What Children Know and Can Do At the End of Head Start and What It Tells Us About The Program's Performance

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The national Head Start Bureau has determined that the ultimate goal of the program is, "to enhance the social competence of children from low-income families." *Social competence* has been defined by the Bureau as, "a child's everyday effectiveness in dealing with both the present environment and later responsibilities in school and life." For the five-year-old child coming to the end of the preschool period, a key test of social competence is how well he or she functions and adjusts to the demands of kindergarten and elementary school, what is often called *school readiness*. One of the primary objectives of the Head Start program supporting the goal of social competence and school readiness is "to enhance children's healthy growth and development."

The instruments used in the Head Start Family and Child Experiences Survey (FACES) were designed to tap major components of social competence. Children's cognitive development and early academic skills were measured through a *direct child assessment* administered to each of the sample children by specially trained assessors. Children's developing social skills were assessed by means of *standardized scales filled out by teachers and parents* and through *direct observation of the children's social play*, observations made during multi-day visits to Head Start centers. Children's approaches to learning and problem behaviors were also captured through standardized teacher and parent reports, as well as through *scales completed by the trained assessors* after they had conducted their one-on-one testing sessions with the children.

Research Questions That Can Be Addressed With FACES Child Assessment Data

- What are the school readiness skills that Head Start children have as they prepare to enter kindergarten? What are the skills they lack?
- How does the cognitive and social development of Head Start children compare with the development of the general population of preschool children in the United States?
- How well do Head Start children do in kindergarten? What skills and knowledge have they acquired by the end of the kindergarten year? What skills do they lack?
- How much variation is there in children's cognitive and social development across Head Start programs?
- What are the child-level, family-level, and program-level correlates of average differences

in children's cognitive and social development?

What Head Start Children Know and Can Do As They Approach Kindergarten

The Spring 1998 assessment results provide a nationally representative picture of what Head Start children know and can do as they complete the program year and prepare to enter kindergarten. These descriptive results are based on the performance of 1,580 children in the FACES sample who were 4 years old or older by the end of the previous calendar year (i.e., by December 31, 1997), and who would be of the prescribed age for entering kindergarten in the fall in most states.

FACES found that "typical" children (those at the median) completing Head Start could do the following things:

- Tell their full name and age;
- Identify ten basic colors by name;
- Show the meaning of basic shape and action words;
- Count four objects and solve simple addition and subtraction problems;
- Use a pencil to copy a circle or letters like "Z" and "E";
- Show the front cover of a story book and open it to start reading;
- Answer simple factual question about a story that was read to them.

Most children completing Head Start have also learned many of the social skills they will need in the kindergarten classroom. According to the Head Start teachers questioned in FACES, majorities of 4- and 5-year-old students showed the following positive social behaviors "very often" in Spring 1998, at the end of the Head Start year:

- Using free time in acceptable ways (64%);
- Helping in putting work materials away (62%);
- Following the teacher's directions (60%);
- Joining in activities without being told (56%);
- Waiting their turns in games (53%); and,
- Following the rules when playing games (52%).

Things they cannot yet do. There are a number of things that soon-to-be graduates of Head Start can *not* yet do. Among these are the following:

- Identify most letters of the alphabet;
- Write letters of the alphabet on request;
- Copy more complex geometric figures, like a star or parallelogram;
- Show they know that you go from left to right and top to bottom when reading English text.

There were also social skills that most Head Start children had not yet mastered at the end of the year. Less than half of the older fours and five year olds showed the following skills "very

often": accepting classmates' ideas for play (47 percent) and, inviting others to join in activities (46 percent). Only about a quarter give compliments to classmates very often, and only about a fifth do not get upset when teased by other children.

How the Cognitive Development of Head Start Children Compares With That of the General Population of Preschoolers

Head Start children who were four years old or older by the end of the previous calendar year had median standard scores of almost 90 on three of the four tasks for which normative data were available. (The overall means of the standard scores for the national standardization samples are set at 100, with standard deviations of 15.) The median standard scores were 88.7 for the Peabody Picture Word Vocabulary Test -- Third edition (PPVT -- III); 87.9 on the Woodcock-Johnson--Revised (WJ-R) Applied Problems math task; 90.2 on the WJ-R Letter-Word Identification task; and 87.9 on the WJ-R Dictation writing task.

