114	2.7246654	91.921606	533	113	3.4440719	76.714416	553	204	3.8717024	75.08066
489	48	2.1867882	87.38041	519	102	2.4378585	94.359465	536	95	2.8954587	79.609875	556	217	4.1184285	79.199089
493	63	2.8701595	90.250569	525	72	1.7208413	96.080306	539	97	2.9564157	82.566291	560	183	3.4731448	82.672234
497	46	2.095672	92.346241	531	51	1.2189293	97.299235	542	104	3.1697653	85.736056	564	174	3.3023344	85.974568
501	32	1.4578588	93.8041	537	32	0.7648184	98.064054	546	78	2.377324	88.11338	568	148	2.8088821	88.78345
505	46	2.095672	95.899772	543	36	0.8604207	98.924474	549	69	2.1030174	90.216397	573	124	2.3533877	91.136838
510	22	1.0022779	96.90205	550	23	0.5497132	99.474187	553	56	1.7067967	91.923194	577	116	2.2015563	93.338394
514	24	1.0933941	97.995444	558	16	0.3824092	99.856597	556	54	1.6458397	93.569034	582	91	1.7270829	95.065477
519	13	0.5922551	98.587699	567	2	0.0478011	99.904398	560	57	1.7372752	95.306309	587	73	1.3854621	96.450939
525	10	0.4555809	99.04328	576	2	0.0478011	99.952199	564	47	1.4324901	96.738799	593	51	0.9679256	97.418865
531	8	0.3644647	99.407745	587	1	0.0239006	99.976099	568	35	1.0667479	97.805547	598	50	0.9489467	98.367812
537	8	0.3644647	99.77221	600	1	0.0239006	100	573	19	0.5790917	98.384639	605	38	0.7211995	99.089011
543	3	0.1366743	99.908884	Total	4184	100		577	22	0.6705273	99.055166	612	19	0.3605997	99.449611

Grade 4 Black				Grade 4 White				Grade 8 Black				Grade 8 White			
Score	N.	%	c%	Score	N.	%	c%	Score	N.	%	c%	Score	N.	%	c%
550	1	0.0455581	99.954442					582	7	0.2133496	99.268516	619	10	0.1897893	99.6394
587	1	0.0455581	100					587	10	0.3047851	99.573301	627	8	0.1518315	99.791232
Total	2195	100						593	7	0.2133496	99.78665	637	6	0.1138736	99.905105
								598	6	0.1828711	99.969521	648	2	0.0379579	99.943063
								612	1	0.0304785	100	681	2	0.0379579	99.981021
								Total	3281	100		712	1	0.0189789	100
												Total	5269	100	