

**Oregon's EI/ECSE Outcomes Analysis  
2015 - 2016**

Daniel Anderson, PhD Research Associate, University of Oregon  
Judy Newman, MS Co-Director, Early Childhood CARES  
LaWanda Potter, MS Program Coordinator, Early Childhood CARES  
Daniel Smellow, ecWeb Database Administrator

*We would like to acknowledge and thank the Review Team for their support and guidance throughout this process. Team members include: Bruce Sheppard from the Oregon Department of Education, Susan Graham from Douglas ESD, Daniel Anderson PhD from the University of Oregon and LaWanda Potter, Dan Smellow and Judy Newman from Early Childhood CARES. A special thank you to Gerald Tindal PhD from the University of Oregon, Behavioral Research and Teaching for his consultation and support to the process.*

The state of Oregon uses the Assessment, Evaluation, and Programming System (AEPS) to report to The Office of Special Education Programs (OSEP) on the status of children receiving early intervention and early childhood special education services on three required outcomes: outcome A -positive social- emotional skills (including social relationships); outcome B-acquisition and use of knowledge and skills (including early language development and early literacy); and outcome C - use of appropriate behaviors to meet their own needs. OSEP requires each state calculate and report the following for each of the three outcomes annually:

- The percentage of infants & toddlers who entered early intervention below age expectations and substantially increased their rate of growth by age 3 or when they exited the program.
- The percentage of infants & toddlers who were functioning within age expectations by age 3 when they exited the program.
- The percentage of preschool children who entered the preschool program below age expectations and substantially increased their rate of growth by age 6 or when they exited the program.
- The percentage of preschool children who were functioning within age expectations by age 6 when they exited the program.

States have been reporting to OSEP on these outcomes for six years and the results reported by Oregon have been consistently different than other states. A review team was established and charged with examining the potential reasons for Oregon's different performance on the outcomes.

Oregon approaches data collection and outcome reporting differently than other states. A comprehensive curriculum based measure (AEPS) is used as the only data source to calculate outcomes. Oregon chose this method to make the information and process of calculating outcomes as objective as possible. Further, all service providers in Oregon use the AEPS to select goals and objectives and track progress for the majority of children they serve. Eligible children receiving services from the early intervention (EI) and early childhood special education (ECSE) programs in Oregon are administered the AEPS assessment upon entry and exit, provided there are at least six-months between

these dates. The only exception are children eligible for ECSE services because of articulation and are functioning at age level in all developmental areas. Most other states use the Child Outcomes Summary Form (COSF) to calculate outcomes. The COSF involves a team of professionals reviewing more than one assessment on each child and making a determination on the child's progress and then assigning the child to one of the outcomes categories listed above in the bulleted list. This method uses a more subjective determination of progress by the team of professionals. Some states use the AEPS as one of the assessments considered in their COSF process. However, the AEPS data are compiled and calculated differently in the following ways:

- States other than Oregon use either (a) the test item sorts (into outcomes) and calculations developed by the Brookes publisher, or (b) the percentage of items a child can successfully perform by developmental domain. Oregon, by contrast, uses the test item sorts suggested by the Early Childhood Outcomes (ECO) Center, now the Early Childhood Technical Assistance Center (NECTAC), and the calculations developed by researchers and experts in Oregon.
- In Oregon items were compared to the same or similar items on standardized assessments and then reviewed by a panel of developmental experts to assign a chronological age to each assessment item. The Brookes calculation was based on an IRT (Rasch) model with items ordered in terms of difficulty. Average scores for each chronological age were then estimated.
- In the Brookes outcomes (A, B, C), the short term objectives and long term goals of each test item are included in the calculations, while only the long term goals were recommended by the ECO Center and used for the Oregon calculations.
- When Brookes calculates the progress children made on outcomes, they use a 90% cut off level representing the score that 90% of typically developing children that age would score. Children are considered delayed when they are unable to successfully perform skills that 90% of typically developing children would be able to perform. Oregon uses an 80% threshold, rather than 90%.

The review team began their analysis of Oregon's outcome differences by first establishing whether or not children in EI/ECSE programs in Oregon are different than

children in EI/ECSE programs in other states by using item-level data to make the scores more directly comparable, despite the differences listed above. The team then focused on the degree to which differences in the way the AEPS items were sorted into the three outcome categories contributed to the differences in results followed by an analysis to determine the degree to which inclusion of the short term objectives contributed to the differences in results. This phase of the study is referred to as the *Comparability Analysis* and involves three distinct analyses, which are described in detail below.

### **Phase 1: Comparability Analysis**

The purpose of this study was to apply common methods (i.e., the same items for each outcome) to an Oregon dataset and a national dataset so the data could be more readily compared. Table 1 below provides the three study research questions, and the corresponding analyses conducted. A separate analysis was conducted for each of the separate research questions listed in Table 1 below. More discussion of each analysis is provided in the Methods section.

Table 1  
*Research Questions and Analyses for Phase 1: Comparability Analysis*

Research Question	Analysis
1 To what extent do Oregon children score differently than children nationally?	Oregon’s method of sorting items into each outcome (A, B, C) was applied to the national dataset. Differences in mean scores between Oregon and the national dataset were then evaluated.
2 How much do children’s scores differ when Oregon’s method of sorting items into outcomes is applied versus the sort used by Brookes?	Only the national dataset was used, and two scores on each outcome were computed for each child: one using Oregon’s method of sorting items into outcomes, and one using the Brookes method of sorting items into outcomes.
3 To what extent do children’s scores vary when short-term objectives are included, rather than just long-term objectives?	The Brookes method of sorting items into outcomes (A, B, C) was applied with long-term objectives only, and compared to short- and long- term objectives.

## Methods

**Sample and Data Cleaning.** There are two levels of the AEPS, with one designed for children 0-3 years old (Level 1), and the other designed for children 3-5 years old (Level 2). A portion of ECSE age children (3-5 years old) are given the Level 1 version of the AEPS because developmentally this is a better match for their skill level. There were therefore three distinct samples of children: (1) EI age children taking AEPS Level 1, (2) ECSE age children taking AEPS Level 1, and (3) ECSE age children taking AEPS Level 2. For each of these samples, a dataset corresponding to an Oregon sample and national sample was used. The second dataset, ECSE age children taking the AEPS Level 1, was only used in the analysis of the first research question. Across samples, the Oregon data contained only total outcome scores for each of the three outcomes, while the national datasets contained item-level information in addition to total outcome scores. Table 2 below reports the sample size for each sample before and after restricting the data to an analytic sample. For the Oregon sample, the difference between the raw and analytic sample was due to out-of-range records being removed. For the national sample, the difference between the raw and analytic samples were due to restricting the sample to (a) children aged 0-36 months [EI] or 37-60 months [ECSE]; (b) only children coded as “Developmentally Delayed”; and (c) only children who had at least two records, with only the first and last record used in the analysis. These restrictions were needed to have a national sample comparable to the Oregon sample.

Table 2

*Sample sizes by dataset*

Sample	Raw <i>n</i> records	Analytic <i>n</i> records
Oregon EI: AEPS 1	14,937	14,791
National EI: AEPS 1	21,710	8,258
Oregon ECSE: AEPS 1	713	684
National ECSE: AEPS 1	10,429	9,252
Oregon ECSE: AEPS 2	16,023	15,884
National ECSE: AEPS 2	54,694	36,044

**Research Question 1 results: *To what extent do Oregon children score differently than children nationally?***

For the first research question, items from the national dataset were sorted into each of Outcomes A, B and C according to the sorting method used by Oregon. Raw total scores were then computed for each outcome, which were directly comparable between datasets given the common items used and the common sort. (One dataset used the Oregon sample and the other used the national sample.) The difference in means between datasets on each outcome were then compared using a *t*-test. It is worth noting, however, that *a priori* we expected there to be statistically significant differences in the means because of the large overall sample size (see Table 2). As such, we evaluated the difference between mean scores primarily for practical, rather than statistical, significance. A 95% confidence interval on the difference between means was computed for each outcome. Large differences between the means would suggest the scores for Oregon children were different (i.e., lower or higher) than average nationally. Small differences were not interpreted as being substantively meaningful (regardless of statistical significance). The analysis was completed for both the first (entrance) and last

(exit) assessments. The distribution of each outcome was also plotted for each dataset to facilitate visual comparisons between the Oregon and National samples.

The distributions of children's scores when applying the Oregon item sorting method to both datasets are displayed for the entrance assessments in Figures 1.1, 1.3, and 1.5, while the distributions of the exit assessment are displayed in Figures 1.2, 1.4, and 1.6. EI children given the AEPS 1 are displayed in Figures 1.1-1.2, ECSE children given the AEPS 1 are displayed in Figures 1.3-1.4, and ECSE children given the AEPS 2 are displayed in Figures 1.5-1.6. For each plot, the national distributions are displayed in blue, while the Oregon distributions are displayed in green. The mean of each distribution is displayed with a vertical dashed red line. A 95% confidence interval on the difference between the National and Oregon means are printed for each outcome.

EI children given the AEPS 1 in Oregon entered the program scoring, on average, 3.24, 5.82, and 6.43 points lower than the national average on Outcomes A, B and C, respectively. These were all statistically significant differences ( $p < .05$ ). However, by the time children were given their exit assessment, children in Oregon were scoring, on average, 0.40 points lower on Outcome X, which was statistically significant ( $p < .05$ ), but not likely substantively meaningful. Children in Oregon did not score statistically significantly different than the national sample on Outcome Y, and scored, on average, 0.69 points higher on Outcome Z, which was statistically significant ( $p < .05$ ).

ECSE children given the AEPS 1 in Oregon entered the program scoring, on average, 1.47, 4.55, and 2.76 points lower than the national average on Outcomes A, B and C, respectively. These were all statistically significant differences ( $p < .05$ ). However, by the time children were given their exit assessment, children in Oregon were scoring, on average, 1.47, 4.55, and 2.76 points higher on Outcomes A, B and C, respectively, which were all statistically significant ( $p < .05$ ).

ECSE children given the AEPS 2 in Oregon entered the program scoring, on average, 7.45, 2.16, and 0.29 points lower than the national average on Outcomes A, B and C, respectively. These were all statistically significant differences ( $p < .05$ ). However, by the time children were given their exit assessment, children in Oregon were scoring, on

average, 7.57, 1.90, and 0.62 points lower on Outcomes A, B and C respectively, which were all statistically significant ( $p < .05$ ).

In sum, these results suggest that when children in Oregon are compared to a national sample using common items, they appear to generally enter the program with lower scores, but exit with scores comparable or higher than their peers nationally. While some children appear to exit with lower scores than the national sample, these differences are not generally substantively meaningful. The exception were ECSE children in the AEPS 2, who began much lower, and generally maintained this gap upon exit. For many outcomes, however, despite the  $t$ -test being significant, their levels of achievement on exit were, for all intents and purposes, indistinguishable. The conclusion, then, is that there are no substantively meaningful differences between children served in EI/ECSE programs in Oregon and those served in other states. And for the purpose of this study, the two data sets can be considered comparable for further analysis.



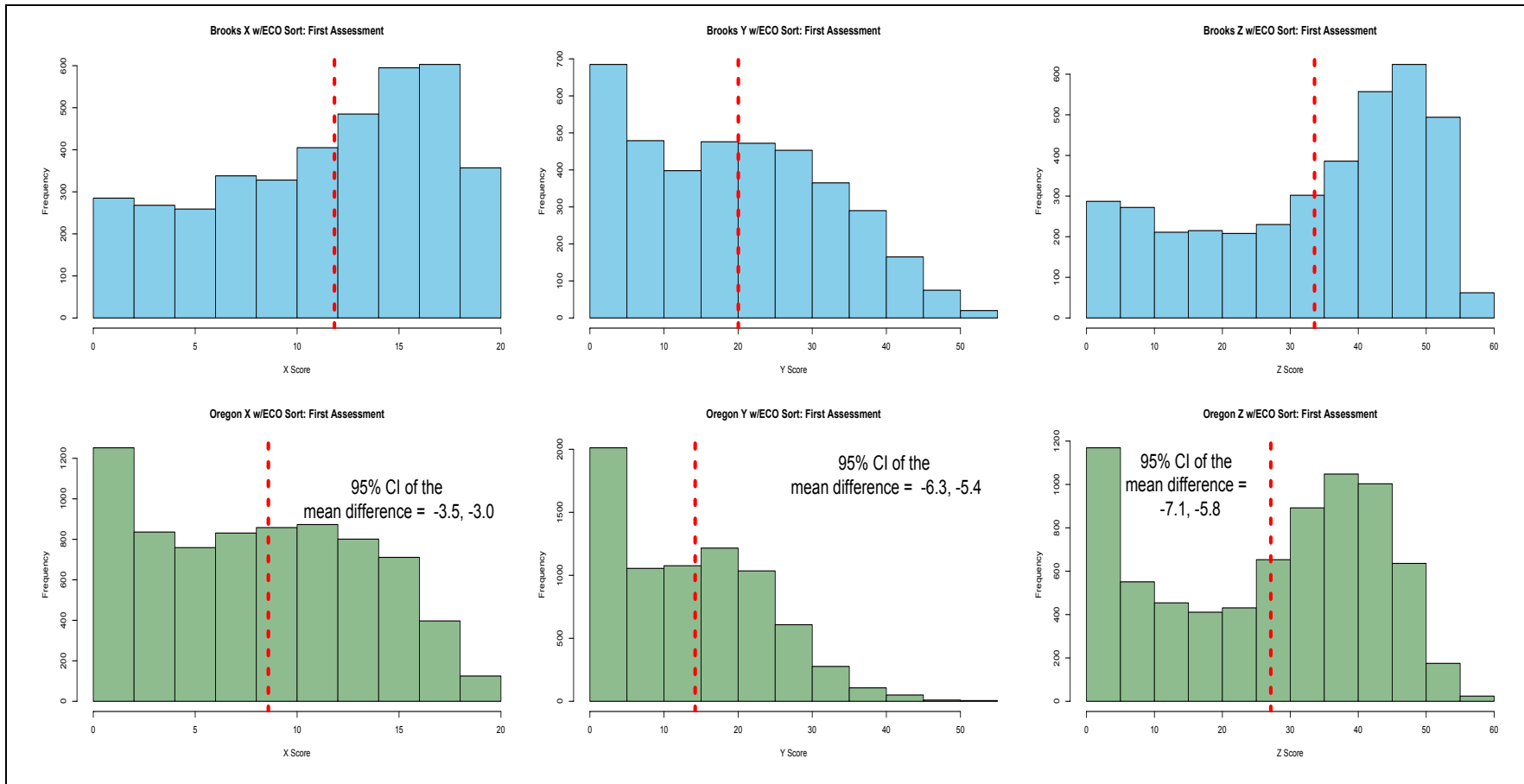


Figure 1.2. Distribution of each outcome for the Oregon and National Samples: EI AEPS 1 Exit Test. Note that the mean of each distribution is displayed with a red dotted vertical line. The mean difference between each distribution is displayed in text for each Oregon distribution. Confidence intervals crossing zero are not statistically significant.

