

5. BAYLEY SHORT FORM–RESEARCH EDITION SCORES

The Bayley Scales of Infant Development, Second Edition (BSID-II), published by The Psychological Corporation, is an assessment of developmental status and not an intelligence (IQ) test in which a single total score is obtained that represents an individual’s verbal and performance intelligence. There is no total score on the BSID-II. Rather, there are separate scores for the mental scale (Mental Development Index) and for the motor scale (Psychomotor Development Index). Similarly, there are separate scores for the Bayley Short Form–Research Edition (BSF-R) mental scale and motor scale, but there is no single BSF-R total score. This conforms to standard scoring procedures for the BSID-II. The BSF-R scores on the longitudinal 9-month–2-year data file are summarized in the following sections.

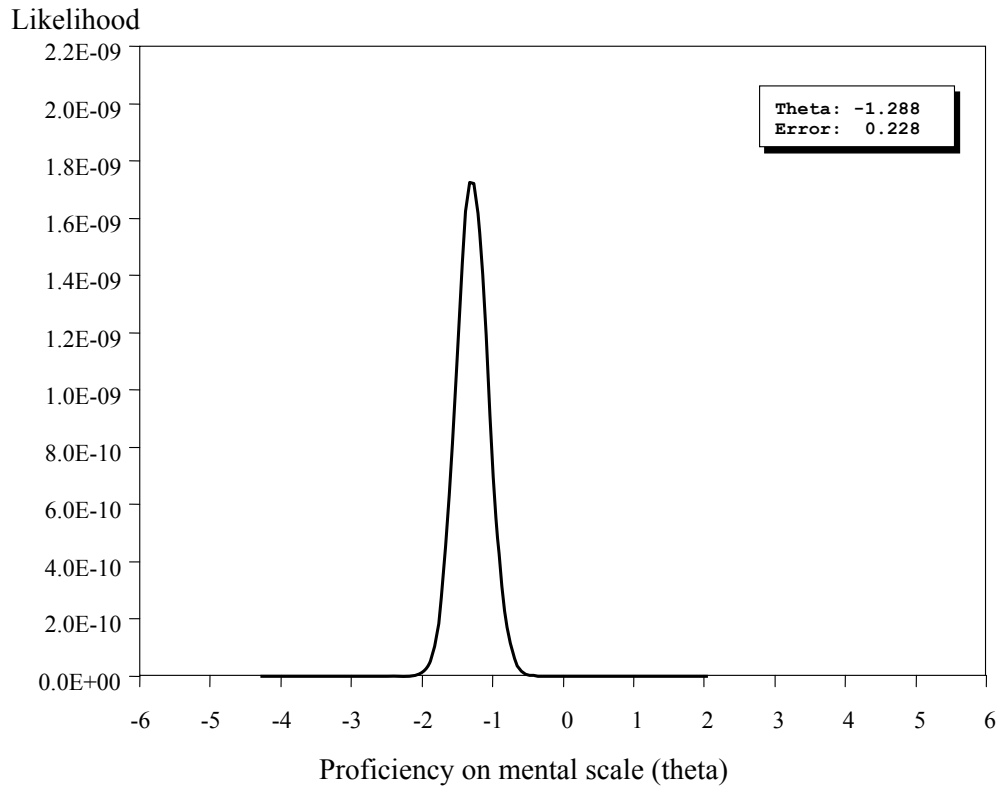
5.1 BSF-R Scoring and Ability Estimates

In Item Response Theory (IRT), the item characteristic curve (ICC) represents the probability of a correct response, $P(x = 1)$, across all levels of ability. Item calibrations model the probabilities of a correct response on each of several items. In probability theory, for any two independent events A and B , the probability of both events occurring simultaneously is given by the product of the probability of either event occurring separately: $P(A \& B) = P(A)P(B)$. In IRT, it is similarly assumed that item responses are independent events. In other words, the answer to any one item provides no information that can be used by the examinee to answer any other item.

In the fashion of independent events A and B , the likelihood of a set of responses is obtained by multiplying all of the corresponding item probabilities in series. If the examinee gets the item right, then the 2-parameter logistic (2-PL) function estimate of $P(x = 1)$ is used. If not, the IRT estimate of $P(x = 0) = 1 - P(x = 1)$ is used. Since the logistic function is a continuous function, the likelihood of any response vector can be estimated across all ability levels. The new distribution is known as the response likelihood distribution. An example of a likelihood distribution for a child in the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) is shown in figure 5-1, which shows that the likelihood of a response vector is quite small at any level of ability but appreciably smaller at some levels than at others. Moreover, when the items and response vectors are informative (that is when they contain information useful for determining ability level), the range of more prominent likelihood values is constrained within a relatively short range. When the likelihood distribution is sharply concentrated, its graphical

representation is similar to a spike. In this particular example, the child is most likely to be found in the lower tail of the ability distribution to the left of the figure. The largest likelihood would provide a good guess of this child’s ability, and indeed the maximum likelihood is often used as if it were *the* ability estimate for a given observation. On the basis of maximum likelihood, the ability level of the child represented by the figure would be $\bar{\theta}_i = -1.288$.

Figure 5-1. Response likelihood function for a specific examinee on the BSF-R mental scale: 2003–04



SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 2-year data collection, 2003–04.

On the other hand, it can be seen that the likelihood around this central tendency forms its own distribution. Indeed, by calculating the standard deviation of the likelihood distribution, the standard error of measurement is obtained, which is reported to be $SE(\bar{\theta}_i) = 0.228$ in the figure. A typical error, that is, the average error, can be expected to lie roughly within a third of a population standard deviation to either side of the maximum likelihood.

5.2 Expected a Posteriori Ability Estimate

The expected a posteriori (EAP) estimate of ability for an individual i is

$$\bar{\theta}_i \cong \frac{\sum_{k=1}^q X_k P(\mathbf{x}_i | X_k) A(X_k)}{\sum_{k=1}^q P(\mathbf{x}_i | X_k) A(X_k)},$$

where $P(\mathbf{x}_i | X_k)$ represents the likelihood of response vector \mathbf{x}_i at point X_k on the ability axis.¹ This is also known as the Bayes estimate of the posterior distribution of θ , given response pattern \mathbf{x}_i . The EAP estimate is approximated using Gaussian quadrature, where $A(X_k)$ are normal ordinate weights for q points X_k spanning the ability distribution for the age group containing member i .

5.3 Expected a Posteriori Standard Error of Measurement

The error variance of the EAP ability estimate is

$$\sigma_e^2 \cong \frac{\sum_{k=1}^q (X_k - \bar{\theta}_i)^2 P(\mathbf{x}_i | X_k) A(X_k)}{\sum_{k=1}^q P(\mathbf{x}_i | X_k) A(X_k)}.$$

The standard error of measurement for EAP ability estimates is the square root of this value. The standard error represents the measurement error but ignores errors that may result from equating to publisher scale metric.

¹ This formula provides an operational definition showing how EAP ability estimates were calculated with quadrature points. For a conceptual discussion of EAP ability estimates, please see the footnote on p. 4-23.

