

NNAT3

Naglieri Nonverbal Ability Test[®] **Third Edition**

Manual

Levels A–D



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2018 Norms Update

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About the Author

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Dr. Naglieri is the author or coauthor of more than 250 scholarly papers, books, and tests. His scholarly research includes investigations related to exceptionalities such as mental impairment, specific learning disabilities, giftedness, and Attention Deficit Disorder; psychometric studies of tests such as the Wechsler Scales of Intelligence, Cognitive Assessment System, and the Kaufman Assessment Battery for Children; examination of race, gender, and ethnic differences in cognitive processing; fair assessment using nonverbal and neurocognitive processing tests; identification of gifted minorities, IDEA and identification of specific learning disabilities; and cognitively based mathematics interventions. He has authored various books, including *Essentials of CAS Assessment* (Naglieri, 1999), and coauthored books such as *Assessment of Cognitive Processes: The PASS Theory of Intelligence* (Das, Naglieri, & Kirby, 1994), *Helping Children Learn: Intervention Handouts for Use at School and Home, Second edition* (Naglieri & Pickering, 2010), *Essentials of Wechsler Nonverbal Assessment* (Brunnert, Naglieri, & Hardy-Braz, 2009), and *Helping All Gifted Children Learn: A Teacher's Guide to Using the NNAT2* (Naglieri, Brulles, & Lansdowne, 2009). Dr. Naglieri has also coedited books such as *Handbook of Assessment Psychology* (Graham & Naglieri, 2002), *Assessment of Autism Spectrum Disorders* (Goldstein, Naglieri, & Ozonoff, 2009), *Assessing Impairment: From Theory to Practice* (Goldstein & Naglieri, 2009), *A Practitioner's Guide to Assessment of Intelligence and Achievement* (Naglieri & Goldstein, 2009), and *Handbook of Executive Function* (Goldstein & Naglieri, 2013).

Dr. Naglieri's scholarly efforts also include development and publication of tests and rating scales. He began this work in the mid-1980s with the publication of the *Matrix Analogies Tests* (Naglieri, 1985), which became the *Naglieri Nonverbal Ability Test—Multilevel Form* (Naglieri, 1997), *Naglieri Nonverbal Ability Test—Second Edition* (2008) and now the *Naglieri Nonverbal Ability Test—Third Edition*

(2016). He also published the *Wechsler Nonverbal Scale of Ability* (Wechsler & Naglieri, 2008), the *Devereux Student Strength Assessment* (LeBuffe, Shapiro, & Naglieri, 2009), the *Autism Spectrum Rating Scale* (Goldstein & Naglieri, 2009), the *Comprehensive Executive Functioning Index* (Naglieri & Goldstein, 2013), and the *Cognitive Assessment System—Second Edition* (Naglieri, Das and Goldstein, 2014).

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CHAPTER 1

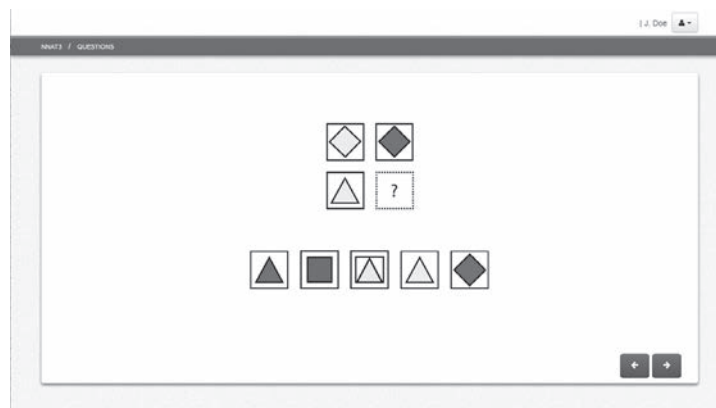
PURPOSE AND DESIGN OF NNAT3 LEVELS A–D

The *Naglieri Nonverbal Ability Test*[®]—Third Edition (NNAT3 Levels A–D) is a brief, nonverbal measure of general ability that can be group administered in online or paper format in about 30 minutes to students aged 5 to 11.^a For information about NNAT3 Levels E–G (grades 5–12), please see the NNAT3 Levels E–G Manual. The purpose of the NNAT3 is to measure general ability using abstract designs which are accessible to a wide variety of students including those with limited educational experiences, those who come from diverse cultural, socioeconomic, or linguistic backgrounds, and those who have language disabilities, autism spectrum disorder, or are deaf or hard of hearing. Because the NNAT3 items consist of geometric shapes that are universal and have no verbal content, and the directions are pictorial with minimal verbal instructions, NNAT3 has great utility as part of the process of identifying students for gifted/talented educational programs, especially for members of groups that have been underrepresented.

The NNAT3 is the latest in a series of related instruments spanning thirty years. It is a revision of the *Naglieri Nonverbal Ability Test*—Second Edition (NNAT2; Naglieri, 2007), which is based on the *Naglieri Nonverbal Ability Test*—Multilevel Form (NNAT-ML; Naglieri, 1997). The original instruments in this series were the *Matrix Analogies Test*—Expanded Form (MAT-EF; Naglieri, 1985a) and *Matrix Analogies Test*—Short Form (MAT-SF; Naglieri, 1985b).

The NNAT3 measures the student’s ability to look at a pattern that has a missing section, understand the relationships among the parts, and determine which of the five options correctly fills the gap. An example is shown in Figure 1.1. In this example, the student needs to comprehend the relationships between the two diamonds in the top row and the diamond and triangle in the left column. When the horizontal and vertical relationships are understood, then the answer (option 1) becomes clear.

Figure 1.1. Example of an NNAT3 Item



^a Norms are also provided for children aged 4:0–4:11 so that NNAT3 Level A may be used with high-ability preschoolers. However, because of its difficulty, the test is not appropriate for general use with children younger than 5 years old.

The kind of thinking required to solve a question like this one, made up of shapes and colors, is essentially the same as the thinking required to solve a verbal question such as “Girl is to woman as boy is to . . . ?” In this case the relationships between girl and woman as well as girl and boy must be understood to arrive at the answer “man.” Although the thinking is the same whether one is reasoning with words or with shapes, one type requires knowledge of a particular language and, usually, the ability to read, whereas the other type does not require these skills.

The NNAT3 measures general ability—a widely used concept that has been studied since the early 1900s. Naglieri, Brulles, and Lansdowne (2009) described general ability as what allows people to solve a number of different kinds of problems that may involve words, pictures, sounds, or numbers. It may also require verbal, quantitative, or nonverbal reasoning; memory; sequencing; pattern recognition; insights; drawing inferences; and analyzing simple and complex ideas. In modern conceptions of ability, the particular type of thinking that NNAT3 questions require—that is, seeing relationships among components of the question and thinking of rules that can explain those relationships—is considered to be closely related to general ability (Carroll, 1993). Thus, it is not surprising that the various versions of NNAT have been found to be good predictors of academic achievement for students in diverse racial/ethnic groups or from diverse language backgrounds. The power of the concept of general ability makes this a useful approach for large-scale testing.

Design

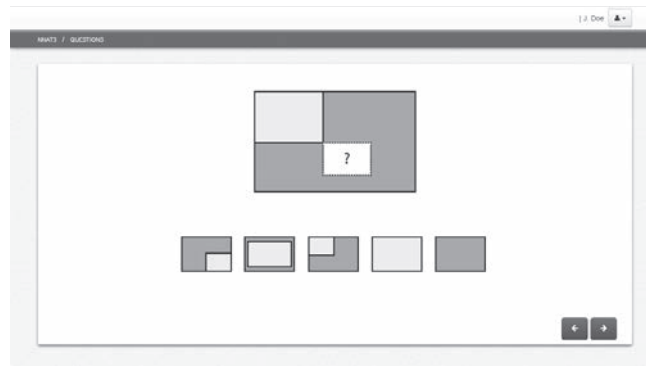
The NNAT3 consists of four levels (A, B, C, and D), each of which is designed specifically for students in the corresponding grade (i.e., K, 1, 2, and 3–4, respectively). Although kindergarten, Grade 1, and Grade 2 each have their own level, Level D is administered to students in Grades 3 and 4. Separate levels are provided for kindergarten through second grade because of the significant amount of development in ability that occurs during each of the early school years.

Unlike the previous versions of the test, the NNAT3 Levels A–D has two parallel forms (Form 1 and Form 2) at each level. The parallel forms are similar in the types of items they contain and in their level of difficulty, and they have no common items. This makes them useful in situations requiring repeated administrations, such as evaluating students’ progress over time or measuring the effectiveness of an intervention or program. Additionally, the lack of common items across forms helps to maintain item and test security.

Each form consists of 48 carefully selected items, arranged in approximate order of difficulty. The items were chosen based on content and level of difficulty. There are common items between adjacent levels within a form (for example, between Levels B and C of Form 1). The specifics of the item-selection and form-development processes are described in later sections of this manual.

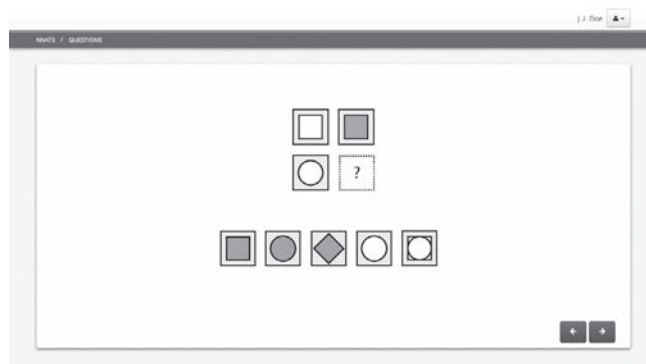
Although NNAT3 Levels A–D items are similar to NNAT2 items, they are all new. Test development was guided by the need to provide items of appropriate difficulty at every level and to vary the structure of the items. For example, the easiest items present a large rectangle with a piece missing (see an example in Figure 1.2). The child must choose the option that would complete the larger image, relying on an understanding of how the entire image is organized.

Figure 1.2. Example of an NNAT3 Item with Missing Piece



More difficult items show a set of images in a 2-by-2, 2-by-3, or 3-by-3 array. The elements of a relatively easy item form a simple pattern as shown in Figure 1.3. In this example, the student must recognize changes in shape and color across the horizontal and vertical dimensions to arrive at the correct answer. The items become more complex and difficult when there is an increase in the number of visual features and in the ways in which they can change (e.g., size, rotation, addition, or progression). This method of item development provided a full range of difficulty necessary to create norms which would measure ability nonverbally for a wide variety of individuals.

Figure 1.3. Example of an NNAT3 Item with Changes in Color and Shape



Administration

The NNAT3 is designed to be administered to groups of students. At grades 2 and above, it can be given to entire classrooms, but smaller groups are recommended at kindergarten (up to five students) and Grade 1 (up to ten students). At any grade level, it is permissible to administer the NNAT3 to a single student.

The teacher reads the directions (in the language appropriate for the students) and leads the students through sample items, but once the actual test begins, the students work on their own. Students have 30 minutes to work on the test questions, and the overall administration, including directions, takes about 35 to 45 minutes.

The NNAT is considered a power test; that is, it is designed to measure the abilities of the test taker, regardless of his or her speed of performance. Power tests contain items with varying degrees of difficulty and allow enough time for test takers to attempt all items. Based on results from tryout and standardization, most students were able to complete the NNAT3 within 30 minutes. Additionally, a study comparing students who were given additional time to complete the NNAT2 versus those who were not found that students who got additional time did not obtain higher scores. As a result, the 30-minute administration time was deemed appropriate for the NNAT3.

Both the paper-and-pencil and computer-based versions of the NNAT3 are available at all levels. With paper administration at kindergarten and Grade 1, students mark their answers directly in a consumable, machine-scorable test booklet. At Grades 2–4, students may use either the consumable booklet or a reusable booklet with a separate machine-scorable answer sheet.

The choice of NNAT3 level to administer is based on the student’s grade, although the norms for the NNAT3 are based on age. The items at any given level span a wide range of difficulty so that the level is appropriate for students of different ages at that grade. If necessary, a student may be tested “out of level” (that is, using a level intended for a different grade), as long as the student’s age is within the range of valid ages shown in Table 1.1.

Table 1.1. Grade and Valid Age Range for Each NNAT3 Level

Level	Grade(s)	Valid Age Range (year:month)
A	Kindergarten	4:0 to 7:11
B	1	5:0 to 9:11
C	2	6:0 to 10:11
D	3–4	7:0 to 11:11

Uses of NNAT3

The NNAT3 is well suited to evaluating general ability in a wide variety of children. It is a good predictor of academic achievement and is effective as part of the process of identifying gifted and talented students. In addition, the NNAT3 has several features that make it desirable for assessing diverse populations. The use of nonverbal test questions and pictorial directions enables valid and interpretable results to be obtained for students with varied linguistic or cultural backgrounds, such as English language learners. That is, the NNAT3 is particularly valuable for those who cannot be effectively and fairly assessed using tests with items that require knowledge and use of a particular language. These features are also beneficial for assessing students with developmental delays or challenges, the deaf and hard of hearing, students with autism spectrum disorder, and students with little or no schooling.

The NNAT3, therefore, has two primary uses. The first is to help in the identification of gifted and talented students, especially those from under-represented groups; this use addresses one of the most serious challenges facing educators of gifted and talented students. The second use is to provide a measure of general ability for students of all ability levels for whom a language-free assessment is required.

CHAPTER 2

INTERPRETATION AND APPLICATIONS

NNAT3 results, like those from any test, should be interpreted in light of the student's background, including classroom performance, social-emotional skills, motivation, and language skills. This chapter provides information designed to assist users in interpreting NNAT3 scores when making decisions about educational placement.

Types of Scores

The various types of scores provided for the NNAT3 have different uses and yield different kinds of information. Therefore, users should focus their interpretation on the particular score types that are most relevant to the purpose for which the test was administered. The score types are described in the following section. Please see the appendices at the end of this manual for score tables.

Raw Scores

The raw score is the number of items answered correctly. Raw scores are the basis for scaled scores (described below), but by themselves they provide little information about the level or quality of student performance. They can be interpreted only in reference to the number of items on the test.

Scaled Scores

The scaled-score system is based on a continuous scale of performance that spans across Levels A to D of the NNAT3. A higher scaled-score value indicates that the student was successful on more difficult items. A raw score on any NNAT3 level has a corresponding scaled-score value. A particular raw score will convert to a higher scaled score on a higher (more difficult) NNAT3 level than on a lower level.

Because the scaled-score system links all levels of the test together, it can be used to compare the performance of students taking different levels of the test. Once a raw score has been converted to its corresponding scaled score, the level that was administered is no longer relevant. This makes scaled scores especially suitable for comparing scores from different levels of the test, for studying growth in performance over time, and for testing out of level. The normative scores described below (NAI, percentile rank, stanine, and normal curve equivalent) are all based on the scaled score and the age of the examinee, rather than the raw score.

Normative Scores

Normative scores describe how the student’s performance (scaled score) compares with the performance of other students of the same age in a nationally representative norm sample. For most purposes, normative scores are the most useful basis for interpretation. Because the NNAT3 is a measure of ability rather than academic achievement, the normative scores are based on age rather than grade.

Naglieri Ability Index (NAI)

The Naglieri Ability Index (NAI) is a score on a scale that ranges from 40 to 160, with an average of 100 and a standard deviation of 16. An NAI of 100 represents the score that is the average for students of the same age. About 68% of students in the norm sample score within one standard deviation of 100 (that is, between NAIs of 84 and 116), and about 95% score within two standard deviations (68 to 132). Because NAIs are normalized standard scores, the relationship of NAIs to percentile ranks and stanines is the same for all ages and all NNAT3 levels.

Percentile Rank

The percentile rank indicates the percentage of students of that age in the norm sample who scored at or below that scaled score. As noted above, there is a constant relationship between NAIs and percentile ranks. For example, an NAI of 116 converts to a percentile rank of 84, meaning that 84 percent of students in the norm sample earned NAIs of 116 or lower. An NAI of 100 corresponds to a percentile rank of 50, representing the average NAI for students in the norm sample.

Percentile ranks are valuable because they are easily interpreted and explained. However, they have certain disadvantages. One is that they are often confused with “percentage correct.” Another is that a given size difference between percentile ranks has different meaning at different score levels; for example, the difference in ability between percentile ranks of 90 and 95 is much greater than that between percentile ranks of 50 and 55. This characteristic results from the concentration of most scaled scores near the middle of the distribution, with relatively few scores at the extremes. Thus, although percentile ranks are very useful for describing the relative standing of a student within the reference group, they are less useful in describing differences between scores (such as between the scores of two students, or between a student’s scores at different times). Because they are not an equal-interval scale, percentile ranks cannot be averaged or used in arithmetical computations such as addition or subtraction.

Stanine

The stanine scale is a simplified version of the NAI scale. Stanines range from 1 to 9 with an average of 5. The nine units of the stanine scale represent equal differences in ability; for example, the difference in ability between stanines 7 and 9 is the same as the difference in ability between stanines 1 and 3. Therefore, stanines may be averaged or used in other arithmetical computations.

In general, stanines 1, 2, and 3 are considered to reflect below-average performance; stanines 4, 5, and 6 reflect average performance; and stanines 7, 8, and 9 reflect above-average performance. Because stanine units are broader than those of the NAI and percentile rank scales, they possess somewhat greater stability and reduce the likelihood of misinterpretations of small differences in test scores.

Normal Curve Equivalent

The normal curve equivalent (NCE) is another version of the NAI scale, this time with an average of 50 and a standard deviation of 21.06. Like NAIs and stanines, NCE scores can be used in arithmetical calculations such as averaging. The benefit of the NCE scale is that NCE scores of 1, 50, and 99 have percentile ranks of 1, 50, and 99, which may assist in interpretation.

All of the normative scores described in this section have fixed relationships with one another. Appendix C may be used to find the equivalent values on these different scales.

Guidelines for Interpreting Different Types of Scores

Scores describe performance. A score should be selected for reporting based on its intended use. Stanine scores report performance on a very simple scale. Stanines range from a low of 1 to a high of 9, with 5 representing an average score. Percentile ranks are generally familiar to teachers and parents, are fairly easy to interpret, and offer more precision than stanines, allowing differentiation of 99 different points. The NAI score allows for even finer distinctions of differences in the performances of students at very high or very low levels. A percentile rank of 99, for example, corresponds to an NAI of 135 through 160. Percentile ranks cannot distinguish among students with NAIs of 135 or higher. In those instances in which a cut-score is used for identification, percentile ranks will usually be sufficient. For example, if a state or district uses a 95th-percentile rank to identify gifted and talented students, then using the percentile score for selection makes sense. But if it is necessary to distinguish students at the very high end of this scale, the NAI will allow for differentiation among students with percentile ranks at or above 99.

Applications and Uses of NNAT3

The NNAT3 has a variety of educational applications. Like the NNAT2, it is a nonverbal measure of general ability that predicts scholastic achievement and is well suited to assessing groups of students with diverse backgrounds and characteristics.

The NNAT3 has ample ceiling for use in identifying gifted students, but it covers the full range of ability and therefore can also be useful in flagging students with low ability who may face difficulties in schoolwork. Furthermore, when used in conjunction with information about academic achievement, the NNAT3 can provide a broader picture of students who are struggling academically and identify students who may have learning problems, whose academic difficulties may be due to learning problems or limited English proficiency, or who may have had inadequate opportunity to learn. These groups of students are likely to do more poorly on tests that require verbal and quantitative knowledge than one that is nonverbal, making a test like the NNAT3 a good choice for accurate assessment.

The design of the NNAT3 items makes its use fair and appropriate with students who have hearing, language, or motor impairments, or who have impaired color vision.

For all of these reasons, the NNAT3 is particularly helpful when the goal is to find all gifted children, including those from diverse cultural, linguistic, or socioeconomic backgrounds, those who have had limited opportunity to learn, and those with hearing or motor impairments. These students may speak a different language or come from a different culture, but they have the potential to learn given the opportunity.

Using NNAT3 with Other Measures for Gifted/Talented Identification

The NNAT3 can be used with other forms of assessment to help identify children who are gifted and talented and provide them with appropriate educational experiences. School districts often use a variety of measures (e.g., standardized achievement tests, creativity measures, grades, and in-class assignments) to identify students who should receive gifted and talented programming. This method of combining different types of information can affect the extent to which the broad reach of the NNAT3 is reflected in the results. Although the NNAT3 provides a way to measure ability that is particularly appropriate for children with limited English-language skills or those settings where enrichment in the home is limited, simply including the test in a larger group of measures will not automatically ensure that the process will identify children from a wide variety of backgrounds. To obtain the greatest benefit from inclusion of the NNAT3, the following factors should be considered.

1. If the identification process requires a series of tests, the NNAT3 should be administered first, and to all of the students. All students should be given the opportunity to demonstrate their abilities, not only those nominated for possible gifted/talented programs. For example, gifted students with limited English skills, learning problems, or inadequate learning opportunities will most likely not be identified if a verbal or quantitative test is administered first.

2. The manner in which information from different sources is combined makes a difference. For example, if students are required to obtain high scores on the NNAT3 and on a verbal or quantitative test, students whose academic achievement has been limited will tend to be excluded. Combining scores from very different tests can yield a misleading conclusion for students in diverse populations and mask a high score on the nonverbal measure of general ability.

The identification of gifted children who may not excel in academics despite high ability presents a challenge to teachers in gifted/talented education (see Winebrenner & Brulles, 2008). In such a situation, high scores on this nonverbal test of general ability allow us to identify those children who have great potential for academic attainment, and those students should be given the opportunity to get additional educational services (Naglieri, Brulles, & Lansdowne, 2009). Addressing the needs of these diverse populations can be accomplished with a variety of educational methods. Differentiated instruction, enrichment clusters, and part-time pull-out classes are common approaches; however, districts vary greatly in the gifted/talented services and programming they provide. Once a student has been found to have high general ability using the NNAT3, the instruction that is delivered must be tailored to the academic needs of the gifted child (Naglieri, Brulles, & Lansdowne, 2009). This will help students from a wide variety of cultural and linguistic groups receive the education they deserve.

What does the NNAT3 Measure?

Concept of General Ability

Group and individually administered intelligence tests that are popular today have been used in educational settings to measure *general ability* for 100 years. The origin of these tests was the Army Alpha and Army Beta tests devised by the U.S. Armed Forces in the early 1900s (Naglieri, 2015). These two tests differed on the basis of the content of the items. The Alpha battery included tests of general information (e.g., how many months are there in a year?), common sense (e.g., why do we use stoves?), verbal knowledge (synonyms/antonyms, verbal analogies), and quantitative skills like completing math word problems (e.g., how many are 40 plus 6 men?). Tests in the Beta battery were nonverbal and

included tasks such as completing a maze, constructing a design using blocks, remembering number-symbol associations, identifying what is missing in a picture, and copying geometric shapes. The Alpha test was viewed as an appropriate measure for literate men who could read and write English, while the Beta tests were intended for those with poor skills in written or spoken English (Yoakum & Yerkes, 1920). The testing procedures ensured that men “who fail in alpha are sent to beta in order that injustice by reason of relative unfamiliarity with English may be avoided” (Yoakum & Yerkes, 1920, p. 19). Thus, the Alpha and Beta tests were considered to be alternative methods of assessing general ability. These tests made a significant and long-lasting contribution to our understanding of how to measure and conceptualize general ability.

The initial thinking about the concept of general ability as a broad, general trait was described by Pintner (1923) when he wrote that “we did not start with a clear definition of general intelligence . . . [but] borrowed from every-day life a vague term implying all-round ability and . . . we [are] still attempting to define it more sharply and endow it with a stricter scientific connotation” (p. 53). Some years later Wechsler (1958) stated that even though his test of general ability was organized into verbal and performance scales, it did not measure two types of intelligence; rather, “the subtests are different measures of intelligence, not measures of different kinds of intelligence” (p. 64), and he viewed both types as equally valid (Boake, 2002). Similarly, the term “nonverbal” refers to the content of the test, not a type of ability (Naglieri, 2008). Thus, tests may differ in their content or specific demands but still measure the concept of general ability—what Spearman referred to as the “indifference of the indicator” (1927, p. 197).

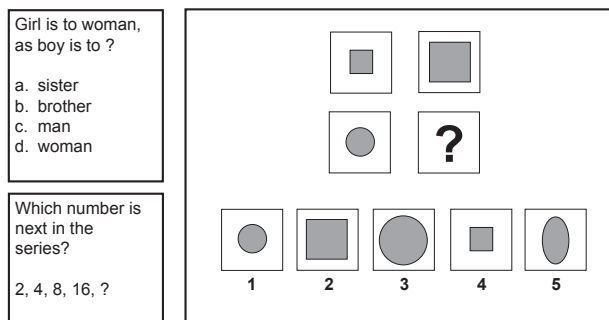
The diversity of tasks and content that may be utilized to measure general ability was highlighted by Naglieri, Brulles, and Lansdowne (2009, p. 5): “General ability is what allows people to solve a number of different kinds of problems that may involve words, pictures, sounds, or numbers. The test questions may also involve verbal, quantitative, or nonverbal reasoning, memory, sequencing, verbal and math skills, patterning, connecting ideas across and within content areas, insights, making connections, drawing inferences, and analyzing simple and complex ideas.”

There is considerable research support for the concept of general ability as measured by individually administered tests such as the Wechsler and Stanford-Binet (see Jensen, 1998, for a review) and by group tests such as the NNAT3. Among the most important sources of validity evidence for general ability tests is the fact that the scores the tests yield are good predictors of school achievement (Naglieri & Bornstein, 2003; Ramsey & Reynolds, 2004).

Verbal, Quantitative, and Nonverbal Ways of Measuring General Ability

General ability can be measured using verbal, quantitative, or nonverbal test questions because of the similarity in the thinking required to answer these questions. In all three test types, the student must understand the relationships among the stimuli and must formulate and evaluate hypotheses about the rule that governs the pattern of relationships. Verbal tests (such as analogies) require the student to understand relationships among words and the concepts they represent, quantitative test questions require the student to understand relationships among numbers, and nonverbal test questions require the student to understand relationships among shapes. Examples of the three question types are shown in Figure 2.1.

Figure 2.1. Examples of Verbal, Quantitative, and Nonverbal Questions



Each of the questions illustrated in Figure 2.1 can only be solved if the examinee can understand the relationships among all the parts of the problem. The verbal analogy “Girl is to woman as boy is to ____?” requires that the examinee understand the way in which the words “girl” and “woman” are related and how “girl” and “boy” are related so that the answer (man) can be determined. Each of these pieces of information has meaning in relation to the others. The same is true for the quantitative reasoning item. In order to arrive at the answer, the student must infer the relationship between the first two numbers, 2 and 4 (the rule could be “add 2” or “multiply by 2”), then see if this relationship applies to the next pair of numbers, 4 and 8 (“add 2” does not work, but “multiply by 2” does), and then test the hypothesized rule by applying it to the last pair of numbers. These verbal and quantitative problems clearly require understanding of the relationships among the stimuli, which depends on knowledge (words and verbal concepts; numbers and arithmetic).

The nonverbal question also requires the student to understand the relationships among the shapes organized in the two-by-two matrix. To solve the problem, the relationships between the two shapes in the top row (change in size—little square becomes big square) and the two shapes in the left column (change in shape—little square becomes little circle) have to be understood and

applied to arrive at the answer (big circle). The relationships can be determined even if the shapes are not labeled as big and little or square and circle. Verbal and quantitative reasoning tests require both knowledge *and* thinking, whereas nonverbal reasoning tests require minimal knowledge but certainly demand thinking. Thus, general ability can be measured using verbal and quantitative tests that require knowledge *and* thinking, but nonverbal tests just require thinking.

CHAPTER 3

CONTENT DEVELOPMENT, STANDARDIZATION, AND NORMS DEVELOPMENT

This chapter describes how the content of NNAT3 Levels A–D was created, how it was evaluated and modified on the basis of item tryout, and how it was assembled into the standardization and final test forms. It also documents the standardization, including data-collection procedures, the demographic characteristics of the norm sample, and the method used to construct the norms.

Item Creation

The development process began with an initial pool of 480 new items which were organized into four levels based on estimated item difficulty. Graphical specifications for the new items were the same as for NNAT2 except for color. In order to ensure that NNAT3 items were appropriate for students with color blindness, careful attention was given to the selection of colors. NNAT3 items were constructed using the five colors of black, white, yellow, blue, and green, whereas NNAT2 items used a second shade of blue instead of green. The purpose of changing the color scheme was to make NNAT3 items more interesting and aesthetically pleasing. A team of color experts reviewed the colors and reported that students with color-vision deficits should be able to discriminate between the colors when they are adjacent, and match areas of the same color. Moreover, an examination of each item type revealed that the hues, saturation, and luminosity of each item were appropriate for individuals with different types of color blindness. Finally, the development team reviewed the items using software that simulates the effects of color blindness, and found that item content could be correctly perceived under each of the following color-blind conditions: monochromacy (complete), monochromacy (partial), protanopia or deuteranopia (complete red-green), protanomaly or deuteranomaly (partial red-green), tritanopia (complete blue-yellow), and tritanomaly (partial blue-yellow).