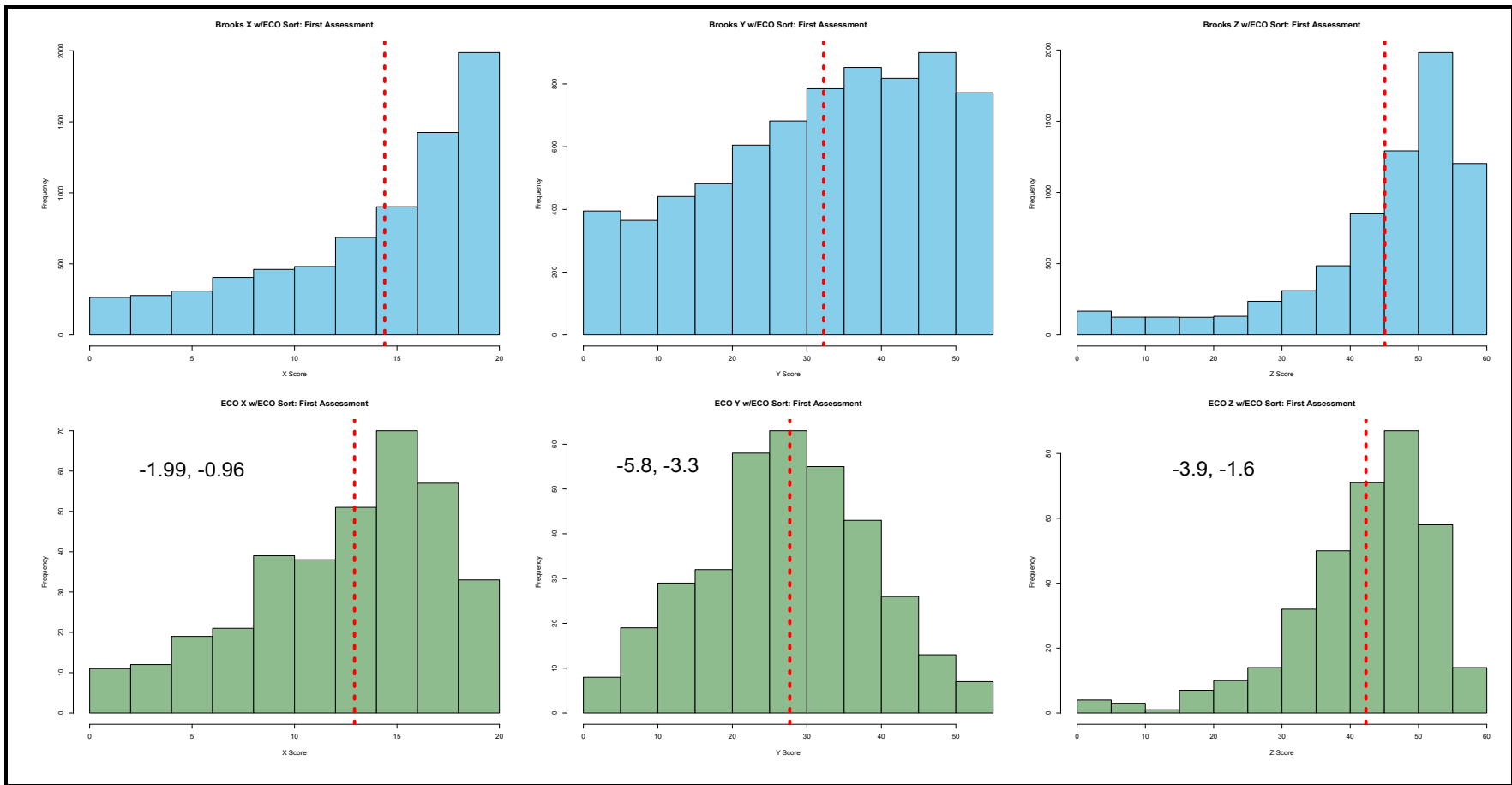


Figure 1.3. Distribution of each outcome for the Oregon and National Samples: ECSE AEPS 1 Entrance Test. Note that the mean of each distribution is displayed with a red dotted vertical line. The mean difference between each distribution is displayed in text for each Oregon distribution. Confidence intervals crossing zero are not statistically significant.

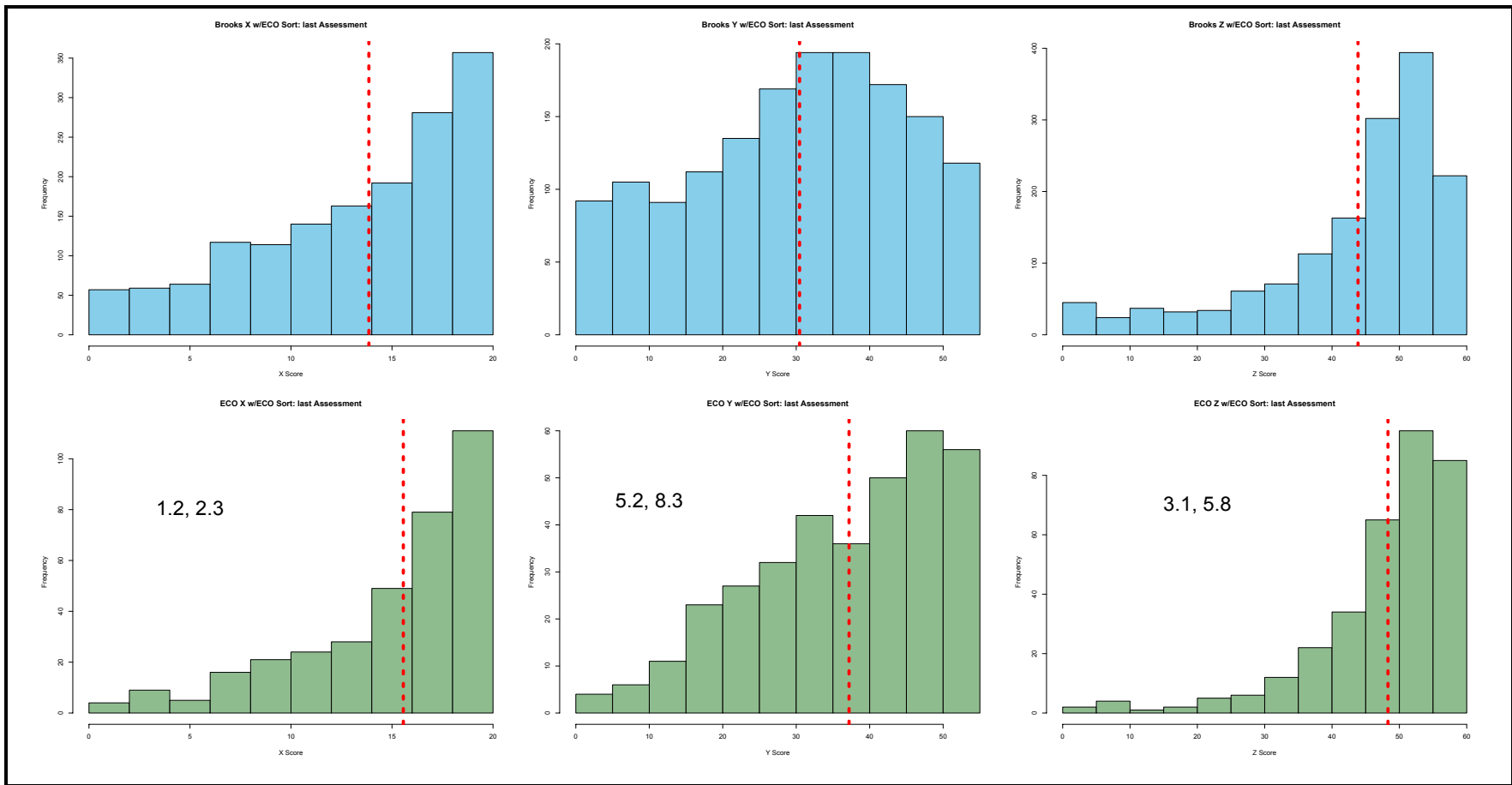


Figure 1.4. Distribution of each outcome for the Oregon and National Samples: ECSE AEPS 1 Exit Test. Note that the mean of each distribution is displayed with a red dotted vertical line. The mean difference between each distribution is displayed in text for each Oregon distribution. Confidence intervals crossing zero are not statistically significant.

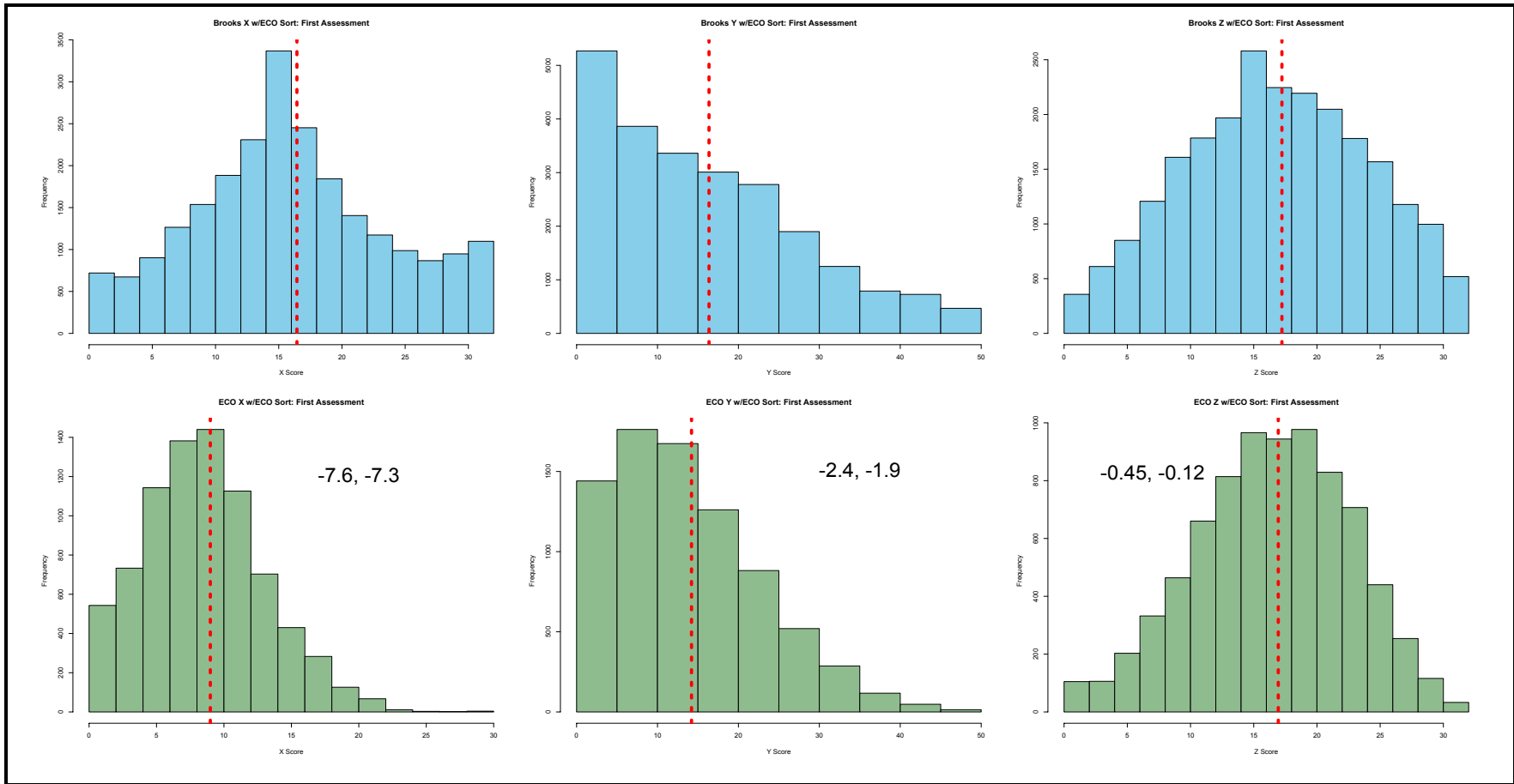


Figure 1.5. Distribution of each outcome for the Oregon and National Samples: ECSE AEPS 2 Entrance Test. Note that the mean of each distribution is displayed with a red dotted vertical line. The mean difference between each distribution is displayed in text for each Oregon distribution. Confidence intervals crossing zero are not statistically significant.

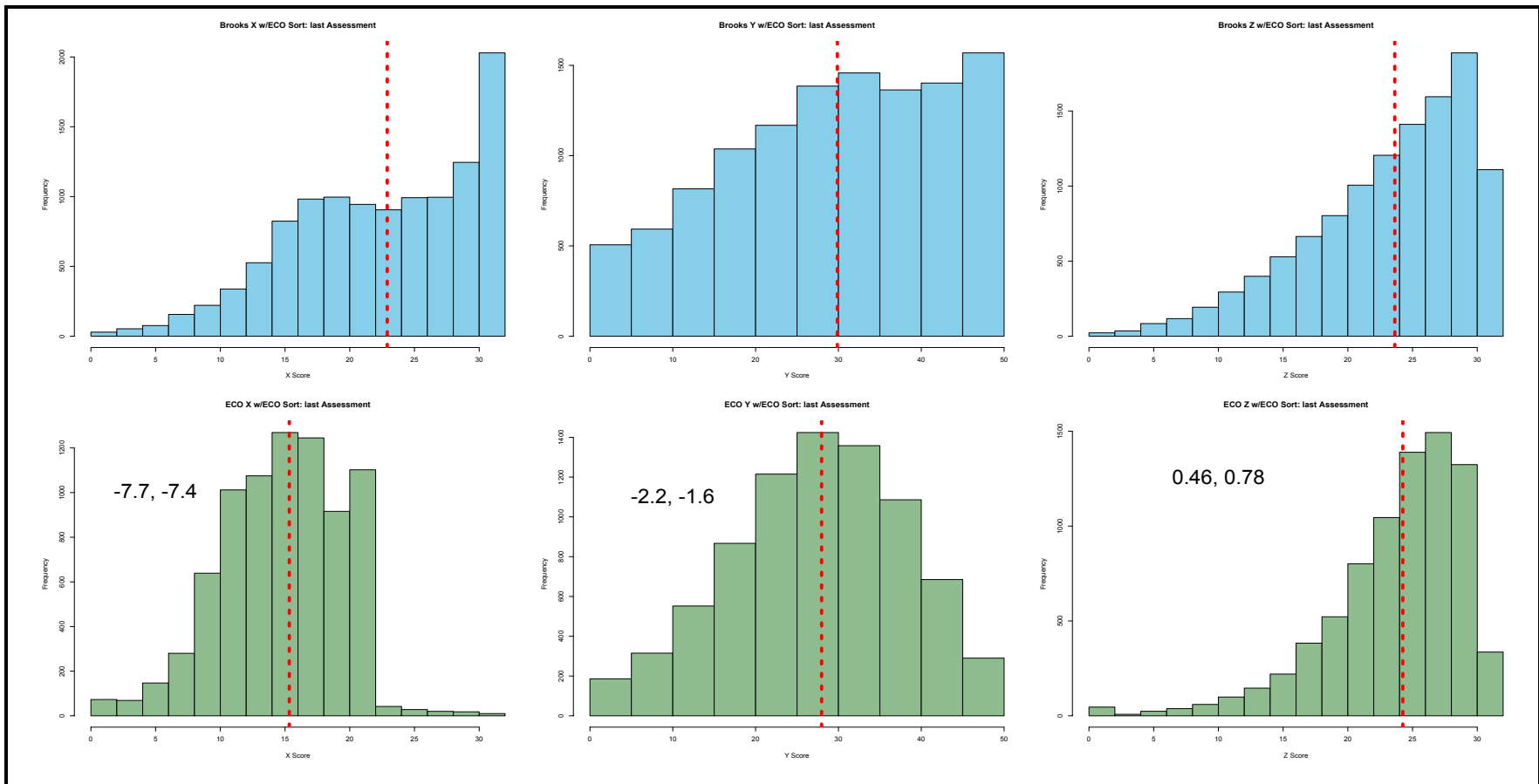


Figure 1.6. Distribution of each outcome for the Oregon and National Samples: ECSE AEPS 2 Exit Test. Note that the mean of each distribution is displayed with a red dotted vertical line. The mean difference between each distribution is displayed in text for each Oregon distribution. Confidence intervals crossing zero are not statistically significant.