5.4 BSF-R Scale Scores and *T* Scores

The BSF-R scores provided in the longitudinal 9-month–2-year data file have been recalibrated from the 9-month cross-sectional file. These longitudinal (9-month to 2-year) recalibrated scores may have changed for an individual child, but relative standing should not have changed (or, if so, only minimally). The analyst is encouraged to use these recalibrated scores exclusively because they supersede the 9-month cross-sectional scores.

The Psychological Corporation uses number-right scoring for the BSID-II mental and motor scales. Raw scores are calculated by adding the number of the item immediately prior to the first item in the administered item set to the total number of correct responses in each administered item set. In essence, the child is automatically given credit for all items from the younger (i.e., easier) age sets. For example, if the BSID-II mental scale were administered beginning with item number 63, and the child was able to complete 6 items correctly within that age set, then the child would receive a raw score of $62 + 6 = 68$ points.

To compare the development levels of children of different ages, The Psychological Corporation provides development index numbers that have a mean of 100 and a standard deviation of 15 in each age group. Development index numbers are obtained in BSID-II by using the raw score to find the corresponding development index number in a lookup table provided in The Psychological Corporation documentation. The child's age in years, months, and days is used to determine which page of the table should be used.

In the ECLS-B, IRT true scores (called scale scores in the data file) substitute for BSID-II raw scores. For each EAP ability estimate $\bar{\theta}_i$, obtained with the BSF-R, a corresponding IRT true score ξ_i is calculated by summing the expected probability of a correct response $\xi_i = \sum_{j=1}^n P_j(\bar{\theta}_i)$ for all items $j = 1 \dots n$ comprising the publisher scale. The number-right true score ξ_i is then used to assign a corresponding development index number. In the ECLS-B, a parametric model based on The Psychological Corporation documentation is used for this purpose, instead of a lookup table. The development indices (called *T* scores) provided in the ECLS-B data file have a mean of 50 and a standard deviation of 10 and should be regarded as approximate values due to any errors associated with $\bar{\theta}_i$. The *T* scores provide a

convenient means to examine the developmental levels of children of different ages, equivalent to the developmental index scores provided with BSID-II.

5.5 ECLS-B Proficiency Level Probabilities

The BSF-R item response models provide interval scales along which every item and every child is positioned. The substantive significance of EAP ability estimates $\bar{\theta}_i$ can be determined by examining the task content of items positioned at the same level of difficulty. Item clusters, representing tasks positioned at the same or similar levels of ability, are examined in this way for evidence of a common pattern of behavior.

To the extent that a consistent interpretation of the items is possible, item clusters can be used to represent specific levels of proficiency. These proficiency levels become benchmark performance standards or anchor points used to interpret scale values and give them a specific behavioral significance. They provide EAP ability estimates $\bar{\theta}_i$ with a tangible, real-world reference. The identification of proficiency levels often helps to establish a scale as a medium of exchange so that measurement results can be easily comprehended and communicated.

The BSF-R has been developed to provide practical measures of children's mental and motor development and to reproduce as closely as possible measures obtained with the BSID-II. Item clusters have been selected from the BSID-II to help interpret EAP ability estimates at specific levels of proficiency. BSID-II proficiency probabilities have been created by selecting item subsets from the BSID-II mental and motor development scales to form item clusters. That is, the proficiency probabilities, though based on the BSF-R calibration, were formed using the full complement of BSID-II items. This means that the item itself did not necessarily have to be administered as part of the BSF-R to be included in the proficiency probabilities. This is possible due to the use of IRT modeling (exhibits 3-1 and 3-2 show which items were part of the BSF-R). Theoretical considerations, item content, and item difficulty parameters were used to select item subsets that would be as internally consistent as possible. Similar considerations were invoked to attribute a behaviorally significant name for each item cluster.

The analyst is also cautioned that the availability of longitudinal data and the recalibration of the 9-month cross-sectional scores have led to changes in the items comprising some of the mental and motor proficiency levels that were provided on the 9-month data file. The 9-month cross-sectional scores

in the previous release were the most accurate that were available at that time. However, with the addition of longitudinal data, the new proficiency levels are preferred. The new 9-month proficiencies supercede those issued in the previous 9-month data file. Exhibit 5-1 lists the items that compose the proficiency probabilities included on both the cross-sectional 9-month and the longitudinal 9-month–2-year data files and notes where changes were made to the contents of specific probabilities.

After consideration to all these issues, the proficiency level probability scales were identified and are presented in table 5-1, which also includes the 9-month and 2-year means.

Subscales for the ECLS-B were constructed using publisher item calibrations by selecting the appropriate subsets of items. By using the publisher item calibrations, the subscale score metric remains identical to that used in the corresponding publisher main scale. Subscales vary in length from three to seven items, depending on the availability of suitable items in BSID-II. The item clusters can be used to calculate subscale true scores, information functions, and standard errors of measurement as with any IRT scale. However, the purpose of the subscales is to define proficiency level probabilities.

A performance level can be defined at a point on the ability scale where two-thirds of the items in the subscale are expected to be answered correctly. This is the point where the IRT true score reaches 67 percent of the total number of items included in the subscale. For example, for a subscale with four items, the performance level is defined at the point on the ability scale where the IRT true score reaches $0.67 \times 4 = 2.66$ correct responses. When 67 percent of the items are expected to be answered correctly, most of the tasks will be completed successfully, and it can be said that mastery of this performance level has been achieved.

The selection of performance level subscales is limited by the availability of items in the corresponding published mental and motor scales. For this reason, it is not possible to define performance milestones at equal scale intervals. As shown in table 5-1, in the case of mental performance, Receptive vocabulary represents a low level of development for 2-year-olds (because almost 85 percent of 2-year-olds can do this). For all practical intents and purposes, Explores objects can be used to identify children with deficient development (because virtually all children can do this by 2 years). At the other extreme, Matching/discrimination and Early counting/quantitative identify children who are highly developed (because relatively fewer can do them). This leaves Expressive vocabulary and Listening/comprehension as milestone events that are more appropriate for 2-year-olds.

Exhibit 5-1. Changes to 9-month proficiency levels following recalibration using longitudinal 9-month–2-year dataset, original 9-month proficiency level variable names, new 9-month proficiency level variable names, and 2-year proficiency level variable names included within each proficiency: 2001–02 and 2003–04