Item Tryout

The national tryout took place during May and June of 2014. Its primary purpose was to evaluate the difficulty, discrimination, and distractor functioning of a representative sample of the new items so that poorly functioning types of items could be revised or deleted and the new item types could be assigned to appropriate levels of the standardization forms. The items were created in pairs,

and only one item from each pair was included in the tryout. Also, the tryout included relatively few items that were highly similar to NNAT2 items, because these were expected to perform similarly to the NNAT2 originals. The reason for including these was to approximately link the difficulty scale of the NNAT3 tryout to the NNAT2 difficulty scale, thus allowing for a comparison of the difficulty of all NNAT3 items with NNAT2 items. It was assumed that the NNAT3 items that were based on NNAT2 items were, on average, as difficult as their NNAT2 counterparts. A total of 119 unique items were included in tryout, of which 42 were based on NNAT2 items.

Tryout Forms and Administration

There was one 48-item tryout form at each of four levels: Level K (administered to preschool and kindergarten students), Level 1 (Grade 1), Level 2 (Grade 2), and Level 3 (Grades 3 and 4). Ten to fifteen items on each form were based on NNAT2 items. Additionally, to link performance across levels, each pair of adjacent levels had 12 items in common. For example, Level 2 shared 12 items with Level 1 and 12 items with Level 3.

All tryout forms were administered on computer using a mouse. Pre-K students were tested in a one-on-one setting with their teachers who recorded the responses. Kindergarten and first-grade students took the assessment in small groups of up to five or ten students, respectively, and recorded their own responses. Second-, third-, and fourth-grade students took the tryout in classroom-size groups and recorded their own responses. Students responded by using a computer mouse to click on their answer choices. Any student who had difficulty manipulating the mouse was assisted by the teacher or proctor.

Administration procedures resembled those for NNAT2. The same kinds of sample items were used, and there was a 30-minute time limit (after the samples). Students were able to skip items and could go back to review earlier items.

Tryout Sample

Data was collected at eight sites in urban, suburban, and rural areas of the southern and midwestern United States. A total of 1,074 public- and private-school students in Pre-K through Grade 4 participated. The sample was designed to reflect a wide range of abilities. Because the tryout was conducted at the end of the school year, children attending preschool were included to provide an approximation of how kindergarten children would perform at the beginning of the school year. Participating schools received monetary compensation.

Table 3.1 shows the representation of the tryout sample by gender and ethnicity. Approximately 67% of the students at kindergarten through Grade 4 were in a free or reduced-price lunch program, and 5% of the overall sample were English language learners.

Table 3.1. Distribution of Gender and Ethnicity in the Tryout Sample

Characteristic	N	Percentage
All	1,074	
Female	476	44
Male	598	56
African American	39	4
Asian	17	2
Hispanic	156	15
White	830	77
Other	32	3

Tryout Results

Classical item-analysis procedures were applied separately at each grade level, and a single Rasch (IRT) calibration was performed on the entire sample. The classical statistics included difficulty (p , or proportion passing), discrimination (the correlation of item score with total score), and distractor information (proportion choosing each distractor, and correlation of each distractor with total score). Grade-level p values were especially useful for identifying the most appropriate level for each item. Because item-total correlations are affected by difficulty, items were flagged for scrutiny if their item-total correlation was low in comparison to other items of similar difficulty. All distractors were evaluated to detect any instances where a distractor attracted high-ability examinees, and distractor information was invaluable in diagnosing items with poor discrimination.

The Rasch item analysis yielded a difficulty value on the logit scale that spanned across all forms and levels, and an index of discrimination (infit mean square) that described how well the item differentiated between lower-ability and higher-ability examinees. Rasch logit difficulties were invaluable for comparing items across levels and for controlling the difficulty of standardization forms. The discrimination index is a robust flag for poor item functioning because it is largely independent of difficulty and it summarizes the information from all the levels at which an item was administered.

Tryout items that were highly similar to NNAT2 items were used to roughly align the Rasch difficulty scale in the tryout with the corresponding scale for NNAT2. Tryout logit difficulties for these 42 NNAT3 items were plotted against the logit difficulties of the corresponding NNAT2 items, and a few outliers were identified and removed. For the remaining items, tryout and NNAT2 difficulties correlated 0.84. The mean difference between the two sets of difficulty values was used as the equating constant between the tryout and NNAT2 scales. Adding this constant to a tryout difficulty value gave an estimate of the item’s difficulty on the NNAT2 scale, allowing some control over the difficulty of NNAT3 standardization forms relative to NNAT2 forms.

About 7% of the 119 tryout items were removed from the item pool because of poor discrimination that did not appear to be remediable through revision. Another 9% of items were dropped because they were either too easy or too difficult for the level at which they had been administered, and so the tryout did not provide useful information about their functioning. The remaining items were retained, either in their tryout versions or with modifications that were indicated by the item analyses; often, modifications involved revision or replacement of distractors.

Standardization

Standardization was conducted during the 2014–2015 school year, with most norm cases collected during the fall. In addition to norming, standardization included an alternate-form reliability study, validity studies with NNAT2 and the *Otis-Lennon School Ability Test*[®], Eighth Edition (OLSAT 8), and a study to compare online and paper administration modes. Except for this last study, all standardization administrations were on computer using a mouse.

There were two 48-item forms (Forms 1 and 2) at each of four levels: Level A (kindergarten), Level B (Grade 1), Level C (Grade 2), and Level D (Grades 3 and 4). At each level, these two forms were parallel in content and difficulty and had virtually no common items. In addition, a 48-item equating form was created at each level that contained items from Forms 1 and 2 as well as unique item pairs that could serve as replacements, if necessary.

Assembly of Standardization Forms

Forms 1 and 2 of each level were designed to resemble the corresponding NNAT2 form in content and difficulty. Regarding content, items were chosen so that these forms would have a similar distribution of broad item types as the NNAT2 form at that level. The forms were also designed to have a similar

distribution of item difficulties (on the NNAT2 scale), although with a few more items at the highest difficulty level. The target difficulty ranges and the mean difficulties of the forms for each level are presented in Table 3.2.

Table 3.2. Difficulty of Items on NNAT3 Standardization Forms 1 and 2

Level	Target Difficulty Range	Mean Difficulty of Forms
A	–4.5 to 1.5	–1.6
B	–4.0 to 2.0	–1.0
C	–3.9 to 2.5	–0.7
D	–3.9 to 3.5	0.0

Note. Values are Rasch logits (on the NNAT2 scale). Lower numbers indicate easier items, and higher numbers represent more difficult items.

The first step in forms construction was to build the Level A forms. Items were selected according to three criteria: content (a target distribution of item types), difficulty (a target distribution of Rasch logit values), and discrimination (item-total correlation and mean square infit). In addition, an effort was made to maximize the diversity of item appearance on each form. While selecting items, those with poor discrimination in tryout were excluded from the forms in order to enhance reliability.

Items were selected in pairs so that one of each pair was included on Form 1 and the other on Form 2. Paired items were very similar, but not so similar that the only difference between them was a change in color or a minor change in the shape of elements.

Next, 15 items were selected from Level A Form 1 for use in Level B Form 1 to provide vertical (across-level) linking, and the same was done for Form 2. The linking items reflected the distribution of content and the entire range of difficulty of the Level A forms. Thirty-three unique items were then added to each Level B form according to the desired distributions of item types and difficulty. These 33 items were also chosen in pairs (66 items total), with one of each pair included on Form 1 and the other on Form 2. This process was repeated to create Level C forms linked to Level B, and Level D forms linked to Level C.

Each of the parallel forms at a level shared fifteen items with the corresponding form at the level(s) immediately above and below it. However, no individual item spanned more than three levels. Also, with one exception there were no common items between Form 1 and Form 2; the exception was an item that appeared on

Level C Form 1 and Level D Form 2. The forms were designed in this manner to allow for linking across the levels via a vertical scaling process, while allowing users to minimize item exposure through their choice of form.

The equating form at each level was developed to provide a linkage between Forms 1 and 2 and to provide replacement pairs of items should they be needed. Fifteen items from Form 1 and fifteen items from Form 2 were selected for the equating form. These items reflected the range of difficulty and item type distribution of Forms 1 and 2 for that level. The items selected from Forms 1 and 2 were not from the same pairs, in order to avoid presenting two highly similar items to the student. Thus, the linking items selected for the equating form made up a miniature version of Forms 1 and 2. For each level, the remaining 18 items consisted of nine new pairs that could be substituted on Forms 1 and 2 in the event that an item pair on those forms did not perform as expected during the standardization process.

Test Administration

The standardization forms were administered during the 2014–2015 school year at 113 schools around the country. All administrations were on computer using a mouse, except for those in the online-paper comparison study. In order to provide norms down to age 4 years 0 months, a specially designed pair of Pre-K forms were administered individually, as had been done in tryout. Levels A and B were administered in small groups (up to 5 or 10 students, respectively).

NORMS DEVELOPMENT

Norm Sample

The NNAT3 norm sample was drawn from 113 schools and preschools in 27 states. Schools were chosen to be representative of the national school population with respect to ethnicity, socioeconomic status, geographical region, urbanicity, and type of school (public or private). Socioeconomic status was measured at the school level by the percentage of students receiving free or reduced-price lunches, grouped into five levels that each correspond to about one-fifth of schools in the United States. For preschools, the socioeconomic status (SES) of the local public schools was used. A list of the participating schools and preschools can be found in Appendix D.

Although schools were selected according to the demographic criteria described above, statistical weighting was applied after testing in order to improve the match of the norm sample to the national population. The weighting procedure involved random deletion or duplication of cases until the desired sample characteristics were obtained. Table 3.3 shows the number of actual cases in the norm sample at each year of age followed by the *N* counts after weighting. Table 3.4 presents the demographic characteristics of the weighted norm sample.

Table 3.3. Numbers of Cases by Age in the NNAT3 Norm Sample

Age	<i>N</i>	
	Actual	Adjusted
4	645	785
5	2,366	1,980
6	1,459	1,494
7	1,384	1,488
8	1,795	1,785
9	879	961
10	785	764
11	642	665
Total	10,225	9,992

Table 3.4. Demographic Characteristics of the NNAT3 Norm Sample

		Percentage of Total U.S. School Enrollment Ages 4:0 to 11:0	Percentage of Students in Norm Sample
Gender	Female	48.9	48.2
	Male	51.1	51.8
Ethnicity	African American	13.7	14.2
	Asian	4.8	4.8
	Hispanic	24.3	23.9
	White	51.8	52.0
	Other	5.5	5.2
SES	Low	21.7	19.1
	Low-Middle	20.1	21.8
	Middle	18.5	20.2
	High-Middle	19.2	19.3
	High	20.5	19.6
Geographic Region	Northeast	16.4	17.7
	Midwest	21.5	23.6
	South	38.0	38.1
	West	24.1	20.6
Urbanicity	Urban	21.7	24.1
	Suburban	47.3	42.2
	Rural	31.0	33.7
School Type	Public	85.7	85.6
	Private/Catholic	14.3	14.4

Source: National Center for Educational Statistics 2012 Census Data, United States Census Bureau 2013 Census Data

Norms Construction

The NNAT3 age norms are based on scaled scores rather than on raw scores. The scaled score system for the NNAT3 links Levels A through D of the test together, yielding a continuous scale that makes it possible to compare the performance of students taking different forms. Once a raw score is converted to its corresponding scaled score, the level and form that was administered is no longer relevant, because the NAI, percentile rank, stanine, and normal curve equivalent (NCE) are all based on the scaled score and the age of the examinee rather than the raw score.

NNAT3 scaled scores are a linear transformation of Rasch ability scores from a single joint calibration of all standardization forms across levels. As noted earlier in this chapter, Forms 1 and 2 at each level are linked through a common-item equating (using the equating form), and levels are vertically linked through common items at adjacent levels. The linear transformation was constructed so that the scaled scores would have a similar range as for the corresponding levels of NNAT2. However, a constant of 1,000 was added to the NNAT3 scaled scores to differentiate them from NNAT2 scaled scores, to prevent accidental misinterpretation. Thus, NNAT3 scaled scores for Levels A to D have a range of approximately 1,300 to 1,800.

The percentile-smoothing method was used to construct the age-norm tables that convert scaled scores to NAI scores. In the initial phase, the data was smoothed vertically (that is, within age). To do this, mid-interval percentile values for the scaled-score distribution at each year of age were calculated for key percentiles (every tenth percentile from 10 through 90, plus 1, 5, 95, and 99). These percentiles were converted to the NAI scale ($M = 100$, $SD = 16$) using a normal-curve area transformation. Scaled scores were plotted against these preliminary NAI scores, and the resulting trend was smoothed by fitting a simple curve (typically linear or quadratic). From this curve, scaled scores corresponding to every fourth NAI value from 64 to 136 were obtained.

The second phase was to fit a growth curve to the trend of scaled scores corresponding to each NAI value across age. For example, a curve was fitted to the trend of scaled scores corresponding to an NAI of 100 (50th percentile) across the range from age 4 to age 11. This was accomplished using CurveExpert Pro (Hyams, 2014), a software program that identifies the best-fitting curves from a large number of curve types. By reviewing the best curve types at different NAI levels, it was possible to select one curve type that had consistently good fit and yielded curves at adjacent NAI values that had similar shape and did not overlap.

Next, for each three-month age range, the scaled-score values for the various NAI levels were read from the growth curves and plotted against NAI. Simple polynomial curves were fitted to these within-age plots, yielding smoothed scaled-score-to-NAI conversions. These curves also provided extrapolation to NAI values of 40 and 160. The final step was to interpolate between adjacent curves in order to obtain norms for each month from 4:0 (4 years 0 months) through 9:11. One-month age intervals are used at these younger ages where growth in performance is relatively rapid so that the NAI for a given scaled score usually will differ by only one point between adjacent age groups.

When the final norm table was applied to the full standardization sample, the mean was 100.2 and the standard deviation was 15.8.

DEVELOPMENT OF FINAL FORMS

The published version of NNAT3 has two parallel, non-overlapping, 48-item forms at each of four levels (A through D). These are nearly the same as standardization Forms 1 and 2, but in order to achieve the desired level of difficulty and to maximize reliability, a few items were dropped from the standardization forms and replaced with more appropriate items that performed well in standardization. Items were dropped if they had relatively poor discrimination (item-total correlation and infit) or if their difficulty or the behavior of the distractors pointed to an aspect of item content that was ambiguous or confusing. In addition, Levels A, B, and C needed some additional greater-difficulty items in order to meet the design requirements, and so a few easy items were replaced with more challenging ones. On average, four items were replaced per form.

Replacement items usually came (in pairs) from the equating form of the same level. However, in situations in which form difficulty was the issue, it was sometimes necessary to obtain replacement items from the next-higher level of the equating form. Table 3.5 shows the number and source of replacement items on each standardization form.

Table 3.5. Number and Source of Replacement Items on NNAT3 Final Forms

Level	Form	Replacement Items	
		From Same Level	From Higher Level
A	1	1	2
	2	2	0
B	1	2	1
	2	3	0
C	1	4	2
	2	3	1
D	1	5	0
	2	7	0

These item replacements sometimes involved vertical linking items (i.e., items that were common between adjacent levels of the standardization forms). As a result, each final NNAT3 form has between 14 and 17 items in common with the corresponding form at the levels immediately above and below it.

After making the item replacements, the difficulty of the final forms was compared to the difficulty of the NNAT3 standardization forms and the NNAT2. The final NNAT3 forms meet the aforementioned desired target difficulties and are of appropriate difficulty for the intended grade levels.

CHAPTER 4

EVIDENCE OF RELIABILITY AND VALIDITY

RELIABILITY

Test-score reliability refers to the consistency of examinees' scores when they are tested on different occasions close together in time, or using different (although parallel) forms. It indicates the precision of test scores, that is, their freedom from the effects of measurement error. Reliability can be assessed in many ways. Therefore, it is important to determine the most appropriate types of reliability for a particular assessment.

IRT-Based Reliability

One approach to reliability estimation uses the Rasch item response theory model to calculate, for each level of examinee ability, the standard error of measurement (*SEM*) of the examinee's ability score when taking a set of items with known difficulties. The average *SEM* in the sample of examinees can then be compared to the standard deviation of ability scores in the sample to compute reliability, using the fundamental formula (Crocker & Algina, 1986):

$$\text{Reliability} = 1 - (SEM^2)/(SD^2)$$

The *SEM* in this formula is the square root of the mean of the squared *SEMs* in the sample.

Green, Bock, Humphreys, Linn, and Reckase (1984) introduced this method under the name *marginal reliability*. IRT-based (or marginal) reliabilities agree closely with internal-consistency reliability measures such as coefficient alpha and split-half reliability (Dimitrov, 2003; Wainer & Thissen, 1996). They estimate the consistency of scores that would be obtained on different but parallel sets of items.

Table 4.1 reports IRT-based reliabilities for NNAT3 by level and form (and, for Level D, by grade). The sample at each level is the full weighted set of examinees in the norm sample who took that level, including those who took the equating form. The mean and standard deviation of Rasch ability scores reflect the entire sample at that level. Likewise, the mean *SEM* for each form (in Rasch ability score units) is based on the *SEM* for each student in the norm sample, calculated by comparing their ability score with the difficulties of the items on that form.

Table 4.1. IRT-Based Reliabilities by Level and Form

Level	N	Ability Scores		Form 1		Form 2	
		Mean	SD	Mean SEM	Reliability	Mean SEM	Reliability
A	1,856	−2.13	1.16	.40	.88	.38	.88
B	1,687	−0.58	1.13	.39	.88	.39	.88
C	1,922	−0.21	0.94	.37	.84	.38	.84
D (Gr 3)	1,103	0.26	0.84	.38	.80	.37	.80
D (Gr 4)	1,021	0.73	0.93	.38	.83	.38	.83
Mean					.85		.85

Note: Mean SEM is the average SEM of student-ability scores. Mean reliabilities were calculated using Fisher’s z transformation.

Alternate-Form Reliability

When parallel forms of a test are available, an alternate-form study is a good way of estimating the consistency of scores obtained on different occasions using different items. The time interval between administrations should be brief enough so that it can be assumed that student-ability levels have not changed, but long enough to allow for variations in mood, alertness, and other factors that could affect performance. Two such alternate-form reliability studies were conducted during NNAT3 standardization. In the first study, both forms were administered online. In the second study, one form was administered online and the other was administered using paper.

Online Study

All 524 participants took both forms of the NNAT3 online. Within one to four weeks after standardization testing (mean interval = 18 days), some students who had taken Form 1 were given Form 2, and an approximately equal number of students who had taken Form 2 were given Form 1. (Only the initial administrations were used for norming.) In order to remove the influence of the order effect, correlations were calculated separately for each sequence group and then averaged. The results (shown in Table 4.2) indicate that scores on the alternate forms were highly correlated, with an average correlation of 0.79.

Table 4.2. Alternate-Form Reliability (Online), by Level

Level	Sequence	N	Form 1		Form 2		r	Adjusted r	Order Effect	
			Mean	SD	Mean	SD				
A	Form 1–Form2	24	91.2	16.3	96.6	15.5	.72	.71	5.0	
	Form 2–Form 1	21	102.3	19.3	97.7	16.2	.87	.86		
		45					Mean r	.80		
B	Form 1–Form2	63	101.0	14.7	105.3	16.6	.67	.70	4.2	
	Form 2–Form 1	87	102.1	14.8	98.0	16.0	.69	.69		
		150					Mean r	.70		
C	Form 1–Form2	89	96.5	16.4	99.3	14.8	.81	.80	2.9	
	Form 2–Form 1	112	99.6	15.6	96.7	13.7	.78	.83		
		201					Mean r	.82		
D	Form 1–Form2	62	100.9	13.9	101.4	16.6	.79	.83	3.0	
	Form 2–Form 1	66	104.0	13.1	98.6	13.5	.76	.81		
		128					Mean r	.82		
								Average	.79	3.8

Note. Mean correlations were calculated using Fisher’s z transformation. Correlations were adjusted for range restriction on the first administration (Cohen, Cohen, West, & Aiken, 2003).

The order effect (sometimes referred to as the practice effect) is the average increase in scores between the first and second administrations. In this study, the order effect averages about four NAI points. This effect is similar in size to the order effects found in the NNAT3–NNAT2 correlation study and the study comparing online and paper administration, both of which are described below. Users of NNAT3 should be aware that when different NNAT forms are administered twice within a period of weeks or a few months, scores on the second administration are likely to be several points higher because of prior experience with these types of items.

Online–Paper Study

The primary purpose of this study was to evaluate the comparability of scores from online- and paper- administration formats, and the results relevant to that evaluation are discussed later in this chapter. However, the study also provides evidence of the consistency of scores obtained on alternate forms administered using different modes.

At each NNAT3 level, about 480 students took Form 1 first and Form 2 one to four weeks later. About half of the students took online administration first and paper second, and the others took paper administration first and online second. NAI scores were computed using the raw-score-to-scaled-score conversion table appropriate for each administration mode. Table 4.3 presents NAI means and intercorrelations separately for each sequence group, and the average correlation across sequence groups. Alternate-form/alternate-mode correlations average 0.79, the same as in the online study. Also, the order effect (4.0) is similar to that in the previous study (3.8).

Table 4.3. Alternate-Form Reliability (Online–Paper), by Level

Level	Sequence	N	Paper		Online		r	Adjusted r	Order Effect
			Mean	SD	Mean	SD			
A	Paper–Online	219	96.1	15.5	101.2	15.4	.83	.84	4.9
	Online–Paper	267	98.1	15.6	93.3	15.6	.75	.75	
		486					Mean r	.80	
B	Paper–Online	257	104.8	15.3	112.1	15.3	.79	.80	6.8
	Online–Paper	224	111.6	14.5	105.3	15.4	.71	.72	
		481					Mean r	.77	
C	Paper–Online	234	106.0	14.1	108.7	14.0	.73	.77	2.7
	Online–Paper	251	104.5	13.6	101.8	14.1	.74	.78	
		485					Mean r	.78	
D	Paper–Online	249	103.1	15.1	104.6	16.4	.78	.80	1.5
	Online–Paper	238	101.9	17.8	100.5	12.8	.74	.81	
		487					Mean r	.80	
							Average	.79	4.0

Note. Mean correlations were calculated using Fisher’s z transformation. Correlations were adjusted for range restriction on the first administration (Cohen, Cohen, West, & Aiken, 2003).

VALIDITY

The validity of test scores is the accuracy of inferences based on them. Inferences can be about a characteristic of the person, the likelihood of the person succeeding in a particular educational program, and so on. Often, validity is assessed by examining the relationship between test scores on the instrument of interest and scores on other instruments believed to measure the same or a similar construct.

In order to assess the validity of the NNAT3, studies were conducted during standardization of its relationship with two other measures of cognitive ability: NNAT2 and the *Otis-Lennon School Ability Test*, eighth edition (OLSAT 8). Correlating performance on the NNAT3 with scores on other ability tests provides important insight into what the test measures and whether it performs as expected in relation to other variables.

Correlation with NNAT2

Although NNAT3 consists of an entirely new set of items, the item types are the same as on NNAT2, and each level of the NNAT3 and NNAT2 forms have a similar representation of types. Therefore, NNAT3 and NNAT2 are expected to measure the same construct and to correlate highly with each other.

In this study, both tests were administered online, within one to four weeks of each other. Most of the 368 students (92%) took Form 2 of NNAT3. Some of the participants took NNAT3 first, as part of the norming study, and the others took NNAT2 first. Although there were more students in the NNAT3-first condition, this did not affect the results because correlations were computed separately for each sequence group and then averaged. Results for Level D are included because they provide valid information about the NNAT3–NNAT2 correlation, even though only cases with NNAT3 given first were available.

Table 4.4 shows the means and standard deviations of NAI scores on NNAT3 and NNAT2, and the correlations between them, by level. NAI scores on the two tests correlate highly (in the high 0.70s), indicating that they measure the same construct. Scores on the second administration average 3.5 points higher than on the first administration, very close in size to the order effect found in the alternate-form studies reported earlier in this chapter. Also, average NAI scores are approximately 2.5 points higher on NNAT3 than NNAT2.

Table 4.4. Correlations between NNAT3 and NNAT2 NAI Scores

Level	NNAT2 First						NNAT3 First						Average Correlation ^a
	N	NNAT2		NNAT3		r	N	NNAT2		NNAT3		r	
		Mean	SD	Mean	SD			Mean	SD	Mean	SD		
A	58	104.7	13.8	109.0	12.6	.68	56	99.1	14.6	92.6	11.3	.74	.79
B	41	106.8	12.3	115.4	13.8	.70	63	98.7	18.5	100.1	16.6	.75	.76
C	37	100.7	12.4	107.5	11.4	.75	67	104.0	14.9	106.0	14.4	.73	.79
D							46	97.5	15.2	98.9	14.5	.74	.77
Weighted mean of within-level <i>r</i> :												.78	

^aWeighted mean of adjusted correlations

Note. Mean correlations were calculated using Fisher’s *z* transformation. Correlations were adjusted for range restriction on the first administration (Cohen, Cohen, West, & Aiken, 2003).

Correlation with Otis-Lennon School Ability Test, Eighth Edition (OLSAT 8)

OLSAT 8 is an ability test that includes verbal as well as nonverbal items, and uses verbal instructions in contrast to the pictorial directions of NNAT3. A comparison of these two tests provides important information about NNAT3 validity because both tests attempt to measure general ability.

A group of 366 students who took NNAT3 online as part of the norming study also took OLSAT 8 (administered in paper-and-pencil format) within four weeks after taking NNAT3. Administration sequence was not counterbalanced because the study was not intended to compare score levels on the two instruments. Table 4.5 shows the means and standard deviations of NNAT3 NAI scores and OLSAT 8 School Ability Index (SAI) scores, and the correlations between them. The NAI scores correlated higher with the OLSAT 8 Nonverbal and Total scores than with the OLSAT 8 Verbal score. In general, the results suggest that the two assessments measure a similar construct.

Table 4.5. Correlations between NNAT3 and OLSAT 8 Scores

NNAT3		OLSAT 8 SAI			NNAT3 NAI		Correlation	
Level	<i>N</i>	Scale	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>r</i>	Adj <i>r</i>
A	98	Total	112.7	15.0	114.0	23.4	.55	.41
	98	Verbal	109.7	15.2			.25	.17
	98	Nonverbal	113.5	17.0			.66	.51
B	86	Total	100.5	15.3	102.2	16.1	.55	.54
	86	Verbal	101.2	15.2			.43	.43
	86	Nonverbal	99.0	15.2			.55	.55
C	77	Total	103.4	14.0	104.5	13.8	.56	.62
	77	Verbal	107.4	16.1			.49	.55
	77	Nonverbal	99.2	11.9			.56	.61
D	105	Total	92.5	14.0	98.7	15.7	.58	.59
	105	Verbal	91.8	14.9			.48	.49
	105	Nonverbal	93.8	15.1			.57	.58

Note. Correlations were adjusted for range restriction on NNAT3 (Cohen, Cohen, West, & Aiken, 2003).

OTHER STUDIES

Comparison of Online and Paper Administration

The main purpose of this study was to see if the administration mode (online or paper) has an effect on NNAT3 scores, and if so, to make appropriate adjustments in the scoring procedures so that scores from both modes are comparable. A secondary purpose was to obtain additional information about alternate-form reliability; those results were reported earlier in this chapter.

At each NNAT3 level, a sample of between 482 and 490 students participated in the study. All students took Form 1 first and Form 2 second, with an interval of 1 to 4 weeks. Scaled scores based on online administration were used throughout the analysis because at the time this study was conducted, NAI norms had not yet been constructed. The order of administration modes was approximately counterbalanced, and scores from the online-first administrations were included in the NNAT3 norming sample.

Multiple regression was used to evaluate whether there was a mode effect. The Time 2 scaled score was predicted by the Time 1 scaled score, a dummy variable representing administration sequence (online-paper or paper-online),

and the product of these two variables representing the interaction of mode and ability. A significant interaction term meant that the mode effect was different at different score levels. If there was no significant interaction, then the analysis was rerun without the interaction term, and a significant sequence term would indicate the existence of a mode effect (i.e., the level of the Time 2 score relative to the Time 1 score differed according to whether the Time 2 administration was online or paper).

At each NNAT3 level there was no significant interaction (at $p < .05$), and there was a significant mode effect (at $p < .01$) with higher scaled scores on the paper administration. Because the absence of interaction meant that the mode effect was uniform (that is, consistent across score levels), a simple mean-difference equating was appropriate. A small number of cases were deleted at random to equalize the number of students taking online first or paper first, and then the overall mean scores for online and paper administration were calculated and compared, as shown in Table 4.6. When converted to NAI points, the difference (which represents the mode effect) ranged from 2.2 to 3.1.

Table 4.6. Comparison of NNAT3 Scaled Scores from Paper and Online Administrations

Level	N	Paper		Online		Difference (mode effect)	
		Mean	SD	Mean	SD	Scaled Scores	NAI
A	444	1,551.8	38.7	1,544.3	40.3	7.4	3.1
B	448	1,602.7	35.8	1,596.8	35.8	5.9	2.5
C	468	1,614.7	31.4	1,609.9	33.0	4.9	2.1
D	476	1,631.0	37.6	1,626.2	34.2	5.8	2.2

The mode effect has been incorporated into the raw-score-to-scaled-score conversion tables so that students of the same ability have the same expected scaled score and NAI regardless of whether they take NNAT3 through an online or a paper administration.

CHAPTER 5

NNAT3 LOWER LEVELS 2018 NORMS UPDATE

The NNAT3 Lower Level norms were updated in 2018 to provide national norms based on an expanded representative norm sample, and to extend the upper end of the norms age range from 11 years 5 months to 11 years 11 months. There were no changes in the test items or forms, the method of administration or scoring, or the scaled scores. The only change was in the age-norm tables (Appendix B) used to convert scaled scores to Naglieri Ability Index (NAI) scores.