**Research Question 2 results: *How much do children’s scores differ when Oregon’s method of sorting items into outcomes is applied versus the sort used by Brookes?***

For the second research question, only the national dataset was used. Children’s scores on each outcome were then computed using both sorting methods (Oregon’s and Brooke’s). Given that the two sorts included a different number of items in each outcome, mean scores could not be compared. However, scores were correlated to examine the extent to which children’s scores computed by one sort corresponded to the score when the alternative sort was used.

Figures 2.1 to 2.4, below, display scatterplots of children’s scores calculated by both the Oregon and the Brookes item sorting method. Scatterplots for the EI age children are displayed in Figures 2.1 and 2.2, while ECSE age children scores are displayed in Figures 2.3 and 2.4. Pearson’s correlation coefficient,  $r$ , is also displayed in each plot. The correlations were all quite strong, indicating that the two sorts were both getting at the same underlying construct. However, meaningful differences were apparent when viewing the data on a by-child basis.

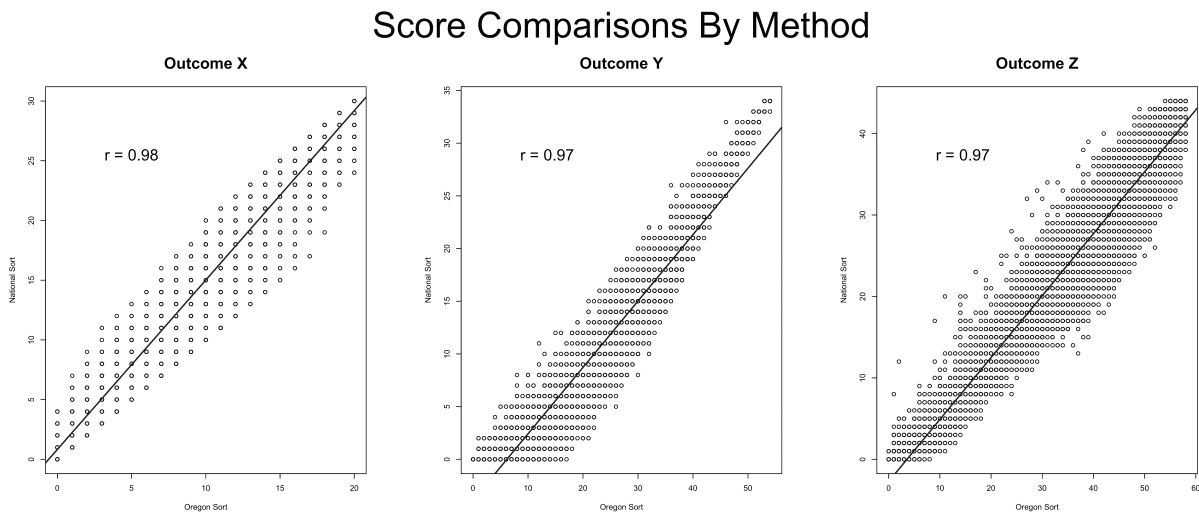


Figure 2.1. *AEPS 1: EI Children, First Assessment*

## Score Comparisons By Method

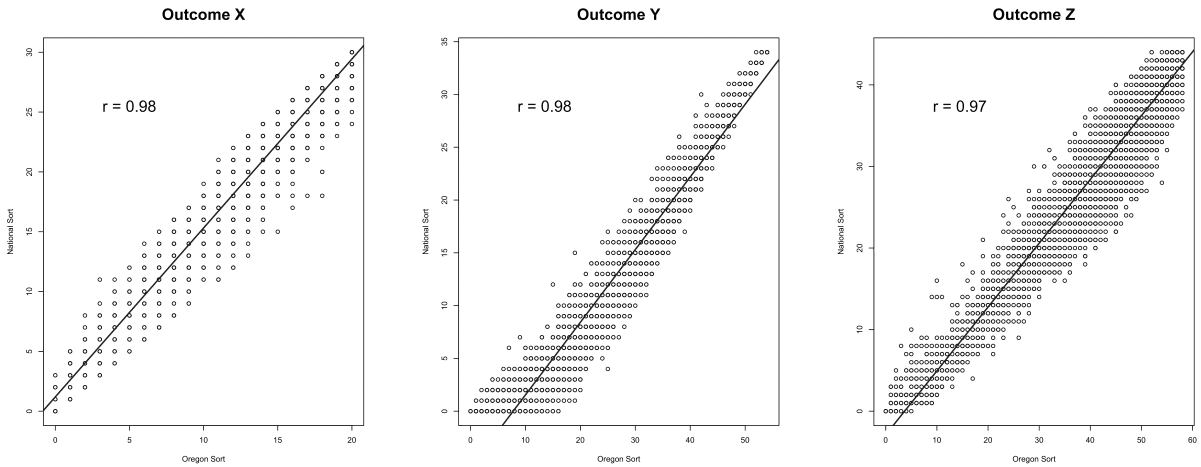


Figure 2.2. AEPS 1: EI Children, Last Assessment

## Score Comparisons By Method

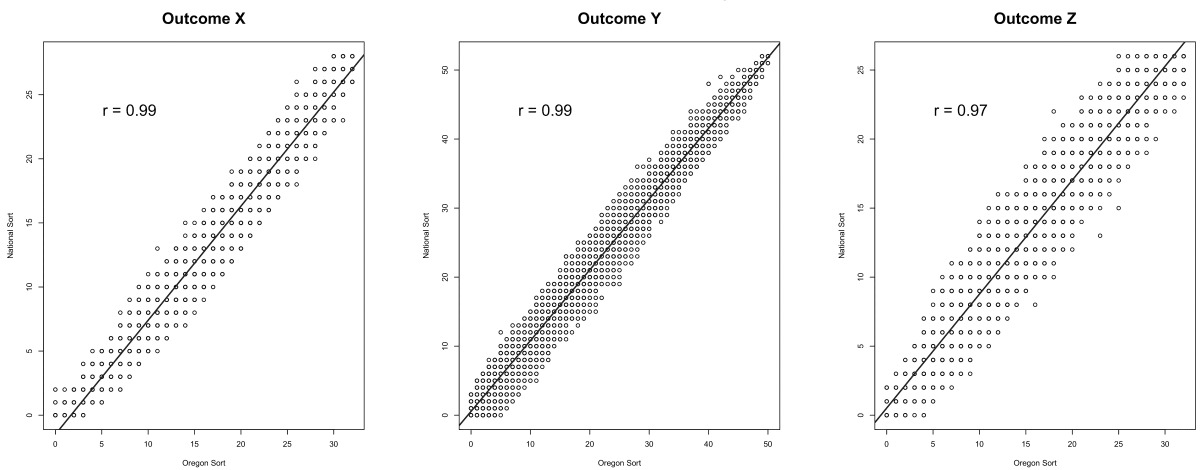


Figure 2.3. AEPS 2: ECSE Children, First Assessment

## Score Comparisons By Method

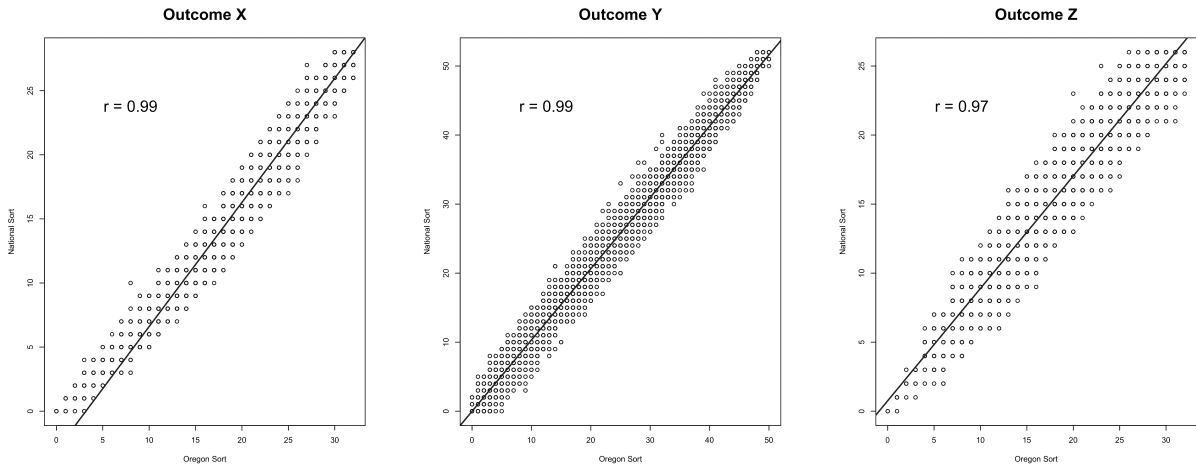


Figure 2.4. AEPS 2: ECSE Children, Last Assessment

In summary these results indicate that the two sorting methods are comparable and highly correlated. There were no statistical differences between *groups* when using the Oregon method to sort AEPS test items into the three outcome categories (A, B, C), rather than when using the Brookes method.

### **Research Question 3 results: *To what extent do children's scores vary when short-term objectives are included, rather than just long-term objectives?***

Only the national dataset was used with the Brookes item sort. Children's scores were computed using long-term goals only, versus with long-term goals and short term objectives. Again, mean score differences between these methods would not be meaningful, given that including short-term objectives resulted in substantially more items. However, children's scores computed with each method were correlated for each outcome. This provided an indication as to whether the inclusion of short-term objectives resulted in the measurement of a different construct.

Overall, we found that the ability estimates correlated very high, implying that the overall "picture" of children's performance would not change when only long term goals are used as compared to when long term goals and short term objectives are used. Figures 3.1 to 3.4 plot these relations. Figures 3.1 and 3.2 show the comparison for each outcome for EI age children and Figures 3.3 and 3.4 show the same comparison for the ECSE age children.