Original 9-month proficiencies in the 9-month data file	9-month recalibrated proficiencies in the longitudinal 9-month–2-year data file	2-year proficiencies in the longitudinal 9-month–2-year data file
Mental scale		
X1MTL1 Explores objects MEN045 Picks up cubes MEN048 Plays with string MEN055 Lifts inverted cup MEN057 Picks up cube deftly MEN053 Reaches for 2nd cube MEN052 Bangs in play	X1MTL_A Explores objects MEN045 Picks up cubes MEN048 Plays with string MEN055 Lifts inverted cup MEN057 Picks up cube deftly MEN053 Reaches for 2nd cube MEN052 Bangs in play	X2MTL_A Explores objects MEN045 Picks up cubes MEN048 Plays with string MEN055 Lifts inverted cup MEN057 Picks up cube deftly MEN053 Reaches for 2nd cube MEN052 Bangs in play
X1MTL2 Explores purposefully MEN059 Manipulates bell MEN062 Pulls string adaptively MEN065 Retains 2 of 3 cubes MEN066 Rings bell purposefully MEN069 Looks at pictures in book	X1MTL_B Explores purposefully MEN059 Manipulates bell MEN062 Pulls string adaptively MEN065 Retains 2 of 3 cubes MEN066 Rings bell purposefully MEN069 Looks at pictures in book	X2MTL_B Explores purposefully MEN059 Manipulates bell MEN062 Pulls string adaptively MEN065 Retains 2 of 3 cubes MEN066 Rings bell purposefully MEN069 Looks at pictures in book
X1MTL3 Babbles MEN061 Vocalizes 3 vowels MEN078 Vocalizes 4 vowel/ consonant combinations MEN081 Responds to request MEN076 Jabbers expressively	X1MTL_C Jabbers Expressively [MEN061 deleted] MEN078 Vocalizes 4 vowel/ consonant combinations MEN081 Responds to request MEN076 Jabbers expressively	X2MTL_C Jabbers Expressively [MEN061 deleted] MEN078 Vocalizes 4 vowel/ consonant combinations MEN081 Responds to request MEN076 Jabbers expressively
X1MTL4 Early problem solving MEN089 Puts 6 beads in box MEN095 Puts 9 cubes in cup MEN102 Retrieves toy MEN104 Uses rod to get toy	X1MTL_D Early problem solving MEN089 Puts 6 beads in box MEN095 Puts 9 cubes in cup MEN102 Retrieves toy MEN104 Uses rod to get toy	X2MTL_D Early problem solving MEN089 Puts 6 beads in box MEN095 Puts 9 cubes in cup MEN102 Retrieves toy MEN104 Uses rod to get toy
X1MTL5 Uses words MEN099 Points to 2 pictures MEN100 Uses 2 different words MEN101 Shows shoe MEN106 Uses words to make wants known	X1MTL_E Names object [MEN099 deleted] MEN100 Uses 2 different words MEN101 Shows shoe MEN106 Uses words to make wants known MEN110 Names 1 object (new)	X2MTL_E Names object [MEN099 deleted] MEN100 Uses 2 different words MEN101 Shows shoe MEN106 Uses words to make wants known MEN110 Names 1 object (new)
	X1MTL_F Receptive vocabulary MEN108 Points to 3 doll parts MEN099 Points to 2 pictures MEN122 Points to 5 pictures	X2MTL_F Receptive vocabulary MEN108 Points to 3 doll parts MEN099 Points to 2 pictures MEN122 Points to 5 pictures
	X1MTL_G Expressive vocabulary MEN111 Combines word/gesture MEN114 Uses s 2-word utterance MEN121 Uses pronouns MEN126 Names 3 objects MEN133 Names 5 pictures	X2MTL_G Expressive vocabulary MEN111 Combines word/gesture MEN114 Uses s 2-word utterance MEN121 Uses pronouns MEN126 Names 3 objects MEN133 Names 5 pictures

See note at end of exhibit.

Exhibit 5-1. Changes to 9-month proficiency levels following recalibration using longitudinal 9-month–2-year dataset, original 9-month proficiency level variable names, new 9-month proficiency level variable names, and 2-year proficiency level variable names included within each proficiency: 2001–02 and 2003–04—Continued

Original 9-month proficiencies in the 9-month data file	9-month recalibrated proficiencies in the longitudinal 9-month–2-year data file	2-year proficiencies in the longitudinal 9-month – 2-year data file
	X1MTL_H Listening/comprehension MEN131 Attends to story MEN134 Displays verbal comp. MEN140 Understands 2 prepositions MEN142 Uses multiword utterance in response to book	X2MTL_H Listening/comprehension MEN131 Attends to story MEN134 Displays verbal comp. MEN140 Understands 2 prepositions MEN142 Uses multiword utterance in response to book
	X1MTL_I Matching/discrimination MEN125 Matches pictures MEN123 Matches 3 colors MEN137 Matches 4 colors MEN144 Discriminates pictures I MEN151 Discriminates pictures II	X2MTL_I Matching/discrimination MEN125 Matches pictures MEN123 Matches 3 colors MEN137 Matches 4 colors MEN144 Discriminates pictures I MEN151 Discriminates pictures II
	X1MTL_J Early counting/quantitative MEN141 Understands concept of 1 MEN146 Counts MEN147 Compares masses MEN152 Repeats 3 number sequence MEN159 Counts (stable number order) MEN156 Understands “more” MEN164 Counts (cardinality)	X2MTL_J Early counting/quantitative MEN141 Understands concept of 1 MEN146 Counts MEN147 Compares masses MEN152 Repeats 3 number sequence MEN159 Counts (stable number order) MEN156 Understands “more” MEN164 Counts (cardinality)
Motor scale		
X1MTR1 Eye-hand coordination MOT031 Uses partial thumb opposition to grasp cube MOT049 Uses partial thumb opposition to grasp pellet MOT032 Attempts to secure pellet MOT041 Uses whole hand to grasp pellet	X1MTR_A Eye-hand coordination MOT031 Uses partial thumb opposition to grasp cube MOT049 Uses partial thumb opposition to grasp pellet MOT032 Attempts to secure pellet MOT041 Uses whole hand to grasp pellet	X2MTR_A Eye-hand coordination MOT031 Uses partial thumb opposition to grasp cube MOT049 Uses partial thumb opposition to grasp pellet MOT032 Attempts to secure pellet MOT041 Uses whole hand to grasp pellet
X1MTR2 Sitting MOT022 Sits with slight support MOT028 Sits alone momentarily MOT036 Sits alone steadily MOT034 Sits alone for 30 sec. MOT043 Moves forward using prewalking movements MOT051 Moves from sit to creeping position	X1MTR_B Sitting MOT022 Sits with slight support MOT028 Sits alone momentarily MOT036 Sits alone steadily MOT034 Sits alone for 30 sec. MOT043 Moves forward using prewalking movements MOT051 Moves from sit to creeping position	X2MTR_B Sitting MOT022 Sits with slight support MOT028 Sits alone momentarily MOT036 Sits alone steadily MOT034 Sits alone for 30 sec. MOT043 Moves forward using prewalking movements MOT051 Moves from sit to creeping position

See note at end of exhibit.