The updated norms were based on a nationally representative sample of 85,959 students, ages 4 years 0 months to 11 years 11 months. The sample came from two sources. Most students were drawn from those who took NNAT3 in 2016–2017, whose tests were scored by Pearson (either through online administration or central scoring of paper administrations), and whose schools used the test for universal screening at a grade level and were eligible for participation (i.e., did not prohibit their data from being used). Grade 5 students within the target age range were included so that the sample fully represented the population of 11-year-olds, and their Level E scaled scores were converted to equivalent Lower Levels scaled scores. The remainder of the sample consisted of students in the original NNAT3 norm sample (described in Chapter 3) who took the test online as part of the 2014–2015 standardization.

Sampling Procedures

A combination of stratified random sampling and statistical weighting was used to achieve a close match of the normative update sample to the national student population demographic characteristics, as reported in the 2015 Census Data from the National Center for Educational Statistics, United States Department of Education. The demographic characteristics controlled were race/ethnicity, socioeconomic status (SES—percentage of students receiving free/reduced lunch), geographic region, urbanicity, and school type (public or private). All demographic variables were controlled at the school level. The weighting procedure involved random deletion or duplication of cases to achieve alignment to the target distributions of demographic variables at each year of age.

Table 5.1 displays the demographic characteristics of the NNAT3 2018 normative update sample. Characteristics of this sample were very consistent with the 2015 census in terms of geographic region, SES, urbanicity, ethnicity, type of school, and gender.

Table 5.1. Demographic Characteristics of the NNAT3 2018 Updated Normative Sample

<i>N</i> = 85,959		Percentage of Total U.S. School Enrollment ¹	Percentage of Students in 2017 Norms Update Sample
Ethnicity	African American	13.8	15.0
	Asian	4.8	5.5
	Hispanic	25.1	25.6
	White	50.5	49.2
	Other	5.8	4.7
SES	Low	20.9	18.8
	Low-Middle	19.6	19.4
	Middle	19.0	20.5
	High-Middle	19.6	20.5
	High	20.9	20.8
Region	Northeast	16.3	16.0
	Midwest	21.1	20.4
	South	38.3	38.8
	West	24.3	24.8
Urbanicity	Urban	29.9	30.2
	Suburban	43.0	43.1
	Rural	27.1	26.7
School Type	Public	88.5	88.5
	Private/Catholic	11.5	11.5
Gender	Female	50.0	49.1
	Male	50.0	50.9

¹National Center for Educational Statistics, United States Department of Education, 2015 Census Data

Norms Development

The NNAT3 2017 updated norms were developed using *inferential norming* (Wilkins, Rolfhus, Weiss & Zhu, 2005; Zhu & Chen, 2011). The first three *moments* (mean, standard deviation, and skewness) of scaled scores were calculated for each year of age. The moments were plotted across age, and various polynomial regressions, ranging from linear to fifth degree polynomial, were fitted to the moment data. Selecting the best-fitting curve for each moment was based on

consistency with underlying theoretical expectations and the pattern of growth curves observed in the normative sample. The selected curves were used to derive estimated population moments by age. Then, those estimates were used to generate a theoretical distribution for each normative age group, yielding an age-based percentile for each scaled score. These percentiles were converted to standard scores on a normal (bell curve) distribution with a mean of 100, a standard deviation of 16, and a range of 40 to 160. The progression of standard scores within and across age groups was then examined, and minor irregularities were eliminated by smoothing. Appendix B presents the 2017 updated NAI equivalents of scaled scores in one-month intervals for ages 4 years 0 months to 9 years 11 months, and in three-month intervals from 10 years 0 months to 11 years 11 months.

The other derived scores—percentile ranks, stanines, and normal curve equivalents—have the same relationship to NAI scores as they did in the original NNAT3 norms. Therefore, Appendix C, which shows the conversion of NAI scores, is unchanged.

COMPARISON OF NNAT3 2015 AND 2018 UPDATED LOWER LEVELS NORMS

Table 5.2 reports the means, standard deviations, and intercorrelations of NAI scores in the normative update sample, using both the 2015 norms and the 2018 updated norms. As expected, the NAIs based on the two sets of norms were almost perfectly correlated because the primary effect of the normative update was to shift NAI scores downward. At each level, mean NAI scores based on the updated norms were about four and a half points lower than those based on the original (2015) norms. Using the updated norms, 10.9% of the students in the 2018 normative update sample scored 120 or above, very close to the 10.6% expected in a normal distribution.

Table 5.2. Comparison of NAI Scores from the 2015 and 2018 Updated Norms

Level	N	2015 Norms		2018 Norms Updated		Difference	r
		Mean	SD	Mean	SD		
A	9,393	103.0	16.3	98.6	16.4	4.4	.999
B	11,090	106.0	17.2	101.5	16.9	4.5	.999
C	44,015	103.6	15.9	99.1	15.6	4.5	.999
D	13,956	106.2	16.0	101.8	16.0	4.4	.998
All	78,454	104.3	16.2	99.9	16.0	4.4	.999

Note. The average correlation coefficient across all levels was calculated using Fisher’s Z transformation.

Standard Error of Measurement

The standard error of measurement (SEM) indicates the precision of a score, that is, the amount by which it would be expected to vary across administrations (assuming no practice or fatigue effects). The change in the norm-sample standard deviation of NAI scores that resulted from the normative update affected the SEM of NAI scores. Table 5.3 presents the SEM of NAI scores at each test level, based on the updated norms and the IRT-based reliabilities reported in Table 4.1. Because those reliabilities were the same on both forms at each level and calculated with reference to the standard deviation of ability scores at each level in the overall norm sample, Table 5.3 provides a single SEM that is applicable to both forms at each level.

Table 5.3. Standard Error of Measurement of 2018 NAI Scores, by Level

Level	<i>N</i>	Mean	<i>SD</i>	Reliability	<i>SEM</i> of NAI
A	1,856	90.9	16.2	0.88	5.6
B	1,687	99.5	17.0	0.88	5.9
C	1,922	94.6	14.4	0.84	5.8
D (Grade 3)	1,103	96.1	13.0	0.80	5.8
D (Grade 4)	1,017	95.5	14.5	0.83	6.0

Note. Calculated using the IRT-based reliabilities reported in Table 4.1.

RE-ANALYSIS OF VALIDITY STUDIES

In principle, the correlation of NNAT3 with other tests should have been affected little, if at all, by the normative update. The primary effect expected of the updated norms was a shift of all students' NAI scores, which would have little impact on the rank ordering of students' scores and, therefore, little effect on correlations with other variables. However, so that users could compare average NNAT3 (2017) NAI scores with average scores on other tests, the updated norms were used to re-analyze the NNAT3 correlation studies with NNAT2 and OLSAT 8 (reported in Chapter 4). Results are presented in Tables 5.4 and 5.5.

Table 5.4. Correlations Between NNAT3 (2018 Updated) and NNAT2 NAI Scores

Level	N	NNAT2 First					NNAT3 First					Mean r ^a	
		NNAT2		NNAT3		r	NNAT2		NNAT3		r		
		Mean	SD	Mean	SD		N	Mean	SD	Mean			SD
A	58	104.7	13.8	104.6	12.6	.68	56	99.1	11.6	88.1	11.1	.74	.80
B	41	106.8	12.3	110.8	13.4	.70	63	98.7	18.5	95.6	16.4	.75	.77
C	37	100.7	12.4	103.1	11.3	.76	67	104.0	14.9	101.5	14.2	.73	.80
D							46	97.5	15.2	94.4	14.0	.74	.78
Mean of within-level r:												.79	

^aMean, using Fisher’s z transformation, of within-sequence correlations after adjusting for range restriction on the first administration (Cohen, Cohen, West, & Aiken, 2003).

Table 5.5. Correlations Between NNAT3 (2018 Updated) and OLSAT 8 Scores

NNAT3 Level	N	OLSAT 8 SAI			NNAT3 NAI		Correlation	
		Scale	M	SD	M	SD	r	Adj r ^a
A	98	Total	112.7	15.0			.55	.41
	98	Verbal	109.7	15.2	109.7	23.4	.25	.17
	98	Nonverbal	113.5	17.0			.66	.51
B	86	Total	100.5	15.3			.54	.53
	86	Verbal	101.2	15.2	97.9	16.3	.43	.42
	86	Nonverbal	99.0	15.2			.55	.54
C	77	Total	103.4	14.0			.57	.64
	77	Verbal	107.4	16.1	100.1	13.5	.50	.56
	77	Nonverbal	99.2	11.9			.56	.63
D	105	Total	92.5	14.0			.58	.60
	105	Verbal	91.8	14.9	94.4	15.1	.47	.49
	105	Nonverbal	93.8	15.1			.57	.59
Mean ^b		Total						.55
		Verbal						.42
		Nonverbal						.57

^aCorrelation adjusted for range restriction on NNAT3 (Cohen, Cohen, West, & Aiken, 2003)

^bUsing Fisher’s z transformation

NNAT3 correlated slightly higher with NNAT2 when the updated norms were used (average of .79 versus .78). NNAT3 correlations with OLSAT 8 were unaffected, on average. In the NNAT3–NNAT2 study, the difference in mean NAI scores (averaged across administration sequences) was about 5 points at Level A, but near zero at Levels B and C. At Level D, where only one sequence was given, the difference of 3.1 points could reasonably be attributed to the practice effect, suggesting that NNAT3 and NNAT2 NAI scores were very similar at this level as well. In the NNAT3–OLSAT 8 study, where NNAT3 was always administered first, the effect of practice could not be removed statistically. At Levels A through C, NNAT3 scores were about 3 points lower than OLSAT 8 Total SAI scores, a difference that was consistent with a practice effect and with the Flynn effect. At Level D, NNAT3 scores were slightly higher than OLSAT 8 scores.

APPENDIX A: SCALED SCORES CORRESPONDING TO RAW SCORES BY LEVEL, FORM, AND ADMINISTRATION MODE

Table 1: Computer-Based Testing

Level A				Level B				Level C				Level D			
Form 1		Form 2		Form 1		Form 2		Form 1		Form 2		Form 1		Form 2	
Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score
48	1761	48	1761	48	1789	48	1789	48	1808	48	1808	48	1817	48	1817
47	1722	47	1710	47	1745	47	1744	47	1764	47	1763	47	1771	47	1775
46	1694	46	1683	46	1717	46	1716	46	1738	46	1736	46	1745	46	1748
45	1677	45	1666	45	1700	45	1699	45	1721	45	1720	45	1729	45	1732
44	1664	44	1653	44	1686	44	1686	44	1708	44	1707	44	1717	44	1719
43	1654	43	1643	43	1675	43	1675	43	1698	43	1697	43	1707	43	1709
42	1644	42	1634	42	1665	42	1666	42	1689	42	1688	42	1698	42	1701
41	1636	41	1625	41	1657	41	1657	41	1681	41	1680	41	1691	41	1693
40	1629	40	1618	40	1649	40	1650	40	1674	40	1673	40	1684	40	1686
39	1622	39	1611	39	1642	39	1643	39	1667	39	1666	39	1677	39	1679
38	1615	38	1605	38	1636	38	1636	38	1661	38	1660	38	1671	38	1673
37	1609	37	1599	37	1630	37	1630	37	1655	37	1654	37	1666	37	1667
36	1603	36	1593	36	1624	36	1624	36	1649	36	1648	36	1660	36	1662
35	1598	35	1588	35	1618	35	1618	35	1644	35	1643	35	1655	35	1656
34	1592	34	1582	34	1613	34	1612	34	1639	34	1637	34	1650	34	1651
33	1587	33	1577	33	1608	33	1607	33	1634	33	1632	33	1645	33	1646
32	1582	32	1572	32	1603	32	1602	32	1629	32	1627	32	1640	32	1641
31	1577	31	1568	31	1598	31	1597	31	1624	31	1622	31	1636	31	1636
30	1572	30	1563	30	1593	30	1592	30	1619	30	1617	30	1631	30	1632
29	1567	29	1558	29	1589	29	1587	29	1614	29	1613	29	1626	29	1627
28	1562	28	1554	28	1584	28	1582	28	1610	28	1608	28	1622	28	1622
27	1557	27	1549	27	1580	27	1578	27	1605	27	1603	27	1617	27	1617
26	1552	26	1545	26	1575	26	1573	26	1601	26	1598	26	1612	26	1613
25	1547	25	1541	25	1571	25	1569	25	1596	25	1594	25	1608	25	1608
24	1542	24	1536	24	1566	24	1564	24	1592	24	1589	24	1603	24	1603
23	1537	23	1532	23	1562	23	1559	23	1587	23	1584	23	1598	23	1599
22	1532	22	1527	22	1557	22	1555	22	1583	22	1580	22	1593	22	1594
21	1527	21	1523	21	1553	21	1550	21	1578	21	1575	21	1589	21	1589
20	1522	20	1519	20	1548	20	1546	20	1573	20	1570	20	1584	20	1584
19	1517	19	1514	19	1543	19	1541	19	1569	19	1565	19	1579	19	1580
18	1512	18	1510	18	1539	18	1536	18	1564	18	1560	18	1573	18	1575
17	1506	17	1505	17	1534	17	1532	17	1559	17	1555	17	1568	17	1570
16	1501	16	1500	16	1529	16	1527	16	1554	16	1550	16	1563	16	1565
15	1495	15	1496	15	1524	15	1522	15	1549	15	1545	15	1557	15	1560
14	1489	14	1491	14	1519	14	1517	14	1544	14	1540	14	1551	14	1554
13	1483	13	1486	13	1513	13	1511	13	1538	13	1534	13	1545	13	1549
12	1477	12	1480	12	1508	12	1506	12	1532	12	1528	12	1539	12	1543
11	1471	11	1475	11	1502	11	1500	11	1526	11	1522	11	1532	11	1537
10	1464	10	1469	10	1495	10	1494	10	1520	10	1516	10	1526	10	1531
9	1457	9	1463	9	1489	9	1488	9	1513	9	1509	9	1518	9	1524
8	1450	8	1456	8	1482	8	1481	8	1505	8	1502	8	1510	8	1517
7	1442	7	1449	7	1474	7	1473	7	1497	7	1494	7	1502	7	1510
6	1433	6	1441	6	1465	6	1465	6	1488	6	1485	6	1493	6	1501
5	1424	5	1433	5	1456	5	1456	5	1478	5	1475	5	1483	5	1492
4	1413	4	1422	4	1444	4	1445	4	1466	4	1463	4	1471	4	1480
3	1400	3	1410	3	1431	3	1432	3	1452	3	1450	3	1457	3	1467
2	1383	2	1393	2	1413	2	1415	2	1433	2	1431	2	1439	2	1449
1	1356	1	1367	1	1385	1	1388	1	1404	1	1403	1	1411	1	1421
0	1312	0	1323	0	1340	0	1344	0	1359	0	1357	0	1366	0	1376

APPENDIX A, CONTINUED

Table 2: Paper-Based Testing

Level A				Level B				Level C				Level D			
Form 1		Form 2		Form 1		Form 2		Form 1		Form 2		Form 1		Form 2	
Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score
48	1761	48	1761	48	1789	48	1789	48	1808	48	1808	48	1817	48	1817
47	1715	47	1703	47	1739	47	1738	47	1759	47	1758	47	1766	47	1770
46	1687	46	1676	46	1711	46	1710	46	1733	46	1731	46	1740	46	1743
45	1670	45	1659	45	1694	45	1693	45	1716	45	1715	45	1724	45	1727
44	1657	44	1646	44	1680	44	1680	44	1703	44	1702	44	1712	44	1714
43	1647	43	1636	43	1669	43	1669	43	1693	43	1692	43	1702	43	1704
42	1637	42	1627	42	1659	42	1660	42	1684	42	1683	42	1693	42	1696
41	1629	41	1618	41	1651	41	1651	41	1676	41	1675	41	1686	41	1688
40	1622	40	1611	40	1643	40	1644	40	1669	40	1668	40	1679	40	1681
39	1615	39	1604	39	1636	39	1637	39	1662	39	1661	39	1672	39	1674
38	1608	38	1598	38	1630	38	1630	38	1656	38	1655	38	1666	38	1668
37	1602	37	1592	37	1624	37	1624	37	1650	37	1649	37	1661	37	1662
36	1596	36	1586	36	1618	36	1618	36	1644	36	1643	36	1655	36	1657
35	1591	35	1581	35	1612	35	1612	35	1639	35	1638	35	1650	35	1651
34	1585	34	1575	34	1607	34	1606	34	1634	34	1632	34	1645	34	1646
33	1580	33	1570	33	1602	33	1601	33	1629	33	1627	33	1640	33	1641
32	1575	32	1565	32	1597	32	1596	32	1624	32	1622	32	1635	32	1636
31	1570	31	1561	31	1592	31	1591	31	1619	31	1617	31	1631	31	1631
30	1565	30	1556	30	1587	30	1586	30	1614	30	1612	30	1626	30	1627
29	1560	29	1551	29	1583	29	1581	29	1609	29	1608	29	1621	29	1622
28	1555	28	1547	28	1578	28	1576	28	1605	28	1603	28	1617	28	1617
27	1550	27	1542	27	1574	27	1572	27	1600	27	1598	27	1612	27	1612
26	1545	26	1538	26	1569	26	1567	26	1596	26	1593	26	1607	26	1608
25	1540	25	1534	25	1565	25	1563	25	1591	25	1589	25	1603	25	1603
24	1535	24	1529	24	1560	24	1558	24	1587	24	1584	24	1598	24	1598
23	1530	23	1525	23	1556	23	1553	23	1582	23	1579	23	1593	23	1594
22	1525	22	1520	22	1551	22	1549	22	1578	22	1575	22	1588	22	1589
21	1520	21	1516	21	1547	21	1544	21	1573	21	1570	21	1584	21	1584
20	1515	20	1512	20	1542	20	1540	20	1568	20	1565	20	1579	20	1579
19	1510	19	1507	19	1537	19	1535	19	1564	19	1560	19	1574	19	1575
18	1505	18	1503	18	1533	18	1530	18	1559	18	1555	18	1568	18	1570
17	1499	17	1498	17	1528	17	1526	17	1554	17	1550	17	1563	17	1565
16	1494	16	1493	16	1523	16	1521	16	1549	16	1545	16	1558	16	1560
15	1488	15	1489	15	1518	15	1516	15	1544	15	1540	15	1552	15	1555
14	1482	14	1484	14	1513	14	1511	14	1539	14	1535	14	1546	14	1549
13	1476	13	1479	13	1507	13	1505	13	1533	13	1529	13	1540	13	1544
12	1470	12	1473	12	1502	12	1500	12	1527	12	1523	12	1534	12	1538
11	1464	11	1468	11	1496	11	1494	11	1521	11	1517	11	1527	11	1532
10	1457	10	1462	10	1489	10	1488	10	1515	10	1511	10	1521	10	1526
9	1450	9	1456	9	1483	9	1482	9	1508	9	1504	9	1513	9	1519
8	1443	8	1449	8	1476	8	1475	8	1500	8	1497	8	1505	8	1512
7	1435	7	1442	7	1468	7	1467	7	1492	7	1489	7	1497	7	1505
6	1426	6	1434	6	1459	6	1459	6	1483	6	1480	6	1488	6	1496
5	1417	5	1426	5	1450	5	1450	5	1473	5	1470	5	1478	5	1487
4	1406	4	1415	4	1438	4	1439	4	1461	4	1458	4	1466	4	1475
3	1393	3	1403	3	1425	3	1426	3	1447	3	1445	3	1452	3	1462
2	1376	2	1386	2	1407	2	1409	2	1428	2	1426	2	1434	2	1444
1	1349	1	1360	1	1379	1	1382	1	1399	1	1398	1	1406	1	1416
0	1307	0	1316	0	1334	0	1338	0	1354	0	1352	0	1361	0	1371

**APPENDIX B: NAGLIERI ABILITY INDEXES CORRESPONDING TO SCALED SCORES BY AGE,
BASED ON 2018 UPDATED NORMS**

NAI		SCALED SCORES										
		4-Year-Olds										
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months
160	Above 1626	Above 1629	Above 1632	Above 1635	Above 1638	Above 1641	Above 1644	Above 1647	Above 1650	Above 1653	Above 1656	Above 1658
159	1624-1626	1628-1629	1631-1632	1634-1635	1637-1638	1640-1641	1643-1644	1646-1647	1649-1650	1652-1653	1654-1656	1657-1658
158	1622-1623	1625-1627	1628-1630	1632-1633	1635-1636	1638-1639	1641-1642	1644-1645	1647-1648	1649-1651	1652-1653	1655-1656
157	1620-1621	1623-1624	1626-1627	1629-1631	1632-1634	1635-1637	1638-1640	1641-1643	1644-1646	1647-1648	1650-1651	1653-1654
156	1617-1619	1620-1622	1624-1625	1627-1628	1630-1631	1633-1634	1636-1637	1639-1640	1642-1643	1645-1646	1648-1649	1650-1652
155	1615-1616	1618-1619	1621-1623	1624-1626	1628-1629	1631-1632	1634-1635	1637-1638	1640-1641	1642-1644	1645-1647	1648-1649
154	1612-1614	1616-1617	1619-1620	1622-1623	1625-1627	1628-1630	1631-1633	1634-1636	1637-1639	1640-1641	1643-1644	1646-1647
153	1610-1611	1613-1615	1617-1618	1620-1621	1623-1624	1626-1627	1629-1630	1632-1633	1635-1636	1638-1639	1641-1642	1644-1645
152	1608-1609	1611-1612	1614-1616	1617-1619	1621-1622	1624-1625	1627-1628	1630-1631	1633-1634	1636-1637	1638-1640	1641-1643
151	1605-1607	1609-1610	1612-1613	1615-1616	1618-1620	1621-1623	1624-1626	1627-1629	1630-1632	1633-1635	1636-1637	1639-1640
150	1603-1604	1606-1608	1609-1611	1613-1614	1616-1617	1619-1620	1622-1623	1625-1626	1628-1629	1631-1632	1634-1635	1637-1638
149	1600-1602	1604-1605	1607-1608	1610-1612	1613-1615	1617-1618	1620-1621	1623-1624	1626-1627	1629-1630	1632-1633	1634-1636
148	1598-1599	1601-1603	1605-1606	1608-1609	1611-1612	1614-1616	1617-1619	1620-1622	1623-1625	1626-1628	1629-1631	1632-1633
147	1596-1597	1599-1600	1602-1604	1606-1607	1609-1610	1612-1613	1615-1616	1618-1619	1621-1622	1624-1625	1627-1628	1630-1631
146	1593-1595	1597-1598	1600-1601	1603-1605	1606-1608	1610-1611	1613-1614	1616-1617	1619-1620	1622-1623	1625-1626	1628-1629
145	1591-1592	1594-1596	1597-1599	1601-1602	1604-1605	1607-1609	1610-1612	1613-1615	1616-1618	1619-1621	1622-1624	1625-1627
144	1588-1590	1592-1593	1595-1596	1598-1600	1602-1603	1605-1606	1608-1609	1611-1612	1614-1615	1617-1618	1620-1621	1623-1624
143	1586-1587	1589-1591	1593-1594	1596-1597	1599-1601	1602-1604	1606-1607	1609-1610	1612-1613	1615-1616	1618-1619	1621-1622
142	1583-1585	1587-1588	1590-1592	1594-1595	1597-1598	1600-1601	1603-1605	1606-1608	1609-1611	1612-1614	1615-1617	1618-1620
141	1581-1582	1584-1586	1588-1589	1591-1593	1594-1596	1598-1599	1601-1602	1604-1605	1607-1608	1610-1611	1613-1614	1616-1617
140	1579-1580	1582-1583	1585-1587	1589-1590	1592-1593	1595-1597	1598-1600	1602-1603	1605-1606	1608-1609	1611-1612	1614-1615
139	1576-1578	1580-1581	1583-1584	1586-1588	1590-1591	1593-1594	1596-1597	1599-1601	1602-1604	1605-1607	1608-1610	1611-1613
138	1574-1575	1577-1579	1581-1582	1584-1585	1587-1589	1591-1592	1594-1595	1597-1598	1600-1601	1603-1604	1606-1607	1609-1610
137	1571-1573	1575-1576	1578-1580	1582-1583	1585-1586	1588-1590	1591-1593	1595-1596	1598-1599	1601-1602	1604-1605	1607-1608
136	1569-1570	1572-1574	1576-1577	1579-1581	1582-1584	1586-1587	1589-1590	1592-1594	1595-1597	1598-1600	1601-1603	1604-1606
135	1566-1568	1570-1571	1573-1575	1577-1578	1580-1581	1583-1585	1587-1588	1590-1591	1593-1594	1596-1597	1599-1600	1602-1603
134	1564-1565	1568-1569	1571-1572	1574-1576	1578-1579	1581-1582	1584-1586	1587-1589	1591-1592	1594-1595	1597-1598	1600-1601
133	1562-1563	1565-1567	1569-1570	1572-1573	1575-1577	1579-1580	1582-1583	1585-1586	1588-1590	1591-1593	1594-1596	1597-1599
132	1559-1561	1563-1564	1566-1568	1570-1571	1573-1574	1576-1578	1579-1581	1583-1584	1586-1587	1589-1590	1592-1593	1595-1596
131	1557-1558	1560-1562	1564-1565	1567-1569	1570-1572	1574-1575	1577-1578	1580-1582	1583-1585	1586-1588	1590-1591	1593-1594
130	1554-1556	1558-1559	1561-1563	1565-1566	1568-1569	1571-1573	1575-1576	1578-1579	1581-1582	1584-1585	1587-1589	1590-1592
129	1552-1553	1555-1557	1559-1560	1562-1564	1566-1567	1569-1570	1572-1574	1575-1577	1579-1580	1582-1583	1585-1586	1588-1589

SCALED SCORES

4-Year-Olds

NAI	SCALED SCORES											
	0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months
128	1549-1551	1553-1554	1556-1558	1560-1561	1563-1565	1567-1568	1570-1571	1573-1574	1576-1578	1579-1581	1582-1584	1585-1587
127	1547-1548	1550-1552	1554-1555	1557-1559	1561-1562	1564-1566	1567-1569	1571-1572	1574-1575	1577-1578	1580-1581	1583-1584
126	1544-1546	1548-1549	1552-1553	1555-1556	1558-1560	1562-1563	1565-1566	1568-1570	1571-1573	1575-1576	1578-1579	1581-1582
125	1542-1543	1546-1547	1549-1551	1553-1554	1556-1557	1559-1561	1563-1564	1566-1567	1569-1570	1572-1574	1575-1577	1578-1580
124	1540-1541	1543-1545	1547-1548	1550-1552	1554-1555	1557-1558	1560-1562	1563-1565	1567-1568	1570-1571	1573-1574	1576-1577
123	1537-1539	1541-1542	1544-1546	1548-1549	1551-1553	1554-1556	1558-1559	1561-1562	1564-1566	1567-1569	1571-1572	1574-1575
122	1535-1536	1538-1540	1542-1543	1545-1547	1549-1550	1551-1553	1555-1557	1559-1560	1562-1563	1565-1566	1568-1570	1571-1573
121	1532-1534	1535-1537	1539-1541	1542-1544	1546-1548	1549-1550	1553-1554	1556-1558	1559-1561	1562-1564	1565-1567	1568-1570
120	1529-1531	1532-1534	1536-1538	1539-1541	1543-1545	1546-1548	1550-1552	1553-1555	1556-1558	1559-1561	1562-1564	1565-1567
119	1526-1528	1530-1531	1533-1535	1537-1538	1540-1542	1544-1545	1547-1549	1550-1552	1554-1555	1557-1558	1560-1561	1563-1564
118	1524-1525	1527-1529	1531-1532	1535-1536	1538-1539	1541-1543	1545-1546	1548-1549	1551-1553	1554-1556	1558-1559	1561-1562
117	1521-1523	1525-1526	1529-1530	1532-1534	1536-1537	1539-1540	1542-1544	1546-1547	1549-1550	1552-1553	1555-1557	1558-1560
116	1519-1520	1523-1524	1526-1528	1530-1531	1533-1535	1536-1538	1540-1541	1543-1545	1546-1548	1550-1551	1553-1554	1556-1557
115	1517-1518	1521-1522	1524-1525	1528-1529	1531-1532	1534-1535	1538-1539	1541-1542	1544-1545	1548-1549	1551-1552	1554-1555
114	1515-1516	1519-1520	1522-1523	1526-1527	1529-1530	1532-1533	1536-1537	1539-1540	1542-1543	1546-1547	1549-1550	1552-1553
113	1513-1514	1516-1518	1520-1521	1523-1525	1527-1528	1530-1531	1534-1535	1537-1538	1540-1541	1543-1545	1546-1548	1550-1551
112	1510-1512	1514-1515	1517-1519	1521-1522	1524-1526	1528-1529	1531-1533	1534-1536	1538-1539	1541-1542	1544-1545	1547-1549
111	1508-1509	1511-1513	1515-1516	1518-1520	1522-1523	1525-1527	1529-1530	1532-1533	1535-1537	1538-1540	1542-1543	1545-1546
110	1505-1507	1509-1510	1512-1514	1516-1517	1519-1521	1523-1524	1526-1528	1530-1531	1533-1534	1536-1537	1539-1541	1542-1544
109	1503-1504	1506-1508	1510-1511	1513-1515	1517-1518	1520-1522	1524-1525	1527-1529	1530-1532	1534-1535	1537-1538	1540-1541
108	1500-1502	1504-1505	1507-1509	1511-1512	1514-1516	1518-1519	1521-1523	1525-1526	1528-1529	1531-1533	1534-1536	1537-1539
107	1498-1499	1501-1503	1505-1506	1508-1510	1512-1513	1515-1517	1519-1520	1522-1524	1525-1527	1529-1530	1532-1533	1535-1536
106	1495-1497	1499-1500	1502-1504	1506-1507	1510-1511	1513-1514	1516-1518	1520-1521	1523-1524	1526-1528	1529-1531	1533-1534
105	1493-1494	1496-1498	1500-1501	1504-1505	1507-1509	1511-1512	1514-1515	1517-1519	1521-1522	1524-1525	1527-1528	1530-1532
104	1490-1492	1494-1495	1498-1499	1501-1503	1505-1506	1508-1510	1511-1513	1515-1516	1518-1520	1521-1523	1525-1526	1528-1529
103	1488-1489	1491-1493	1495-1497	1499-1500	1502-1504	1506-1507	1509-1510	1512-1514	1516-1517	1519-1520	1522-1524	1525-1527
102	1485-1487	1489-1490	1493-1494	1496-1498	1500-1501	1503-1505	1507-1508	1510-1511	1513-1515	1516-1518	1520-1521	1523-1524
101	1483-1484	1486-1488	1490-1492	1494-1495	1497-1499	1501-1502	1504-1506	1507-1509	1511-1512	1514-1515	1517-1519	1520-1522
100	1480-1482	1484-1485	1488-1489	1491-1493	1495-1496	1498-1500	1502-1503	1505-1506	1508-1510	1512-1513	1515-1516	1518-1519
99	1478-1479	1482-1483	1486-1487	1489-1490	1493-1494	1496-1497	1500-1501	1503-1505	1505-1506	1509-1510	1512-1513	1515-1516
98	1476-1477	1480-1481	1484-1485	1488-1489	1491-1492	1493-1494	1496-1497	1500-1501	1503-1504	1506-1507	1510-1511	1513-1514
97	1474-1475	1478-1479	1481-1483	1484-1485	1488-1490	1491-1492	1495-1497	1498-1499	1501-1502	1503-1505	1508-1509	1511-1512