## Scoring with Long- Versus Long- & Short-Term Goals

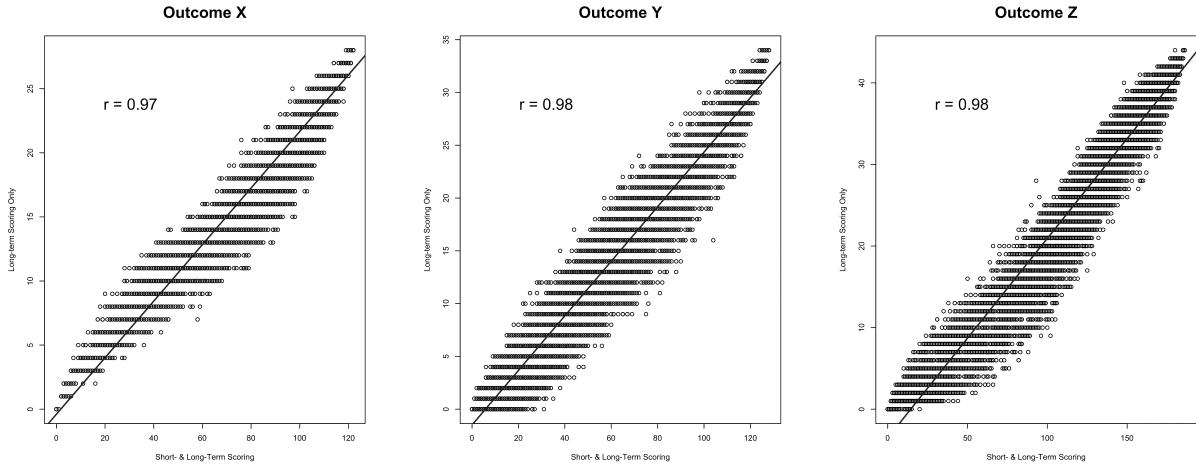


Figure 3.1. *AEPS 1: EI Children, First Assessment*

## Scoring with Long- Versus Long- & Short-Term Goals

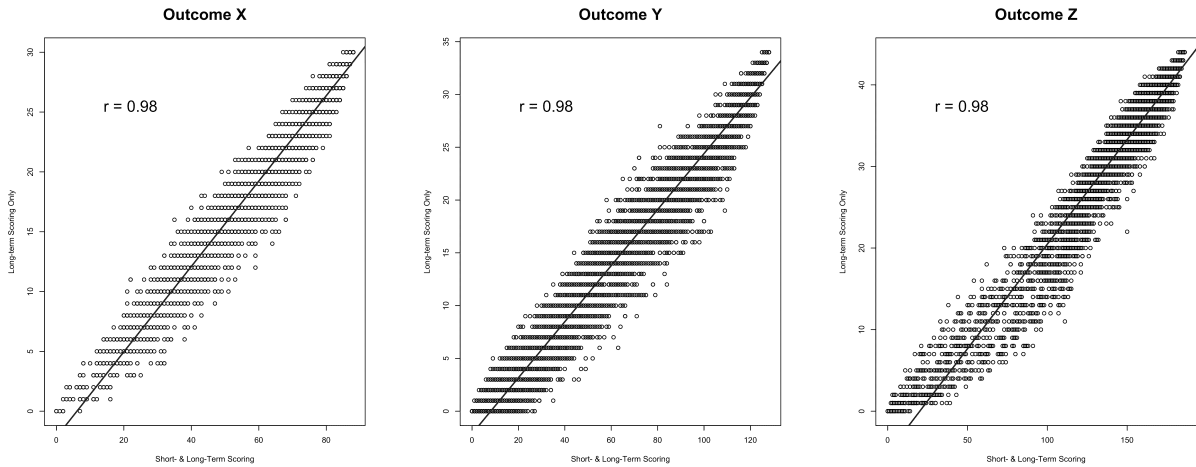


Figure 3.2. *AEPS 1: EI Children, Last Assessment*

## Scoring with Long- Versus Long- & Short-Term Goals

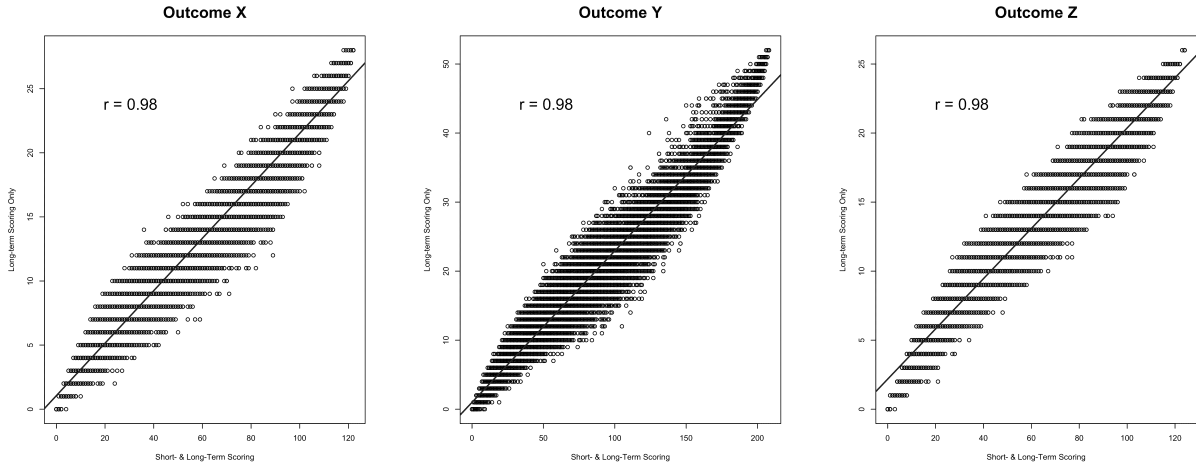


Figure 3.3. *AEPS 2: ECSE Children, First Assessment*

## Scoring with Long- Versus Long- & Short-Term Goals

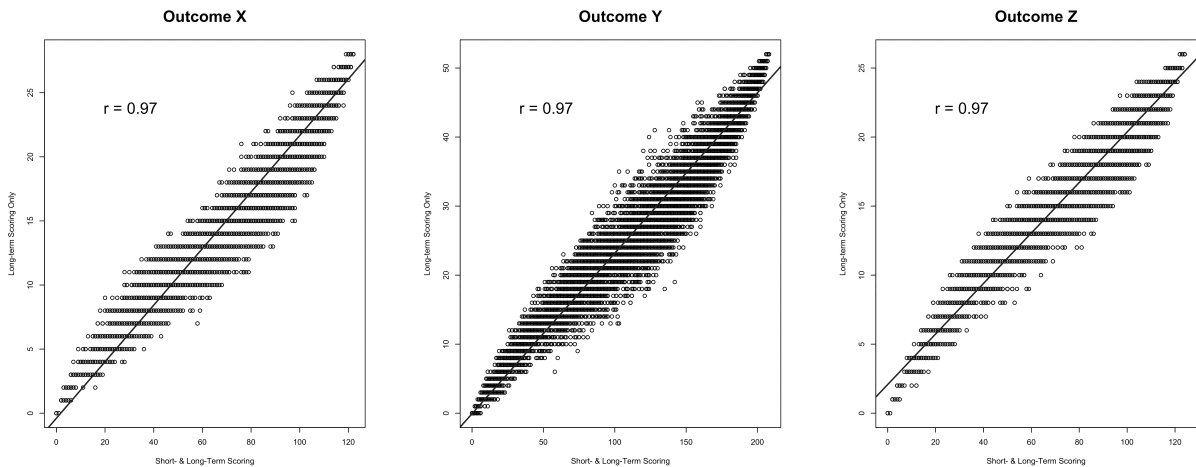


Figure 3.4. *AEPS 2: ECSE Children, Last Assessment*

### Conclusions of Phase 1 Comparability Analysis

The results of these three analyses suggest that (a) when common methods are used, children in Oregon do not appear to be performing substantially different upon exit from the EI or ECSE programs, although Oregon children do enter performing substantially lower; (b) inferences of children's ability, overall, are invariant to both the method used for sorting items into outcomes and the inclusion of short-term objectives versus long term goals only, while (c) inferences about a *single child* may depend on these factors.

Following this analysis, Oregon made a decision to set new developmental standards for each age using the method for sorting items into outcomes used by Paul Brookes publisher, and to include short-term objectives into the outcome calculation. These decisions were made, in part, to better align with data collected and analyzed nationally, as well as to obtain more nuanced information about children that could potentially be used to inform individual decisions.

## **Phase 2: Setting New Cut-Off Points**

Phase 2 of the project involved setting new cutoff scores (developmental standards) for the Brookes item sort using the long term goals and short term objectives. This was accomplished using a four-step process. Step 1 consisted of setting initial cut-scores guided by an empirical process with a large extant dataset (the national dataset used in the analyses in Phase 1). Step 2 consisted of gathering judgments by experts in the field to confirm or modify the initial cut-score placement. Step 3 consisted of reviewing the recommendations from the experts and determining final cut-score placement, based on balancing recommendations from the field with empirical evidence from a small pilot sample of children. Finally step 4 of the project compared and considered the data results using 90%, 85% and 80% percentile cutoffs and the national data results to decide what cutoff level best reflected Oregon's children in EI/ECSE programs.

### **Step 1**

A large national dataset was used to set initial developmental cut scores for each outcome. The dataset was the same that was used in Phase 1, but was restricted to include only children who were typically developing. Raw-total scores were then computed for each child for each outcome. The normative 10<sup>th</sup>, 15<sup>th</sup>, 20<sup>th</sup> and 50<sup>th</sup> percentiles were then calculated for each outcome by child's age, in months, rounded to the nearest whole month. These represented the points at which 90%, 85%, 80% and 50% of children who were typically developing would perform at or above, respectively, for the corresponding age. The raw-total score corresponding to a particular percentile (i.e., 10<sup>th</sup>) generally increased as age increased. However, there was some variability due to measurement and sampling error, necessitating a smoothing function be applied (e.g., so the cut score did not bounce around as age level increased). Three smoothing functions were explored: linear, quadratic, and a locally weighted scatterplot smoothing (LOESS).

Figure 4.1-4.3 below shows the plots evaluated to set initial cut scores. The plots shown represent Outcome A, B and C for the AEPS level 1 (for birth to 3 year old children). Similar plots are presented for Outcome A, B and C for the AEPS level 2 (for 3 to 5 year old children) in Figure 4.4-6.6. At the top of the figures, a histogram of the number of children represented within each age, in months, is presented. The histogram helped evaluate how many children's scores were represented within each normative data point. A child's age, in months, is plotted along the x-axis of the figures below the histogram, while their score is plotted along the y-axis. Among children within each age month, the scores corresponding to the normative 10<sup>th</sup> percentile are plotted with red circles, while the scores corresponding to the normative 50<sup>th</sup> percentile are plotted with blue triangles. The 50<sup>th</sup> percentile data points were plotted as a point of reference relative to the 10<sup>th</sup> percentile data points. Three smoothing functions were then fit, with the LOESS displayed by the thin line of the corresponding color, linear function displayed with a thick dashed line, and quadratic function displayed with a thick dotted line in a slightly lighter color. Smoothing functions were chosen based on the fit of the function to the data, and the consistency of fit across outcomes. That is, there was a desire to have the same smoothing function applied across outcomes, within and across the AEPS level 1 and the AEPS level 2.

## Typical Children Birth through 3 years – Outcome A

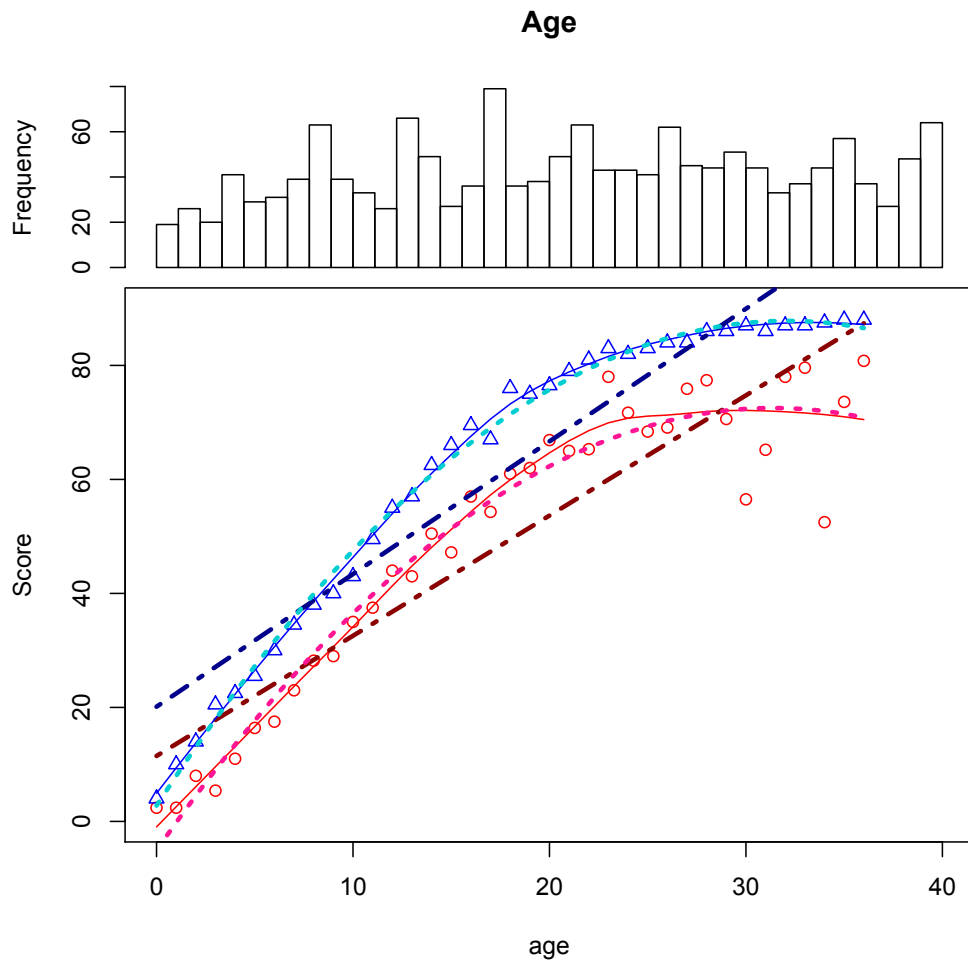


Figure 4.1. Normative 10<sup>th</sup> (red) and 50<sup>th</sup> (blue) national percentiles for AEPS 1, with three smoothing functions fit to the data (linear, quadratic, and LOESS).

## Typical Children Birth through 3 years – Outcome B

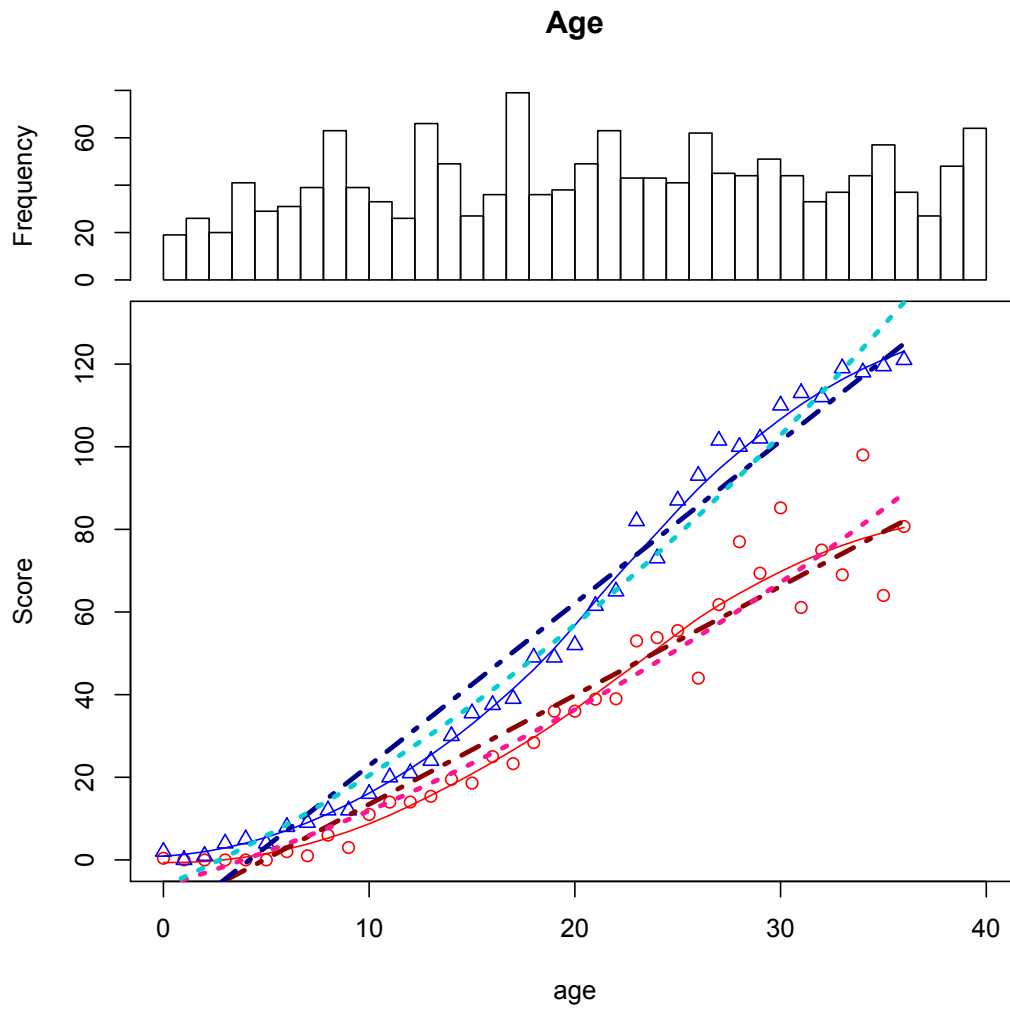


Figure 4.2. Normative 10<sup>th</sup> (red) and 50<sup>th</sup> (blue) national percentiles for AEPS 1, with three smoothing functions fit to the data (linear, quadratic, and LOESS).

## Typical Children Birth through 3 years – Outcome C

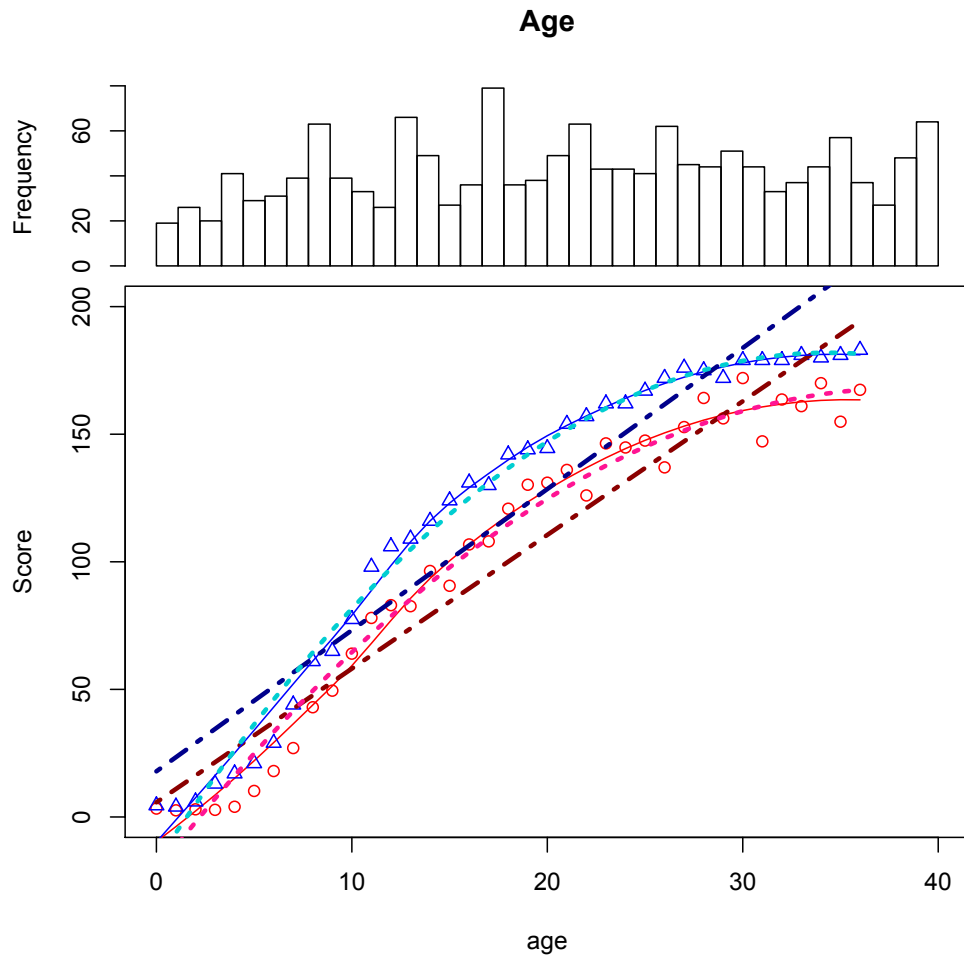


Figure 4.3. Normative 10<sup>th</sup> (red) and 50<sup>th</sup> (blue) national percentiles for AEPS 1, with three smoothing functions fit to the data (linear, quadratic, and LOESS).