Exhibit 5-1. Changes to 9-month proficiency levels following recalibration using longitudinal 9-month–2-year dataset, original 9-month proficiency level variable names, new 9-month proficiency level variable names, and 2-year proficiency level variable names included within each proficiency: 2001–02 and 2003–04—Continued

Original 9-month proficiencies in the 9-month data file	9-month recalibrated proficiencies in the longitudinal 9-month–2-year data file	2-year proficiencies in the longitudinal 9-month–2-year data file
X1MTR3 Pre-walking MOT044 Supports weight momentarily MOT045 Pulls to standing MOT046 Shifts weight while standing MOT052 Raises self to standing MOT053 Attempts to walk MOT054 Walks sideways while holding onto furniture	X1MTR_C Pre-walking MOT044 Supports weight momentarily MOT045 Pulls to standing MOT046 Shifts weight while standing MOT052 Raises self to standing MOT053 Attempts to walk MOT054 Walks sideways while holding onto furniture	X2MTR_C Pre-walking MOT044 Supports weight momentarily MOT045 Pulls to standing MOT046 Shifts weight while standing MOT052 Raises self to standing MOT053 Attempts to walk MOT054 Walks sideways while holding onto furniture
X1MTR4 Independent walking MOT060 Walks with help MOT061 Stands alone MOT059 Stands up I MOT063 Walks alone with good coordination MOT062 Walks alone	X1MTR_D Stands alone MOT060 Walks with help MOT061 Stands alone MOT059 Stands up I [MOT063 deleted] MOT062 Walks alone	X2MTR_D Stands alone MOT060 Walks with help MOT061 Stands alone MOT059 Stands up I [MOT063 deleted] MOT062 Walks alone
X1MTR5 Balance (all moved to X2MTR_F) MOT072 Stands on right foot with help MOT065 Squats briefly MOT068 Stands up II MOT073 Stands on left foot with help	X1MTR_E Skillful walking MOT063 Walks alone with good coordination MOT067 Walks backward (new) MOT071 Walks sideways (new)	X2MTR_E Skillful walking MOT063 Walks alone with good coordination MOT067 Walks backward (new) MOT071 Walks sideways (new)
	X1MTR_F Balance MOT065 Squats briefly MOT068 Stands up II MOT072 Stands on right foot with help MOT073 Stands on left foot with help	X2MTR_F Balance MOT065 Squats briefly MOT068 Stands up II MOT072 Stands on right foot with help MOT073 Stands on left foot with help
	X1MTR_G Fine motor control MOT074 Uses fingerpads to grasp pencil MOT075 Uses hand to hold paper MOT090 Grasps pencil at end nearest point	X2MTR_G Fine motor control MOT074 Uses fingerpads to grasp pencil MOT075 Uses hand to hold paper MOT090 Grasps pencil at end nearest point

See note at end of exhibit.

Exhibit 5-1. Changes to 9-month proficiency levels following recalibration using longitudinal 9-month–2-year dataset, original 9-month proficiency level variable names, new 9-month proficiency level variable names, and 2-year proficiency level variable names included within each proficiency: 2001–02 and 2003–04—Continued

Original 9-month proficiencies in the 9-month data file	9-month recalibrated proficiencies in the longitudinal 9-month–2-year data file	2-year proficiencies in the longitudinal 9-month–2-year data file
	X1MTR_H Uses stairs MOT069 Walks down stairs with help MOT079 Walks up stairs alone, placing both feet on each step MOT080 Walks down stairs alone, placing both feet on each step MOT095 Walks up stairs, alternating feet	X2MTR_H Uses stairs MOT069 Walks down stairs with help MOT079 Walks up stairs alone, placing both feet on each step MOT080 Walks down stairs alone, placing both feet on each step MOT095 Walks up stairs, alternating feet
	X1MTR_I Alternating balance MOT082 Stands alone on right foot MOT083 Stands alone on left foot MOT089 Walks on tiptoe for 4 steps MOT086 Swings leg to kick ball	X2MTR_I Alternating balance MOT082 Stands alone on right foot MOT083 Stands alone on left foot MOT089 Walks on tiptoe for 4 steps MOT086 Swings leg to kick ball
	X1MTR_J Motor planning MOT096 Copies circles MOT093 Manipulates pencil in hand MOT098 Imitates postures MOT088 Laces 3 beads MOT091 Imitates hand movements MOT101 Buttons one button	X2MTR_J Motor planning MOT096 Copies circles MOT093 Manipulates pencil in hand MOT098 Imitates postures MOT088 Laces 3 beads MOT091 Imitates hand movements MOT101 Buttons one button

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 9-month and 2-year data collections, 2001–02 and 2003–04.

Table 5-1. ECLS-B descriptive statistics for BSF-R proficiency level subscales, including proficiency level subscale labels, numbers of items in each subscale, mean scale score, and 9-month and 2-year percentages, in the data file: 2003–04

Proficiency level subscale	Number of items in subscale	Mean score ¹ (publisher)	9-month percent ² (ECLS-B)	2-year percent (ECLS-B)
Mental				
X1MTL_A: Explores objects	6	53	98.9	100.0
X1MTL_B: Explores purposefully	5	68	87.1	100.0
X1MTL_C: Jabbers expressively	3	83	41.5	99.9
X1MTL_D: Early problem solving	4	98	11.1	98.5
X1MTL_E: Names object	4	104	4.8	97.6
X2MTL_F: Receptive vocabulary	3	116	1.5	84.8
X2MTL_G: Expressive vocabulary	5	126	0.3	64.5
X2MTL_H: Listening/comprehension	4	139	0.1	37.3
X2MTL_I: Matching/discrimination	5	140	0.2	32.6
X2MTL_J: Early counting/quantitative	7	159	#	4.2
Motor				
X1MTR_A: Demonstrates eye-hand coordination	4	42	89.4	99.9
X1MTR_B: Sitting	6	42	91.4	100.0
X1MTR_C: Pre-walking	6	52	71.9	99.9
X1MTR_D: Stands alone	4	62	32.6	99.8
X1MTR_E: Skillful walking	3	70	18.2	92.8
X2MTR_F: Balance	4	74	9.2	89.7
X2MTR_G: Fine motor control	3	84	4.6	56.3
X2MTR_H: Uses stairs	4	87	3.6	48.9
X2MTR_I: Alternating balance	4	90	1.5	31.0
X2MTR_J: Motor planning	6	99	0.5	10.8

Rounds to zero.

¹ Scale score, mean value corresponding to 67 percent of total credit possible on each subscale item set. Mean value obtained using BSID-II publisher item calibrations. Scale scores are reported in publisher raw score metric.

² Percentage estimate obtained with the weighted ECLS-B sample.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 9-month data collection, 2001–02 and 2-year data collection; 2003–04; publisher standardization data set of the Bayley Scales of Infant Development, Second Edition (BSID-II), The Psychological Corporation, 1993.

For the motor scale, Balance (at 90 percent) and Fine motor control (at 56 percent) are found at a relatively low level of development for 2 years. By contrast, Motor planning (at about 11 percent) is at the upper limits for most 2-year-olds. In the middle range of motor development, Uses stairs (49 percent) and Alternating balance (31 percent) are milestones appropriate for 2-year-olds.

Each of these levels represents a developmental milestone that is a qualitatively different outcome. A qualitative outcome can be scored 1 for mastery and 0 for nonmastery. However, a more informative alternative is available. The IRT subscales reveal how probable it is that a given child can successfully execute each of the tasks belonging to the scale. By averaging scores over tasks, it is possible

to calculate the probability of mastering a developmental milestone. Each subscale is treated as a single item in order to estimate the probability of mastery of each skill. The hierarchical nature of skill item sets justifies using the IRT model in this fashion. These items perform much as they would in a Guttman model (Guttman 1944), where a child who is able to complete a given task is expected to have mastered tasks at lower levels of ability; a failure to complete a given task implies nonmastery of items at higher levels of ability. The only difference is that Guttman items are deterministic, whereas IRT items are probabilistic. If the child masters a given milestone, it is highly likely that the child has also mastered all previous milestones.