APPENDIX B, CONTINUED

NAI		SCALED SCORES										
		4-Year-Olds										
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months
96	1471-1473	1475-1477	1479-1480	1481-1483	1486-1487	1488-1490	1493-1494	1497-1498	1499-1500	1503-1504	1506-1507	1509-1511
95	1469-1470	1473-1474	1476-1478	1479-1480	1483-1485	1486-1487	1490-1492	1494-1496	1497-1498	1500-1502	1503-1505	1507-1508
94	1466-1468	1470-1472	1473-1475	1476-1478	1480-1482	1483-1485	1488-1489	1492-1493	1494-1496	1498-1499	1501-1502	1504-1506
93	1464-1465	1468-1469	1471-1472	1474-1475	1477-1479	1481-1482	1485-1487	1489-1491	1492-1493	1495-1497	1498-1500	1502-1503
92	1461-1463	1465-1467	1468-1470	1471-1473	1475-1476	1478-1480	1483-1484	1487-1488	1489-1491	1493-1494	1496-1497	1499-1501
91	1459-1460	1463-1464	1466-1467	1469-1470	1473-1474	1477	1480-1482	1484-1486	1487-1488	1490-1492	1493-1495	1496-1498
90	1456-1458	1460-1462	1464-1465	1467-1468	1471-1472	1474-1476	1478-1479	1482-1483	1484-1486	1488-1489	1491-1492	1494-1495
89	1454-1455	1458-1459	1461-1463	1465-1466	1468-1470	1472-1473	1475-1477	1479-1481	1482-1483	1485-1487	1489-1490	1492-1493
88	1452-1453	1456-1457	1459-1460	1463-1464	1466-1467	1470-1471	1473-1474	1477-1478	1480-1481	1483-1484	1487-1488	1490-1491
87	1449-1451	1453-1455	1456-1458	1460-1462	1463-1465	1467-1469	1470-1472	1474-1476	1477-1479	1480-1482	1484-1486	1487-1489
86	1447-1448	1451-1452	1454-1455	1458-1459	1461-1462	1465-1466	1468-1469	1472-1473	1475-1476	1478-1479	1482-1483	1485-1486
85	1445-1446	1448-1450	1452-1453	1456-1457	1459-1460	1463-1464	1466-1467	1470-1471	1473-1474	1476-1477	1480-1481	1483-1484
84	1442-1444	1446-1447	1450-1451	1453-1455	1457-1458	1460-1462	1464-1465	1467-1469	1470-1472	1474-1475	1477-1479	1480-1482
83	1439-1441	1443-1445	1447-1449	1450-1452	1454-1456	1458-1459	1461-1463	1465-1466	1468-1469	1471-1473	1474-1476	1478-1479
82	1436-1438	1440-1442	1444-1446	1447-1449	1451-1453	1455-1457	1458-1460	1462-1464	1465-1467	1468-1470	1471-1473	1475-1477
81	1433-1435	1437-1439	1441-1443	1445-1446	1448-1450	1452-1454	1455-1457	1459-1461	1462-1464	1465-1467	1468-1470	1472-1474
80	1430-1432	1434-1436	1438-1440	1442-1444	1445-1447	1449-1451	1452-1454	1456-1458	1459-1461	1462-1464	1465-1467	1469-1471
79	1428-1429	1431-1433	1435-1437	1439-1441	1442-1444	1446-1448	1449-1451	1453-1455	1456-1458	1459-1461	1462-1464	1466-1468
78	1425-1427	1429-1430	1433-1434	1436-1438	1440-1441	1443-1445	1447-1448	1450-1452	1453-1455	1457-1458	1460-1461	1463-1465
77	1423-1424	1426-1428	1430-1432	1434-1435	1437-1439	1441-1442	1444-1446	1448-1449	1451-1452	1454-1456	1457-1459	1461-1462
76	1420-1422	1424-1425	1427-1429	1431-1433	1435-1436	1438-1440	1442-1443	1445-1447	1448-1450	1452-1453	1455-1456	1458-1460
75	1418-1419	1421-1423	1425-1426	1429-1430	1432-1434	1436-1437	1439-1441	1442-1444	1446-1447	1449-1451	1452-1454	1456-1457
74	1415-1417	1419-1420	1422-1424	1426-1428	1430-1431	1433-1435	1437-1438	1440-1441	1443-1445	1447-1448	1450-1451	1453-1455
73	1413-1414	1416-1418	1420-1421	1423-1425	1427-1429	1431-1432	1434-1436	1437-1439	1441-1442	1444-1446	1447-1449	1450-1452
72	1410-1412	1414-1415	1417-1419	1421-1422	1425-1426	1428-1430	1431-1433	1435-1436	1438-1440	1442-1443	1445-1446	1448-1449
71	1407-1409	1411-1413	1415-1416	1418-1420	1422-1424	1425-1427	1429-1430	1432-1434	1436-1437	1439-1441	1442-1444	1445-1447
70	1405-1406	1409-1410	1412-1414	1416-1417	1419-1421	1423-1424	1426-1428	1430-1431	1433-1435	1436-1438	1440-1441	1443-1444
69	1402-1404	1406-1408	1410-1411	1413-1415	1417-1418	1420-1422	1424-1425	1427-1429	1431-1432	1434-1435	1437-1439	1440-1442
68	1400-1401	1404-1405	1407-1409	1411-1412	1414-1416	1418-1419	1421-1423	1425-1426	1428-1430	1431-1433	1435-1436	1438-1439
67	1397-1399	1401-1403	1405-1406	1408-1410	1412-1413	1415-1417	1419-1420	1422-1424	1426-1427	1429-1430	1432-1434	1435-1437
66	1395-1396	1398-1400	1402-1404	1406-1407	1409-1411	1413-1414	1416-1418	1420-1421	1423-1425	1426-1428	1429-1431	1433-1434
65	1392-1394	1396-1397	1400-1401	1403-1405	1407-1408	1410-1412	1414-1415	1417-1419	1420-1422	1424-1425	1427-1428	1430-1432

NAI		SCALED SCORES												
		4-Year-Olds												
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months	
64	1390-1391	1394-1395	1397-1399	1401-1402	1405-1406	1408-1409	1412-1413	1415-1416	1418-1419	1422-1423	1425-1426	1428-1429		
63	1388-1389	1392-1393	1395-1396	1399-1400	1403-1404	1406-1407	1410-1411	1413-1414	1416-1417	1420-1421	1423-1424	1426-1427		
62	1386-1387	1389-1391	1393-1394	1397-1398	1400-1402	1404-1405	1407-1409	1410-1412	1414-1415	1417-1419	1420-1422	1423-1425		
61	1383-1385	1387-1388	1390-1392	1394-1396	1398-1399	1401-1403	1404-1406	1408-1409	1411-1413	1414-1416	1418-1419	1421-1422		
60	1381-1382	1385-1386	1388-1389	1392-1393	1396-1397	1399-1400	1402-1403	1406-1407	1409-1410	1412-1413	1416-1417	1419-1420		
59	1379-1380	1383-1384	1386-1387	1390-1391	1393-1395	1397-1398	1400-1401	1404-1405	1407-1408	1410-1411	1414-1415	1417-1418		
58	1376-1378	1380-1382	1384-1385	1387-1389	1391-1392	1394-1396	1398-1399	1401-1403	1404-1406	1408-1409	1411-1413	1414-1416		
57	1374-1375	1378-1379	1381-1383	1385-1386	1388-1390	1392-1393	1395-1397	1399-1400	1402-1403	1405-1407	1408-1410	1412-1413		
56	1371-1373	1375-1377	1379-1380	1382-1384	1386-1387	1389-1391	1393-1394	1396-1398	1399-1401	1403-1404	1406-1407	1409-1411		
55	1369-1370	1372-1374	1376-1378	1380-1381	1383-1385	1387-1388	1390-1392	1393-1395	1397-1398	1400-1402	1403-1405	1406-1408		
54	1366-1368	1370-1371	1373-1375	1377-1379	1381-1382	1384-1386	1387-1389	1391-1392	1394-1396	1397-1399	1401-1402	1404-1405		
53	1364-1365	1367-1369	1371-1372	1374-1376	1378-1380	1381-1383	1385-1386	1388-1390	1392-1393	1395-1396	1398-1400	1401-1403		
52	1361-1363	1365-1366	1368-1370	1372-1373	1375-1377	1379-1380	1382-1384	1386-1387	1389-1391	1392-1394	1396-1397	1399-1400		
51	1358-1360	1362-1364	1366-1367	1369-1371	1373-1374	1376-1378	1380-1381	1383-1385	1386-1388	1390-1391	1393-1395	1396-1398		
50	1356-1357	1360-1361	1363-1365	1367-1368	1370-1372	1374-1375	1377-1379	1381-1382	1384-1385	1387-1389	1390-1392	1393-1395		
49	1353-1355	1357-1359	1361-1362	1364-1366	1368-1369	1371-1373	1375-1376	1378-1380	1381-1383	1385-1386	1388-1389	1391-1392		
48	1351-1352	1354-1356	1358-1360	1362-1363	1365-1367	1369-1370	1372-1374	1375-1377	1379-1380	1382-1384	1385-1387	1388-1390		
47	1349-1350	1352-1353	1355-1357	1359-1361	1363-1364	1366-1368	1369-1371	1373-1374	1376-1378	1379-1381	1383-1384	1386-1387		
46	1346-1348	1349-1351	1353-1354	1356-1358	1360-1362	1363-1365	1367-1368	1370-1372	1373-1375	1377-1378	1380-1382	1383-1385		
45	1344-1345	1347-1348	1350-1352	1354-1355	1357-1359	1361-1362	1364-1366	1368-1369	1371-1372	1374-1376	1377-1379	1380-1382		
44	1342-1343	1345-1346	1348-1349	1351-1353	1355-1356	1358-1360	1362-1363	1365-1367	1368-1370	1372-1373	1375-1376	1378-1379		
43	1340-1341	1343-1344	1346-1347	1349-1350	1352-1354	1356-1357	1359-1361	1362-1364	1366-1367	1369-1371	1372-1374	1375-1377		
42	1338-1339	1341-1342	1343-1345	1346-1348	1350-1351	1353-1355	1356-1358	1360-1361	1363-1365	1366-1368	1369-1371	1373-1374		
41	1336-1337	1339-1340	1341-1342	1344-1345	1347-1349	1350-1352	1354-1355	1357-1359	1360-1362	1364-1365	1367-1368	1370-1372		
40	Below 1336	Below 1339	Below 1341	Below 1344	Below 1347	Below 1350	Below 1354	Below 1357	Below 1360	Below 1364	Below 1367	Below 1370		

APPENDIX B, CONTINUED

NAI		SCALED SCORES										
		5-Year-Olds										
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months
160	Above 1661	Above 1664	Above 1666	Above 1669	Above 1671	Above 1673	Above 1676	Above 1678	Above 1680	Above 1683	Above 1685	Above 1687
159	1660-1661	1662-1664	1665-1666	1667-1669	1670-1671	1672-1673	1675-1676	1677-1678	1679-1680	1681-1683	1684-1685	1686-1687
158	1658-1659	1660-1661	1663-1664	1665-1666	1668-1669	1670-1671	1673-1674	1675-1676	1677-1678	1679-1680	1682-1683	1684-1685
157	1655-1657	1658-1659	1661-1662	1663-1664	1666-1667	1668-1669	1670-1672	1673-1674	1675-1676	1677-1678	1679-1681	1682-1683
156	1653-1654	1656-1657	1658-1660	1661-1662	1663-1665	1666-1667	1668-1669	1671-1672	1673-1674	1675-1676	1677-1678	1679-1681
155	1651-1652	1653-1655	1656-1657	1659-1660	1661-1662	1664-1665	1666-1667	1668-1670	1671-1672	1673-1674	1675-1676	1677-1678
154	1649-1650	1651-1652	1654-1655	1656-1658	1659-1660	1661-1663	1664-1665	1666-1667	1669-1670	1671-1672	1673-1674	1675-1676
153	1646-1648	1649-1650	1652-1653	1654-1655	1657-1658	1659-1660	1662-1663	1664-1665	1666-1668	1669-1670	1671-1672	1673-1674
152	1644-1645	1647-1648	1649-1651	1652-1653	1655-1656	1657-1658	1659-1661	1662-1663	1664-1665	1667-1668	1669-1670	1671-1672
151	1642-1643	1644-1646	1647-1648	1650-1651	1652-1654	1655-1656	1657-1658	1660-1661	1662-1663	1664-1666	1667-1668	1669-1670
150	1639-1641	1642-1643	1645-1646	1647-1649	1650-1651	1653-1654	1655-1656	1657-1659	1660-1661	1662-1663	1664-1666	1667-1668
149	1637-1638	1640-1641	1643-1644	1645-1646	1648-1649	1650-1652	1653-1654	1655-1656	1658-1659	1660-1661	1662-1663	1665-1666
148	1635-1636	1638-1639	1640-1642	1643-1644	1646-1647	1648-1649	1651-1652	1653-1654	1655-1657	1658-1659	1660-1661	1662-1664
147	1633-1634	1635-1637	1638-1639	1641-1642	1643-1645	1646-1647	1648-1650	1651-1652	1653-1654	1656-1657	1658-1659	1660-1661
146	1630-1632	1633-1634	1636-1637	1638-1640	1641-1642	1644-1645	1646-1647	1649-1650	1651-1652	1653-1655	1656-1657	1658-1659
145	1628-1629	1631-1632	1634-1635	1636-1637	1639-1640	1641-1643	1644-1645	1646-1648	1649-1650	1651-1652	1654-1655	1656-1657
144	1626-1627	1629-1630	1631-1633	1634-1635	1637-1638	1639-1640	1642-1643	1644-1645	1647-1648	1649-1650	1651-1653	1654-1655
143	1623-1625	1626-1628	1629-1630	1632-1633	1634-1636	1637-1638	1639-1641	1642-1643	1644-1646	1647-1648	1649-1650	1652-1653
142	1621-1622	1624-1625	1627-1628	1629-1631	1632-1633	1635-1636	1637-1638	1640-1641	1642-1643	1645-1646	1647-1648	1649-1651
141	1619-1620	1622-1623	1624-1626	1627-1628	1630-1631	1632-1634	1635-1636	1637-1639	1640-1641	1642-1644	1645-1646	1647-1648
140	1616-1618	1619-1621	1622-1623	1625-1626	1628-1629	1630-1631	1633-1634	1635-1636	1638-1639	1640-1641	1643-1644	1645-1646
139	1614-1615	1617-1618	1620-1621	1623-1624	1625-1627	1628-1629	1630-1632	1633-1634	1635-1637	1638-1639	1640-1642	1643-1644
138	1612-1613	1615-1616	1617-1619	1620-1622	1623-1624	1626-1627	1628-1629	1631-1632	1633-1634	1636-1637	1638-1639	1640-1642
137	1610-1611	1612-1614	1615-1616	1618-1619	1621-1622	1623-1625	1626-1627	1628-1630	1631-1632	1633-1635	1636-1637	1638-1639
136	1607-1609	1610-1611	1613-1614	1616-1617	1618-1620	1621-1622	1624-1625	1626-1627	1629-1630	1631-1632	1634-1635	1636-1637
135	1605-1606	1608-1609	1611-1612	1613-1615	1616-1617	1619-1620	1621-1623	1624-1625	1626-1628	1629-1630	1631-1633	1634-1635
134	1603-1604	1605-1607	1608-1610	1611-1612	1614-1615	1616-1618	1619-1620	1622-1623	1624-1625	1627-1628	1629-1630	1632-1633
133	1600-1602	1603-1604	1606-1607	1609-1610	1611-1613	1614-1615	1617-1618	1619-1621	1622-1623	1624-1626	1627-1628	1629-1631
132	1598-1599	1601-1602	1604-1605	1606-1608	1609-1610	1612-1613	1614-1616	1617-1618	1620-1621	1622-1623	1625-1626	1627-1628
131	1595-1597	1598-1600	1601-1603	1604-1605	1607-1608	1610-1611	1612-1613	1615-1616	1617-1619	1620-1621	1622-1624	1625-1626
130	1593-1594	1596-1597	1599-1600	1602-1603	1604-1606	1607-1609	1610-1611	1612-1614	1615-1616	1618-1619	1620-1621	1622-1624
129	1591-1592	1594-1595	1597-1598	1599-1601	1602-1603	1605-1606	1608-1609	1610-1611	1613-1614	1615-1617	1618-1619	1620-1621

SCALED SCORES

5-Year-Olds

NAI	SCALED SCORES											
	0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months
128	1588-1590	1591-1593	1594-1596	1597-1598	1600-1601	1603-1604	1605-1607	1608-1609	1610-1612	1613-1614	1615-1617	1618-1619
127	1586-1587	1589-1590	1592-1593	1595-1596	1597-1599	1600-1602	1603-1604	1606-1607	1608-1609	1611-1612	1613-1614	1616-1617
126	1584-1585	1587-1588	1590-1591	1592-1594	1595-1596	1598-1599	1601-1602	1603-1605	1606-1607	1608-1610	1611-1612	1613-1615
125	1581-1583	1584-1586	1587-1589	1590-1591	1593-1594	1596-1597	1598-1600	1601-1602	1604-1605	1606-1607	1609-1610	1611-1612
124	1579-1580	1582-1583	1585-1586	1588-1589	1590-1592	1593-1595	1596-1597	1599-1600	1601-1603	1604-1605	1606-1608	1609-1610
123	1577-1578	1580-1581	1582-1584	1585-1587	1588-1589	1591-1592	1594-1595	1596-1598	1599-1600	1601-1603	1604-1605	1606-1608
122	1574-1576	1577-1579	1580-1581	1583-1584	1586-1587	1589-1590	1591-1593	1594-1595	1597-1598	1599-1600	1602-1603	1604-1605
121	1571-1573	1574-1576	1577-1579	1580-1582	1583-1585	1586-1588	1589-1590	1591-1593	1594-1596	1596-1598	1599-1601	1601-1603
120	1568-1570	1571-1573	1574-1576	1577-1579	1580-1582	1583-1585	1586-1588	1588-1590	1591-1593	1593-1595	1596-1598	1598-1600
119	1566-1567	1569-1570	1572-1573	1575-1576	1578-1579	1580-1582	1583-1585	1586-1587	1589-1590	1591-1592	1594-1595	1596-1597
118	1564-1565	1567-1568	1570-1571	1572-1574	1575-1577	1578-1579	1581-1582	1584-1585	1586-1588	1589-1590	1591-1593	1594-1595
117	1561-1563	1564-1566	1567-1569	1570-1571	1573-1574	1576-1577	1578-1580	1581-1583	1584-1585	1586-1588	1589-1590	1591-1593
116	1559-1560	1562-1563	1565-1566	1568-1569	1571-1572	1573-1575	1576-1577	1579-1580	1581-1583	1584-1585	1587-1588	1589-1590
115	1557-1558	1560-1561	1563-1564	1566-1567	1569-1570	1571-1572	1574-1575	1577-1578	1579-1580	1582-1583	1585-1586	1587-1588
114	1555-1556	1558-1559	1561-1562	1564-1565	1567-1568	1569-1570	1572-1573	1575-1576	1577-1578	1580-1581	1583-1584	1585-1586
113	1553-1554	1556-1557	1559-1560	1562-1563	1564-1566	1567-1568	1570-1571	1573-1574	1575-1576	1578-1579	1581-1582	1583-1584
112	1550-1552	1553-1555	1556-1558	1559-1561	1562-1563	1565-1566	1568-1569	1570-1572	1573-1574	1576-1577	1578-1580	1581-1582
111	1548-1549	1551-1552	1554-1555	1557-1558	1560-1561	1562-1564	1565-1567	1568-1569	1571-1572	1573-1575	1576-1577	1578-1580
110	1545-1547	1548-1550	1551-1553	1554-1556	1557-1559	1560-1561	1563-1564	1566-1567	1568-1570	1571-1572	1573-1575	1576-1577
109	1543-1544	1546-1547	1549-1550	1552-1553	1555-1556	1558-1559	1560-1562	1563-1565	1566-1567	1568-1570	1571-1572	1574-1575
108	1541-1542	1544-1545	1547-1548	1549-1551	1552-1554	1555-1557	1558-1559	1561-1562	1563-1565	1566-1567	1569-1570	1571-1573
107	1538-1540	1541-1543	1544-1546	1547-1548	1550-1551	1553-1554	1556-1557	1558-1560	1561-1562	1564-1565	1566-1568	1569-1570
106	1536-1537	1539-1540	1542-1543	1545-1546	1548-1549	1550-1552	1553-1555	1556-1557	1559-1560	1561-1563	1564-1565	1566-1568
105	1533-1535	1536-1538	1539-1541	1542-1544	1545-1547	1548-1549	1551-1552	1554-1555	1556-1558	1559-1560	1561-1563	1564-1565
104	1531-1532	1534-1535	1537-1538	1540-1541	1543-1544	1546-1547	1548-1550	1551-1553	1554-1555	1556-1558	1559-1560	1562-1563
103	1528-1530	1531-1533	1534-1536	1537-1539	1540-1542	1543-1545	1546-1547	1549-1550	1551-1553	1554-1555	1557-1558	1559-1561
102	1526-1527	1529-1530	1532-1533	1535-1536	1538-1539	1541-1542	1543-1545	1546-1548	1549-1550	1552-1553	1554-1556	1557-1558
101	1523-1525	1527-1528	1530-1531	1532-1534	1535-1537	1538-1540	1541-1542	1544-1545	1547-1548	1549-1551	1552-1553	1554-1556
100	1521-1522	1524-1526	1527-1529	1530-1531	1533-1534	1536-1537	1539-1540	1542-1543	1544-1546	1547-1548	1550-1551	1552-1553
99	1519-1520	1522-1523	1525-1526	1528-1529	1531-1532	1534-1535	1537-1538	1540-1541	1542-1543	1545-1546	1548-1549	1550-1551
98	1517-1518	1520-1521	1523-1524	1526-1527	1529-1530	1532-1533	1535-1536	1538-1539	1540-1541	1543-1544	1546-1547	1548-1549
97	1515-1516	1518-1519	1521-1522	1524-1525	1527-1528	1529-1531	1532-1534	1535-1537	1538-1539	1541-1542	1543-1545	1546-1547

APPENDIX B, CONTINUED

NAI		SCALED SCORES										
		5-Year-Olds										
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months
96	1512-1514	1515-1517	1518-1520	1521-1523	1524-1526	1527-1528	1530-1531	1533-1534	1535-1537	1538-1540	1541-1542	1543-1545
95	1510-1511	1513-1514	1516-1517	1519-1520	1522-1523	1525-1526	1527-1529	1530-1532	1533-1534	1536-1537	1538-1540	1541-1542
94	1507-1509	1510-1512	1513-1515	1516-1518	1519-1521	1522-1524	1525-1526	1528-1529	1530-1532	1533-1535	1536-1537	1538-1540
93	1505-1506	1508-1509	1511-1512	1514-1515	1517-1518	1520-1521	1522-1524	1525-1527	1528-1529	1531-1532	1533-1535	1536-1537
92	1502-1504	1505-1507	1508-1510	1511-1513	1514-1516	1517-1519	1520-1521	1523-1524	1526-1527	1528-1530	1531-1532	1534-1535
91	1499-1501	1502-1504	1505-1507	1508-1510	1511-1513	1514-1516	1517-1519	1520-1522	1523-1525	1525-1527	1528-1530	1531-1533
90	1497-1498	1500-1501	1503-1504	1506-1507	1509-1510	1512-1513	1515-1516	1518-1519	1521-1522	1523-1524	1526-1527	1529-1530
89	1495-1496	1498-1499	1501-1502	1504-1505	1507-1508	1510-1511	1513-1514	1515-1517	1518-1520	1521-1522	1524-1525	1526-1528
88	1493-1494	1496-1497	1499-1500	1502-1503	1505-1506	1508-1509	1511-1512	1513-1514	1516-1517	1519-1520	1522-1523	1524-1525
87	1490-1492	1493-1495	1496-1498	1499-1501	1502-1504	1505-1507	1508-1510	1510-1512	1513-1515	1516-1518	1519-1521	1521-1523
86	1488-1489	1491-1492	1494-1495	1497-1498	1500-1501	1503-1504	1506-1507	1508-1509	1511-1512	1514-1515	1517-1518	1519-1520
85	1486-1487	1489-1490	1492-1493	1495-1496	1498-1499	1501-1502	1504-1505	1506-1507	1509-1510	1512-1513	1515-1516	1517-1518
84	1483-1485	1486-1488	1489-1491	1492-1494	1495-1497	1498-1500	1501-1503	1504-1505	1507-1508	1509-1511	1512-1514	1515-1516
83	1481-1482	1484-1485	1487-1488	1490-1491	1493-1494	1496-1497	1499-1500	1501-1503	1504-1506	1507-1508	1510-1511	1512-1514
82	1478-1480	1481-1483	1484-1486	1487-1489	1490-1492	1493-1495	1496-1498	1498-1500	1501-1503	1504-1506	1507-1509	1509-1511
81	1475-1477	1478-1480	1481-1483	1484-1486	1487-1489	1490-1492	1493-1495	1495-1497	1498-1500	1501-1503	1504-1506	1506-1508
80	1472-1474	1475-1477	1478-1480	1481-1483	1484-1486	1487-1489	1490-1492	1492-1494	1495-1497	1498-1500	1501-1503	1503-1505
79	1469-1471	1472-1474	1475-1477	1478-1480	1481-1483	1484-1486	1487-1489	1489-1491	1492-1494	1495-1497	1498-1500	1500-1502
78	1466-1468	1469-1471	1472-1474	1475-1477	1478-1480	1481-1483	1484-1486	1487-1488	1490-1491	1492-1494	1495-1497	1498-1499
77	1464-1465	1467-1468	1470-1471	1473-1474	1476-1477	1479-1480	1482-1483	1484-1486	1487-1489	1490-1491	1493-1494	1495-1497
76	1461-1463	1464-1466	1467-1469	1470-1472	1473-1475	1476-1478	1479-1481	1482-1483	1485-1486	1487-1489	1490-1492	1493-1494
75	1459-1460	1462-1463	1465-1466	1468-1469	1471-1472	1474-1475	1477-1478	1479-1481	1482-1484	1485-1486	1488-1489	1490-1492
74	1456-1458	1459-1461	1462-1464	1465-1467	1468-1470	1471-1473	1474-1476	1477-1478	1480-1481	1482-1484	1485-1487	1488-1489
73	1454-1455	1457-1458	1460-1461	1463-1464	1466-1467	1469-1470	1472-1473	1474-1476	1477-1479	1480-1481	1482-1484	1485-1487
72	1451-1453	1454-1456	1457-1459	1460-1462	1463-1465	1466-1468	1469-1471	1472-1473	1475-1476	1477-1479	1480-1481	1483-1484
71	1449-1450	1452-1453	1455-1456	1458-1459	1461-1462	1464-1465	1466-1468	1469-1471	1472-1474	1475-1476	1477-1479	1480-1482
70	1446-1448	1449-1451	1452-1454	1455-1457	1458-1460	1461-1463	1464-1466	1467-1468	1469-1471	1472-1474	1475-1476	1477-1479
69	1443-1445	1447-1448	1450-1451	1453-1454	1456-1457	1458-1460	1461-1463	1464-1466	1467-1468	1470-1471	1472-1474	1475-1476
68	1441-1442	1444-1446	1447-1449	1450-1452	1453-1455	1456-1457	1459-1460	1462-1463	1464-1466	1467-1469	1470-1471	1472-1474
67	1438-1440	1441-1443	1445-1446	1448-1449	1450-1452	1453-1455	1456-1458	1459-1461	1462-1463	1465-1466	1467-1469	1470-1471
66	1436-1437	1439-1440	1442-1444	1445-1447	1448-1449	1451-1452	1454-1455	1456-1458	1459-1461	1462-1464	1465-1466	1467-1469
65	1433-1435	1436-1438	1439-1441	1442-1444	1445-1447	1448-1450	1451-1453	1454-1455	1457-1458	1459-1461	1462-1464	1465-1466