## Typical Children 3-5 years Old – Outcome A

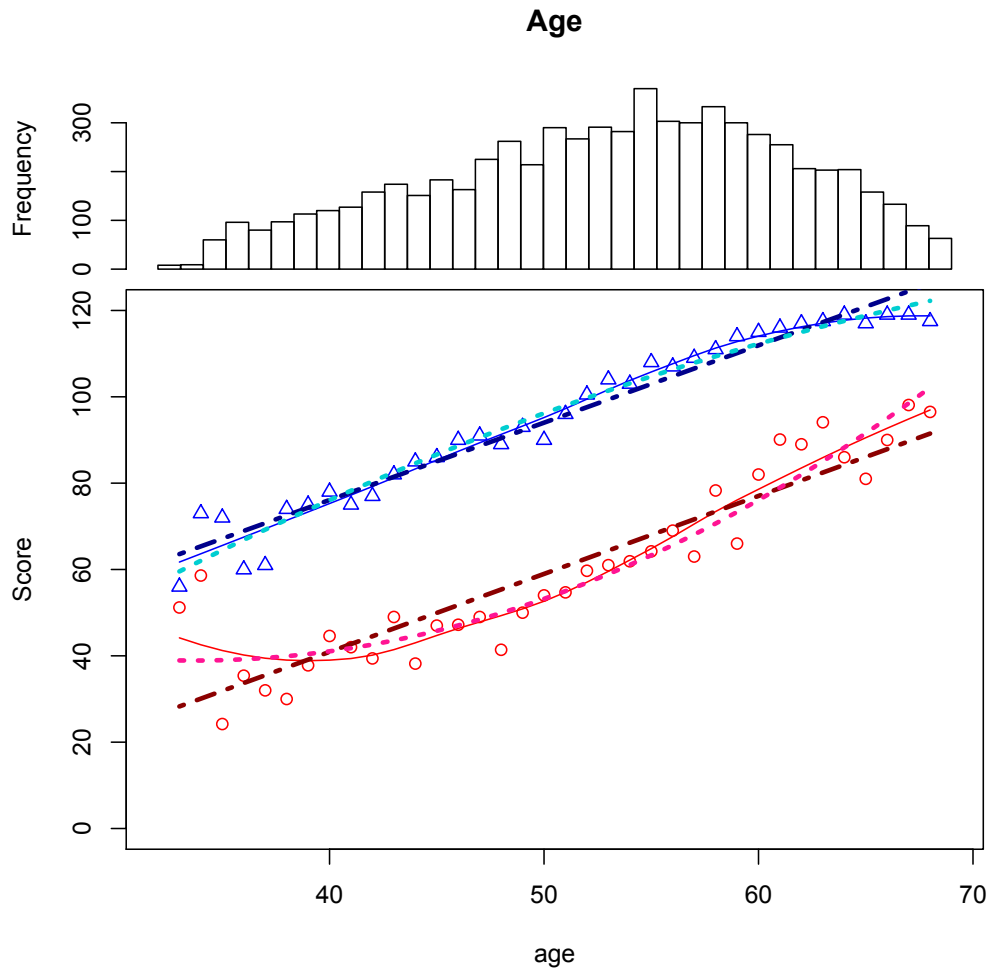


Figure 4.4. Normative 10<sup>th</sup> (red) and 50<sup>th</sup> (blue) national percentiles for AEPS 2, with three smoothing functions fit to the data (linear, quadratic, and LOESS).



## Typical Children 3-5 years Old – Outcome B

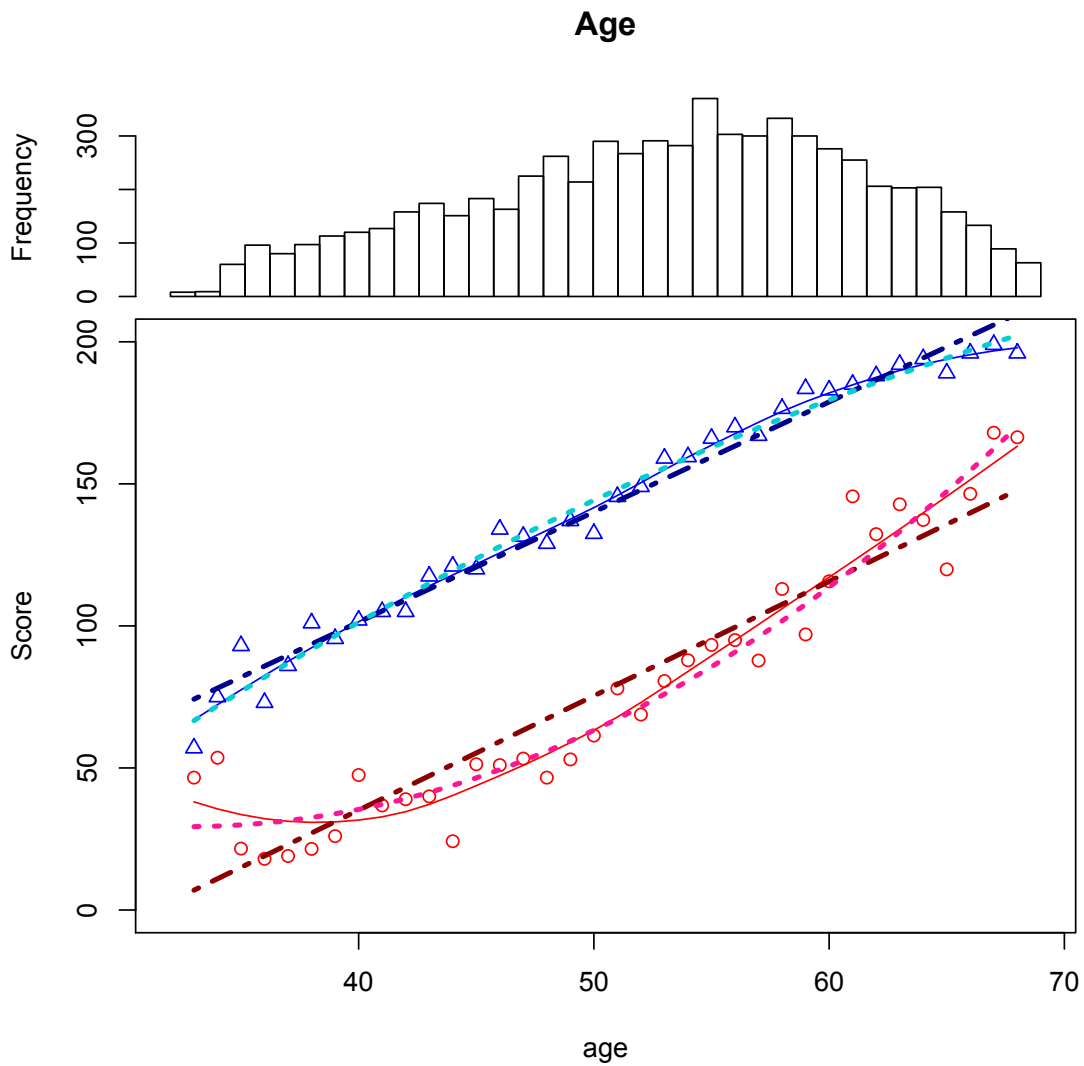


Figure 4.5. Normative 10<sup>th</sup> (red) and 50<sup>th</sup> (blue) national percentiles for AEPS 2, with three smoothing functions fit to the data (linear, quadratic, and LOESS).

## Typical Children 3-5 years Old – Outcome C

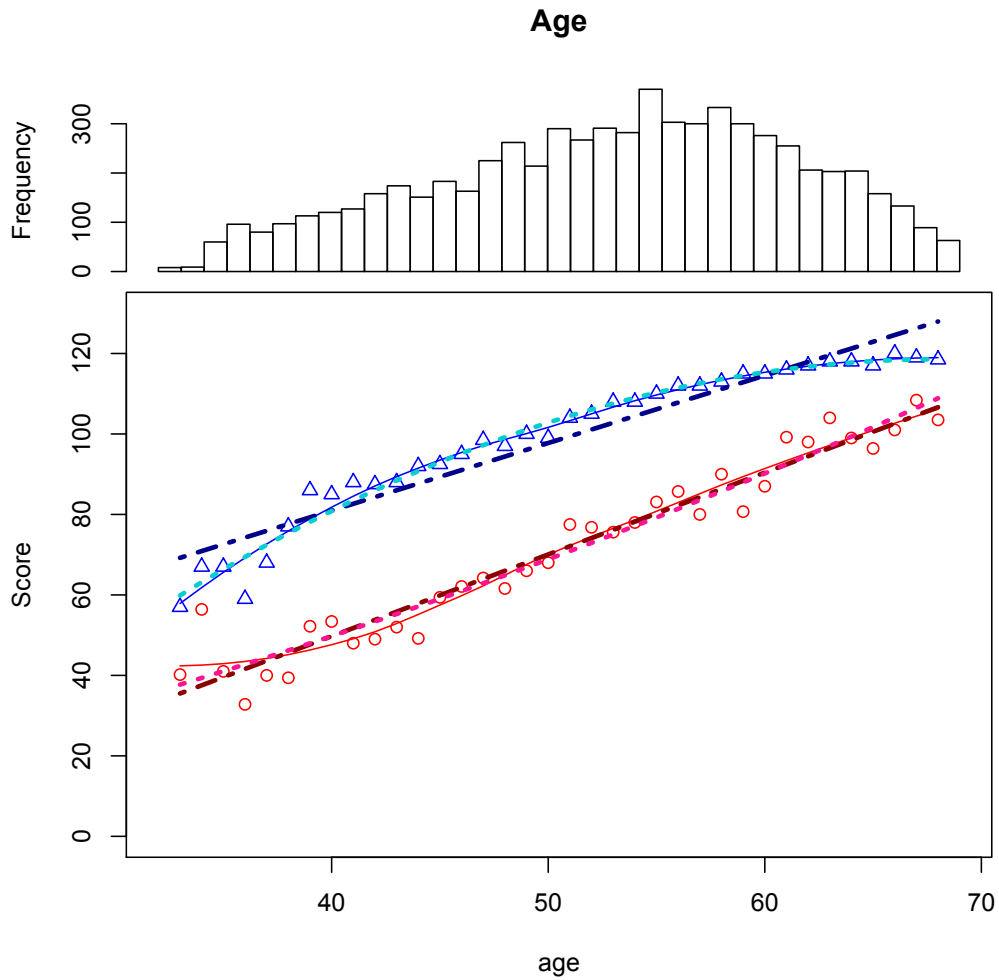


Figure 4.6. Normative 10<sup>th</sup> (red) and 50<sup>th</sup> (blue) national percentiles for AEPS 2, with three smoothing functions fit to the data (linear, quadratic, and LOESS).

Based on the analysis of the plots in Figures 4.1-4.3, the decision was made for the AEPS level 1 to set a cut score corresponding to a quadratic function because the loess line was too erratic and likely represented overfitting to the data, while the quadratic curve followed the data progression most closely. The initial standards for each of the birth to 3 outcomes were set according to the normative 10<sup>th</sup>, 15<sup>th</sup>, and 20<sup>th</sup> percentiles following the quadratic lines with minor smoothing functions at the oldest month(s).

The AEPS level 2 assessment had more children represented in each age category, which generally led to less variability in the same percentile across age groups (see Figures 4.4-4.6 above). The LOESS function was again deemed too erratic, and likely represented overfitting to the data. The linear and quadratic functions were nearly indistinguishable, so the decision was made to use the quadratic curve to be consistent with the birth to 3 year old outcomes from the AEPS level 1 calculations. The initial standards for each outcome were set according to the normative 10<sup>th</sup>, 15<sup>th</sup>, and 20<sup>th</sup> percentiles, and similar to the birth to 3 outcomes, at the very end of each curve, the line was smoothed so it did not decline because for practical and theoretical purposes, a cut score should not decline as age increases.

The initial cutoffs for each outcome, set according to the normative 10<sup>th</sup>, 15<sup>th</sup>, and 20<sup>th</sup> percentiles, and following the quadratic lines with minor smoothing functions at the oldest month(s), described above, are displayed for both the AEPS level 1 (EI ages birth to 3 years) and AEPS level 2 (ECSE ages 3 through 5 years) in Appendix A.

## **Step 2**

Following the initial setting of standards, derived from a normative, empirically driven process, expert recommendations were sought to confirm or disconfirm the initial placement of cut scores. The process mirrored a bookmark standard setting methodology. First, a partial-credit Rasch model was fit to obtain item difficulty estimates for all items across outcomes. Rasch modeling represents a special case of item response theory, and has considerable benefits over classical test theory methods. For example, item parameters are not necessarily reliant on representative samples. All item difficulties were estimated concurrently, leading to all estimates being calibrated to a common scale and being directly comparable (for more information on Rasch modeling see: <http://testolog.narod.ru/Rasch5.pdf>).

All items were assembled by outcome into an EXCEL spreadsheet and ordered according to the calibrated item difficulty. Items within the spreadsheet, theoretically, represented a

developmental progression. In other words, as children became older and their skills increased, they would be able to correctly perform more items for each outcome. A cumulative score was then computed, which would correspond to a child having previously responded to all previous items correctly. The corresponding cut scores representing the raw score that 90% of children at that monthly age would score for each age were then mapped to the cumulative score, and the experts were asked whether 90% of typically developing children could reasonably be expected to have the skills up to that item. In some cases, it was deemed that more than 90% of typically developing children at that age would have those skills, and the cut score was moved up to include more difficult items (and a higher cumulative score). In other cases, it was deemed that fewer than 90% of typically developing children at that age would have those skills, and the cut score was moved down to easier items (corresponding to a lower cumulative score). The 80% and 50% cut off scores were also calculated and added to the spreadsheet to provide a developmental perspective to the cumulative score to assist the experts in their review. Appendix B contains the EXCEL spreadsheets for each of the three outcomes for the EI birth to 3 year olds using the AEPS 1 level items and each of the three outcomes for the ECSE 3 to 5 year olds using the AEPS level 2 items in the outcomes.

Experts were recruited from the University Oregon Early Intervention Masters and PhD Program faculty and experienced staff from the Early Childhood CARES Program who conduct assessments and provide services to children enrolled in early intervention and early childhood special education. The individuals selected had expertise in both typical and atypical development as well as a minimum of 20 years experience.