Probabilities were calculated from IRT true scores after dividing by the total number of items in the subscale. When the resulting probabilities are plotted against the EAP ability estimates on the x axis, they represent the ICC for what is essentially a super-item constructed out of all of the items in the subscale. Users can analyze developmental milestones by examining performance-level probabilities included in the ECLS-B data file.

5.6 ECLS-B Data File

The key BSF-R mental and motor scale scores, standard error, and proficiency levels are included in the ECLS-B data file and listed in table 5-2, which provides the variable names, variable labels, and ranges of values for each.

As a final note, the data file includes a variable for BSID age. BSID age is the child's age at the time of assessment, adjusted for prematurity. BSID-II Mental and Psychomotor Index scores, together with ECLS-B mental and motor age-normed *T* scores, are all based on the child's age at assessment, corrected for prematurity. This variable was programmed into the computer-assisted personal interviewing (CAPI) portion of the Child Activities section and was generated automatically for all children. The IRT analyses that were conducted on the shorter BSF-R use BSID age to calculate mental and motor *T* scores. This information was obtained from the parent respondent at the time of the child assessments.

Table 5-2. BSF-R mental scale and motor scale variable names, variable labels, and range of values, 2-year data collection: 2003–04

Variable name	Variable label	Range of values
X2MTLTSC	ECLS-B mental age-normed <i>T</i> scores in N(50, 10) metric	15.144 – 88.814
X2MTLSCL	Mental scale (IRT true) score in publisher metric	92.351 – 174.141
X2MTLSSE	Standard error of mental scale (IRT true) score	2.378 – 8.294
X2MTL_F	Receptive vocabulary	0.037 – 1.000
X2MTL_G	Expressive vocabulary	0.005 – 1.000
X2MTL_H	Listening/comprehension	0.001 – 0.993
X2MTL_I	Matching/discrimination	0.004 – 0.990
X2MTL_J	Early counting/quantitative	0.000 – 0.962
X2MTRTSC	ECLS-B motor age-normed <i>T</i> scores in N(50, 10) metric	-15.546 – 97.362
X2MTRSCL	Motor scale (IRT true) score in publisher metric	56.427 – 108.527
X2MTRSSE	Standard error of motor scale (IRT true)score	1.624 – 5.421
X2MTR_F	Balance	0.000 – 1.000
X2MTR_G	Fine motor control	0.013 – 0.991
X2MTR_H	Uses stairs	0.003 – 0.993
X2MTR_I	Alternating balance	0.003 – 0.996
X2MTR_J	Motor planning	0.001 – 0.971

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 2-year data collection, 2003–04.

As described in the previous chapter, with the availability of BSF-R scores at both 9 months and 2 years, IRT item calibration was conducted with the full set of ECLS-B data, and all observations were rescored using the new item calibrations. The recalibrated 9-month BSF-R scores in the current data file supersede those that were released in the 9-month data file. Analysts who are specifically interested in the 9-month scores should use the new set of recalibrated 9-month scores because these are based on a more consistent scale metric. In addition, as mentioned in section 5.5, the recalibrated 9-month proficiency probability subscales are slightly different from those released in the 9-month data file. For further information about the first release of 9-month BSF-R data, please refer to chapters 2 to 5 of the *ECLS-B, Methodology Report for the Nine-Month Data Collection, Volume 1: Psychometric Characteristics* (NCES 2005-100) (Andreassen and Fletcher 2005).

The variable names and variable labels of the recalibrated 9-month BSF-R scores in this second release are listed in table 5-3.

5.7 Average BSF-R Scores and Probabilities by Key Demographic Variables

Table 5-4 and table 5-5 summarize the average scale scores, *T* scores, and probability proficiency levels for the mental scale and motor scale, respectively, for the total sample and for the main grouping variables. These grouping variables are considered to be key factors that are likely to influence children’s BSF-R scores. For example, children living at or above the poverty level tend to have higher scores on almost all variables than children living below the poverty level. For this grouping variable, the average 2-year BSF-R mental scale *T* score (X2MTLTSC) was 46.52 for children living below poverty and 50.96 for children living at or above poverty level. The means presented in these tables represent children of all ages, within each grouping variable, in the current data collection.

Table 5-3. Recalibrated 9-month BSF-R mental scale and motor scale variable names, variable labels, and range of values, 2-year data collection: 2003–04

Variable name	Variable label	Range of values
X1RMTLS	X1 R MENTAL SCALE SCORE	32.04 – 131.17
X1RMTLSE	X1 R MENTAL: STAND ERR IRT MENTAL SCALE SCORER	3.11 – 10.33
X1RMTRS	X1 R MOTOR SCALE SCORE	21.16 – 87.10
X1RMTRSE	X1 R MOTOR: STAND ERR MOTOR SCALE SCORE	1.56 – 8.65
X1RMTLT	X1 R MENTAL T-SCORE	0.09 – 99.16
X1RMTRT	X1 R MOTOR T-SCORE	2.35 – 83.86
X1MTL_A	X1 MTL PB A: EXPLORES OBJECTS	0.02 – 1.00
X1MTL_B	X1 MTL PB B: EXPLORES PURPOSEFULLY	0.00 – 1.00
X1MTL_C	X1 MTL PB C: JABBERS EXPRESSIVELY	0.00 – 1.00
X1MTL_D	X1 MTL PB D: EARLY PROBLEM SOLVING	0.00 – 1.00
X1MTL_E	X1 MTL PB E: NAMES OBJECT	0.00 – 1.00
X1MTR_A	X1 MTR PB A: EYE-HAND COORDINATION	0.03 – 1.00
X1MTR_B	X1 MTR PB B: SITTING	0.02 – 1.00
X1MTR_C	X1 MTR PB C: PRE-WALKING	0.01 – 1.00
X1MTR_D	X1 MTR PB D: STANDS ALONE	0.00 – 1.00
X1MTR_E	X1 MTR PB E: SKILLFUL WALKING	0.00 – 0.99

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 2-year data collection, 2003–04.