NAI		SCALED SCORES												
		5-Year-Olds												
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months	
64	1431-1432	1434-1435	1437-1438	1440-1441	1443-1444	1446-1447	1449-1450	1452-1453	1455-1456	1457-1458	1460-1461	1463-1464		
63	1429-1430	1432-1433	1435-1436	1438-1439	1441-1442	1444-1445	1447-1448	1450-1451	1453-1454	1455-1456	1458-1459	1461-1462		
62	1427-1428	1430-1431	1433-1434	1436-1437	1439-1440	1442-1443	1444-1446	1447-1449	1450-1452	1453-1454	1455-1457	1458-1460		
61	1424-1426	1427-1429	1430-1432	1433-1435	1436-1438	1439-1441	1442-1443	1445-1446	1447-1449	1450-1452	1453-1454	1455-1457		
60	1422-1423	1425-1426	1428-1429	1431-1432	1434-1435	1437-1438	1440-1441	1442-1444	1445-1446	1448-1449	1451-1452	1453-1454		
59	1420-1421	1423-1424	1426-1427	1429-1430	1432-1433	1435-1436	1438-1439	1440-1441	1443-1444	1446-1447	1449-1450	1451-1452		
58	1417-1419	1420-1422	1423-1425	1426-1428	1429-1431	1432-1434	1435-1437	1438-1439	1441-1442	1443-1445	1446-1448	1449-1450		
57	1415-1416	1418-1419	1421-1422	1424-1425	1427-1428	1430-1431	1433-1434	1435-1437	1438-1440	1441-1442	1443-1445	1446-1448		
56	1412-1414	1415-1417	1418-1420	1421-1423	1424-1426	1427-1429	1430-1432	1433-1434	1435-1437	1438-1440	1441-1442	1443-1445		
55	1410-1411	1413-1414	1416-1417	1419-1420	1422-1423	1424-1426	1427-1429	1430-1432	1433-1434	1436-1437	1438-1440	1441-1442		
54	1407-1409	1410-1412	1413-1415	1416-1418	1419-1421	1422-1423	1425-1426	1428-1429	1430-1432	1433-1435	1436-1437	1438-1440		
53	1404-1406	1407-1409	1410-1412	1413-1415	1416-1418	1419-1421	1422-1424	1425-1427	1428-1429	1430-1432	1433-1435	1436-1437		
52	1402-1403	1405-1406	1408-1409	1411-1412	1414-1415	1417-1418	1420-1421	1422-1424	1425-1427	1428-1429	1430-1432	1433-1435		
51	1399-1401	1402-1404	1405-1407	1408-1410	1411-1413	1414-1416	1417-1419	1420-1421	1422-1424	1425-1427	1428-1429	1430-1432		
50	1397-1398	1400-1401	1403-1404	1406-1407	1409-1410	1411-1413	1414-1416	1417-1419	1420-1421	1422-1424	1425-1427	1428-1429		
49	1394-1396	1397-1399	1400-1402	1403-1405	1406-1408	1409-1410	1412-1413	1414-1416	1417-1419	1420-1421	1423-1424	1425-1427		
48	1391-1393	1394-1396	1397-1399	1400-1402	1403-1405	1406-1408	1409-1411	1412-1413	1415-1416	1417-1419	1420-1422	1422-1424		
47	1389-1390	1392-1393	1395-1396	1398-1399	1401-1402	1404-1405	1406-1408	1409-1411	1412-1414	1415-1416	1417-1419	1420-1421		
46	1386-1388	1389-1391	1392-1394	1395-1397	1398-1400	1401-1403	1404-1405	1407-1408	1409-1411	1412-1414	1415-1416	1417-1419		
45	1384-1385	1387-1388	1390-1391	1393-1394	1396-1397	1398-1400	1401-1403	1404-1406	1407-1408	1409-1411	1412-1414	1415-1416		
44	1381-1383	1384-1386	1387-1389	1390-1392	1393-1395	1396-1397	1399-1400	1401-1403	1404-1406	1407-1408	1409-1411	1412-1414		
43	1378-1380	1381-1383	1384-1386	1387-1389	1390-1392	1393-1395	1396-1398	1399-1400	1401-1403	1404-1406	1407-1408	1409-1411		
42	1376-1377	1379-1380	1382-1383	1385-1386	1388-1389	1390-1392	1393-1395	1396-1398	1399-1400	1401-1403	1404-1406	1407-1408		
41	1373-1375	1376-1378	1379-1381	1382-1384	1385-1387	1388-1389	1391-1392	1393-1395	1396-1398	1399-1400	1401-1403	1404-1406		
40	Below 1373	Below 1376	Below 1379	Below 1382	Below 1385	Below 1388	Below 1391	Below 1393	Below 1396	Below 1399	Below 1401	Below 1404		

APPENDIX B, CONTINUED

NAI		SCALED SCORES										
		6-Year-Olds										
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months
160	Above 1689	Above 1691	Above 1693	Above 1695	Above 1697	Above 1698	Above 1700	Above 1702	Above 1704	Above 1705	Above 1707	Above 1708
159	1688-1689	1690-1691	1692-1693	1694-1695	1696-1697	1697-1698	1699-1700	1701-1702	1703-1704	1704-1705	1706-1707	1708
158	1686-1687	1688-1689	1690-1691	1692-1693	1694-1695	1695-1696	1697-1698	1699-1700	1701-1702	1702-1703	1704-1705	1706-1707
157	1684-1685	1686-1687	1688-1689	1690-1691	1692-1693	1693-1694	1695-1696	1697-1698	1699-1700	1701	1702-1703	1704-1705
156	1682-1683	1684-1685	1686-1687	1688-1689	1690-1691	1691-1692	1693-1694	1695-1696	1697-1698	1699-1700	1700-1701	1702-1703
155	1680-1681	1682-1683	1684-1685	1686-1687	1688-1689	1689-1690	1691-1692	1693-1694	1695-1696	1697-1698	1698-1699	1700-1701
154	1677-1679	1679-1681	1682-1683	1684-1685	1686-1687	1687-1688	1689-1690	1691-1692	1693-1694	1695-1696	1696-1697	1698-1699
153	1675-1676	1677-1678	1679-1681	1681-1683	1683-1685	1685-1686	1687-1688	1689-1690	1691-1692	1693-1694	1694-1695	1696-1697
152	1673-1674	1675-1676	1677-1678	1679-1680	1681-1682	1683-1684	1685-1686	1687-1688	1689-1690	1691-1692	1692-1693	1694-1695
151	1671-1672	1673-1674	1675-1676	1677-1678	1679-1680	1681-1682	1683-1684	1685-1686	1687-1688	1689-1690	1690-1691	1692-1693
150	1669-1670	1671-1672	1673-1674	1675-1676	1677-1678	1679-1680	1681-1682	1683-1684	1685-1686	1687-1688	1688-1689	1690-1691
149	1667-1668	1669-1670	1671-1672	1673-1674	1675-1676	1677-1678	1679-1680	1681-1682	1683-1684	1685-1686	1686-1687	1688-1689
148	1665-1666	1667-1668	1669-1670	1671-1672	1673-1674	1675-1676	1677-1678	1679-1680	1681-1682	1683-1684	1684-1685	1686-1687
147	1662-1664	1665-1666	1667-1668	1669-1670	1671-1672	1673-1674	1675-1676	1677-1678	1679-1680	1681-1682	1682-1683	1684-1685
146	1660-1661	1663-1664	1665-1666	1667-1668	1669-1670	1671-1672	1673-1674	1675-1676	1677-1678	1679-1680	1680-1681	1682-1683
145	1658-1659	1660-1662	1663-1664	1665-1666	1667-1668	1669-1670	1671-1672	1673-1674	1675-1676	1676-1678	1678-1679	1680-1681
144	1656-1657	1658-1659	1660-1662	1663-1664	1665-1666	1667-1668	1669-1670	1671-1672	1673-1674	1674-1675	1676-1677	1678-1679
143	1654-1655	1656-1657	1658-1659	1660-1662	1662-1664	1665-1666	1667-1668	1668-1670	1670-1672	1672-1673	1674-1675	1676-1677
142	1652-1653	1654-1655	1656-1657	1658-1659	1660-1661	1662-1664	1664-1666	1666-1667	1668-1669	1670-1671	1672-1673	1674-1675
141	1649-1651	1652-1653	1654-1655	1656-1657	1658-1659	1660-1661	1662-1663	1664-1665	1666-1667	1668-1669	1670-1671	1672-1673
140	1647-1648	1649-1651	1652-1653	1654-1655	1656-1657	1658-1659	1660-1661	1662-1663	1664-1665	1666-1667	1668-1669	1670-1671
139	1645-1646	1647-1648	1650-1651	1652-1653	1654-1655	1656-1657	1658-1659	1660-1661	1662-1663	1664-1665	1666-1667	1668-1669
138	1643-1644	1645-1646	1647-1649	1650-1651	1652-1653	1654-1655	1656-1657	1658-1659	1660-1661	1662-1663	1664-1665	1665-1667
137	1641-1642	1643-1644	1645-1646	1647-1649	1649-1651	1652-1653	1654-1655	1656-1657	1658-1659	1660-1661	1662-1663	1663-1664
136	1638-1640	1641-1642	1643-1644	1645-1646	1647-1648	1649-1651	1651-1653	1654-1655	1655-1657	1657-1659	1659-1661	1661-1662
135	1636-1637	1638-1640	1641-1642	1643-1644	1645-1646	1647-1648	1649-1650	1651-1653	1653-1654	1655-1656	1657-1658	1659-1660
134	1634-1635	1636-1637	1638-1640	1641-1642	1643-1644	1645-1646	1647-1648	1649-1650	1651-1652	1653-1654	1655-1656	1657-1658
133	1632-1633	1634-1635	1636-1637	1638-1640	1641-1642	1643-1644	1645-1646	1647-1648	1649-1650	1651-1652	1653-1654	1655-1656
132	1629-1631	1632-1633	1634-1635	1636-1637	1638-1640	1641-1642	1643-1644	1645-1646	1647-1648	1649-1650	1651-1652	1653-1654
131	1627-1628	1629-1631	1632-1633	1634-1635	1636-1637	1638-1640	1640-1642	1643-1644	1645-1646	1647-1648	1649-1650	1650-1652
130	1625-1626	1627-1628	1630-1631	1632-1633	1634-1635	1636-1637	1638-1639	1640-1642	1642-1644	1644-1646	1646-1648	1648-1649
129	1623-1624	1625-1626	1627-1629	1630-1631	1632-1633	1634-1635	1636-1637	1638-1639	1640-1641	1642-1643	1644-1645	1646-1647

SCALED SCORES

6-Year-Olds

NAI	SCALED SCORES											
	0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months
128	1620-1622	1623-1624	1625-1626	1627-1629	1629-1631	1632-1633	1634-1635	1636-1637	1638-1639	1640-1641	1642-1643	1644-1645
127	1618-1619	1620-1622	1623-1624	1625-1626	1627-1628	1629-1631	1632-1633	1634-1635	1636-1637	1638-1639	1640-1641	1642-1643
126	1616-1617	1618-1619	1620-1622	1623-1624	1625-1626	1627-1628	1629-1631	1631-1633	1634-1635	1636-1637	1638-1639	1639-1641
125	1613-1615	1616-1617	1618-1619	1620-1622	1623-1624	1625-1626	1627-1628	1629-1630	1631-1633	1633-1635	1635-1637	1637-1638
124	1611-1612	1614-1615	1616-1617	1618-1619	1620-1622	1623-1624	1625-1626	1627-1628	1629-1630	1631-1632	1633-1634	1635-1636
123	1609-1610	1611-1613	1614-1615	1616-1617	1618-1619	1620-1622	1623-1624	1625-1626	1627-1628	1629-1630	1631-1632	1633-1634
122	1607-1608	1609-1610	1611-1613	1614-1615	1616-1617	1618-1619	1620-1622	1622-1624	1625-1626	1627-1628	1629-1630	1631-1632
121	1604-1606	1606-1608	1609-1610	1611-1613	1613-1615	1616-1617	1618-1619	1620-1621	1622-1624	1624-1626	1626-1628	1628-1630
120	1601-1603	1603-1605	1606-1608	1608-1610	1610-1612	1613-1615	1615-1617	1617-1619	1619-1621	1621-1623	1623-1625	1625-1627
119	1599-1600	1601-1602	1603-1605	1606-1607	1608-1609	1610-1612	1612-1614	1615-1616	1617-1618	1619-1620	1621-1622	1623-1624
118	1596-1598	1599-1600	1601-1602	1603-1605	1606-1607	1608-1609	1610-1611	1612-1614	1614-1616	1616-1618	1619-1620	1621-1622
117	1594-1595	1596-1598	1599-1600	1601-1602	1603-1605	1606-1607	1608-1609	1610-1611	1612-1613	1614-1615	1616-1618	1618-1620
116	1592-1593	1594-1595	1596-1598	1599-1600	1601-1602	1603-1605	1606-1607	1608-1609	1610-1611	1612-1613	1614-1615	1616-1617
115	1590-1591	1592-1593	1594-1595	1597-1598	1599-1600	1601-1602	1604-1605	1606-1607	1608-1609	1610-1611	1612-1613	1614-1615
114	1588-1589	1590-1591	1592-1593	1595-1596	1597-1598	1599-1600	1602-1603	1604-1605	1606-1607	1608-1609	1610-1611	1612-1613
113	1586-1587	1588-1589	1590-1591	1593-1594	1595-1596	1597-1598	1600-1601	1602-1603	1604-1605	1606-1607	1608-1609	1610-1611
112	1583-1585	1586-1587	1588-1589	1590-1592	1593-1594	1595-1596	1597-1599	1599-1601	1602-1603	1604-1605	1606-1607	1608-1609
111	1581-1582	1583-1585	1586-1587	1588-1589	1590-1592	1593-1594	1595-1596	1597-1598	1599-1601	1601-1603	1603-1605	1605-1607
110	1578-1580	1581-1582	1583-1585	1586-1587	1588-1589	1590-1592	1593-1594	1595-1596	1597-1598	1599-1600	1601-1602	1603-1604
109	1576-1577	1579-1580	1581-1582	1583-1585	1586-1587	1588-1589	1590-1592	1592-1594	1595-1596	1597-1598	1599-1600	1601-1602
108	1574-1575	1576-1578	1579-1580	1581-1582	1583-1585	1586-1587	1588-1589	1590-1591	1592-1594	1594-1596	1596-1598	1599-1600
107	1571-1573	1574-1575	1576-1578	1579-1580	1581-1582	1583-1585	1586-1587	1588-1589	1590-1591	1592-1593	1594-1595	1596-1598
106	1569-1570	1571-1573	1574-1575	1576-1578	1579-1580	1581-1582	1583-1585	1585-1587	1588-1589	1590-1591	1592-1593	1594-1595
105	1567-1568	1569-1570	1571-1573	1574-1575	1576-1578	1579-1580	1581-1582	1583-1584	1585-1587	1587-1589	1589-1591	1591-1593
104	1564-1566	1567-1568	1569-1570	1572-1573	1574-1575	1576-1578	1578-1580	1581-1582	1583-1584	1585-1586	1587-1588	1589-1590
103	1562-1563	1564-1566	1567-1568	1569-1571	1571-1573	1574-1575	1576-1577	1578-1580	1580-1582	1583-1584	1585-1586	1587-1588
102	1559-1561	1562-1563	1564-1566	1567-1568	1569-1570	1571-1573	1574-1575	1576-1577	1578-1579	1580-1582	1582-1584	1584-1586
101	1557-1558	1559-1561	1562-1563	1564-1566	1567-1568	1569-1570	1571-1573	1573-1575	1576-1577	1578-1579	1580-1581	1582-1583
100	1555-1556	1557-1558	1560-1561	1562-1563	1564-1566	1567-1568	1569-1570	1571-1572	1573-1575	1575-1577	1578-1579	1580-1581
99	1553-1554	1555-1556	1558-1559	1560-1561	1562-1563	1565-1566	1567-1568	1569-1570	1571-1572	1573-1574	1576-1577	1578-1579
98	1551-1552	1553-1554	1556-1557	1558-1559	1560-1561	1563-1564	1565-1566	1567-1568	1569-1570	1571-1572	1574-1575	1576-1577
97	1548-1550	1551-1552	1553-1555	1556-1557	1558-1559	1560-1562	1563-1564	1565-1566	1567-1568	1569-1570	1571-1573	1573-1575

APPENDIX B, CONTINUED

NAI		SCALED SCORES												
		6-Year-Olds												
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months	
96	1546-1547	1548-1550	1551-1552	1553-1555	1556-1557	1558-1559	1560-1562	1562-1564	1565-1566	1567-1568	1569-1570	1571-1572		
95	1543-1545	1548-1550	1548-1550	1551-1552	1553-1555	1556-1557	1558-1559	1560-1561	1562-1564	1564-1566	1567-1568	1569-1570		
94	1541-1542	1543-1545	1546-1547	1548-1550	1551-1552	1553-1555	1555-1557	1558-1559	1560-1561	1562-1563	1564-1566	1566-1568		
93	1539-1540	1541-1542	1544-1545	1546-1547	1548-1550	1551-1552	1553-1554	1555-1557	1558-1559	1560-1561	1562-1563	1564-1566		
92	1536-1538	1539-1540	1542-1543	1544-1545	1546-1547	1547-1550	1551-1552	1553-1554	1556-1557	1558-1559	1560-1561	1562-1563		
91	1533-1535	1536-1538	1539-1541	1541-1543	1543-1545	1545-1546	1548-1550	1550-1552	1553-1555	1555-1557	1557-1559	1559-1561		
90	1531-1532	1534-1535	1537-1538	1539-1540	1541-1542	1543-1544	1545-1547	1548-1549	1551-1552	1553-1554	1555-1556	1557-1558		
89	1529-1530	1532-1533	1535-1536	1536-1538	1539-1540	1541-1542	1543-1544	1546-1547	1549-1550	1551-1552	1553-1554	1554-1556		
88	1527-1528	1530-1531	1532-1534	1534-1535	1537-1538	1539-1540	1541-1542	1544-1545	1546-1548	1548-1550	1550-1552	1552-1553		
87	1524-1526	1526-1529	1529-1531	1531-1533	1534-1536	1536-1538	1538-1540	1541-1543	1543-1545	1545-1547	1547-1549	1549-1551		
86	1522-1523	1524-1525	1527-1528	1529-1530	1532-1533	1534-1535	1536-1537	1539-1540	1541-1542	1543-1544	1545-1546	1547-1548		
85	1520-1521	1522-1523	1525-1526	1527-1528	1530-1531	1532-1533	1534-1535	1537-1538	1539-1540	1541-1542	1543-1544	1545-1546		
84	1517-1519	1520-1521	1522-1524	1525-1526	1527-1529	1529-1531	1532-1533	1534-1536	1536-1538	1538-1540	1541-1542	1543-1544		
83	1515-1516	1517-1519	1520-1521	1522-1524	1525-1526	1527-1528	1529-1531	1532-1533	1534-1535	1536-1537	1538-1540	1540-1542		
82	1512-1514	1514-1516	1517-1519	1519-1521	1522-1524	1524-1526	1526-1528	1529-1531	1531-1533	1533-1535	1535-1537	1537-1539		
81	1509-1511	1511-1513	1514-1516	1516-1518	1519-1521	1521-1523	1523-1525	1526-1528	1528-1530	1530-1532	1532-1534	1534-1536		
80	1506-1508	1508-1510	1511-1513	1513-1515	1516-1518	1518-1520	1520-1522	1523-1525	1525-1527	1527-1529	1529-1531	1531-1533		
79	1503-1505	1505-1507	1508-1510	1510-1512	1513-1515	1515-1517	1517-1519	1520-1522	1522-1524	1524-1526	1526-1528	1528-1530		
78	1500-1502	1503-1504	1505-1507	1508-1509	1510-1512	1512-1514	1515-1516	1517-1519	1519-1521	1521-1523	1524-1525	1526-1527		
77	1498-1499	1500-1502	1503-1504	1505-1507	1508-1509	1510-1511	1512-1514	1515-1516	1517-1518	1519-1520	1521-1523	1523-1525		
76	1495-1497	1498-1499	1500-1502	1503-1504	1505-1507	1507-1509	1510-1511	1512-1514	1514-1516	1516-1518	1519-1520	1521-1522		
75	1493-1494	1495-1497	1498-1499	1500-1502	1503-1504	1505-1506	1507-1509	1510-1511	1512-1513	1514-1515	1516-1518	1518-1520		
74	1490-1492	1493-1494	1495-1497	1498-1499	1500-1502	1502-1504	1505-1506	1507-1509	1509-1511	1511-1513	1514-1515	1516-1517		
73	1488-1489	1490-1492	1493-1494	1495-1497	1498-1499	1500-1501	1502-1504	1504-1506	1507-1508	1509-1510	1511-1513	1513-1515		
72	1485-1487	1488-1489	1490-1492	1493-1494	1495-1497	1497-1499	1500-1501	1502-1503	1504-1506	1506-1508	1509-1510	1511-1512		
71	1483-1484	1485-1487	1488-1489	1490-1492	1492-1494	1495-1496	1497-1499	1499-1501	1502-1503	1504-1505	1506-1508	1508-1510		
70	1480-1482	1483-1484	1485-1487	1488-1489	1490-1491	1492-1494	1495-1496	1497-1498	1499-1501	1501-1503	1503-1505	1506-1507		
69	1477-1479	1480-1482	1483-1484	1485-1487	1487-1489	1490-1491	1492-1494	1494-1496	1497-1498	1499-1500	1501-1502	1503-1505		
68	1475-1476	1477-1479	1480-1482	1482-1484	1485-1486	1487-1489	1489-1491	1492-1493	1494-1496	1496-1498	1498-1500	1500-1502		
67	1472-1474	1475-1476	1477-1479	1480-1481	1482-1484	1485-1486	1487-1488	1489-1491	1491-1493	1494-1495	1496-1497	1498-1499		
66	1470-1471	1472-1474	1475-1476	1477-1479	1480-1481	1482-1484	1484-1486	1487-1488	1489-1490	1491-1493	1493-1495	1495-1497		
65	1467-1469	1470-1471	1472-1474	1475-1476	1477-1479	1479-1481	1482-1483	1484-1486	1486-1488	1488-1490	1491-1492	1493-1494		

NAI		SCALED SCORES												
		6-Year-Olds												
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months	
64	1465-1466	1468-1469	1470-1471	1473-1474	1475-1476	1477-1478	1480-1481	1482-1483	1484-1485	1486-1487	1488-1490	1491-1492		
63	1463-1464	1466-1467	1468-1469	1471-1472	1473-1474	1475-1476	1478-1479	1480-1481	1482-1483	1484-1485	1486-1487	1489-1490		
62	1461-1462	1463-1465	1466-1467	1468-1470	1470-1472	1473-1474	1475-1477	1477-1479	1480-1481	1482-1483	1484-1485	1486-1488		
61	1458-1460	1460-1462	1463-1465	1465-1467	1468-1469	1470-1472	1472-1474	1475-1476	1477-1479	1479-1481	1481-1483	1483-1485		
60	1456-1457	1458-1459	1461-1462	1463-1464	1466-1467	1468-1469	1470-1471	1473-1474	1474-1476	1477-1478	1479-1480	1481-1482		
59	1454-1455	1456-1457	1459-1460	1461-1462	1464-1465	1466-1467	1468-1469	1471-1472	1473	1475-1476	1477-1478	1479-1480		
58	1451-1453	1454-1455	1456-1458	1459-1460	1461-1463	1463-1465	1466-1467	1468-1470	1470-1472	1472-1474	1475-1476	1477-1478		
57	1449-1450	1451-1453	1454-1455	1456-1458	1458-1460	1461-1462	1463-1465	1465-1467	1468-1469	1470-1471	1472-1474	1474-1476		
56	1446-1448	1449-1450	1451-1453	1453-1455	1456-1457	1458-1460	1460-1462	1463-1464	1465-1467	1467-1469	1469-1471	1471-1473		
55	1443-1445	1446-1448	1448-1450	1451-1452	1453-1455	1456-1457	1458-1459	1460-1462	1462-1464	1465-1466	1467-1468	1469-1470		
54	1441-1442	1443-1445	1446-1447	1448-1450	1451-1452	1453-1455	1455-1457	1457-1459	1460-1461	1462-1464	1464-1466	1466-1468		
53	1438-1440	1441-1442	1443-1445	1446-1447	1448-1450	1450-1452	1453-1454	1455-1456	1457-1459	1459-1461	1461-1463	1463-1465		
52	1436-1437	1438-1440	1441-1442	1443-1445	1445-1447	1448-1449	1450-1452	1452-1454	1454-1456	1457-1458	1459-1460	1461-1462		
51	1433-1435	1435-1437	1438-1440	1440-1442	1443-1444	1445-1447	1447-1449	1450-1451	1452-1453	1454-1456	1456-1458	1458-1460		
50	1430-1432	1433-1434	1435-1437	1438-1439	1440-1442	1442-1444	1445-1446	1447-1449	1449-1451	1451-1453	1453-1455	1456-1457		
49	1428-1429	1430-1432	1433-1434	1435-1437	1437-1439	1440-1441	1442-1444	1444-1446	1447-1448	1449-1450	1451-1452	1453-1455		
48	1425-1427	1428-1429	1430-1432	1432-1434	1435-1436	1437-1439	1439-1441	1442-1443	1444-1446	1446-1448	1448-1450	1450-1452		
47	1422-1424	1425-1427	1427-1429	1430-1431	1432-1434	1434-1436	1437-1438	1439-1441	1441-1443	1443-1445	1446-1447	1448-1449		
46	1420-1421	1422-1424	1425-1426	1427-1429	1429-1431	1432-1433	1434-1436	1436-1438	1439-1440	1441-1442	1443-1445	1445-1447		
45	1417-1419	1420-1421	1422-1424	1424-1426	1427-1428	1429-1431	1431-1433	1434-1435	1436-1438	1438-1440	1440-1442	1442-1444		
44	1414-1416	1417-1419	1419-1421	1422-1423	1424-1426	1427-1428	1429-1430	1431-1433	1433-1435	1435-1437	1438-1439	1440-1441		
43	1412-1413	1414-1416	1417-1418	1419-1421	1422-1423	1424-1426	1426-1428	1428-1430	1431-1432	1433-1434	1435-1437	1437-1439		
42	1409-1411	1412-1413	1414-1416	1417-1418	1419-1421	1421-1423	1423-1425	1426-1427	1428-1430	1430-1432	1432-1434	1434-1436		
41	1407-1408	1409-1411	1411-1413	1414-1416	1416-1418	1419-1420	1421-1422	1423-1425	1425-1427	1427-1429	1430-1431	1432-1433		
40	Below 1407	Below 1409	Below 1411	Below 1414	Below 1416	Below 1419	Below 1421	Below 1423	Below 1425	Below 1427	Below 1430	Below 1432		