- Misti Waddell – a Senior Research Assistant in the Early Intervention Program at the University of Oregon working the development and standardization of the AEPS and the SEAM. She is an author on the AEPS and is a national trainer.
- Jantina Clifford – a Lecturer and Research Associate in the Early Intervention masters and doctoral program at the University of Oregon. She has been involved with research on the AEPS and ASQ and is currently working on the research of the ASQ Inventory.
- LaWanda Potter – A Program Coordinator and supervisor for early Childhood CARES with experience serving and assessing children from 3 to 5 years of age. She is an author and trainer of the Ages and Stages Questionnaire (ASQ3).

- Val Taylor Close – Co-director of Early Childhood CARES with extensive experience in serving children birth to three years of age and doing standardized, criterion referenced and observational developmental assessments.
- Judy Newman – Co-director of Early Childhood CARES with extensive experience in serving children birth to three years of age and doing standardized, criterion referenced and observational developmental assessments.
- Natalya McComas – a service provider for birth to 5 year old children with extensive experience working with three through 5 year olds. Natalya has been involved with gathering data on the AEPS for revisions over the years.
- Jane Farrell – a service provider of birth to 5 year olds with extensive experience working with birth to three year olds Jane is a national trainer of the ASQ3 and ASQSE with over 30 years of experience in the field.
- Vicki Swanson – a service provider of for birth to 5 year olds with over 30 years of experience in all settings and with all disabilities.

The experts found it was very difficult to look at a cumulative score and make a determination about whether or not this was a score that 90% or even 80% of children at that age would receive on the AEPS. However, the group was able to determine if items were in a developmental sequence based on the Rasch analysis and look at individual items and assess why they may have been out of place. A few items (3-4) stood out to all experts as being divergent from an appropriate developmental age and these items were adjusted in the analysis. In addition, some items were found to be out of the expected developmental sequence. Upon further analysis of those test items, it was discovered that these items were exclusively “additive” AEPS items that are scored differently than the “developmental” AEPS test items, which comprise the majority of the test items. The scoring of these items was adjusted for the cumulative score analysis by using only a 0 or a 2 for the score of a long term additive goal and not allowing the use of a 1 score. So if the additive long-term goal had been scored 1, it was calculated as a 0 in the cumulative score to be consistent with the developmental process. Once the scoring of these items was adjusted for the analysis, the developmental sequences appeared to be correct.

### **Step 3**

Since the developmental experts had difficulty confirming the cutoff cumulative scores, an additional cross check was added. The cumulative scores associated with the cut off levels were compared to a small sample ( $n = 15$ ) of AEPS scores of typically developing children at various ages to help verify whether or not the cumulative scores suggested for the cutoffs for each chronological age were accurate. This analysis provided reassurance that the cutoff scores were accurate and reflected the scores that a typically developing child would have at the ages sampled.

### **Step 4**

Finally, the outcome scores were calculated for each outcome using an 80%, 85% and 90% cut off level with the current Oregon dataset, as they are prepared for the annual federal report. The results from all three were displayed along with national outcome results from the previous year. (Figure 5.1 below shows the figures used in the comparison.) The original review team, the Oregon Department of Education staff, the EI/ECSE Contractors and the EI/ECSE stakeholder group who sets statewide outcome targets were all asked to study and analyze them and determine which cut off level Oregon should use for reporting to the federal government. The consensus was to use the 80% cut off level for reporting the EI and the ECSE outcomes. It was believed that this most closely represents the children who are eligible for EI/ECSE programs and receive services in Oregon.

**EI Child Outcome Data Comparison Table**

Data for July 1, 2014 through June 30, 2015, last edited 10/27/15

	National FFY 2012	2015-Q(90) v10/26	2015-Q(85) v10/26	2015-Q(80) v10/26
number of test pairs		1446	1446	1446
Social/Growth (A1)	66%	88.9	86.6	86.4
Social/Met (A2)	61%	63.8	51.2	42.7
Knowledge and Skills/Growth (B1)	71%	69.5	67.3	66.9
Knowledge and Skills/Met (B2)	52%	50.8	42.7	35.9
Behaviors Meet Needs/Growth (C1)	71%	77.3	77.0	77.3
Behaviors Meet Needs/Met (C2)	59%	51.7	43.6	37.8

**ECSE Child Outcome Data Comparison Table**

	National FFY 2012	2015-Q(90) v10/3	2015-Q(85) v10/3	2015-Q(80) v10/3
number of test pairs		2890	2890	2890
Social/Growth (A3)	80%	77.4	75.1	75.7
Social/Met (A4)	59%	74.1	66.7	59.7
Knowledge and Skills/Growth (B3)	80%	62.6	68.8	71.7
Knowledge and Skills/Met (B4)	53%	73.1	64.8	57.7
Behaviors Meet Needs/Growth (C3)	80%	68.0	69.3	70.8
Behaviors Meet Needs/Met (C4)	65%	77.1	68.8	61.5

Figure 5.1 Outcome comparison table.

## **Conclusion**

Oregon's EI/ECSE program is unique in the way it collects and calculates its annual outcomes to report to the federal government. Because Oregon's outcome results to date have differed significantly from national results, the authors of this paper undertook a study to examine whether the unique aspects of Oregon's system were causing results to differ. The first task was to demonstrate that Oregon's population was similar to a national EI/ECSE sample and if the methods and applications used were significantly influencing Oregon's results. Authors concluded that while some differences existed, Oregon's methods and sample were comparable to national data and outcome results. Ultimately the authors recommended Oregon adopt procedures more closely aligned with the procedures used by other states who use the AEPS assessment tool in order to achieve greater consistency over time. Specifically Oregon's new methodology uses the same sorting of items into outcome categories as Brookes Publishing Company uses and includes both short term objectives and long term goals in the scores. The second task of this group was to develop new standards that would inform cutoff points for determining progress and status using the results from the new methodology. These results were analyzed and shared with the Oregon Department of Education who recommended that Oregon adopt the 80% cutoff point because the results appear to most accurately represent Oregon's EI/ECSE population and more closely align with national averages.

February 8, 2016



## Appendix A

### Cutoff levels for EI age birth to 3 years old for outcomes A, B, and C

Age	AEPS Level I EI age birth to 3 years								
	Outcome A			Outcome B			Outcome C		
	80%	85%	90%	80%	85%	90%	80%	85%	90%
0	0	0	0	0	0	0	0	0	0
1	3	1	0	0	0	0	0	0	0
2	7	6	5	0	0	0	1	0	0
3	12	10	9	0	0	0	10	9	7
4	17	15	13	1	0	0	20	18	16
5	21	19	18	3	2	2	29	27	25
6	25	23	22	4	4	4	38	35	33
7	29	28	26	7	6	6	46	44	42
8	33	31	29	9	8	8	54	52	49
9	37	35	33	11	11	10	62	60	57
10	40	39	37	13	13	12	70	67	65
11	44	42	40	16	15	14	78	75	72
12	47	45	43	18	18	16	85	82	79
13	50	48	46	21	20	19	92	89	85
14	53	51	49	24	23	21	99	95	92
15	56	54	51	27	25	23	105	101	98
16	58	57	54	29	28	26	111	107	104
17	61	59	56	32	31	28	117	113	109
18	63	61	58	36	34	31	123	119	115
19	65	64	60	39	37	34	128	124	120
20	67	66	62	42	40	36	133	129	125
21	69	67	64	46	43	39	138	134	129
22	71	69	66	49	46	42	142	138	134
23	73	70	67	53	50	45	147	142	138
24	74	72	68	57	53	48	151	146	142
25	75	73	69	60	57	51	154	150	145
26	76	74	70	64	60	54	158	154	148
27	77	75	71	68	64	57	161	157	151
28	78	76	72	73	68	61	164	160	154
29	79	76	72	77	71	64	166	162	157
30	79	76	72	81	75	67	169	165	159
31	80	77	73	86	79	71	171	167	161
32	80	77	73	90	83	74	173	169	163
33	80	77	73	95	87	78	174	170	164
34	80	77	73	99	92	81	176	172	166
35	80	78	73	104	96	85	177	173	167
36	80	78	73	109	100	89	177	174	167

**Cutoff levels for ECSE age 3 to 5 years old for outcomes A, B, and C**

Age	AEPS Level 2 ECSE ages 3 to 5 yrs								
	Outcome A			Outcome B			Outcome C		
	80%	85%	90%	80%	85%	90%	80%	85%	90%
32	30	30	39	20	15	10	39	33	28
33	33	31	39	24	19	12	42	36	30
34	35	33	39	28	22	15	45	39	33
35	37	35	39	32	25	17	47	42	35
36	39	37	39	36	28	19	50	44	38
37	42	38	39	41	32	22	53	47	40
38	44	40	40	45	35	25	55	49	43
39	46	42	40	49	39	27	58	52	45
40	48	44	41	53	42	30	60	54	47
41	51	46	42	58	46	33	63	57	50
42	53	48	43	62	50	36	65	59	52
43	55	50	44	66	54	40	67	62	54
44	57	51	45	71	58	43	70	64	57
45	59	53	46	75	62	47	72	66	59
46	62	55	47	79	66	50	74	69	61
47	64	57	48	84	70	54	76	71	64
48	66	59	50	88	74	58	79	73	66
49	68	61	51	93	78	62	81	75	68
50	71	64	53	97	83	66	83	77	70
51	73	66	55	102	87	71	85	80	72
52	75	68	57	106	92	75	87	82	74
53	77	70	59	111	96	79	89	84	76
54	79	72	61	115	101	84	91	86	79
55	82	74	63	120	106	89	93	88	81
56	84	76	66	124	111	94	95	90	83
57	86	79	68	129	116	99	96	92	85
58	88	81	71	134	120	104	98	93	87
59	90	83	73	138	126	109	100	95	89
60	92	85	76	143	131	115	102	97	91
61	95	88	79	147	136	120	103	99	93
62	97	90	82	152	141	126	105	101	94
63	99	92	85	157	146	132	107	102	96
64	101	95	88	162	152	137	108	104	98
65	103	97	92	166	157	143	110	106	100
66	105	100	95	171	163	150	111	107	102
67	108	102	99	176	169	156	113	109	104
68	110	105	102	181	174	162	114	110	105
69	112	107	106	185	180	169	116	112	107
70	114	110	110	190	186	175	117	113	109
71	116	112	114	195	192	182	118	115	111
72	118	115	118	200	198	189	119	116	112

## AEPS I Outcome A, EI Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

Item	Cumulative Score	Item Description	Age	Cutoff Point 90%	Cutoff Point 85%	Cutoff Point 80%	Cutoff Point 50%
sc_A1.2	2	Turns and looks toward noise-producing object for at least 5 seconds	0	0	0	0	
soc_A1.3	4	Smiles in response to familiar adult	1	0	1	3	
sc_A1.1	6	Turns and looks toward object and person speaking for at least 5 seconds	2	5	6	7	5
sc_A2.2	8	Looks toward object for longer than 1 second	3	9	10	12	5
sc_A3.1	10	Engages in 2 or more consecutive vocal exchanges by cooing	4	13	15	17	5
sc_C1.5	12	Quiets to familiar voice	5	18	19	21	5
soc_A1.2	14	Responds appropriately to familiar adult's affective tone	6	22	23	25	5
soc_A2.3	16	Uses familiar adults for comfort, closeness, or physical contact	7	26	28	29	5
sc_A1.0	18	Turns and looks toward person speaking for at least 5 seconds	8	29	31	33	5
soc_A1.1	20	Displays affection toward familiar adult	9	33	35	37	19
sc_B1.4	22	Uses gestures and/or vocalizations to protest actions or reject objects/people	10	37	39	40	19
sc_C1.4	24	Recognizes own name	11	40	42	44	23
soc_A2.2	26	Responds to familiar adult's social behavior	12	43	45	47	23
soc_A1.0	28	Responds appropriately to familiar adult's affect	13	46	48	50	23
sc_A3.0	30	Engages in 2 or more consecutive vocal exchanges by babbling	14	49	51	53	23

## AEPS I Outcome A, EI Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

cog_C2.1	32	Indicates desire to continue game and/or action	15	51	54	56	23
sc_A2.1	34	Follows person's pointing gesture to establish joint attention for longer than 1 second	16	54	57	58	23
soc_A3.2	36	Responds to communication from familiar adult	17	56	59	61	35
soc_C1.4	38	Observes peers	18	58	61	63	35
sc_B1.3	40	Gestures and/or vocalizes to greet others	19	60	64	65	39
soc_C1.3	42	Plays near one or two peers	20	62	66	67	39
soc_A2.0	44	Initiates and maintains 2 or more consecutive exchanges of interaction with familiar adult	21	64	67	69	43
soc_C1.3	46	Plays near one or two peers	22	66	69	71	43
soc_A2.1	48	Initiates simple social game with familiar adult	23	67	70	73	43
sc_A2.0	50	Follows person's gaze to establish joint attention for longer than 1 second	24	68	72	74	49
soc_A3.1	52	Initiates communication with familiar adult	25	69	73	75	49
soc_B2.1	54	Responds to established social routines with a single response associated with the routine	26	70	74	76	53
sc_B1.2	56	Points to object, person, and/or event	27	71	75	77	53
soc_A2.0	58	Initiates and maintains 2 or more consecutive exchanges of interaction with familiar adult	28	72	76	78	53
sc_C2.3	60	Carries out one-step direction with contextual cues	29	72	76	79	53
sc_B1.1	62	Responds with vocalization and gestures to simple questions	30	72	76	79	61

## AEPS I Outcome A, EI Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

cog_C2.0	64	Reproduces part of interactive game and/or action in order to continue game and/or action	31	73	77	80	63
cog_E4.1	66	Uses more than one strategy in attempt to solve common problem	32	73	77	80	63
sc_B1.0	68	Gains person's attention and refers to an object, person, and/or event	33	73	77	80	63
soc_C1.2	70	Responds appropriately to peer's social behavior	34	73	77	80	63
sc_C2.2	72	Carries out one-step direction without contextual cues	35	73	78	80	63
soc_C2.2	74	Solves common problems	36	73	78	80	63
soc_A3.0	76	Initiates and maintains 2 or more consecutive exchanges of communicative exchange with					
soc_C1.1	78	Initiates social behavior toward peer					
soc_B2.0	80	Participates in established social routines - preforms a series of responses associated with the					
cog_E4.0	82	Solves common problems					
soc_C2.1	84	Initiates communication with peer					
sc_C2.1	86	Carries out two-step direction with contextual cues					
soc_C2.0	86	Initiates and maintains communicative exchange with peer - 2 or more consecutive exchanges					

## AEPS I Outcome B, EI Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

Item	Cumulative Score	Item Description	Age	Cutoff Point 90%	Cutoff Point 85%	Cutoff Point 80%	Cutoff Point 50%
sc_B2.4	2	Vocalizes open syllables, at least 2 different vowel sounds.	0	0	0	0	0
sc_B2.3	4	Vocalizes to express affective states	1	0	0	0	3
cog_F1.4	6	Uses sensory examination with objects (olfactory, tactile, auditory, visual, gustatory)	2	0	0	0	5
sc_B1.4	8	Uses gestures and/or vocalizations to protest actions or reject objects/people	3	0	0	0	7
cog_F1.3	10	Uses simple motor actions on objects.	4	0	0	1	7
sc_B2.2	12	Uses nonspecific -vowel combination and/or jargon.	5	2	2	3	7
sc_B1.3	14	Gestures and/or vocalizes to greet others.	6	4	4	4	7
sc_B2.1	16	Uses consistent consonant-vowel combinations.	7	6	6	7	7
cog_F1.2	18	Uses functionally appropriate actions with objects	8	8	8	9	17
sc_B1.2	20	Points to objects, person and/or event.	9	10	11	11	17
fm_B5.2	22	Scribbles	10	12	13	13	17
sc_B1.1	24	Responds with vocalizations and gestures to simple questions.	11	14	15	16	17
cog_E2.1	26	Uses part of object and/or support to obtain another object	12	16	18	18	25
cog_D2.2	28	Imitates words frequently used	13	19	20	21	25
cog_E4.1	30	Uses more than one strategy in attempt to solve common problem	14	21	23	24	25
sc_B1.0	32	Gains person's attention and refers to an object, person, and/or event.	15	23	25	27	31