Table 5-4. Weighted means (and standard deviations) of the BSF-R mental scale and mental probability scores by key demographic variables, 2-year data collection: 2003–04

Characteristic	Number	BSF-R mental scale mean scores						
		Mental <i>T</i> score ¹ (X2MTLTSC)	Mental scale score (X2MTLSCL)	Receptive vocabulary (X2MTL_F)	Expressive vocabulary (X2MTL_G)	Listening/ comprehension (X2MTL_H)	Matching/ discrimination (X2MTL_I)	Early counting/ prequantitative (X2MTL_J)
Total sample	8,900	50.00 (10.00)	127.09 (10.65)	0.85 (0.19)	0.65 (0.27)	0.37 (0.22)	0.33 (0.21)	0.04 (0.09)
Child's race/ethnicity ²								
White	3,850	52.51 (9.77)	129.64 (10.32)	0.89 (0.16)	0.71 (0.25)	0.43 (0.22)	0.38 (0.22)	0.06 (0.10)
Black	1,400	47.28 (9.46)	124.10 (10.31)	0.80 (0.22)	0.57 (0.27)	0.31 (0.21)	0.27 (0.19)	0.03 (0.06)
Hispanic, race specified	1,250	46.84 (9.31)	123.92 (10.10)	0.80 (0.21)	0.56 (0.27)	0.30 (0.20)	0.26 (0.19)	0.02 (0.06)
Hispanic, no race specified	550	45.43 (8.93)	122.74 (9.77)	0.78 (0.21)	0.53 (0.26)	0.28 (0.20)	0.24 (0.18)	0.02 (0.06)
Asian	900	49.23 (10.63)	126.51 (11.31)	0.83 (0.22)	0.63 (0.28)	0.36 (0.23)	0.32 (0.21)	0.04 (0.10)
Native Hawaiian, Pacific Islander	50	46.50 (8.25)	122.92 (9.07)	0.79 (0.21)	0.55 (0.25)	0.28 (0.17)	0.24 (0.15)	0.01 (0.05)
American Indian, Alaska Native	250	45.10 (9.31)	122.10 (10.62)	0.76 (0.24)	0.52 (0.28)	0.27 (0.20)	0.23 (0.18)	0.02 (0.06)
More than 1 race	700	50.00 (9.48)	126.94 (10.18)	0.85 (0.19)	0.65 (0.27)	0.37 (0.22)	0.32 (0.20)	0.04 (0.07)
Poverty status								
Below poverty threshold	1,950	46.52 (9.15)	123.67 (9.99)	0.80 (0.21)	0.56 (0.27)	0.30 (0.20)	0.26 (0.18)	0.02 (0.06)
At or above poverty threshold	6,950	50.96 (10.01)	128.03 (10.63)	0.86 (0.18)	0.67 (0.27)	0.39 (0.22)	0.34 (0.21)	0.05 (0.09)
Child's sex								
Male	4,550	48.30 (9.99)	125.33 (10.70)	0.82 (0.21)	0.60 (0.28)	0.34 (0.22)	0.29 (0.20)	0.03 (0.08)
Female	4,350	51.78 (9.70)	128.93 (10.27)	0.88 (0.16)	0.69 (0.25)	0.41 (0.22)	0.36 (0.21)	0.05 (0.10)

See notes at end of table.

Table 5-4. Weighted means (and standard deviations) of the BSF-R mental scale and mental probability scores by key demographic variables, 2-year data collection: 2003–04—Continued

Characteristic	Number	BSF-R mental scale mean scores						
		Mental <i>T</i> score ¹ (X2MTLTSC)	Mental scale score (X2MTLSCL)	Receptive vocabulary (X2MTL_F)	Expressive vocabulary (X2MTL_G)	Listening/ comprehension (X2MTL_H)	Matching/ discrimination (X2MTL_I)	Early counting/ prequantitative (X2MTL_J)
Birth weight								
Normal	6,550	50.20 (9.97)	127.49 (10.52)	0.86 (0.19)	0.66 (0.27)	0.38 (0.22)	0.33 (0.21)	0.04 (0.09)
Moderately low	1,400	47.83 (9.99)	123.16 (10.78)	0.78 (0.23)	0.55 (0.28)	0.29 (0.21)	0.25 (0.19)	0.02 (0.07)
Very low	950	46.06 (9.68)	117.06 (10.43)	0.64 (0.27)	0.38 (0.27)	0.18 (0.17)	0.16 (0.15)	0.01 (0.03)
Child's age at assessment								
21 months and under	#	58.53 (3.71)	125.45 (3.08)	0.89 (0.07)	0.63 (0.11)	0.33 (0.08)	0.26 (0.06)	0.01 (0.00)
22–23 months	850	50.34 (10.20)	123.93 (10.79)	0.79 (0.23)	0.57 (0.28)	0.31 (0.21)	0.27 (0.19)	0.03 (0.06)
24–25 months	6,850	50.37 (9.79)	126.94 (10.40)	0.85 (0.19)	0.64 (0.27)	0.37 (0.22)	0.32 (0.21)	0.04 (0.08)
26–27 months	950	47.64 (10.20)	129.83 (10.49)	0.89 (0.16)	0.71 (0.25)	0.43 (0.22)	0.38 (0.22)	0.06 (0.11)
28 months and over	250	46.26 (12.25)	134.56 (12.13)	0.93 (0.11)	0.79 (0.22)	0.52 (0.24)	0.47 (0.25)	0.12 (0.19)
Mother's age (in years)								
19 and under	300	47.24 (8.77)	124.34 (9.30)	0.81 (0.18)	0.57 (0.26)	0.31 (0.20)	0.26 (0.18)	0.02 (0.06)
20–29	3,950	48.78 (9.62)	125.93 (10.32)	0.83 (0.19)	0.62 (0.27)	0.35 (0.22)	0.30 (0.20)	0.03 (0.08)
30–39	3,900	51.51 (10.23)	128.59 (10.85)	0.87 (0.19)	0.68 (0.27)	0.41 (0.23)	0.36 (0.22)	0.05 (0.10)
40 and over	700	50.51 (10.23)	127.32 (10.91)	0.85 (0.21)	0.66 (0.27)	0.38 (0.22)	0.33 (0.21)	0.04 (0.09)

See notes at end of table.

Table 5-4. Weighted means (and standard deviations) of the BSF-R mental scale and mental probability scores by key demographic variables, 2-year data collection: 2003–04—Continued

Characteristic	Number	BSF-R mental scale mean scores						
		Mental <i>T</i> score ¹ (X2MTLTSC)	Mental scale score (X2MTLSCL)	Receptive vocabulary (X2MTL_F)	Expressive vocabulary (X2MTL_G)	Listening/ comprehension (X2MTL_H)	Matching/ discrimination (X2MTL_I)	Early counting/ prequantitative (X2MTL_J)
Mother's race/ethnicity ²								
White	4,200	52.36 (9.69)	129.48 (10.26)	0.89 (0.16)	0.71 (0.25)	0.42 (0.22)	0.37 (0.21)	0.05 (0.10)
Black	1,450	47.44 (9.47)	124.24 (10.33)	0.80 (0.22)	0.58 (0.27)	0.31 (0.21)	0.27 (0.19)	0.03 (0.06)
Hispanic, race specified	1,500	45.93 (9.14)	123.09 (9.94)	0.78 (0.21)	0.54 (0.27)	0.29 (0.20)	0.24 (0.18)	0.02 (0.06)
Hispanic, no race specified	50	46.83 (10.61)	124.50 (12.63)	0.78 (0.28)	0.58 (0.32)	0.33 (0.24)	0.29 (0.22)	0.04 (0.09)
Asian	1,050	49.34 (10.49)	126.56 (11.19)	0.84 (0.21)	0.63 (0.28)	0.37 (0.22)	0.32 (0.21)	0.04 (0.09)
Native Hawaiian, Pacific Islander	50	48.28 (11.03)	125.17 (11.78)	0.81 (0.22)	0.58 (0.28)	0.33 (0.23)	0.29 (0.23)	0.05 (0.10)
American Indian, Alaska Native	300	45.26 (9.26)	122.37 (10.21)	0.77 (0.23)	0.52 (0.28)	0.28 (0.20)	0.24 (0.18)	0.02 (0.05)
More than 1 race	250	49.32 (10.34)	126.56 (10.74)	0.84 (0.19)	0.62 (0.27)	0.36 (0.23)	0.31 (0.22)	0.04 (0.09)

See notes at end of table.