APPENDIX B, CONTINUED

NAI		SCALED SCORES										
		7-Year-Olds										
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months
160	Above 1710	Above 1711	Above 1713	Above 1714	Above 1715	Above 1717	Above 1718	Above 1719	Above 1720	Above 1722	Above 1723	Above 1724
159	1709-1710	1711	1712-1713	1713-1714	1715	1716-1717	1717-1718	1719	1720	1721-1722	1722-1723	1723-1724
158	1707-1708	1709-1710	1710-1711	1712	1713-1714	1714-1715	1716	1717-1718	1718-1719	1719-1720	1721	1722
157	1705-1706	1707-1708	1708-1709	1710-1711	1711-1712	1713	1714-1715	1715-1716	1716-1717	1718	1719-1720	1720-1721
156	1703-1704	1705-1706	1707	1708-1709	1709-1710	1711-1712	1712-1713	1713-1714	1715	1716-1717	1717-1718	1718-1719
155	1702	1703-1704	1705-1706	1706-1707	1708	1709-1710	1710-1711	1712	1713-1714	1714-1715	1716	1717
154	1700-1701	1701-1702	1703-1704	1704-1705	1706-1707	1707-1708	1709	1710-1711	1711-1712	1713	1714-1715	1715-1716
153	1698-1699	1699-1700	1701-1702	1702-1703	1704-1705	1705-1706	1707-1708	1708-1709	1709-1710	1711-1712	1712-1713	1713-1714
152	1696-1697	1697-1698	1699-1700	1701	1702-1703	1703-1704	1705-1706	1706-1707	1708	1709-1710	1710-1711	1711-1712
151	1694-1695	1695-1696	1697-1698	1699-1700	1700-1701	1702	1703-1704	1704-1705	1706-1707	1707-1708	1708-1709	1710
150	1692-1693	1694	1695-1696	1697-1698	1698-1699	1699-1700	1701-1702	1703	1704-1705	1705-1706	1707	1708-1709
149	1690-1691	1692-1693	1693-1694	1695-1696	1696-1697	1698-1699	1699-1700	1701-1702	1702-1703	1703-1704	1705-1706	1706-1707
148	1688-1689	1690-1691	1691-1692	1693-1694	1694-1695	1696-1697	1697-1698	1699-1700	1700-1701	1702	1703-1704	1704-1705
147	1686-1687	1688-1689	1689-1690	1691-1692	1692-1693	1694-1695	1695-1696	1697-1698	1698-1699	1700-1701	1701-1702	1702-1703
146	1684-1685	1686-1687	1687-1688	1689-1690	1690-1691	1692-1693	1693-1694	1695-1696	1696-1697	1698-1699	1699-1700	1700-1701
145	1682-1683	1684-1685	1685-1686	1687-1688	1688-1689	1690-1691	1692	1693-1694	1694-1695	1696-1697	1697-1698	1699
144	1680-1681	1682-1683	1683-1684	1685-1686	1686-1687	1688-1689	1690-1691	1691-1692	1692-1693	1694-1695	1695-1696	1697-1698
143	1678-1679	1679-1681	1681-1682	1683-1684	1684-1685	1686-1687	1688-1689	1689-1690	1691	1692-1693	1693-1694	1695-1696
142	1676-1677	1677-1678	1679-1680	1681-1682	1682-1683	1684-1685	1686-1687	1687-1688	1688-1689	1690-1691	1691-1692	1693-1694
141	1674-1675	1675-1676	1677-1678	1679-1680	1680-1681	1682-1683	1684-1685	1685-1686	1687-1688	1688-1689	1689-1690	1691-1692
140	1672-1673	1673-1674	1675-1676	1677-1678	1678-1679	1680-1681	1681-1683	1683-1684	1685-1686	1686-1687	1687-1688	1689-1690
139	1669-1671	1671-1672	1673-1674	1675-1676	1676-1677	1678-1679	1679-1680	1681-1682	1683-1684	1684-1685	1685-1686	1687-1688
138	1667-1668	1669-1670	1671-1672	1673-1674	1674-1675	1676-1677	1677-1678	1679-1680	1681-1682	1682-1683	1683-1684	1685-1686
137	1665-1666	1667-1668	1669-1670	1670-1672	1672-1673	1674-1675	1675-1676	1677-1678	1678-1680	1680-1681	1681-1682	1683-1684
136	1663-1664	1665-1666	1667-1668	1668-1669	1670-1671	1672-1673	1673-1674	1675-1676	1676-1677	1678-1679	1679-1680	1681-1682
135	1661-1662	1663-1664	1665-1666	1666-1667	1668-1669	1670-1671	1671-1672	1673-1674	1674-1675	1676-1677	1677-1678	1679-1680
134	1659-1660	1661-1662	1662-1664	1664-1665	1666-1667	1667-1669	1669-1670	1671-1672	1672-1673	1674-1675	1675-1676	1677-1678
133	1657-1658	1658-1660	1660-1661	1662-1663	1664-1665	1665-1666	1667-1668	1669-1670	1670-1671	1672-1673	1673-1674	1675-1676
132	1654-1656	1656-1657	1658-1659	1660-1661	1662-1663	1663-1664	1665-1666	1667-1668	1668-1669	1670-1671	1671-1672	1673-1674
131	1652-1653	1654-1655	1656-1657	1658-1659	1659-1661	1661-1662	1663-1664	1664-1666	1666-1667	1668-1669	1669-1670	1671-1672
130	1650-1651	1652-1653	1654-1655	1656-1657	1657-1658	1659-1660	1661-1662	1662-1663	1664-1665	1665-1667	1667-1668	1668-1670
129	1648-1649	1650-1651	1652-1653	1653-1655	1655-1656	1657-1658	1659-1660	1660-1661	1662-1663	1663-1664	1665-1666	1666-1667

SCALED SCORES

7-Year-Olds

NAI	SCALED SCORES											
	0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months
128	1646-1647	1648-1649	1649-1651	1651-1652	1653-1654	1655-1656	1656-1658	1658-1659	1660-1661	1661-1662	1663-1664	1664-1665
127	1644-1645	1645-1647	1647-1648	1649-1650	1651-1652	1653-1654	1654-1655	1656-1657	1657-1659	1659-1660	1661-1662	1662-1663
126	1641-1643	1643-1644	1645-1646	1647-1648	1649-1650	1650-1652	1652-1653	1654-1655	1655-1656	1657-1658	1658-1660	1660-1661
125	1639-1640	1641-1642	1643-1644	1645-1646	1646-1648	1648-1649	1650-1651	1652-1653	1653-1654	1655-1656	1656-1657	1658-1659
124	1637-1638	1639-1640	1641-1642	1642-1644	1644-1645	1646-1647	1648-1649	1649-1651	1651-1652	1653-1654	1654-1655	1656-1657
123	1635-1636	1637-1638	1638-1640	1640-1641	1642-1643	1644-1645	1646-1647	1647-1648	1649-1650	1650-1652	1652-1653	1654-1655
122	1632-1634	1634-1636	1636-1637	1638-1639	1640-1641	1642-1643	1643-1645	1645-1646	1647-1648	1648-1649	1650-1651	1651-1653
121	1630-1631	1632-1633	1634-1635	1636-1637	1637-1639	1639-1641	1641-1642	1643-1644	1644-1646	1646-1647	1647-1649	1649-1650
120	1627-1629	1629-1631	1631-1633	1633-1635	1634-1636	1636-1638	1638-1640	1640-1642	1641-1643	1643-1645	1644-1646	1646-1648
119	1625-1626	1627-1628	1629-1630	1630-1632	1632-1633	1634-1635	1636-1637	1637-1639	1639-1640	1641-1642	1642-1643	1644-1645
118	1622-1624	1624-1626	1626-1628	1628-1629	1630-1631	1632-1633	1633-1635	1635-1636	1637-1638	1638-1640	1640-1641	1642-1643
117	1620-1621	1622-1623	1624-1625	1626-1627	1628-1629	1629-1631	1631-1632	1633-1634	1635-1636	1636-1637	1638-1639	1639-1641
116	1618-1619	1620-1621	1622-1623	1624-1625	1626-1627	1627-1628	1629-1630	1631-1632	1633-1634	1634-1635	1636-1637	1637-1638
115	1616-1617	1618-1619	1620-1621	1622-1623	1624-1625	1625-1626	1627-1628	1629-1630	1631-1632	1632-1633	1634-1635	1635-1636
114	1614-1615	1616-1617	1618-1619	1620-1621	1622-1623	1623-1624	1625-1626	1627-1628	1629-1630	1630-1631	1632-1633	1633-1634
113	1612-1613	1614-1615	1616-1617	1618-1619	1620-1621	1621-1622	1623-1624	1625-1626	1627-1628	1628-1629	1630-1631	1631-1632
112	1610-1611	1612-1613	1614-1615	1616-1617	1617-1619	1619-1620	1621-1622	1623-1624	1624-1626	1626-1627	1628-1629	1629-1630
111	1607-1609	1609-1611	1611-1613	1613-1615	1615-1616	1617-1618	1619-1620	1620-1622	1622-1623	1624-1625	1625-1627	1627-1628
110	1605-1606	1607-1608	1609-1610	1611-1612	1613-1614	1615-1616	1616-1618	1618-1619	1620-1621	1621-1623	1623-1624	1625-1626
109	1603-1604	1605-1606	1607-1608	1609-1610	1610-1612	1612-1614	1614-1615	1616-1617	1617-1619	1619-1620	1621-1622	1622-1624
108	1601-1602	1602-1604	1604-1606	1606-1608	1608-1609	1610-1611	1612-1613	1613-1615	1615-1616	1617-1618	1619-1620	1620-1621
107	1598-1600	1600-1601	1602-1603	1604-1605	1606-1607	1608-1609	1609-1611	1611-1612	1613-1614	1615-1616	1616-1618	1618-1619
106	1596-1597	1598-1599	1600-1601	1602-1603	1603-1605	1605-1607	1607-1608	1609-1610	1611-1612	1612-1614	1614-1615	1616-1617
105	1593-1595	1595-1597	1597-1599	1599-1601	1601-1602	1603-1604	1605-1606	1607-1608	1608-1610	1610-1611	1612-1613	1613-1615
104	1591-1592	1593-1594	1595-1596	1597-1598	1599-1600	1601-1602	1602-1604	1604-1606	1606-1607	1608-1609	1609-1611	1611-1612
103	1589-1590	1591-1592	1593-1594	1595-1596	1596-1598	1598-1600	1600-1601	1602-1603	1604-1605	1605-1607	1607-1608	1609-1610
102	1586-1588	1588-1590	1590-1592	1592-1594	1594-1595	1596-1597	1598-1599	1600-1601	1601-1603	1603-1604	1605-1606	1606-1608
101	1584-1585	1586-1587	1588-1589	1590-1591	1592-1593	1594-1595	1595-1597	1597-1599	1599-1600	1601-1602	1602-1604	1604-1605
100	1582-1583	1584-1585	1586-1587	1588-1589	1590-1591	1592-1593	1593-1594	1595-1596	1597-1598	1599-1600	1600-1601	1602-1603
99	1580-1581	1582-1583	1584-1585	1586-1587	1588-1589	1590-1591	1592	1593-1594	1595-1596	1597-1598	1598-1599	1600-1601
98	1578-1579	1580-1581	1582-1583	1584-1585	1586-1587	1587-1589	1589-1591	1591-1592	1593-1594	1595-1596	1596-1597	1598-1599
97	1575-1577	1577-1579	1579-1581	1581-1583	1583-1585	1585-1586	1587-1588	1589-1590	1590-1592	1592-1594	1594-1595	1595-1597

APPENDIX B, CONTINUED

NAI		SCALED SCORES											
		7-Year-Olds											
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months
96	1573-1574	1575-1576	1577-1578	1579-1580	1581-1582	1583-1584	1585-1586	1586-1588	1588-1589	1590-1591	1591-1593	1593-1594	
95	1571-1572	1573-1574	1575-1576	1577-1578	1578-1580	1580-1582	1582-1584	1584-1585	1586-1587	1587-1589	1589-1590	1591-1592	
94	1568-1570	1570-1572	1572-1574	1574-1576	1576-1577	1578-1579	1580-1581	1582-1583	1584-1585	1585-1586	1587-1588	1589-1590	
93	1566-1567	1568-1569	1570-1571	1572-1573	1574-1575	1576-1577	1578-1579	1580-1581	1582-1583	1583-1584	1585-1586	1587-1588	
92	1564-1565	1566-1567	1568-1569	1570-1571	1572-1573	1574-1575	1576-1577	1578-1579	1580-1581	1581-1582	1583-1584	1585-1586	
91	1561-1563	1563-1565	1565-1567	1567-1569	1569-1571	1571-1573	1573-1575	1575-1577	1577-1579	1578-1580	1580-1582	1582-1584	
90	1558-1560	1560-1562	1562-1564	1564-1566	1567-1568	1569-1570	1571-1572	1573-1574	1575-1576	1576-1577	1578-1579	1580-1581	
89	1556-1557	1558-1559	1560-1561	1562-1563	1565-1566	1567-1568	1569-1570	1570-1572	1572-1574	1574-1575	1576-1577	1577-1579	
88	1554-1555	1556-1557	1558-1559	1560-1561	1562-1564	1564-1566	1566-1568	1568-1569	1570-1571	1571-1573	1573-1575	1575-1576	
87	1551-1553	1553-1555	1555-1557	1557-1559	1559-1561	1561-1563	1563-1565	1565-1567	1566-1569	1568-1570	1570-1572	1572-1574	
86	1549-1550	1551-1552	1553-1554	1555-1556	1557-1558	1559-1560	1561-1562	1563-1564	1564-1565	1566-1567	1568-1569	1570-1571	
85	1547-1548	1549-1550	1551-1552	1553-1554	1555-1556	1557-1558	1559-1560	1561-1562	1562-1563	1564-1565	1566-1567	1568-1569	
84	1545-1546	1547-1548	1549-1550	1551-1552	1553-1554	1555-1556	1556-1558	1558-1560	1560-1561	1562-1563	1563-1565	1565-1567	
83	1542-1544	1544-1546	1546-1548	1548-1550	1550-1552	1552-1554	1554-1555	1556-1557	1557-1559	1559-1561	1561-1562	1563-1564	
82	1539-1541	1541-1543	1543-1545	1545-1547	1547-1549	1549-1551	1551-1553	1553-1555	1554-1556	1556-1558	1557-1560	1560-1562	
81	1536-1538	1538-1540	1540-1542	1542-1544	1544-1546	1546-1548	1548-1550	1550-1552	1552-1553	1553-1555	1555-1556	1557-1559	
80	1533-1535	1535-1537	1537-1539	1539-1541	1541-1543	1543-1545	1545-1547	1547-1549	1549-1551	1550-1552	1552-1554	1554-1556	
79	1530-1532	1532-1534	1534-1536	1536-1538	1538-1540	1540-1542	1542-1544	1544-1546	1546-1548	1547-1549	1549-1551	1551-1553	
78	1528-1529	1530-1531	1532-1533	1534-1535	1536-1537	1538-1539	1539-1541	1541-1543	1543-1545	1545-1546	1546-1548	1548-1550	
77	1525-1527	1527-1529	1529-1531	1531-1533	1533-1535	1535-1537	1537-1538	1539-1540	1541-1542	1542-1544	1544-1545	1546-1547	
76	1523-1524	1525-1526	1527-1528	1529-1530	1531-1532	1533-1534	1534-1536	1536-1538	1538-1540	1540-1541	1541-1543	1543-1545	
75	1520-1522	1522-1524	1524-1526	1526-1528	1528-1530	1530-1532	1532-1533	1534-1535	1536-1537	1537-1539	1539-1540	1541-1542	
74	1518-1519	1520-1521	1522-1523	1524-1525	1526-1527	1528-1529	1529-1531	1531-1533	1533-1535	1535-1536	1536-1538	1538-1540	
73	1515-1517	1517-1519	1519-1521	1521-1523	1523-1525	1525-1527	1527-1528	1529-1530	1530-1532	1532-1534	1534-1535	1536-1537	
72	1513-1514	1515-1516	1517-1518	1519-1520	1521-1522	1522-1524	1524-1526	1526-1528	1528-1529	1530-1531	1531-1533	1533-1535	
71	1510-1512	1512-1514	1514-1516	1516-1518	1518-1520	1520-1521	1522-1523	1524-1525	1525-1527	1527-1529	1529-1530	1531-1532	
70	1508-1509	1510-1511	1512-1513	1514-1515	1516-1517	1517-1519	1519-1521	1521-1523	1523-1524	1525-1526	1526-1528	1528-1530	
69	1505-1507	1507-1509	1509-1511	1511-1513	1513-1515	1515-1516	1517-1518	1519-1520	1520-1522	1522-1524	1524-1525	1525-1527	
68	1503-1504	1505-1506	1507-1508	1509-1510	1510-1512	1512-1514	1514-1516	1516-1518	1518-1519	1519-1521	1521-1523	1523-1524	
67	1500-1502	1502-1504	1504-1506	1506-1508	1508-1509	1510-1511	1512-1513	1513-1515	1515-1517	1517-1519	1519-1520	1520-1522	
66	1497-1499	1499-1501	1501-1503	1503-1505	1505-1507	1507-1509	1509-1511	1511-1512	1513-1514	1514-1516	1516-1518	1518-1519	

SCALED SCORES

7-Year-Olds

NAI	SCALED SCORES											
	0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months
65	1495-1496	1497-1498	1499-1500	1501-1502	1503-1504	1505-1506	1506-1508	1508-1510	1510-1512	1512-1513	1514-1515	1515-1517
64	1493-1494	1495-1496	1497-1498	1499-1500	1501-1502	1503-1504	1504-1505	1506-1507	1508-1509	1510-1511	1512-1513	1513-1514
63	1491-1492	1493-1494	1495-1496	1497-1498	1499-1500	1500-1502	1502-1503	1504-1505	1506-1507	1508-1509	1509-1511	1511-1512
62	1488-1490	1490-1492	1492-1494	1494-1496	1496-1498	1498-1499	1500-1501	1502-1503	1503-1505	1505-1507	1507-1508	1508-1510
61	1485-1487	1488-1489	1490-1491	1491-1493	1493-1495	1495-1497	1497-1499	1499-1501	1501-1502	1502-1504	1504-1506	1506-1507
60	1483-1484	1485-1487	1487-1489	1489-1490	1491-1492	1493-1494	1495-1496	1497-1498	1498-1500	1500-1501	1502-1503	1504-1505
59	1481-1482	1483-1484	1485-1486	1487-1488	1489-1490	1491-1492	1493-1494	1495-1496	1497	1498-1499	1500-1501	1502-1503
58	1479-1480	1481-1482	1483-1484	1485-1486	1487-1488	1488-1490	1490-1492	1492-1494	1494-1496	1496-1497	1497-1499	1499-1501
57	1476-1478	1478-1480	1480-1482	1482-1484	1484-1486	1486-1487	1488-1489	1489-1491	1491-1493	1493-1495	1495-1496	1496-1498
56	1473-1475	1475-1477	1477-1479	1479-1481	1481-1483	1483-1485	1485-1487	1487-1488	1489-1490	1490-1492	1492-1494	1494-1495
55	1471-1472	1473-1474	1475-1476	1477-1478	1479-1480	1481-1482	1482-1484	1484-1486	1486-1488	1488-1489	1489-1491	1491-1493
54	1468-1470	1470-1472	1472-1474	1474-1476	1476-1478	1478-1480	1480-1481	1482-1483	1483-1485	1485-1487	1487-1488	1488-1490
53	1466-1467	1468-1469	1470-1471	1472-1473	1473-1475	1475-1477	1477-1479	1479-1481	1481-1482	1482-1484	1484-1486	1486-1487
52	1463-1465	1465-1467	1467-1469	1469-1471	1471-1472	1473-1474	1474-1476	1476-1478	1478-1480	1480-1481	1482-1483	1483-1485
51	1460-1462	1462-1464	1464-1466	1466-1468	1468-1470	1470-1472	1472-1473	1474-1475	1475-1477	1477-1479	1479-1481	1481-1482
50	1458-1459	1460-1461	1462-1463	1464-1465	1465-1467	1467-1469	1469-1471	1471-1473	1473-1474	1474-1476	1476-1478	1478-1480
49	1455-1457	1457-1459	1459-1461	1461-1463	1463-1464	1465-1466	1467-1468	1468-1470	1470-1472	1472-1473	1474-1475	1475-1477
48	1452-1454	1454-1456	1456-1458	1458-1460	1460-1462	1462-1464	1464-1466	1466-1467	1467-1469	1469-1471	1471-1473	1473-1474
47	1450-1451	1452-1453	1454-1455	1456-1457	1457-1459	1459-1461	1461-1463	1463-1465	1465-1466	1466-1468	1468-1470	1470-1472
46	1447-1449	1449-1451	1451-1453	1453-1455	1455-1456	1457-1458	1458-1460	1460-1462	1462-1464	1464-1465	1465-1467	1467-1469
45	1444-1446	1446-1448	1448-1450	1450-1452	1452-1454	1454-1456	1456-1457	1458-1459	1459-1461	1461-1463	1463-1464	1464-1466
44	1442-1443	1444-1445	1446-1447	1448-1449	1449-1451	1451-1453	1453-1455	1455-1457	1457-1458	1458-1460	1460-1462	1462-1463
43	1439-1441	1441-1443	1443-1445	1445-1447	1447-1448	1449-1450	1450-1452	1452-1454	1454-1456	1456-1457	1457-1459	1459-1461
42	1436-1438	1438-1440	1440-1442	1442-1444	1444-1446	1446-1448	1448-1449	1450-1451	1451-1453	1453-1455	1455-1456	1456-1458
41	1434-1435	1436-1437	1438-1439	1440-1441	1441-1443	1443-1445	1445-1447	1447-1449	1449-1450	1450-1452	1452-1454	1454-1455
40	Below 1434	Below 1436	Below 1438	Below 1440	Below 1441	Below 1443	Below 1445	Below 1447	Below 1449	Below 1450	Below 1452	Below 1454

APPENDIX B, CONTINUED

NAI		SCALED SCORES										
		8-Year-Olds										
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months
160	Above 1725	Above 1726	Above 1727	Above 1728	Above 1729	Above 1730	Above 1730	Above 1731	v1732	Above 1733	Above 1733	Above 1734
159	1724-1725	1725-1726	1726-1727	1727-1728	1728-1729	1729-1730	1730	1731	1732	1733	1733	1734
158	1723	1724	1725	1726	1727	1728	1729	1730	1730-1731	1731-1732	1732	1733
157	1721-1722	1722-1723	1723-1724	1724-1725	1725-1726	1726-1727	1727-1728	1728-1729	1729	1730	1731	1731-1732
156	1720	1721	1722	1723	1724	1725	1726	1727	1728	1728-1729	1729-1730	1730
155	1718-1719	1719-1720	1720-1721	1721-1722	1722-1723	1723-1724	1724-1725	1725-1726	1726-1727	1727	1728	1729
154	1716-1717	1717-1718	1718-1719	1720	1721	1722	1723	1724	1725	1725-1726	1726-1727	1727-1728
153	1714-1715	1716	1717	1718-1719	1719-1720	1720-1721	1721-1722	1722-1723	1723-1724	1724	1725	1726
152	1713	1714-1715	1715-1716	1716-1717	1717-1718	1718-1719	1719-1720	1720-1721	1721-1722	1722-1723	1723-1724	1724-1725
151	1711-1712	1712-1713	1713-1714	1714-1715	1716	1717	1718	1719	1720	1721	1722	1723
150	1709-1710	1710-1711	1712	1713	1714-1715	1715-1716	1716-1717	1717-1718	1718-1719	1719-1720	1720-1721	1721-1722
149	1707-1708	1709	1710-1711	1711-1712	1712-1713	1713-1714	1714-1715	1715-1716	1716-1717	1717-1718	1718-1719	1719-1720
148	1706	1707-1708	1708-1709	1709-1710	1710-1711	1711-1712	1713	1714	1715	1716	1717	1718
147	1704-1705	1705-1706	1706-1707	1707-1708	1709	1710	1711-1712	1712-1713	1713-1714	1714-1715	1715-1716	1716-1717
146	1702-1703	1703-1704	1704-1705	1706	1707-1708	1708-1709	1709-1710	1710-1711	1711-1712	1712-1713	1713-1714	1714-1715
145	1700-1701	1701-1702	1702-1703	1704-1705	1705-1706	1706-1707	1707-1708	1708-1709	1709-1710	1711	1712	1713
144	1698-1699	1699-1700	1701	1702-1703	1703-1704	1704-1705	1705-1706	1707	1708	1709-1710	1710-1711	1711-1712
143	1696-1697	1697-1698	1699-1700	1700-1701	1701-1702	1702-1703	1704	1705-1706	1706-1707	1707-1708	1708-1709	1709-1710
142	1694-1695	1695-1696	1697-1698	1698-1699	1699-1700	1700-1701	1702-1703	1703-1704	1704-1705	1705-1706	1706-1707	1707-1708
141	1692-1693	1694	1695-1696	1696-1697	1697-1698	1699	1700-1701	1701-1702	1702-1703	1703-1704	1704-1705	1705-1706
140	1690-1691	1692-1693	1693-1694	1694-1695	1695-1696	1697-1698	1698-1699	1699-1700	1700-1701	1701-1702	1702-1703	1704
139	1688-1689	1690-1691	1691-1692	1692-1693	1694	1695-1696	1696-1697	1697-1698	1698-1699	1699-1700	1701	1702-1703
138	1686-1687	1688-1689	1689-1690	1690-1691	1692-1693	1693-1694	1694-1695	1695-1696	1696-1697	1698	1699-1700	1700-1701
137	1684-1685	1686-1687	1687-1688	1688-1689	1690-1691	1691-1692	1692-1693	1693-1694	1694-1695	1696-1697	1697-1698	1698-1699
136	1682-1683	1684-1685	1685-1686	1686-1687	1688-1689	1689-1690	1690-1691	1691-1692	1693	1694-1695	1695-1696	1696-1697
135	1680-1681	1682-1683	1683-1684	1684-1685	1686-1687	1687-1688	1688-1689	1689-1690	1691-1692	1692-1693	1693-1694	1694-1695
134	1678-1679	1680-1681	1681-1682	1682-1683	1684-1685	1685-1686	1686-1687	1687-1688	1688-1689	1689-1690	1691-1692	1692-1693
133	1676-1677	1678-1679	1679-1680	1680-1681	1682-1683	1683-1684	1684-1685	1685-1686	1687-1688	1688-1689	1689-1690	1690-1691
132	1674-1675	1675-1677	1677-1678	1678-1679	1680-1681	1681-1682	1682-1683	1683-1684	1685-1686	1686-1687	1687-1688	1688-1689
131	1672-1673	1673-1674	1675-1676	1676-1677	1678-1679	1679-1680	1680-1681	1681-1682	1683-1684	1684-1685	1685-1686	1686-1687
130	1670-1671	1671-1672	1673-1674	1674-1675	1675-1677	1677-1678	1678-1679	1679-1680	1680-1681	1681-1682	1682-1683	1683-1684
129	1668-1669	1669-1670	1671-1672	1672-1673	1673-1674	1675-1676	1676-1677	1677-1678	1678-1679	1679-1680	1680-1681	1681-1682

NAI		SCALED SCORES												
		8-Year-Olds												
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months	
128	1666-1667	1667-1668	1669-1670	1670-1671	1671-1672	1673-1674	1674-1675	1675-1676	1676-1678	1678-1679	1679-1680	1680-1681		
127	1664-1665	1665-1666	1666-1668	1668-1669	1669-1670	1671-1672	1672-1673	1673-1674	1674-1675	1676-1677	1677-1678	1678-1679		
126	1661-1663	1663-1664	1664-1665	1666-1667	1667-1668	1668-1670	1670-1671	1671-1672	1672-1673	1674-1675	1675-1676	1676-1677		
125	1659-1660	1661-1662	1662-1663	1664-1665	1665-1666	1666-1667	1668-1669	1669-1670	1670-1671	1672-1673	1673-1674	1674-1675		
124	1657-1658	1659-1660	1660-1661	1662-1663	1663-1664	1664-1665	1666-1667	1667-1668	1668-1669	1669-1671	1671-1672	1672-1673		
123	1655-1656	1657-1658	1658-1659	1659-1661	1661-1662	1662-1663	1663-1665	1665-1666	1666-1667	1667-1668	1669-1670	1670-1671		
122	1653-1654	1654-1656	1656-1657	1657-1658	1659-1660	1660-1661	1661-1662	1663-1664	1664-1665	1665-1666	1666-1668	1668-1669		
121	1651-1652	1652-1653	1653-1655	1655-1656	1656-1658	1658-1659	1659-1660	1661-1662	1662-1663	1663-1664	1664-1665	1665-1667		
120	1648-1650	1649-1651	1650-1652	1652-1654	1653-1655	1655-1657	1656-1658	1657-1660	1659-1661	1660-1662	1661-1663	1662-1664		
119	1645-1647	1647-1648	1648-1649	1650-1651	1651-1652	1653-1654	1654-1655	1655-1656	1657-1658	1658-1659	1659-1660	1660-1661		
118	1643-1644	1645-1646	1646-1647	1648-1649	1649-1650	1650-1652	1652-1653	1653-1654	1654-1656	1656-1657	1657-1658	1658-1659		
117	1641-1642	1642-1644	1644-1645	1645-1647	1647-1648	1648-1649	1650-1651	1651-1652	1652-1653	1654-1655	1655-1656	1656-1657		
116	1639-1640	1640-1641	1642-1643	1643-1644	1645-1646	1646-1647	1648-1649	1649-1650	1650-1651	1651-1653	1653-1654	1654-1655		
115	1637-1638	1638-1639	1640-1641	1641-1642	1643-1644	1644-1645	1646-1647	1647-1648	1648-1649	1649-1650	1651-1652	1652-1653		
114	1635-1636	1636-1637	1638-1639	1639-1640	1641-1642	1642-1643	1644-1645	1644-1646	1646-1647	1647-1648	1649-1650	1650-1651		
113	1633-1634	1634-1635	1636-1637	1637-1638	1639-1640	1640-1641	1642-1643	1642-1643	1644-1645	1645-1646	1647-1648	1648-1649		
112	1631-1632	1632-1633	1634-1635	1635-1636	1637-1638	1638-1639	1640-1641	1640-1641	1642-1643	1643-1644	1645-1646	1646-1647		
111	1629-1630	1630-1631	1632-1633	1633-1634	1635-1636	1636-1637	1637-1639	1638-1639	1640-1641	1641-1642	1643-1644	1644-1645		
110	1626-1628	1628-1629	1629-1631	1631-1632	1632-1634	1634-1635	1635-1636	1636-1637	1638-1639	1639-1640	1640-1642	1642-1643		
109	1624-1625	1626-1627	1627-1628	1629-1630	1630-1631	1631-1633	1633-1634	1634-1635	1636-1637	1637-1638	1638-1639	1640-1641		
108	1622-1623	1623-1625	1625-1626	1626-1628	1628-1629	1629-1630	1631-1632	1632-1633	1633-1635	1635-1636	1636-1637	1637-1639		
107	1619-1621	1621-1622	1623-1624	1624-1625	1625-1627	1627-1628	1628-1630	1630-1631	1631-1632	1632-1634	1634-1635	1635-1636		
106	1617-1618	1619-1620	1620-1622	1622-1623	1623-1624	1625-1626	1626-1627	1627-1629	1629-1630	1630-1631	1631-1633	1633-1634		
105	1615-1616	1616-1618	1618-1619	1619-1621	1621-1622	1622-1624	1624-1625	1625-1626	1627-1628	1628-1629	1629-1630	1631-1632		
104	1613-1614	1614-1615	1616-1617	1617-1618	1619-1620	1620-1621	1621-1623	1623-1624	1624-1626	1626-1627	1627-1628	1628-1630		
103	1610-1612	1612-1613	1613-1615	1615-1616	1616-1618	1618-1619	1619-1620	1621-1622	1622-1623	1623-1625	1625-1626	1626-1627		
102	1608-1609	1609-1611	1611-1612	1613-1614	1614-1615	1615-1617	1617-1618	1618-1620	1620-1621	1621-1622	1622-1624	1624-1625		
101	1606-1607	1607-1608	1609-1610	1610-1612	1612-1613	1613-1614	1615-1616	1616-1617	1617-1619	1619-1620	1620-1621	1621-1623		
100	1604-1605	1605-1606	1607-1608	1608-1609	1609-1611	1611-1612	1612-1614	1614-1615	1615-1616	1616-1618	1618-1619	1619-1620		
99	1602-1603	1603-1604	1605-1606	1606-1607	1607-1608	1608-1610	1610-1611	1611-1613	1613-1614	1614-1615	1615-1617	1617-1618		
98	1599-1601	1601-1602	1603-1604	1604-1605	1605-1606	1606-1607	1608-1609	1609-1610	1610-1612	1612-1613	1613-1614	1614-1616		
97	1597-1598	1599-1600	1600-1602	1602-1603	1602-1604	1604-1605	1605-1607	1607-1608	1608-1609	1609-1611	1611-1612	1612-1613		