## AEPS I Outcome B, EI Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

fm_B4.1	34	Turns pages of books	16	26	28	29	31
cog_D2.1	36	Imitates speech sounds not frequently used	17	28	31	32	31
sc_D1.5	38	Uses three proper names	18	31	34	36	37
sc_B2.0	40	Uses 10 consistent word approximations.	19	34	37	39	37
fm_B4.2	42	Turns/holds picture book right side up	20	36	40	42	37
cog_G4.3	44	Sits and attends to entire story during shared reading time	21	39	43	46	43
cog_F1.1	46	Uses representational actions with objects	22	42	46	49	43
sc_D1.4	48	Uses 15 object or event labels	23	45	50	53	43
cog_E2.0	50	Uses an object to obtain another object	24	48	53	57	49
cog_E4.0	52	Solves common problems	25	51	57	60	49
cog_G3.1	54	Labels familiar people, actions, objects, and events in pictures	26	54	60	64	53
cog_G1.3	56	Matches 3-4 pictures and/or objects	27	57	64	68	53
sc_D1.3	58	Uses two pronouns	28	61	68	73	53
cog_D2.0	60	Imitates words not frequently used	29	64	71	77	53
sc_D1.2	62	Uses five action words	30	67	75	81	53
sc_D2.6	64	Uses two-word utterances to express negation	31	71	79	86	63
sc_D2.5	66	Uses two-word utterances to express recurrence	32	74	83	90	63

## AEPS I Outcome B, EI Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

cog_G2.1	68	Demonstrates concept of one	33	78	87	95	67
fm_B4.0	70	Orients picture book correctly and turns pages one by one	34	81	92	99	67
sc_D2.2	72	Uses two-word utterances to express possession	35	85	96	104	67
sc_D1.1	74	Uses five descriptive words	36	89	100	109	67
fm_B5.1	76	Draws circles and lines					67
sc_D2.1	78	Uses two-word utterances to express agent-action, action-object, and agent-object					67
cog_G4.2	80	Makes comments and asks questions while looking at picture books					67
sc_D2.4	82	Uses two-word utterances to describe objects, people, and/or events					81
sc_D2.3	84	Uses two-word utterances to express location					81
cog_F1.0	86	Uses imaginary objects in play					87
cog_G6.2	88	Says nursery rhymes along with familiar adult					87
sc_D1.0	90	Uses 50 single words (includes 5 descriptive, 5 action, 2 pronouns, 15 objects/events, 3 proper names)					87
cog_G1.2	92	Groups objects according to size, shape, and/or color					93
cog_G1.1	94	Groups at least 3 functionally related objects					93
cog_G5.2	96	Demonstrates use of at least two pairs of common opposite concepts					93
sc_D2.0	98	Uses two-word utterances (includes negative, reoccurrence, location, possession, 2 parts of speech)					99



## AEPS I Outcome B, EI Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

sc_D3.4	100	Uses 5 different three-word agent-action-object utterances				
sc_D3.2	102	Asks 5 different questions				
sc_D3.3	104	Uses 5 different three-word action-object-location utterances				
cog_G3.0	106	Recognizes environment symbols (signs, logos, labels)				
sc_D3.1	108	Uses 5 different three-word negative utterances				
cog_G2.0	110	Demonstrates functional use of one-to-one correspondence				
cog_G4.1	112	Orally fills in or completes familiar text while looking at picture books				
cog_G5.1	114	Demonstrates use of at least four pairs of common opposite concepts				
cog_G6.1	116	Fills in rhyming words in familiar rhymes				
cog_G4.0	118	Repeats at least 2 times simple nursery rhymes				
sc_D3.0	120	Uses three-word utterances (agent-action-objects, agent-object-location, questions, negatives)				
cog_G1.0	122	Categorizes at least 3 according to a broad-based category like objects				
cog_G6.0	124	Repeats at least 2 times simple nursery rhymes				
cog_G5.0	126	Demonstrates use of at least 6 pairs of common opposite concepts				
fm_B5.0	128	Copies simple written shapes after demonstration				

## AEPS I Outcome C, EI Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

Item	Cumulative Score	Item Description	Age	Cutoff Point 90%	Cutoff Point 85%	Cutoff Point 80%	Cutoff Point 50%
adapt_A1.4	2	Swallows liquids	0	0	0	0	0
gm_B1.6	4	Holds head in midline when in supported sitting position	1	0	0	0	0
gm_A3.6	6	Lifts head and chest off surface with weight on arms	2	0	0	1	0
fm_A3.3	8	Grasps hand-size object with either hand using whole hand	3	7	9	10	0
fm_A3.2	10	Grasps cylindrical object with either hand by closing fingers around it	4	16	18	20	0
sc_B2.4	12	Vocalizes open syllables	5	25	27	29	0
adapt_A4.3	14	Accepts food presented on spoon	6	33	35	38	11
gm_A3.5	16	Bears weight on one hand and/or arm while reaching with opposite hand	7	42	44	46	11
gm_B1.5	18	Sits balanced using hands for support	8	49	52	54	11
sc_B2.3	22	Vocalizes to express affective states	9	57	60	62	11
gm_A3.4	20	Pivots on stomach	10	65	67	70	11
adapt_A1.3	24	Swallows solid and semi-solid foods	11	72	75	78	20
sc_B1.4	28	Uses gestures and/or vocalizations to protest actions or reject objects/people	12	79	82	85	20
adapt_A1.2	26	Uses lips to take food off spoon and/or fork	13	85	89	92	20
fm_A3.1	30	Grasps hand-size object with either hand using the palm, with object placed toward the thumb and index finger	14	92	95	99	20

## AEPS I Outcome C, EI Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

gm_B1.4	32	Sits balanced without support	15	98	101	105	29
gm_B1.3	34	Regains balanced, upright sitting position after leaning to the left, to the right, and forward	16	104	107	111	29
gm_B1.2	36	Regains balanced, upright sitting position after reaching across the body to the right and to the left	17	109	113	117	29
gm_A3.3	38	Crawls forward on stomach	18	115	119	123	29
adapt_A2.2	42	Munches soft and crisp foods	19	120	124	128	29
gm_A3.2	40	Assumes creeping position	20	125	129	133	38
adapt_A4.2	44	Eats with fingers	21	129	134	138	38
gm_A3.1	46	Rocks while in a creeping position	22	134	138	142	38
gm_B1.1	48	Assumes hands and knees position from sitting	23	138	142	147	38
adapt_A1.1	54	Uses lips to take in liquids from a cup and/or glass	24	142	146	151	46
soc_A3.2	62	Responds to communication from familiar adult	25	145	150	154	46
soc_B1.2	66	Uses appropriate strategies to self-soothe	26	148	154	158	46
gm_B1.0	50	Assumes balanced sitting position	27	151	157	161	46
fm_A3.0	52	Grasps hand-size object with either hand using ends of thumb, index, and second fingers	28	154	160	164	46
gm_C2.3	56	Pulls to kneeling position	29	157	162	166	54
gm_A3.0	58	Creeps forward using alternating arm and leg movements	30	159	165	169	54

## AEPS I Outcome C, EI Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

gm_C2.2	60	Pulls to standing position	31	161	167	171	54
adapt_C1.6	64	Takes off hat	32	163	169	173	54
adapt_A2.1	68	Bites and chews soft and crisp foods	33	164	170	174	62
adapt_A3.2	72	Drinks from cup and/or glass held by adult	34	166	172	176	62
gm_C1.5	70	Cruises	35	167	173	177	62
gm_C1.3	74	Walks with two-hand support	36	167	174	177	62
sc_B2.2	80	Uses nonspecific consonant-vowel combination and/or jargon					70
fm_B1.1	82	Turns object over using wrist and arm rotation with each hand					70
cog_E3.2	78	Moves around barriers to change location					70
sc_B1.3	84	Gestures and/or vocalizes to greet others					77
adapt_A1.0	76	Uses tongue and lips to take in and swallow solid foods and liquids					77
gm_C1.4	86	Stands unsupported					77
gm_C1.2	88	Walks with one-hand support					77
cog_E3.1	90	Moves or goes around barriers to obtain object					84
adapt_C1.4	92	Takes off socks					84
gm_C2.1	94	Rises from sitting position to standing positions					84
gm_C1.1	96	Walks without support					91

## AEPS I Outcome C, EI Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

soc_A3.1	100	Initiates communication with familiar adult					91
soc_B2.1	106	Responds to established social routines					91
sc_B2.1	104	Uses consistent consonant-vowel combinations					91
adapt_A2.0	98	Bites and chews hard and chewy foods					98
gm_C2.0	102	Stoops and regains balanced standing position without support					98
sc_B1.2	108	Points to object, person, and/or event					98
adapt_B3.1	112	Cooperates with teeth brushing					104
adapt_C1.5	110	Puts off shoes					104
adapt_A4.1	116	Brings food to mouth using utensil					104
sc_B1.1	118	Responds with vocalization and gestures to simple questions					110
gm_C1.0	114	Walks avoiding obstacles					110
soc_B1.1	120	Meets internal physical needs of hunger, thirst, and rest					110
adapt_A3.1	124	Drinks from cup and/or glass with some spilling					115
fm_B1.0	122	Rotates either wrist on horizontal plane					115
cog_E3.0	126	Navigates large object around barriers.					121
sc_B1.0	128	Gains person's attention and refers to an object, person, and/or event					121
sc_D1.5	130	Uses three proper names					121

## AEPS I Outcome C, EI Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

sc_B2.0	132	Uses consistent word approximations					126
soc_A3.0	134	Initiates and maintains communicative exchange with familiar adult					126
adapt_B2.1	136	Washes hands					131
adapt_A4.0	138	Eats with fork and/or spoon					131
adapt_A3.0	140	Drinks from cup and/or glass					131
soc_B2.0	146	Participates in established social routines					135
sc_D1.4	142	Uses 15 object or event labels					135
adapt_C1.3	144	Takes off pants					140
soc_B1.0	152	Meets observable physical needs in socially appropriate ways					140
adapt_C1.2	148	Takes off front-fastened coat, jacket, or shirt					144
adapt_B1.2	150	Indicates awareness of soiled and wet pants and/or diapers					147
sc_D1.3	154	Uses two pronouns					147
sc_D1.2	156	Uses five action words					151
adapt_B2.0	162	Washes and dries hands					154
sc_D2.6	158	Uses two-word utterances to express negation					154
sc_D2.5	160	Uses two-word utterances to express recurrence					157
adapt_B3.0	168	Brushes teeth					160

## AEPS I Outcome C, EI Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

sc_D2.2	164	Uses two-word utterances to express possession					162
sc_D1.1	166	Uses five descriptive words					162
sc_D2.1	170	Uses two-word utterances to express agent-action, action-object, and agent-object					162
sc_D2.4	174	Uses two-word utterances to describe objects, people, and/or events					169
sc_D2.3	176	Uses two-word utterances to express location					169
adapt_C1.1	172	Takes off pullover shirt/sweater					169
sc_D1.0	178	Uses 50 single words					174
sc_D2.0	184	Uses two-word utterances					174
adapt_C1.0	192	Undresses self					179
adapt_B1.1	186	Demonstrates bowel and bladder control					179
adapt_B1.0	196	Initiates toileting					184
sc_D3.0	194	Uses three-word utterances					190
sc_D3.1	190	Uses three-word negative utterances					195
sc_D3.2	182	Asks questions					200
sc_D3.3	188	Uses three-word action-object-location utterances					
sc_D3.4	180	Uses three-word agent-action-object utterances					

**AEPS II Outcome A ECSE Developmental Order and Proposed 90, 85, 80 and 50%tile Cutoff Points**

<b>Item #</b>	<b>Cumulative Score</b>	<b>Item Description</b>	<b>Age</b>	<b>Cutoff Point 90%</b>	<b>Cutoff Point 85%</b>	<b>Cutoff Point 80%</b>	<b>Cutoff Point 50%</b>
soc_B2.4	2	Remains with group during small group activities	32	39	30	30	
soc_B3.4	4	Remains with group during large group activities	33	39	31	33	
cog_F2.0	6	Engages in games with rules	34	39	33	35	
cog_F2.1	8	Maintains participation	35	39	35	37	
soc_A1.2	10	Establishes and maintains proximity to peers	36	39	37	39	
cog_F2.2	12	Conforms to game rules	37	39	38	42	53
soc_A1.5	14	Responds to affective initiations from others	38	40	40	44	55
soc_B1.2	16	Responds to request to begin activity	39	40	42	46	57
soc_B2.3	18	Looks at appropriate object, person, or event during small group activities	40	41	44	48	57
soc_A3.3	20	Claims and defends possessions	41	42	46	51	57
soc_B2.1	22	Interacts appropriately with materials during small group activities	42	43	48	53	57
soc_B2.0	24	Watches, listens, and participates during small group activities	43	44	50	55	67
soc_B2.2	26	Responds appropriately to directions during small group activities	44	45	51	57	69
soc_A1.4	28	Initiates greetings to others who are familiar	45	46	53	59	71
soc_B1.1	30	Responds to request to finish activity	46	47	55	62	73



**AEPS II Outcome A ECSE Developmental Order and Proposed 90, 85, 80 and 50%tile Cutoff Points**

soc_B3.1	32	Interacts appropriately with materials during large group activities	47	48	57	64	73
soc_B1.0	34	Initiates and completes age-appropriate activities	48	50	59	66	73
soc_B3.3	36	Looks at appropriate object, person, or event during large group activities	49	51	61	68	73
soc_A2.1	38	Joins others in cooperative activity	50	53	64	71	83
soc_A2.3	40	Shares or exchanges objects	51	55	66	73	85
soc_A1.3	42	Takes turns with others	52	57	68	75	87
soc_B3.0	44	Watches, listens, and participates during large group activities	53	59	70	77	89
soc_C2.2	46	Follows established rules at home and in classroom	54	61	72	79	89
soc_A2.2	48	Maintains cooperative participation with others	55	63	74	82	89
sc_A1.7	50	Uses words, phrases, or sentences to inform	56	66	76	84	89
soc_B3.2	52	Responds appropriately to directions during large group activities	57	68	79	86	99
soc_A1.0	54	Interacts with others as play partners	58	71	81	88	101
sc_A1.5	56	Uses words, phrases, or sentences to make commands to and requests of others	59	73	83	90	103
sc_A3.2	58	Uses socially appropriate physical orientation	60	76	85	92	105
soc_C2.0	60	Follows context-specific rules outside home and classroom	61	79	88	95	105
sc_A1.6	62	Uses words, phrases, or sentences to obtain information	62	82	90	97	105