Table 5-4. Weighted means (and standard deviations) of the BSF-R mental scale and mental probability scores by key demographic variables, 2-year data collection: 2003–04—Continued

Characteristic	Number	BSF-R mental scale mean scores						
		Mental <i>T</i> score ¹ (X2MTLTSC)	Mental scale score (X2MTLSCL)	Receptive vocabulary (X2MTL_F)	Expressive vocabulary (X2MTL_G)	Listening/comprehension (X2MTL_H)	Matching/discrimination (X2MTL_I)	Early counting/prequantitative (X2MTL_J)
Mother's education								
8th grade or below	400	44.23 (7.90)	121.74 (9.09)	0.77 (0.21)	0.51 (0.25)	0.25 (0.18)	0.22 (0.16)	0.01 (0.04)
9–12th grades	1,800	47.21 (9.10)	124.36 (9.72)	0.81 (0.20)	0.58 (0.26)	0.31 (0.20)	0.27 (0.18)	0.03 (0.07)
High school diploma	1,900	48.78 (9.78)	125.71 (10.59)	0.83 (0.21)	0.61 (0.27)	0.35 (0.22)	0.30 (0.20)	0.03 (0.08)
Vocational/technical	200	50.39 (9.54)	127.45 (10.16)	0.86 (0.17)	0.65 (0.25)	0.38 (0.22)	0.33 (0.21)	0.04 (0.09)
Some college	2,150	50.47 (9.73)	127.56 (10.36)	0.86 (0.19)	0.66 (0.27)	0.38 (0.22)	0.34 (0.21)	0.04 (0.08)
Bachelor's degree	1,450	53.33 (9.79)	130.38 (10.43)	0.90 (0.16)	0.73 (0.25)	0.44 (0.22)	0.39 (0.22)	0.06 (0.11)
Graduate school (no degree)	150	55.12 (9.58)	132.33 (10.23)	0.92 (0.16)	0.78 (0.23)	0.49 (0.21)	0.44 (0.21)	0.08 (0.11)
Master's degree	600	56.18 (10.19)	133.30 (10.64)	0.92 (0.14)	0.79 (0.23)	0.51 (0.22)	0.46 (0.23)	0.09 (0.13)
Doctoral/professional degree	200	55.38 (9.66)	132.75 (10.30)	0.92 (0.15)	0.78 (0.22)	0.50 (0.21)	0.45 (0.22)	0.08 (0.12)

Rounds to zero

¹Mental *T* scores are age-adjusted.

²Race categories exclude Hispanic origin unless specified.

NOTE: Results were obtained by using the sampling child weight W2C0, however cell counts are unweighted to demonstrate better the distribution in the ECLS-B. Standard deviations appear in parentheses. Detail may not sum to total due to rounding. Sample sizes have been rounded to the nearest 50.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 2-year data collection, 2003–04.

Table 5-5. Weighted means (and standard deviations) of the BSF-R motor scale and motor probability scores by key demographic variables, 2-year data collection: 2003–04

Characteristic	Number	BSF-R motor scale mean scores						
		Motor <i>T</i> score ¹ (X2MTRTSC)	Motor scale score (X2MTRSCL)	Balance (X2MTR_F)	Fine motor control (X2MTR_G)	Uses stairs (X2MTR_H)	Alternating balance (X2MTR_I)	Motor planning (X2MTR_J)
Total sample	8,850	50.00 (10.00)	81.47 (5.07)	0.90 (0.15)	0.56 (0.18)	0.49 (0.16)	0.31 (0.17)	0.11 (0.08)
Child's race/ethnicity ²								
White	3,800	50.20 (9.93)	81.53 (4.95)	0.90 (0.14)	0.56 (0.18)	0.49 (0.15)	0.31 (0.17)	0.11 (0.08)
Black	1,400	51.65 (9.87)	82.21 (5.10)	0.91 (0.14)	0.59 (0.18)	0.51 (0.16)	0.34 (0.18)	0.12 (0.09)
Hispanic, race specified	1,250	48.57 (9.96)	80.84 (5.15)	0.88 (0.17)	0.54 (0.19)	0.47 (0.16)	0.29 (0.17)	0.10 (0.08)
Hispanic, no race specified	550	49.09 (10.39)	81.27 (5.43)	0.89 (0.16)	0.55 (0.20)	0.48 (0.17)	0.31 (0.19)	0.11 (0.09)
Asian	900	49.53 (10.09)	81.35 (5.18)	0.89 (0.15)	0.56 (0.19)	0.48 (0.16)	0.31 (0.18)	0.11 (0.09)
Native Hawaiian, Pacific Islander	50	50.06 (7.53)	81.15 (4.44)	0.90 (0.12)	0.55 (0.16)	0.48 (0.14)	0.29 (0.16)	0.10 (0.08)
American Indian, Alaska Native	250	49.61 (9.91)	81.38 (5.19)	0.89 (0.14)	0.56 (0.19)	0.49 (0.16)	0.31 (0.18)	0.11 (0.08)
More than 1 race	650	49.76 (9.71)	81.24 (4.99)	0.89 (0.14)	0.55 (0.19)	0.48 (0.16)	0.30 (0.17)	0.10 (0.08)
Poverty status								
Below poverty threshold	1,950	49.25 (10.09)	81.24 (5.17)	0.89 (0.16)	0.56 (0.19)	0.48 (0.16)	0.30 (0.17)	0.11 (0.08)
At or above poverty threshold	6,900	50.21 (9.96)	81.53 (5.04)	0.90 (0.14)	0.57 (0.18)	0.49 (0.16)	0.31 (0.17)	0.11 (0.08)
Child's sex								
Male	4,500	49.28 (9.99)	81.11 (5.09)	0.89 (0.16)	0.55 (0.19)	0.48 (0.16)	0.30 (0.17)	0.10 (0.07)
Female	4,350	50.76 (9.95)	81.85 (5.02)	0.91 (0.13)	0.58 (0.18)	0.50 (0.16)	0.32 (0.18)	0.11 (0.09)

See notes at end of table.