APPENDIX B, CONTINUED

NAI		SCALED SCORES										
		8-Year-Olds										
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months
96	1595-1596	1596-1598	1598-1599	1599-1601	1600-1601	1601-1603	1603-1604	1604-1606	1606-1607	1607-1608	1608-1610	1610-1611
95	1592-1594	1594-1595	1596-1597	1597-1598	1598-1599	1599-1600	1601-1602	1602-1603	1603-1605	1605-1606	1606-1607	1607-1609
94	1590-1591	1592-1593	1593-1595	1595-1596	1596-1597	1597-1598	1599-1600	1600-1601	1601-1602	1603-1604	1604-1605	1605-1606
93	1588-1589	1590-1591	1591-1592	1593-1594	1594-1595	1595-1596	1597-1598	1598-1599	1599-1600	1601-1602	1602-1603	1603-1604
92	1586-1587	1588-1589	1589-1590	1591-1592	1592-1593	1593-1594	1595-1596	1596-1597	1597-1598	1599-1600	1600-1601	1601-1602
91	1583-1585	1585-1587	1586-1588	1588-1590	1589-1591	1591-1592	1592-1594	1594-1595	1595-1596	1597-1598	1598-1599	1599-1600
90	1581-1582	1583-1584	1583-1585	1586-1587	1588-1589	1589-1590	1590-1591	1592-1593	1592-1594	1595-1596	1596-1597	1597-1598
89	1579-1580	1581-1582	1581-1582	1584-1585	1585-1587	1587-1588	1587-1589	1590-1591	1590-1591	1592-1594	1594-1595	1595-1596
88	1576-1578	1578-1580	1579-1580	1581-1583	1583-1584	1584-1586	1585-1586	1587-1589	1588-1589	1590-1591	1591-1593	1593-1594
87	1573-1575	1575-1577	1576-1578	1578-1580	1580-1582	1581-1583	1582-1584	1584-1586	1585-1587	1587-1589	1588-1590	1590-1592
86	1571-1572	1573-1574	1574-1575	1576-1577	1578-1579	1579-1580	1580-1581	1582-1583	1583-1584	1585-1586	1586-1587	1588-1589
85	1569-1570	1571-1572	1572-1573	1574-1575	1575-1577	1577-1578	1578-1579	1580-1581	1581-1582	1583-1584	1584-1585	1585-1587
84	1567-1568	1568-1570	1570-1571	1571-1573	1573-1574	1574-1576	1576-1577	1577-1579	1579-1580	1580-1582	1582-1583	1583-1584
83	1564-1566	1566-1567	1567-1569	1569-1570	1570-1572	1572-1573	1573-1575	1575-1576	1576-1578	1578-1579	1579-1581	1580-1582
82	1561-1563	1563-1565	1564-1566	1566-1568	1567-1569	1569-1571	1570-1572	1572-1574	1573-1575	1575-1577	1576-1578	1577-1579
81	1558-1560	1560-1562	1561-1563	1563-1565	1565-1566	1566-1568	1568-1569	1569-1571	1570-1572	1572-1574	1573-1575	1575-1576
80	1555-1557	1557-1559	1558-1560	1560-1562	1562-1564	1563-1565	1565-1567	1566-1568	1567-1569	1569-1571	1570-1572	1572-1574
79	1552-1554	1554-1556	1556-1557	1557-1559	1559-1561	1560-1562	1562-1564	1563-1565	1564-1566	1566-1568	1567-1569	1569-1571
78	1550-1551	1551-1553	1553-1555	1555-1556	1556-1558	1558-1559	1559-1561	1561-1562	1562-1563	1563-1565	1565-1566	1566-1568
77	1547-1549	1549-1550	1551-1552	1552-1554	1554-1555	1555-1557	1557-1558	1558-1560	1559-1561	1561-1562	1562-1564	1564-1565
76	1545-1546	1546-1548	1548-1550	1550-1551	1551-1553	1553-1554	1554-1556	1556-1557	1557-1558	1558-1560	1560-1561	1561-1563
75	1542-1544	1544-1545	1546-1547	1547-1549	1549-1550	1550-1552	1552-1553	1553-1555	1554-1556	1556-1557	1557-1559	1559-1560
74	1540-1541	1541-1543	1543-1545	1545-1546	1546-1548	1548-1549	1549-1551	1551-1552	1552-1553	1553-1555	1555-1556	1556-1558
73	1537-1539	1539-1540	1540-1542	1542-1544	1544-1545	1545-1547	1547-1548	1548-1550	1549-1551	1551-1552	1552-1554	1554-1555
72	1535-1536	1536-1538	1538-1539	1540-1541	1541-1543	1543-1544	1544-1546	1546-1547	1547-1548	1548-1550	1550-1551	1551-1553
71	1532-1534	1534-1535	1535-1537	1537-1539	1539-1540	1540-1542	1542-1543	1543-1545	1544-1546	1546-1547	1547-1549	1549-1550
70	1530-1531	1531-1533	1533-1534	1534-1536	1536-1538	1538-1539	1539-1541	1540-1542	1542-1543	1543-1545	1545-1546	1546-1548
69	1527-1529	1529-1530	1530-1532	1532-1533	1533-1535	1535-1537	1536-1538	1538-1539	1539-1541	1541-1542	1542-1544	1543-1545
68	1525-1526	1526-1528	1528-1529	1529-1531	1531-1532	1532-1534	1534-1535	1535-1537	1537-1538	1538-1540	1540-1541	1541-1542
67	1522-1524	1524-1525	1525-1527	1527-1528	1528-1530	1530-1531	1531-1533	1533-1534	1534-1536	1536-1537	1537-1539	1538-1540
66	1519-1521	1521-1523	1523-1524	1524-1526	1526-1527	1527-1529	1529-1530	1530-1532	1532-1533	1533-1535	1534-1536	1536-1537
65	1517-1518	1519-1520	1520-1522	1522-1523	1523-1525	1525-1526	1526-1528	1528-1529	1529-1531	1531-1532	1532-1533	1533-1535

NAI		SCALED SCORES												
		8-Year-Olds												
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months	
64	1515-1516	1516-1518	1518-1519	1520-1521	1521-1522	1523-1524	1524-1525	1525-1527	1527-1528	1529-1530	1530-1531	1531-1532		
63	1513-1514	1514-1515	1516-1517	1518-1519	1519-1520	1521-1522	1522-1523	1523-1524	1525-1526	1526-1528	1528-1529	1529-1530		
62	1510-1512	1512-1513	1513-1515	1515-1517	1516-1518	1518-1520	1519-1521	1521-1522	1522-1524	1524-1525	1525-1527	1526-1528		
61	1508-1509	1509-1511	1511-1512	1512-1514	1514-1515	1515-1517	1517-1518	1518-1520	1520-1521	1521-1523	1523-1524	1524-1525		
60	1505-1507	1507-1508	1509-1510	1510-1511	1512-1513	1513-1514	1515-1516	1516-1517	1518-1519	1519-1520	1520-1522	1521-1523		
59	1503-1504	1505-1506	1507-1508	1508-1509	1510-1511	1511-1512	1513-1514	1514-1515	1515-1517	1516-1518	1517-1519	1519-1520		
58	1501-1502	1502-1504	1504-1506	1505-1507	1507-1509	1509-1510	1510-1512	1511-1513	1513-1514	1513-1515	1515-1516	1516-1518		
57	1498-1500	1500-1501	1501-1503	1503-1504	1504-1506	1506-1508	1507-1509	1509-1510	1510-1512	1511-1512	1512-1514	1513-1515		
56	1495-1497	1497-1499	1499-1500	1500-1502	1502-1503	1503-1505	1505-1506	1506-1508	1508-1509	1508-1510	1509-1511	1511-1512		
55	1493-1494	1494-1496	1496-1498	1498-1499	1499-1501	1501-1502	1502-1504	1504-1505	1505-1507	1505-1507	1507-1508	1508-1510		
54	1490-1492	1492-1493	1493-1495	1495-1497	1496-1498	1498-1500	1499-1501	1501-1503	1502-1504	1503-1504	1504-1506	1505-1507		
53	1487-1489	1489-1491	1491-1492	1492-1494	1494-1495	1495-1497	1497-1498	1498-1500	1498-1499	1499-1499	1501-1503	1503-1504		
52	1485-1486	1486-1488	1488-1490	1488-1489	1491-1493	1493-1494	1494-1496	1496-1497	1497-1499	1497-1499	1499-1500	1500-1502		
51	1482-1484	1484-1485	1485-1487	1487-1489	1488-1490	1490-1492	1491-1493	1493-1495	1494-1496	1495-1496	1496-1498	1497-1499		
50	1479-1481	1481-1483	1483-1484	1484-1486	1486-1487	1487-1489	1489-1490	1490-1492	1492-1493	1492-1494	1493-1495	1495-1496		
49	1477-1478	1478-1480	1480-1482	1482-1483	1483-1485	1485-1486	1486-1488	1487-1489	1489-1491	1489-1491	1491-1492	1492-1494		
48	1474-1476	1476-1477	1477-1479	1479-1481	1480-1482	1482-1484	1483-1485	1485-1486	1486-1488	1487-1488	1488-1490	1489-1491		
47	1471-1473	1473-1475	1475-1476	1476-1478	1478-1479	1479-1481	1481-1482	1482-1484	1484-1485	1484-1486	1485-1487	1487-1488		
46	1469-1470	1470-1472	1472-1474	1474-1475	1475-1477	1477-1478	1478-1480	1479-1481	1481-1483	1481-1483	1483-1484	1484-1486		
45	1466-1468	1468-1469	1469-1471	1471-1473	1472-1474	1474-1476	1475-1477	1477-1478	1478-1480	1479-1480	1480-1482	1481-1483		
44	1463-1465	1465-1467	1467-1468	1468-1470	1470-1471	1471-1473	1473-1474	1474-1476	1475-1477	1476-1478	1477-1479	1479-1480		
43	1461-1462	1462-1464	1464-1466	1465-1467	1467-1469	1468-1470	1470-1472	1471-1473	1473-1474	1473-1475	1475-1476	1476-1478		
42	1458-1460	1460-1461	1461-1463	1463-1464	1464-1466	1466-1467	1467-1469	1469-1470	1470-1472	1471-1472	1472-1474	1473-1475		
41	1455-1457	1457-1459	1459-1460	1460-1462	1462-1463	1463-1465	1465-1466	1466-1468	1467-1469	1468-1470	1469-1471	1471-1472		
40	Below 1455	Below 1457	Below 1459	Below 1460	Below 1462	Below 1463	Below 1465	Below 1466	Below 1467	Below 1468	Below 1469	Below 1471		

APPENDIX B, CONTINUED

NAI		SCALED SCORES											
		9-Year-Olds											
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months
160	Above 1735	Above 1736	Above 1736	Above 1737	Above 1737	Above 1737	Above 1738	Above 1739	Above 1740	Above 1741	Above 1742	Above 1743	Above 1744
159	1735	1735-1736	1736	1737	1737	1737	1738	1739	1740	1741	1742	1743	1744
158	1734	1734	1735	1736	1736	1736	1737	1738	1739	1740	1741	1742	-
157	1732-1733	1733	1734	1734-1735	1735	1735	1736	1737	1738	1739	1740	1741	1743
156	1731	1732	1732-1733	1733	1734	1734	1735	1736	1737	1738	1739	1740	1742
155	1730	1730-1731	1731	1732	1733	1733	1733-1734	1735	1736	1737	1738	1739	1740-1741
154	1728-1729	1729	1730	1731	1731-1732	1732	1732	1734	1735	1735-1736	1736-1737	1738	1739
153	1727	1728	1728-1729	1729-1730	1730	1731	1732-1733	1734	1733-1734	1734	1735	1736-1737	1737-1738
152	1725-1726	1726-1727	1727	1728	1729	1729-1730	1731	1731	1732	1733	1733-1734	1735	1736
151	1724	1724-1725	1725-1726	1726-1727	1727-1728	1728	1730	1730	1730-1731	1731-1732	1732	1734	1734-1735
150	1722-1723	1723	1724	1725	1726	1726-1727	1728-1729	1729	1729	1730	1731	1732-1733	1733
149	1720-1721	1721-1722	1722-1723	1723-1724	1724-1725	1725	1727	1727	1727-1728	1728-1729	1729-1730	1730-1731	1731-1732
148	1719	1720	1721	1721-1722	1722-1723	1723-1724	1725-1726	1726	1726	1727	1728	1728-1729	1729-1730
147	1717-1718	1718-1719	1719-1720	1720	1721	1722	1723-1724	1724	1724-1725	1725-1726	1726-1727	1727	1728
146	1715-1716	1716-1717	1717-1718	1718-1719	1719-1720	1720-1721	1721-1722	1722	1722-1723	1723-1724	1724-1725	1725-1726	1726-1727
145	1714	1715	1716	1716-1717	1717-1718	1718-1719	1719-1720	1719	1720-1721	1721-1722	1722	1724	1724-1725
144	1712-1713	1713-1714	1714-1715	1715	1716	1717	1718	1718	1718-1719	1719-1720	1721-1722	1722-1723	1723
143	1710-1711	1711-1712	1712-1713	1713-1714	1714-1715	1715-1716	1716-1717	1717	1717	1718	1719-1720	1720-1721	1721-1722
142	1708-1709	1709-1710	1710-1711	1711-1712	1712-1713	1713-1714	1714-1715	1715	1715-1716	1716-1717	1717-1718	1719	1720
141	1706-1707	1707-1708	1708-1709	1709-1710	1710-1711	1711-1712	1712-1713	1713	1713-1714	1714-1715	1715-1716	1717-1718	1718-1719
140	1705	1706	1707	1708	1709	1710	1711	1711	1711-1712	1712-1713	1713-1714	1715-1716	1716-1717
139	1703-1704	1704-1705	1705-1706	1706-1707	1707-1708	1708-1709	1709-1710	1710	1710	1711	1712	1713-1714	1714-1715
138	1701-1702	1702-1703	1703-1704	1704-1705	1705-1706	1706-1707	1707-1708	1708	1708-1709	1709-1710	1710-1711	1712	1713
137	1699-1700	1700-1701	1701-1702	1702-1703	1703-1704	1704-1705	1705-1706	1706	1706-1707	1707-1708	1708-1709	1710-1711	1711-1712
136	1697-1698	1698-1699	1699-1700	1700-1701	1701-1702	1702-1703	1703-1704	1704	1704-1705	1705-1706	1706-1707	1708-1709	1709-1710
135	1695-1696	1696-1697	1697-1698	1698-1699	1699-1700	1700-1701	1701-1702	1702	1702-1703	1703-1704	1704-1705	1706-1707	1707-1708
134	1693-1694	1694-1695	1695-1696	1696-1697	1697-1698	1698-1699	1699-1700	1700	1700-1701	1701-1702	1702-1703	1704-1705	1705-1706
133	1691-1692	1692-1693	1693-1694	1694-1695	1695-1696	1696	1697	1698	1699	1700	1701	1702-1703	1703-1704
132	1689-1690	1690-1691	1691-1692	1693	1694-1695	1695-1696	1696-1697	1697	1697-1698	1698-1699	1699-1700	1700-1701	1701-1702
131	1687-1688	1688-1689	1689-1690	1691-1692	1692-1693	1693-1694	1694-1695	1695	1695-1696	1696-1697	1697-1698	1698-1699	1699-1700
130	1685-1686	1686-1687	1688	1689-1690	1690-1691	1691-1692	1692-1693	1693	1693-1694	1694-1695	1695-1696	1696-1697	1697-1698

SCALED SCORES

9-Year-Olds

NAI	SCALED SCORES											
	0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months
129	1683-1684	1684-1685	1686-1687	1687-1688	1688-1689	1689-1690	1690-1691	1691-1692	1692-1693	1693-1694	1694-1695	1695-1696
128	1681-1682	1682-1683	1684-1685	1685-1686	1686-1687	1687-1688	1688-1689	1689-1690	1690-1691	1691-1692	1692-1693	1693-1694
127	1679-1680	1680-1681	1681-1682	1683-1684	1684-1685	1685-1686	1686-1687	1687-1688	1688-1689	1689-1690	1690-1691	1691-1692
126	1677-1678	1678-1679	1679-1680	1681-1682	1682-1683	1683-1684	1684-1685	1685-1686	1686-1687	1687-1688	1688-1689	1689-1690
125	1675-1676	1676-1677	1677-1678	1679-1680	1680-1681	1681-1682	1682-1683	1683-1684	1684-1685	1685-1686	1686-1687	1687-1688
124	1673-1674	1674-1675	1675-1676	1676-1677	1677-1678	1678-1679	1679-1680	1680-1681	1681-1682	1682-1683	1683-1684	1684-1685
123	1671-1672	1672-1673	1673-1674	1674-1675	1675-1676	1676-1677	1677-1678	1678-1679	1679-1680	1680-1681	1681-1682	1682-1683
122	1669-1670	1670-1671	1671-1672	1672-1673	1673-1674	1674-1675	1675-1676	1676-1677	1677-1678	1678-1679	1679-1680	1680-1681
121	1667-1668	1668-1669	1669-1670	1670-1671	1671-1672	1672-1673	1673-1674	1674-1675	1675-1676	1676-1677	1677-1678	1678-1679
120	1664-1666	1665-1667	1666-1668	1667-1669	1668-1670	1669-1671	1671-1673	1672-1674	1673-1675	1674-1676	1675-1677	1676-1678
119	1662-1663	1663-1664	1664-1665	1665-1666	1666-1667	1667-1668	1668-1670	1670-1671	1671-1672	1672-1673	1673-1674	1674-1675
118	1659-1661	1661-1662	1662-1663	1663-1664	1664-1665	1665-1666	1666-1667	1667-1669	1668-1670	1670-1671	1671-1672	1672-1673
117	1657-1658	1658-1660	1660-1661	1661-1662	1662-1663	1663-1664	1664-1665	1665-1666	1666-1667	1667-1669	1669-1670	1670-1671
116	1655-1656	1656-1657	1658-1659	1659-1660	1660-1661	1661-1662	1662-1663	1663-1664	1664-1665	1665-1666	1666-1668	1668-1669
115	1653-1654	1654-1655	1655-1657	1657-1658	1658-1659	1659-1660	1660-1661	1661-1662	1662-1663	1663-1664	1664-1665	1666-1667
114	1651-1652	1652-1653	1653-1654	1655-1656	1656-1657	1657-1658	1658-1659	1659-1660	1660-1661	1661-1662	1662-1663	1664-1665
113	1649-1650	1650-1651	1651-1652	1653-1654	1654-1655	1655-1656	1656-1657	1657-1658	1658-1659	1659-1660	1660-1661	1662-1663
112	1647-1648	1648-1649	1649-1650	1651-1652	1652-1653	1653-1654	1654-1655	1655-1656	1656-1657	1657-1658	1658-1659	1660-1661
111	1645-1646	1646-1647	1647-1648	1649-1650	1650-1651	1651-1652	1652-1653	1653-1654	1654-1655	1655-1656	1656-1657	1658-1659
110	1643-1644	1644-1645	1645-1646	1647-1648	1648-1649	1649-1650	1650-1651	1651-1652	1652-1653	1653-1654	1654-1655	1656-1657
109	1641-1642	1642-1643	1643-1644	1644-1646	1646-1647	1647-1648	1648-1649	1649-1650	1650-1651	1651-1652	1652-1653	1653-1655
108	1639-1640	1640-1641	1641-1642	1642-1643	1643-1645	1645-1646	1646-1647	1647-1648	1648-1649	1649-1650	1650-1651	1651-1652
107	1636-1638	1638-1639	1639-1640	1640-1641	1641-1642	1642-1644	1644-1645	1645-1646	1646-1647	1647-1648	1648-1649	1649-1650
106	1634-1635	1635-1637	1637-1638	1638-1639	1639-1640	1640-1641	1641-1643	1642-1644	1644-1645	1645-1646	1646-1647	1647-1648
105	1632-1633	1633-1634	1634-1636	1635-1637	1637-1638	1638-1639	1639-1640	1640-1641	1641-1643	1642-1644	1644-1645	1645-1646
104	1630-1631	1631-1632	1632-1633	1633-1634	1634-1636	1636-1637	1637-1638	1638-1639	1639-1640	1640-1641	1641-1643	1642-1644
103	1627-1629	1628-1630	1630-1631	1631-1632	1632-1633	1633-1635	1635-1636	1636-1637	1637-1638	1638-1639	1639-1640	1640-1641
102	1625-1626	1626-1627	1627-1629	1629-1630	1630-1631	1631-1632	1632-1634	1633-1635	1635-1636	1636-1637	1637-1638	1638-1639
101	1623-1624	1624-1625	1625-1626	1626-1628	1628-1629	1629-1630	1630-1631	1631-1632	1632-1634	1633-1635	1635-1636	1636-1637
100	1620-1622	1622-1623	1623-1624	1624-1625	1625-1627	1626-1628	1628-1629	1629-1630	1630-1631	1631-1632	1632-1634	1633-1635
99	1618-1619	1619-1621	1621-1622	1622-1623	1623-1624	1624-1625	1625-1627	1627-1628	1628-1629	1629-1630	1630-1631	1631-1632
98	1616-1617	1617-1618	1618-1620	1619-1621	1621-1622	1622-1623	1623-1624	1624-1626	1625-1627	1627-1628	1628-1629	1629-1630

APPENDIX B, CONTINUED

NAI		SCALED SCORES										
		9-Year-Olds										
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months
97	1613-1615	1615-1616	1616-1617	1617-1618	1618-1620	1620-1621	1621-1622	1622-1623	1623-1624	1624-1626	1625-1627	1626-1628
96	1611-1612	1612-1614	1614-1615	1615-1616	1616-1617	1617-1619	1618-1620	1620-1621	1621-1622	1622-1623	1623-1624	1624-1625
95	1609-1610	1610-1611	1611-1613	1613-1614	1614-1615	1615-1616	1616-1617	1618-1619	1618-1620	1620-1621	1621-1622	1622-1623
94	1607-1608	1608-1609	1609-1610	1611-1612	1612-1613	1613-1614	1614-1615	1615-1617	1616-1617	1617-1619	1618-1620	1619-1621
93	1605-1606	1606-1607	1607-1608	1609-1610	1610-1611	1611-1612	1612-1613	1614	1614-1615	1615-1616	1616-1617	1617-1618
92	1603-1604	1604-1605	1605-1606	1607-1608	1608-1609	1609-1610	1610-1611	1611-1613	1612-1613	1613-1614	1614-1615	1615-1616
91	1601-1602	1602-1603	1603-1604	1605-1606	1606-1607	1607-1608	1608-1609	1609-1610	1610-1611	1611-1612	1612-1613	1613-1614
90	1599-1600	1600-1601	1601-1602	1603-1604	1604-1605	1605-1606	1606-1607	1607-1608	1608-1609	1609-1610	1610-1611	1611-1612
89	1596-1598	1598-1599	1599-1600	1600-1602	1601-1603	1603-1604	1604-1605	1605-1606	1605-1607	1606-1608	1607-1609	1609-1610
88	1594-1595	1595-1597	1597-1598	1598-1599	1599-1600	1600-1602	1601-1603	1603-1604	1603-1604	1604-1605	1605-1606	1606-1608
87	1591-1593	1592-1594	1594-1596	1595-1597	1596-1598	1597-1599	1598-1600	1600-1602	1601-1602	1602-1603	1603-1604	1604-1605
86	1589-1590	1590-1591	1592-1593	1593-1594	1594-1595	1595-1596	1596-1597	1598-1599	1599-1600	1600-1601	1601-1602	1602-1603
85	1587-1588	1588-1589	1589-1591	1590-1592	1592-1593	1593-1594	1594-1595	1595-1597	1597-1598	1598-1599	1599-1600	1600-1601
84	1584-1586	1586-1587	1587-1588	1588-1589	1589-1591	1591-1592	1592-1593	1593-1594	1594-1596	1595-1597	1597-1598	1598-1599
83	1582-1583	1583-1585	1584-1586	1586-1587	1587-1588	1588-1590	1589-1591	1591-1592	1592-1593	1593-1594	1594-1596	1596-1597
82	1579-1581	1580-1582	1581-1583	1583-1585	1584-1586	1585-1587	1586-1588	1588-1590	1589-1591	1590-1592	1591-1593	1593-1595
81	1576-1578	1577-1579	1578-1580	1580-1582	1581-1583	1582-1584	1583-1585	1585-1587	1586-1588	1587-1589	1588-1590	1590-1592
80	1573-1575	1574-1576	1575-1577	1577-1579	1578-1580	1579-1581	1580-1582	1582-1584	1583-1585	1584-1586	1585-1587	1587-1589
79	1570-1572	1571-1573	1573-1574	1574-1576	1575-1577	1576-1578	1577-1579	1579-1581	1580-1582	1581-1583	1582-1584	1584-1586
78	1567-1569	1569-1570	1570-1572	1571-1573	1573-1574	1574-1575	1575-1576	1576-1578	1577-1579	1579-1580	1580-1581	1581-1583
77	1565-1566	1566-1568	1568-1569	1569-1570	1570-1572	1571-1573	1573-1574	1574-1575	1575-1576	1576-1578	1577-1579	1578-1580
76	1562-1564	1564-1565	1565-1567	1566-1568	1568-1569	1569-1570	1570-1572	1571-1573	1572-1574	1574-1575	1575-1576	1576-1577
75	1560-1561	1561-1563	1563-1564	1564-1565	1565-1567	1566-1568	1568-1569	1569-1570	1570-1571	1571-1573	1572-1574	1573-1575
74	1557-1559	1559-1560	1560-1562	1561-1563	1563-1564	1564-1565	1565-1567	1566-1568	1567-1569	1569-1570	1570-1571	1571-1572
73	1555-1556	1556-1558	1558-1559	1559-1560	1560-1562	1561-1563	1563-1564	1564-1565	1565-1566	1566-1568	1567-1569	1568-1570
72	1552-1554	1554-1555	1555-1557	1556-1558	1558-1559	1559-1560	1560-1562	1561-1563	1562-1564	1564-1565	1565-1566	1566-1567
71	1550-1551	1551-1553	1553-1554	1554-1555	1555-1557	1556-1558	1558-1559	1559-1560	1560-1561	1561-1563	1562-1564	1563-1565
70	1547-1549	1549-1550	1550-1552	1551-1553	1553-1554	1554-1555	1555-1557	1556-1558	1557-1559	1559-1560	1560-1561	1561-1562
69	1545-1546	1546-1548	1547-1549	1549-1550	1550-1552	1551-1553	1552-1554	1554-1555	1555-1556	1556-1558	1557-1559	1558-1560
68	1542-1544	1544-1545	1545-1546	1546-1548	1547-1549	1549-1550	1550-1551	1551-1553	1552-1554	1554-1555	1555-1556	1556-1557
67	1540-1541	1541-1543	1542-1544	1544-1545	1545-1546	1546-1548	1547-1549	1549-1550	1550-1551	1551-1553	1552-1554	1553-1555
66	1537-1539	1538-1540	1540-1541	1541-1543	1542-1544	1544-1545	1545-1546	1546-1548	1547-1549	1548-1550	1549-1551	1551-1552