**AEPS II Outcome A ECSE Developmental Order and Proposed 90, 85, 80 and 50%tile Cutoff Points**

soc_C2.1	64	Seeks adult permission	63	85	92	99	105
soc_D2.2	66	Identifies own affect/emotions	64	88	95	101	115
soc_A1.1	68	Responds to peers in distress or need	65	92	97	103	117
cog_E2.3	70	Gives possible cause for some event	66	95	100	105	119
cog_E1.2	72	Identifies means to goal	67	99	102	108	121
sc_A2.6	74	Responds to others' topic initiations	68	102	105	110	
soc_A2.0	76	Initiates cooperative activity	69	106	107	112	
sc_A2.1	78	Alternates between speaker/ listener role	70	110	110	114	
sc_A3.1	80	Varies voice to impart meaning	71	114	112	116	
sc_A1.4	82	Uses words, phrases, or sentences to describe past events	72	118	115	118	
sc_A1.0	84	Uses words, phrases, or sentences to inform, direct, ask questions, and express anticipation, imagination, affect, and emotions					
sc_A3.0	86	Establishes and varies social-communicative roles			51		
sc_A2.4	88	Responds to contingent questions			52		
sc_A2.2	90	Responds to topic changes initiated by others			53		
sc_A1.3	92	Uses words, phrases, or sentences to label own or others' affect/emotions			54		
sc_A1.2	94	Uses words, phrases, or sentences to describe pretend objects, events, or people			55		

**AEPS II Outcome A ECSE Developmental Order and Proposed 90, 85, 80 and 50%tile Cutoff Points**

soc_D2.1	96	Identifies affect/emotions of others			56		
sc_A2.5	98	Initiates context-relevant topics					
sc_A1.1	100	Uses words, phrases, or sentences to express anticipated outcomes			57		
soc_A3.2	102	Uses simple strategies to resolve conflicts			58		
sc_A2.0	104	Uses conversational rules			59		
cog_E2.0	106	Makes statements and appropriately answers questions that require reasoning about objects, situations, or people			60		
sc_A2.3	108	Asks questions for clarification			61		
cog_E2.2	110	Makes prediction about future or hypothetical events			62		
soc_D2.0	112	Understands how own behaviors, thoughts, feelings relate to consequences for others			63		
soc_A3.0	114	Resolves conflicts by selecting effective strategy					
cog_E1.1	116	Suggests acceptable solutions to problems			64		
cog_E2.1	118	Gives reason for inference			65		
cog_E1.0	120	Evaluates solutions to problems			66		
soc_A3.1	122	Negotiates to resolve conflicts			67		

## AEPS II Outcome B, ECSE Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff points

Item	Cumulative Score	Item Description	Age	Cutoff Point 90%	Cutoff Point 85%	Cutoff Point 80%	Cutoff Point 50%
cog_G1.2	2	Counts 3 objects	32	10	15	20	
cog_F1.3	4	Uses imaginary props	33	12	19	24	
sc_A1.7	6	Uses words, phrases, or sentences to inform	34	15	22	28	
cog_B1.3	8	Groups objects on the basis of physical attribute	35	17	25	32	
cog_D1.2	10	Recalls events immediately after they occur	36	19	28	36	55
cog_A1.1	12	Demonstrates understanding of 8 colors	37	22	32	41	60
sc_A1.5	14	Uses words, phrases, or sentences to make commands to and requests of others	38	25	35	45	64
sc_A3.2	16	Uses socially appropriate physical orientation	39	27	39	49	69
sc_A1.6	18	Uses words, phrases, or sentences to obtain information	40	30	42	53	73
cog_F1.2	20	Plans and acts out recognizable event, theme, or story line	41	33	46	58	78
fm_B2.3	22	Copies simple shapes	42	36	50	62	83
sc_B3.1	24	Asks yes/no questions	43	40	54	66	87
cog_A1.2	26	Demonstrates understanding of five shapes	44	43	58	71	92
sc_A2.6	28	Responds to others' topic initiations	45	47	62	75	97
cog_C2.1	30	Fits one ordered set of objects to another	46	50	66	79	101
sc_B3.6	32	Asks questions using rising inflection	47	54	70	84	106

## AEPS II Outcome B, ECSE Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff points

sc_B3.5	34	Asks what and where questions	48	58	74	88	110
cog_F1.1	36	Enacts roles or identities	49	62	78	93	115
sc_A2.1	38	Alternates between speaker/ listener role	50	66	83	97	120
sc_B2.3	40	Uses regular plural nouns	51	71	87	102	124
sc_A1.4	42	Uses words, phrases, or sentences to describe past events	52	75	92	106	129
sc_A3.1	44	Varies voice to impart meaning	53	79	96	111	134
sc_B1.6	46	Uses present progressive “ing”	54	84	101	115	138
cog_D1.1	48	Recalls events that occurred on same day, with contextual cues	55	89	106	120	143
cog_C1.1	50	Follows directions of three or more related steps that are routinely given	56	94	111	124	147
cog_A1.3	52	Demonstrates understanding of six different size concepts	57	99	116	129	152
sc_B5.6	54	Uses articles	58	104	120	134	157
sc_A2.4	56	Responds to contingent questions	59	109	126	138	161
sc_A1.2	58	Uses words, phrases, or sentences to describe pretend objects, events, or people	60	115	131	143	166
sc_A1.3	60	Uses words, phrases, or sentences to label own or others’ affect/emotions	61	120	136	147	171
sc_A2.2	62	Responds to topic changes initiated by others	62	126	141	152	175
sc_B5.1	64	Uses adjectives	63	132	146	157	180
cog_G1.1	66	Counts at least 10 objects	64	137	152	162	184

## AEPS II Outcome B, ECSE Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff points

cog_B1.2	68	Groups objects on the basis of function	65	143	157	166	189
sc_A2.5	70	Initiates context-relevant topics	66	150	163	171	194
sc_B4.1	72	Uses subject pronouns	67	156	169	176	198
sc_B4.5	74	Uses demonstrative pronouns	68	162	174	181	203
sc_A1.1	76	Uses words, phrases, or sentences to express anticipated outcomes	69	169	180	185	208
cog_B1.1	78	Groups objects, people, or events on the basis of category	70	175	186	190	212
sc_B4.2	80	Uses object pronouns	71	182	192	195	271
sc_B5.4	82	Uses prepositions	72	189	198	200	221
sc_B3.4	84	Asks why, who, and how questions					
sc_B4.3	86	Uses possessive pronouns					
sc_B3.3	88	Asks when questions					
fm_B3.3	90	Copies three letters					
sc_B1.5	92	Uses regular past tense verbs					
cog_E2.3	94	Gives possible cause for some event					
sc_B5.5	96	Uses conjunctions					
sc_A2.3	98	Asks questions for clarification					
cog_E1.2	100	Identifies means to goal					

## AEPS II Outcome B, ECSE Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff points

sc_B2.1	102	Uses possessive "s"					
cog_C3.1	104	Completes sequence of familiar story or event					
sc_B4.4	106	Uses indefinite pronouns					
cog_A2.1	108	Demonstrates understanding of ten different qualitative concepts					
sc_B1.1	110	Uses auxiliary verbs					
sc_B1.2	112	Uses copula verb "to be"					
sc_B3.2	114	Asks when questions					
sc_B5.2	116	Uses adjectives to make comparisons					
cog_A2.2	118	Demonstrates understanding of eight different quantitative concepts					
sc_B5.3	120	Uses adverbs					
fm_B2.1	122	Draws using representational figures					
cog_G2.2	124	Recognizes printed numerals					
sc_B1.3	126	Uses third person singular verb forms					
cog_A3.1	128	Demonstrates understanding of 12 different spatial relations concepts					
fm_B3.2	130	Copies first name					
cog_E2.2	132	Makes prediction about future or hypothetical events					
fm_B3.1	134	Prints three letters					

## AEPS II Outcome B, ECSE Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff points

cog_F1.0	136	Engages in cooperative, imaginary play					
cog_A3.2	138	Demonstrates understanding of seven different temporal relations concepts					
cog_E1.1	140	Suggests acceptable solutions to problems					
sc_A3.0	142	Establishes and varies social-communicative roles					
cog_E2.1	144	Gives reason for inference					
sc_B1.4	146	Uses irregular past tense verbs					
fm_B2.2	148	Copies complex shapes					
cog_A1.0	150	Demonstrates understanding of color, shape, and size concepts					
cog_H3.1	152	Identifies letter names					
cog_G2.1	154	Labels printed numerals up to 10					
sc_A1.0	156	Uses words, phrases, or sentences to inform, direct, ask questions, and express anticipation, imagination, affect, and emotions					
cog_C2.0	158	Places objects in series according to length or size					
sc_B2.2	160	Uses irregular plural nouns					
cog_D1.0	162	Recalls events that occurred on same day, without contextual cues					
cog_B1.0	164	Groups objects, people, or events on the basis of specified criteria					
fm_B2.0	166	Prints pseudo-letters					



## AEPS II Outcome B, ECSE Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff points

sc_B3.0	168	Asks questions					
fm_B3.0	170	Prints first name					
sc_A2.0	172	Uses conversational rules					
sc_B4.0	174	Uses pronouns					
cog_G2.0	176	Demonstrates understanding of printed numerals					
cog_C3.0	176	Retells event in sequence					
cog_A2.0	178	Demonstrates understanding of qualitative and quantitative concepts					
cog_C1.0	180	Follows directions of three or more related steps that are not routinely given					
sc_B5.0	182	Uses descriptive words					
cog_H1.1	184	Uses rhyming skills					
cog_H2.3	188	Produces correct sounds for letters					
cog_E2.0	190	Makes statements and appropriately answers questions that require reasoning about objects, situations, or people					
cog_E1.0	192	Evaluates solutions to problems					
cog_H1.4	194	Identifies same and different sounds at the beginning and end of words					
cog_A3.0	196	Demonstrates understanding of spatial and temporal relations concepts					
cog_G1.0	198	Counts at least 20 objects					

**AEPS II Outcome B, ECSE Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff points**

sc_B1.0	200	Uses verbs					
cog_H1.3	202	Blends single sounds and syllables					
sc_B2.0	204	Uses noun inflections					
cog_H1.2	206	Segments sentences and words					
cog_H2.2	208	Sounds out words					
cog_H2.1	210	Writes words using letter sounds					
cog_H3.0	212	Reads words by sight					
cog_H1.0	214	Demonstrates phonological awareness skills					
cog_H2.0	216	Uses letter-sound associations to sound out and write words					

## AEPS II Outcome C Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

Item	Cumulative Score	Item Description	Age	Cutoff Point 90%	Cutoff Point 85%	Cutoff Point 80%	Cutoff Point 50%
soc_D1.0	2	Communicates personal likes and dislikes	32	28	33	39	
soc_D1.2	4	Selects activities and/or objects	33	30	36	42	
adapt_A1.2	6	Takes in proper amount of liquid and returns cup to surface	34	33	39	45	
adapt_A1.5	8	Eats with utensil	35	35	42	47	
adapt_A1.1	10	Puts proper amount of food in mouth, chews with mouth closed, swallows before taking another bite	36	38	44	50	
adapt_A1.0	12	Eats and drinks a variety of foods using appropriate utensils with little or no spilling	37	40	47	53	65
soc_D1.1	14	Initiates preferred activities	38	43	49	55	67
fm_A1.1	16	Holds object with one hand while the other hand manipulates	39	45	52	58	69
soc_C1.3	18	Meets physical needs of hunger and thirst	40	47	54	60	71
adapt_A1.3	20	Eats a variety of food textures	41	50	57	63	73
adapt_B1.2	22	Uses toilet	42	52	59	65	75
adapt_A1.4	24	Selects and eats a variety of food types	43	54	62	67	77
adapt_C1.3	26	Unzips zipper	44	57	64	70	79
soc_C1.0	28	Meets physical needs in socially appropriate ways	45	59	66	72	81
adapt_B1.3	30	Indicates need to use toilet	46	61	69	74	83

## AEPS II Outcome C Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

fm_A1.0	32	Uses two hands to manipulate objects, each hand performing different movements	47	64	71	76	85
adapt_B1.1	34	Uses toilet paper, flushes toilet, washes hands after using toilet	48	66	73	79	87
adapt_B1.0	36	Carries out all toileting functions	49	68	75	81	89
soc_C1.2	38	Meets observable physical needs	50	70	77	83	91
adapt_C1.0	40	Unfastens fasteners on garments	51	72	80	85	93
adapt_C2.5	42	Puts on underpants, shorts, or skirt	52	74	82	87	95
adapt_B2.1	44	Uses tissue to clean nose	53	76	84	89	96
adapt_C1.1	46	Unfastens buttons/snaps/ Velcro fasteners on garments	54	79	86	91	
soc_C1.1	48	Meets physical needs when uncomfortable, sick, hurt, or tired	55	81	88	93	
adapt_C2.2	50	Puts on front-opening garment	56	83	90	95	
adapt_C2.4	52	Puts on shoes	57	85	92	96	
soc_C2.2	54	Follows established rules at home and in classroom	58	87	93	98	
adapt_C2.1	56	Puts on long pants	59	89	95	100	
soc_C2.0	58	Follows context-specific rules outside home and classroom	60	91	97	102	
adapt_C2.3	60	Puts on pullover garment	61	93	99	103	
adapt_C1.2	62	Unties string-type fastener	62	94	101	105	

## AEPS II Outcome C Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

sc_A1.7	64	Uses words, phrases, or sentences to inform	63	96	102	107	
adapt_B2.2	66	Brushes teeth	64	98	104	108	
soc_C2.1	68	Seeks adult permission	65	100	106	110	
sc_A1.5	70	Uses words, phrases, or sentences to make commands to and requests of others	66	102	107	111	
adapt_C2.0	72	Selects appropriate clothing and dresses self at designated times	67	104	109	113	
sc_A1.6	74	Uses words, phrases, or sentences to obtain information	68	105	110	114	
adapt_B2.0	76	Washes and grooms self	69	107	112	116	
adapt_A2.3	78	Pours liquid into a variety of containers	70	109	113	117	
adapt_A2.4	80	Serves food with utensil	71	111	115	118	
adapt_B2.5	82	Washes and dries face	72	112	116	119	
sc_B3.1	84	Asks yes/no questions					
sc_A1.0	86	Uses words, phrases, or sentences to inform, direct, ask questions, and express anticipation, imagination, affect, and emotions					
sc_B3.5	88	Asks what and where questions					
sc_B3.6	90	Asks questions using rising inflection					
adapt_A2.1	92	Prepares food for eating					
sc_A1.4	94	Uses words, phrases, or sentences to describe past events					

## AEPS II Outcome C Developmental Order and Proposed 90, 85, 80 and 50%ile Cutoff Points

adapt_A2.0	96	Prepares and serves food					
adapt_C3.2	98	Fastens buttons, snaps, and Velcro fasteners					
sc_A1.3	100	Uses words, phrases, or sentences to label own or others' affect/emotions					
sc_A1.2	102	Uses words, phrases, or sentences to describe pretend objects, events, or people					
adapt_B2.4	104	Brushes or combs hair					
sc_B3.0	106	Asks questions					
sc_A1.1	108	Uses words, phrases, or sentences to express anticipated outcomes					
adapt_B2.3	110	Bathes and dries self					
sc_B3.4	112	Asks why, who, and how questions					
sc_B3.3	114	Asks when questions					
adapt_A2.2	116	Uses knife to spread food					
sc_B3.2	118	Asks questions with inverted auxiliary					
adapt_C3.3	120	Threads and zips zipper					
adapt_C3.0	122	Fastens fasteners on garments					
adapt_C3.1	124	Ties string-type fastener					