Table 5-5. Weighted means (and standard deviations) of the BSF-R motor scale and motor probability scores by key demographic variables, 2-year data collection: 2003–04—Continued

Characteristic	BSF-R motor scale mean scores							
	Number	Motor <i>T</i> score ¹ (X2MTRTSC)	Motor scale score (X2MTRSCL)	Balance (X2MTR_F)	Fine motor control (X2MTR_G)	Uses stairs (X2MTR_H)	Alternating balance (X2MTR_I)	Motor planning (X2MTR_J)
Birth weight								
Normal	6,500	50.12 (9.93)	81.65 (4.97)	0.90 (0.14)	0.57 (0.18)	0.49 (0.15)	0.32 (0.17)	0.11 (0.08)
Moderately low	1,400	48.72 (10.53)	79.77 (5.52)	0.85 (0.19)	0.50 (0.20)	0.44 (0.16)	0.26 (0.16)	0.09 (0.07)
Very low	900	47.40 (11.65)	76.73 (5.81)	0.75 (0.25)	0.39 (0.20)	0.35 (0.16)	0.18 (0.14)	0.06 (0.05)
Child's age at assessment								
21 months and under	#	62.91 (6.68)	81.73 (3.06)	0.93 (0.11)	0.59 (0.13)	0.50 (0.09)	0.30 (0.08)	0.10 (0.03)
22–23 months	850	52.75 (10.50)	80.59 (5.29)	0.87 (0.17)	0.53 (0.20)	0.46 (0.16)	0.28 (0.17)	0.10 (0.08)
24–25 months	6,800	50.21 (9.55)	81.21 (4.82)	0.90 (0.15)	0.56 (0.18)	0.48 (0.15)	0.30 (0.16)	0.10 (0.07)
26–27 months	950	46.46 (10.59)	83.12 (5.31)	0.92 (0.13)	0.62 (0.18)	0.54 (0.16)	0.38 (0.20)	0.14 (0.10)
28 months and over	250	45.20 (12.85)	86.54 (6.37)	0.96 (0.11)	0.71 (0.18)	0.64 (0.18)	0.51 (0.24)	0.23 (0.17)
Mother's age (in years)								
19 and under	300	49.11 (10.73)	81.11 (5.56)	0.88 (0.17)	0.55 (0.20)	0.48 (0.17)	0.30 (0.19)	0.11 (0.09)
20–29	3,950	49.74 (9.85)	81.42 (5.07)	0.90 (0.15)	0.56 (0.18)	0.49 (0.16)	0.31 (0.17)	0.11 (0.08)
30–39	3,900	50.47 (10.06)	81.64 (5.01)	0.90 (0.14)	0.57 (0.18)	0.49 (0.16)	0.32 (0.17)	0.11 (0.08)
40 and over	700	49.23 (10.17)	80.89 (5.18)	0.88 (0.16)	0.54 (0.19)	0.47 (0.16)	0.29 (0.17)	0.10 (0.08)

See notes at end of table.

Table 5-5. Weighted means (and standard deviations) of the BSF-R motor scale and motor probability scores by key demographic variables, 2-year data collection: 2003–04—Continued

Characteristic	Number	BSF-R motor scale mean scores						
		Motor <i>T</i> score ¹ (X2MTRTSC)	Motor scale score (X2MTRSCL)	Balance (X2MTR_F)	Fine motor control (X2MTR_G)	Uses stairs (X2MTR_H)	Alternating balance (X2MTR_I)	Motor planning (X2MTR_J)
Mother's race/ethnicity ²								
White	4,200	50.22 (9.86)	81.53 (4.95)	0.90 (0.14)	0.56 (0.18)	0.49 (0.15)	0.31 (0.17)	0.11 (0.08)
Black	1,400	51.81 (9.88)	82.27 (5.11)	0.91 (0.14)	0.59 (0.18)	0.51 (0.16)	0.34 (0.18)	0.12 (0.09)
Hispanic, race specified	1,500	48.62 (10.20)	80.94 (5.29)	0.88 (0.17)	0.54 (0.19)	0.47 (0.16)	0.29 (0.17)	0.10 (0.08)
Hispanic, no race specified	50	48.73 (8.81)	81.32 (5.00)	0.90 (0.13)	0.55 (0.19)	0.48 (0.16)	0.31 (0.18)	0.11 (0.07)
Asian	1,050	49.27 (10.22)	81.17 (5.15)	0.89 (0.15)	0.55 (0.19)	0.48 (0.16)	0.30 (0.18)	0.10 (0.08)
Native Hawaiian, Pacific Islander	50	51.51 (8.98)	82.11 (4.94)	0.91 (0.13)	0.59 (0.18)	0.51 (0.15)	0.33 (0.17)	0.12 (0.09)
American Indian, Alaska Native	300	49.07 (9.48)	81.17 (4.86)	0.89 (0.13)	0.55 (0.18)	0.48 (0.15)	0.30 (0.17)	0.10 (0.07)
More than 1 race	250	47.22 (10.25)	80.19 (4.92)	0.87 (0.16)	0.52 (0.19)	0.45 (0.15)	0.27 (0.16)	0.09 (0.06)

See notes at end of table.

Table 5-5. Weighted means (and standard deviations) of the BSF-R motor scale and motor probability scores by key demographic variables, 2-year data collection: 2003–04—Continued

Characteristic	Number	BSF-R motor scale mean scores						
		Motor <i>T</i> score ¹ (X2MTRTSC)	Motor scale score (X2MTRSCL)	Balance (X2MTR_F)	Fine motor control (X2MTR_G)	Uses stairs (X2MTR_H)	Alternating balance (X2MTR_I)	Motor planning (X2MTR_J)
Mother's education								
8th grade or below	400	47.65 (9.41)	80.73 (5.05)	0.88 (0.16)	0.54 (0.19)	0.47 (0.16)	0.28 (0.17)	0.10 (0.07)
9–12th grades	1,800	49.47 (9.95)	81.32 (5.11)	0.89 (0.16)	0.56 (0.19)	0.48 (0.16)	0.31 (0.17)	0.11 (0.08)
High school diploma	1,900	49.79 (9.95)	81.31 (5.07)	0.89 (0.15)	0.56 (0.19)	0.48 (0.16)	0.31 (0.17)	0.11 (0.08)
Vocational/technical	150	51.91 (9.98)	82.39 (5.05)	0.92 (0.12)	0.59 (0.18)	0.52 (0.16)	0.34 (0.19)	0.12 (0.09)
Some college	2,150	49.87 (10.17)	81.39 (5.04)	0.90 (0.14)	0.56 (0.18)	0.49 (0.16)	0.31 (0.17)	0.11 (0.08)
Bachelor's degree	1,450	51.01 (10.05)	81.84 (5.10)	0.91 (0.14)	0.57 (0.18)	0.50 (0.16)	0.32 (0.18)	0.11 (0.09)
Graduate school (no degree)	150	49.80 (8.59)	81.30 (4.39)	0.90 (0.13)	0.56 (0.17)	0.48 (0.14)	0.30 (0.15)	0.10 (0.06)
Master's degree	600	51.47 (9.96)	82.06 (5.07)	0.91 (0.13)	0.58 (0.18)	0.51 (0.16)	0.33 (0.18)	0.12 (0.09)
Doctoral/professional degree	200	51.47 (9.56)	82.25 (4.91)	0.91 (0.13)	0.59 (0.18)	0.51 (0.15)	0.34 (0.18)	0.12 (0.08)

Rounds to zero.

¹Motor *T* scores are age-adjusted.

²Race categories exclude Hispanic origin unless specified.

NOTE: Results were obtained by applying the sampling child weight W2C0, however cell counts are unweighted to demonstrate better the distribution in the ECLS-B. Standard deviations appear in parentheses. Detail may not sum to total due to rounding. Sample sizes have been rounded to the nearest 50.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), 2-year data collection, 2003–04.