NAI		SCALED SCORES												
		9-Year-Olds												
		0 months	1 month	2 months	3 months	4 months	5 months	6 months	7 months	8 months	9 months	10 months	11 months	
65	1535-1536	1536-1537	1537-1539	1539-1540	1540-1541	1541-1543	1542-1544	1543-1545	1545-1546	1546-1547	1547-1549	1548-1550		
64	1533-1534	1534-1535	1535-1536	1536-1538	1538-1539	1539-1540	1540-1541	1541-1542	1542-1544	1543-1545	1544-1546	1546-1547		
63	1530-1532	1532-1533	1533-1534	1534-1535	1536-1537	1537-1538	1538-1539	1538-1540	1539-1541	1541-1542	1542-1543	1543-1545		
62	1528-1529	1529-1531	1530-1532	1532-1533	1533-1535	1534-1536	1535-1537	1536-1537	1537-1538	1538-1540	1539-1541	1540-1542		
61	1525-1527	1527-1528	1528-1529	1529-1531	1530-1532	1532-1533	1533-1534	1533-1535	1534-1536	1535-1537	1537-1538	1538-1539		
60	1523-1524	1524-1526	1525-1527	1527-1528	1528-1529	1529-1531	1530-1532	1530-1532	1532-1533	1533-1534	1534-1536	1535-1537		
59	1520-1522	1521-1523	1523-1524	1524-1526	1525-1527	1526-1528	1528-1529	1528-1529	1529-1531	1530-1532	1531-1533	1533-1534		
58	1517-1519	1519-1520	1520-1522	1521-1523	1523-1524	1524-1525	1525-1527	1525-1527	1526-1528	1528-1529	1529-1530	1530-1532		
57	1515-1516	1516-1518	1517-1519	1519-1520	1520-1522	1521-1523	1522-1524	1523-1524	1524-1525	1525-1527	1526-1528	1527-1529		
56	1512-1514	1513-1515	1515-1516	1516-1518	1517-1519	1518-1520	1520-1521	1520-1522	1521-1523	1522-1524	1523-1525	1525-1526		
55	1509-1511	1511-1512	1512-1514	1513-1515	1515-1516	1516-1517	1517-1519	1517-1519	1518-1520	1520-1521	1521-1522	1522-1524		
54	1507-1508	1508-1510	1509-1511	1511-1512	1512-1514	1513-1515	1514-1516	1515-1516	1516-1517	1517-1519	1518-1520	1519-1521		
53	1504-1506	1505-1507	1507-1508	1508-1510	1509-1511	1510-1512	1512-1513	1512-1514	1513-1515	1514-1516	1515-1517	1517-1518		
52	1501-1503	1503-1504	1504-1506	1505-1507	1507-1508	1508-1509	1509-1511	1509-1511	1510-1512	1512-1513	1513-1514	1515-1516		
51	1499-1500	1500-1502	1501-1503	1503-1504	1504-1506	1505-1507	1506-1508	1507-1508	1508-1509	1509-1511	1510-1512	1512-1514		
50	1496-1498	1497-1499	1499-1500	1500-1502	1501-1503	1502-1504	1504-1505	1504-1506	1505-1507	1506-1508	1508-1509	1510-1511		
49	1493-1495	1495-1496	1496-1498	1497-1499	1498-1500	1500-1501	1501-1503	1501-1503	1502-1504	1504-1505	1506-1507	1507-1509		
48	1491-1492	1492-1494	1493-1495	1495-1496	1496-1497	1497-1499	1498-1500	1498-1500	1500-1501	1501-1503	1503-1505	1505-1506		
47	1488-1490	1489-1491	1491-1492	1492-1494	1493-1495	1494-1496	1496-1497	1496-1497	1497-1499	1498-1500	1500-1502	1502-1504		
46	1485-1487	1487-1488	1488-1490	1489-1491	1490-1492	1492-1493	1493-1495	1493-1495	1494-1496	1495-1497	1498-1499	1500-1501		
45	1483-1484	1484-1486	1485-1487	1486-1488	1488-1489	1489-1491	1490-1492	1490-1492	1492-1493	1493-1494	1495-1497	1497-1499		
44	1480-1482	1481-1483	1483-1484	1484-1485	1485-1487	1486-1488	1487-1489	1488-1489	1489-1491	1490-1492	1492-1494	1494-1496		
43	1477-1479	1479-1480	1480-1482	1481-1483	1482-1484	1484-1485	1485-1486	1485-1487	1486-1488	1487-1489	1490-1491	1492-1493		
42	1475-1476	1476-1478	1477-1479	1478-1480	1480-1481	1481-1483	1482-1484	1482-1484	1484-1485	1485-1486	1487-1489	1489-1491		
41	1472-1474	1473-1475	1474-1476	1476-1477	1477-1479	1478-1480	1479-1481	1480-1481	1481-1483	1482-1484	1484-1486	1486-1488		
40	Below 1472	Below 1473	Below 1474	Below 1476	Below 1477	Below 1478	Below 1479	Below 1480	Below 1481	Below 1482	Below 1484	Below 1486		

APPENDIX B, CONTINUED

NAI	SCALED SCORES											
	10-Year-Olds					11-Year-Olds						
	0-2 months	3-5 months	6-8 months	9-11 months	0-2 months	3-5 months	6-8 months	9-11 months	0-2 months	3-5 months	6-8 months	9-11 months
160	Above 1745	Above 1746	Above 1748	Above 1750	Above 1753	Above 1754	Above 1756	Above 1758	Above 1753	Above 1754	Above 1756	Above 1758
159	-	-	-	-	-	-	-	-	-	-	-	-
158	1745	1746	1748	1750	1753	1754	1756	1758	1753	1754	1756	1758
157	1744	1745	1747	1749	1752	1753	1755	1757	1752	1753	1755	1757
156	1743	1744	1746	1748	1751	1752	1754	1756	1751	1752	1754	1756
155	1742	1743	1745	1747	1750	1751	1753	1755	1750	1751	1753	1755
154	1741	1742	1744	1746	1749	1750	1752	1754	1749	1750	1752	1754
153	1739-1740	1740-1741	1742-1743	1744-1745	1747-1748	1748-1749	1750-1751	1752-1753	1747-1748	1748-1749	1750-1751	1752-1753
152	1738	1739	1741	1743	1746	1747	1749	1751	1746	1747	1749	1751
151	1737	1738	1740	1742	1745	1746	1748	1750	1745	1746	1748	1750
150	1735-1736	1736-1737	1738-1739	1740-1741	1743-1744	1744-1745	1746-1747	1748-1749	1743-1744	1744-1745	1746-1747	1748-1749
149	1733-1734	1734-1735	1736-1737	1739	1742	1743	1745	1747	1742	1743	1745	1747
148	1731-1732	1733	1735	1737-1738	1740-1741	1742	1744	1746	1740-1741	1742	1744	1746
147	1729-1730	1731-1732	1734	1736	1739	1740-1741	1743	1745	1739	1740-1741	1743	1745
146	1728	1730	1732-1733	1734-1735	1738	1739	1741-1742	1744	1738	1739	1741-1742	1744
145	1726-1727	1728-1729	1731	1733	1736-1737	1738	1740	1743	1736-1737	1738	1740	1743
144	1724-1725	1727	1729-1730	1732	1735	1736-1737	1739	1742	1735	1736-1737	1739	1742
143	1723	1725-1726	1728	1730-1731	1733-1734	1735	1737-1738	1740	1733-1734	1735	1737-1738	1740
142	1721-1722	1724	1726-1727	1728-1729	1732	1733-1734	1736	1740	1732	1733-1734	1736	1738-1739
141	1720	1722-1723	1724-1725	1727	1730-1731	1732	1734-1735	1737	1730-1731	1732	1734-1735	1737
140	1718-1719	1720-1721	1723	1725-1726	1729	1730-1731	1733	1736-1737	1729	1730-1731	1733	1735-1736
139	1716-1717	1719	1721-1722	1724	1727-1728	1729	1731-1732	1734	1727-1728	1729	1731-1732	1734
138	1714-1715	1717-1718	1719-1720	1722-1723	1725-1726	1727-1728	1730	1733	1725-1726	1727-1728	1730	1732-1733
137	1713	1715-1716	1718	1720-1721	1724	1725-1726	1728-1729	1731	1724	1725-1726	1728-1729	1731
136	1711-1712	1713-1714	1716-1717	1719	1722-1723	1724	1726-1727	1729	1722-1723	1724	1726-1727	1729-1730
135	1709-1710	1711-1712	1714-1715	1717-1718	1720-1721	1722-1723	1725	1728	1720-1721	1722-1723	1725	1728
134	1707-1708	1709-1710	1712-1713	1715-1716	1718-1719	1720-1721	1723-1724	1726	1718-1719	1720-1721	1723-1724	1726-1727
133	1705-1706	1707-1708	1710-1711	1713-1714	1716-1717	1718-1719	1721-1722	1724	1716-1717	1718-1719	1721-1722	1724-1725
132	1703-1704	1705-1706	1708-1709	1711-1712	1714-1715	1716-1717	1719-1720	1722	1714-1715	1716-1717	1719-1720	1722-1723
131	1701-1702	1703-1704	1706-1707	1709-1710	1712-1713	1714-1715	1717-1718	1720	1709-1710	1714-1715	1717-1718	1720-1721
130	1699-1700	1701-1702	1704-1705	1707-1708	1710-1711	1712-1713	1715-1716	1718	1710-1711	1712-1713	1715-1716	1718-1719
129	1697-1698	1699-1700	1702-1703	1705-1706	1708-1709	1710-1711	1713-1714	1716	1708-1709	1710-1711	1713-1714	1716-1717

APPENDIX B, CONTINUED

NAI	SCALED SCORES										
	10-Year-Olds					11-Year-Olds					
	0-2 months	3-5 months	6-8 months	9-11 months	0-2 months	3-5 months	6-8 months	9-11 months	0-2 months	3-5 months	6-8 months
128	1695-1696	1698	1700-1701	1703-1704	1706-1707	1709	1712	1714-1715			
127	1693-1694	1696-1697	1698-1699	1701-1702	1704-1705	1707-1708	1710-1711	1713			
126	1691-1692	1694-1695	1697	1699-1700	1702-1703	1705-1706	1708-1709	1711-1712			
125	1689-1690	1692-1693	1695-1696	1697-1698	1700-1701	1703-1704	1706-1707	1709-1710			
124	1687-1688	1690-1691	1693-1694	1695-1696	1698-1699	1701-1702	1704-1705	1707-1708			
123	1685-1686	1688-1689	1691-1692	1694	1696-1697	1699-1700	1702-1703	1705-1706			
122	1683-1684	1686-1687	1689-1690	1692-1693	1694-1695	1697-1698	1700-1701	1703-1704			
121	1681-1682	1684-1685	1687-1688	1690-1691	1692-1693	1695-1696	1698-1699	1701-1702			
120	1678-1680	1681-1683	1684-1686	1687-1689	1689-1691	1692-1694	1695-1697	1699-1700			
119	1676-1677	1679-1680	1682-1683	1685-1686	1687-1688	1690-1691	1693-1694	1697-1698			
118	1674-1675	1677-1678	1680-1681	1683-1684	1685-1686	1688-1689	1691-1692	1695-1696			
117	1672-1673	1675-1676	1678-1679	1681-1682	1683-1684	1686-1687	1690	1693-1694			
116	1670-1671	1673-1674	1676-1677	1678-1680	1681-1682	1684-1685	1688-1689	1691-1692			
115	1668-1669	1671-1672	1674-1675	1676-1677	1679-1680	1682-1683	1686-1687	1689-1690			
114	1666-1667	1669-1670	1672-1673	1674-1675	1677-1678	1680-1681	1684-1685	1687-1688			
113	1664-1665	1667-1668	1670-1671	1672-1673	1675-1676	1678-1679	1682-1683	1685-1686			
112	1662-1663	1665-1666	1668-1669	1670-1671	1673-1674	1676-1677	1680-1681	1683-1684			
111	1660-1661	1663-1664	1666-1667	1668-1669	1671-1672	1674-1675	1678-1679	1681-1682			
110	1658-1659	1661-1662	1664-1665	1666-1667	1669-1670	1672-1673	1676-1677	1678-1680			
109	1656-1657	1659-1660	1662-1663	1664-1665	1667-1668	1670-1671	1674-1675	1676-1677			
108	1653-1655	1657-1658	1660-1661	1662-1663	1665-1666	1668-1669	1672-1673	1674-1675			
107	1651-1652	1654-1656	1657-1659	1660-1661	1663-1664	1666-1667	1670-1671	1672-1673			
106	1649-1650	1652-1653	1655-1656	1658-1659	1661-1662	1664-1665	1668-1669	1670-1671			
105	1647-1648	1650-1651	1653-1654	1656-1657	1659-1660	1662-1663	1666-1667	1668-1669			
104	1645-1646	1648-1649	1651-1652	1654-1655	1657-1658	1660-1661	1663-1665	1666-1667			
103	1642-1644	1646-1647	1649-1650	1652-1653	1655-1656	1658-1659	1661-1662	1664-1665			
102	1640-1641	1643-1645	1646-1648	1650-1651	1653-1654	1656-1657	1659-1660	1662-1663			
101	1638-1639	1641-1642	1644-1645	1647-1649	1650-1652	1654-1655	1657-1658	1660-1661			
100	1636-1637	1639-1640	1642-1643	1645-1646	1648-1649	1651-1653	1655-1656	1658-1659			
99	1633-1635	1636-1638	1640-1641	1643-1644	1646-1647	1649-1650	1652-1654	1656-1657			
98	1631-1632	1634-1635	1637-1639	1641-1642	1644-1645	1647-1648	1650-1651	1653-1655			
97	1629-1630	1632-1633	1635-1636	1638-1640	1641-1643	1644-1645	1648-1649	1651-1652			

APPENDIX B, CONTINUED

NAI	SCALED SCORES											
	10-Year-Olds						11-Year-Olds					
	0-2 months	3-5 months	6-8 months	9-11 months	0-2 months	3-5 months	6-8 months	9-11 months	0-2 months	3-5 months	6-8 months	9-11 months
96	1626-1628	1630-1631	1633-1634	1636-1637	1639-1640	1642-1644	1646-1647	1649-1650	1639-1640	1642-1644	1646-1647	1649-1650
95	1624-1625	1627-1629	1630-1632	1634-1635	1637-1638	1640-1641	1643-1645	1647-1648	1637-1638	1640-1641	1643-1645	1647-1648
94	1622-1623	1625-1626	1628-1629	1631-1633	1635-1636	1638-1639	1641-1642	1644-1646	1635-1636	1638-1639	1641-1642	1644-1646
93	1619-1621	1623-1624	1626-1627	1629-1630	1632-1634	1635-1637	1639-1640	1642-1643	1632-1634	1635-1637	1639-1640	1642-1643
92	1617-1618	1620-1622	1623-1625	1627-1628	1630-1631	1633-1634	1636-1638	1640-1641	1630-1631	1633-1634	1636-1638	1640-1641
91	1615-1616	1618-1619	1621-1622	1624-1626	1628-1629	1631-1632	1634-1635	1637-1639	1628-1629	1631-1632	1634-1635	1637-1639
90	1613-1614	1616-1617	1619-1620	1622-1623	1625-1627	1628-1630	1632-1633	1635-1636	1625-1627	1628-1630	1632-1633	1635-1636
89	1611-1612	1614-1615	1616-1618	1620-1621	1623-1624	1626-1627	1629-1631	1633-1634	1623-1624	1626-1627	1629-1631	1633-1634
88	1608-1610	1612-1613	1614-1615	1617-1619	1620-1622	1624-1625	1627-1628	1630-1632	1620-1622	1624-1625	1627-1628	1630-1632
87	1606-1607	1609-1611	1612-1613	1615-1616	1618-1619	1621-1623	1625-1626	1628-1629	1618-1619	1621-1623	1625-1626	1628-1629
86	1604-1605	1607-1608	1609-1611	1612-1614	1616-1617	1619-1620	1622-1624	1626-1627	1616-1617	1619-1620	1622-1624	1626-1627
85	1602-1603	1605-1606	1607-1608	1610-1611	1613-1615	1617-1618	1620-1621	1623-1625	1613-1615	1617-1618	1620-1621	1623-1625
84	1600-1601	1602-1604	1604-1606	1608-1609	1611-1612	1614-1616	1617-1619	1621-1622	1611-1612	1614-1616	1617-1619	1621-1622
83	1598-1599	1600-1601	1602-1603	1605-1607	1608-1610	1612-1613	1615-1616	1619-1620	1608-1610	1612-1613	1615-1616	1619-1620
82	1595-1597	1598-1599	1600-1601	1603-1604	1606-1607	1609-1611	1613-1614	1616-1618	1606-1607	1609-1611	1613-1614	1616-1618
81	1592-1594	1595-1597	1597-1599	1600-1602	1604-1605	1607-1608	1610-1612	1614-1615	1604-1605	1607-1608	1610-1612	1614-1615
80	1589-1591	1592-1594	1595-1596	1598-1599	1601-1603	1604-1606	1608-1609	1611-1613	1594-1595	1597-1599	1601-1602	1604-1605
79	1586-1588	1589-1591	1592-1594	1595-1597	1599-1600	1602-1603	1605-1607	1609-1610	1591-1593	1595-1596	1598-1600	1602-1603
78	1583-1585	1587-1588	1590-1591	1593-1594	1596-1598	1600-1601	1603-1604	1606-1608	1589-1590	1592-1594	1596-1597	1599-1601
77	1581-1582	1584-1586	1587-1589	1591-1592	1594-1595	1597-1599	1601-1602	1604-1605	1586-1588	1590-1591	1593-1595	1597-1598
76	1578-1580	1582-1583	1585-1586	1588-1590	1591-1593	1595-1596	1598-1600	1602-1603	1581-1582	1587-1589	1591-1592	1594-1596
75	1576-1577	1579-1581	1582-1584	1586-1587	1589-1590	1592-1594	1596-1597	1599-1601	1586-1587	1589-1590	1592-1594	1596-1597
74	1573-1575	1577-1578	1580-1581	1583-1585	1586-1588	1590-1591	1593-1595	1597-1598	1583-1585	1587-1589	1591-1592	1594-1596
73	1571-1572	1574-1576	1577-1579	1581-1582	1584-1585	1587-1589	1591-1592	1594-1596	1581-1582	1587-1589	1591-1592	1594-1596
72	1568-1570	1572-1573	1575-1576	1578-1580	1582-1583	1585-1586	1588-1590	1592-1593	1578-1580	1582-1583	1585-1586	1588-1590
71	1566-1567	1569-1571	1572-1574	1576-1577	1579-1581	1582-1584	1586-1587	1589-1591	1579-1581	1582-1584	1586-1587	1589-1591
70	1563-1565	1567-1568	1570-1571	1573-1575	1577-1578	1580-1581	1583-1585	1586-1588	1577-1578	1580-1581	1583-1585	1587-1588
69	1561-1562	1564-1566	1567-1569	1571-1572	1574-1576	1577-1579	1581-1582	1584-1586	1574-1576	1577-1579	1581-1582	1584-1586
68	1558-1560	1562-1563	1565-1566	1568-1570	1571-1573	1575-1576	1578-1580	1582-1583	1571-1573	1575-1576	1578-1580	1582-1583
67	1556-1557	1559-1561	1562-1564	1566-1567	1569-1570	1572-1574	1576-1577	1579-1581	1569-1570	1572-1574	1576-1577	1579-1581
66	1553-1555	1556-1558	1560-1561	1563-1565	1566-1568	1570-1571	1573-1575	1576-1578	1566-1568	1570-1571	1573-1575	1577-1578
65	1550-1552	1554-1555	1557-1559	1560-1562	1564-1565	1567-1569	1571-1572	1574-1576	1564-1565	1567-1569	1571-1572	1574-1576

APPENDIX B, CONTINUED

NAI	SCALED SCORES											
	10-Year-Olds						11-Year-Olds					
	0-2 months	3-5 months	6-8 months	9-11 months	0-2 months	3-5 months	6-8 months	9-11 months	0-2 months	3-5 months	6-8 months	9-11 months
64	1548-1549	1551-1553	1555-1556	1558-1559	1561-1563	1565-1566	1568-1570	1572-1573	1548-1549	1551-1553	1555-1556	1558-1560
63	1545-1547	1549-1550	1552-1554	1555-1557	1559-1560	1562-1564	1565-1567	1569-1571	1545-1547	1549-1550	1552-1554	1556-1558
62	1543-1544	1546-1548	1549-1551	1553-1554	1556-1558	1559-1561	1563-1564	1566-1568	1543-1544	1546-1548	1549-1551	1552-1554
61	1540-1542	1543-1545	1547-1548	1550-1552	1553-1555	1557-1558	1560-1562	1564-1565	1540-1542	1543-1545	1547-1548	1550-1552
60	1537-1539	1541-1542	1544-1546	1547-1549	1551-1552	1554-1556	1558-1559	1561-1563	1537-1539	1541-1542	1544-1546	1547-1549
59	1535-1536	1538-1540	1542-1543	1545-1546	1548-1550	1552-1553	1555-1557	1558-1560	1535-1536	1538-1540	1542-1543	1545-1546
58	1532-1534	1536-1537	1539-1541	1542-1544	1546-1547	1549-1551	1552-1554	1556-1557	1532-1534	1536-1537	1539-1541	1542-1544
57	1530-1531	1533-1535	1536-1538	1540-1541	1543-1545	1546-1548	1550-1551	1553-1555	1530-1531	1533-1535	1536-1538	1540-1541
56	1527-1529	1530-1532	1534-1535	1537-1539	1540-1542	1544-1545	1547-1549	1550-1552	1527-1529	1530-1532	1534-1535	1537-1539
55	1524-1526	1528-1529	1531-1533	1534-1536	1538-1539	1541-1543	1544-1546	1548-1549	1524-1526	1528-1529	1531-1533	1534-1536
54	1522-1523	1525-1527	1528-1530	1532-1533	1535-1537	1538-1540	1542-1543	1545-1547	1522-1523	1525-1527	1528-1530	1532-1533
53	1519-1521	1522-1524	1526-1527	1529-1531	1532-1534	1535-1537	1539-1541	1542-1544	1519-1521	1522-1524	1526-1527	1529-1531
52	1517-1518	1520-1521	1523-1525	1526-1528	1529-1531	1533-1534	1536-1538	1540-1541	1517-1518	1520-1521	1523-1525	1526-1528
51	1514-1516	1517-1519	1520-1522	1523-1525	1527-1528	1530-1532	1533-1535	1537-1539	1514-1516	1517-1519	1520-1522	1523-1525
50	1512-1513	1514-1516	1517-1519	1521-1522	1524-1526	1527-1529	1531-1532	1534-1536	1512-1513	1514-1516	1517-1519	1521-1522
49	1509-1511	1511-1513	1515-1516	1518-1520	1521-1523	1525-1526	1528-1530	1532-1533	1509-1511	1511-1513	1515-1516	1518-1520
48	1506-1508	1509-1510	1512-1514	1515-1517	1519-1520	1522-1524	1525-1527	1529-1531	1506-1508	1509-1510	1512-1514	1515-1517
47	1504-1505	1506-1508	1509-1511	1513-1514	1516-1518	1519-1521	1523-1524	1526-1528	1504-1505	1506-1508	1509-1511	1513-1514
46	1501-1503	1503-1505	1507-1508	1510-1512	1513-1515	1517-1518	1520-1522	1524-1525	1501-1503	1503-1505	1507-1508	1510-1512
45	1498-1500	1501-1502	1504-1506	1507-1509	1511-1512	1514-1516	1517-1519	1521-1523	1498-1500	1501-1502	1504-1506	1507-1509
44	1496-1497	1498-1500	1501-1503	1505-1506	1508-1510	1511-1513	1515-1516	1518-1520	1496-1497	1498-1500	1501-1503	1505-1506
43	1493-1495	1495-1497	1499-1500	1502-1504	1505-1507	1509-1510	1512-1514	1516-1517	1493-1495	1495-1497	1499-1500	1502-1504
42	1490-1492	1493-1494	1496-1498	1499-1501	1503-1504	1506-1508	1509-1511	1513-1515	1490-1492	1493-1494	1496-1498	1499-1501
41	1488-1489	1490-1492	1493-1495	1497-1498	1500-1502	1503-1505	1507-1508	1510-1512	1488-1489	1490-1492	1493-1495	1497-1498
40	Below 1488	Below 1490	Below 1493	Below 1497	Below 1500	Below 1503	Below 1507	Below 1510	Below 1488	Below 1490	Below 1493	Below 1497

APPENDIX C: PERCENTILE RANKS, STANINES, AND NORMAL CURVE EQUIVALENTS (NCE) CORRESPONDING TO NAGLIERI ABILITY INDEX (NAI) SCORES

Naglieri Ability Index	Percentile Rank	Stanine	Normal Curve Equivalent
135–160	99	9	99
132–134	98	9	93
130–131	97	9	90
128–129	96	9	87
126–127	95	8	85
125	94	8	83
124	93	8	81
123	92	8	80
122	91	8	78
121	90	8	77
120	89	8	76
119	88	7	75
118	87	7	74
117	86	7	73
116	84	7	71
115	83	7	70
114	81	7	68
113	79	7	67
112	77	7	66
111	75	6	64
110	73	6	63
109	71	6	62
108	69	6	60
107	67	6	59
106	65	6	58
105	62	6	56
104	60	6	55
103	57	5	54
102	55	5	53
101	52	5	51
100	50	5	50
99	48	5	49
98	45	5	47

APPENDIX C, CONTINUED

Naglieri Ability Index	Percentile Rank	Stanine	Normal Curve Equivalent
97	43	5	46
96	40	5	45
95	38	4	44
94	35	4	42
93	33	4	41
92	31	4	40
91	29	4	38
90	27	4	37
89	25	4	36
88	23	4	34
87	21	3	33
86	19	3	32
85	17	3	30
84	16	3	29
83	14	3	27
82	13	3	26
81	12	3	25
80	11	3	24
79	10	2	23
78	9	2	22
77	8	2	20
76	7	2	19
75	6	2	17
73–74	5	2	15
71–72	4	2	13
69–70	3	1	10
66–68	2	1	7
40–65	1	1	1

APPENDIX D: LIST OF SCHOOLS PARTICIPATING IN 2015 STANDARDIZATION

Alabama

Christ the King School

Arizona

Aire Libre Elementary School
Arrowhead Elementary School
Beibei Amigos Language School
Cactus View Elementary School
Campo Bello Elementary School
Desert Cove Elementary School
Desert Mesa Elementary School
Eagle Ridge Elementary School
Echo Mountain Primary School
Hidden Hills Elementary School
Indian Bend Elementary School
Larkspur Elementary School
Palomino Primary School
Ruth Fisher Elementary School
Sunset Canyon School
Tartesso Elementary School
Whispering Wind Academy

California

Camellia Basic Elementary School

Colorado

Green Mountain Elementary School
Teaching Tree Early Childhood Learning Center
United Day Care Center

Connecticut

Central Christian Academy

Florida

Bethany Christian School
Bradenton Christian School
NCEF Early Childhood Development Center
Union Baptist Educational Center

Georgia

Benton Elementary School
Bleckley County Primary School
Cloverleaf Elementary

Iowa

Dr. Walter Cunningham School for Excellence
Highland Elementary School
Kingsley Elementary School
Lincoln Elementary School
New Hartford Elementary School
Orange Elementary School
Willowwind School

Idaho

Aberdeen Elementary School
Homedale Elementary School
Melba Elementary School

Illinois

Glencoe School
Glencoe Park District
Northfield Community Nursery School
Winnetka Public School Nursery

Indiana

Blackhawk Christian School
Highland Park Elem School
Sand Creek Elementary
West Noble Primary School

Kansas

Genesis Christian School
Holy Rosary Wea Catholic School

Kentucky

Audubon Elementary School
North Hancock Elementary School
Whitesville Elementary School

Massachusetts

Brookwood School
Florence Sawyer School
Franklin D. Roosevelt K–8 School
Neighborhood House Charter School
New Beginnings Academy
Sarah Greenwood
The Hathaway School
Passos Avante Preschool
West Memorial

Maryland

Seven Oaks Elementary

Michigan

Forest Park School
Friends Preschool & Kindergarten

Minnesota

Stevenson Elementary

Missouri

Smithville Elementary

Nebraska

Brownell-Talbot Lower School

New Hampshire

St. Augustin Preschool and Kindergarten

Ohio

Babeck Early Childhood School
Columbus Bilingual Academy
Horizon Science Academy
Liberty Bible Academy
Rivertree Christian School
Westside Academy

Oklahoma

Barnes Elementary

Midwest City Elementary
Miss Helen’s Private School
Parkview Elementary
Ridgecrest Elementary
Schwartz Elementary

Oregon

McKinley Elementary School

Pennsylvania

Learning Tree School
Olney Elementary
Samuel Pennypacker School
Trinity Academy
Wyoming Valley Montessori School

Tennessee

Vision Preparatory Charter School

Texas

Blair Elementary
Blanton Elementary
Carrollton Elementary
Central Elementary
Country Place Elementary
Davis Elementary
Faith Lutheran Day School
Farmers Branch Elementary
Freeman Elementary
Furneaux Elementary
Good Elementary
Kent Elementary
La Villita Elementary
Landry Elementary
Las Colinas Elementary
Lujan-Chavez Elementary
McCoy Elementary
McKamy Elementary
McLaughlin Strickland Elementary
McWhorter Elementary

Rainbow Station Preschool
Rainwater Elementary
Resurrection Catholic School
Riverchase Elementary
Rosemeade Elementary
Sheffield Elementary
Stark Elementary
Thompson Elementary

Washington

Holy Rosary School
Sonshine Christian School and Daycare

West Virginia

St. Joseph Catholic School

Wyoming

Basic Beginnings
Evanston Child Development Center

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