Children in the highest quarter of the Head Start sample were close to the national mean of 100 on all of the four tasks. These values were: 98 for the Peabody vocabulary task; 98 on the WJ-R math task; 96 on the WJ-R letter identification task; and 98 on the WJ-R dictation task. Thus, the upper fourth of Head Start students were essentially at the national norm. On the other hand, children in the lowest quarter of the Head Start sample had standard scores that ranged from 78 to 83.

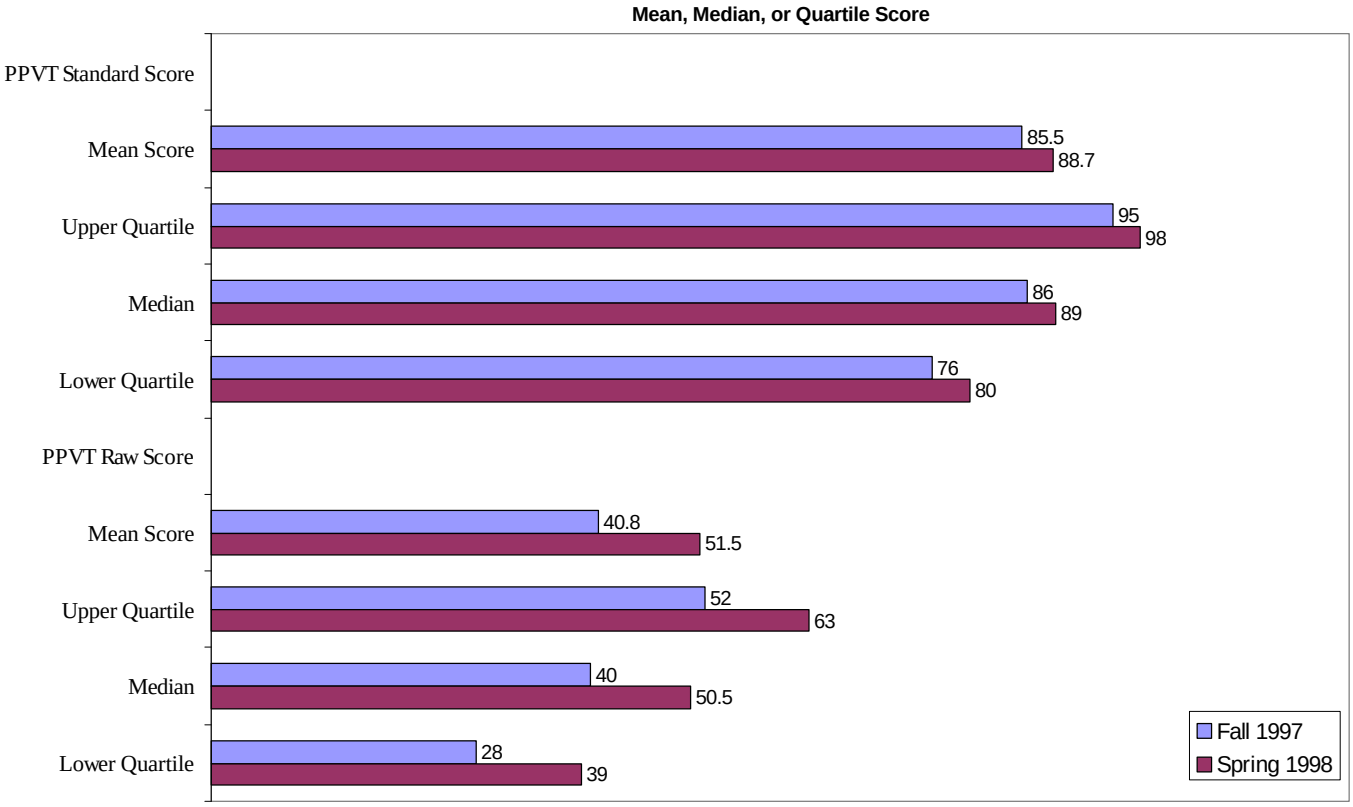
Gains In Vocabulary Knowledge

Children in Head Start show significant expansion of their vocabularies between the beginning and end of the program year. Children in the FACES sample who were 4 years old or older by the end of the calendar year demonstrated that they knew 11 more words on the PPVT-III in the spring of the Head Start year than they knew in the fall. The increase in raw score moved the Head Start children up with respect to national norms, as shown by the fact that their mean standard score on the vocabulary test went up by 3.2 points, or nearly one-quarter of a standard deviation.

While this gain is relatively modest, it falls within the range that has been deemed "educationally meaningful" (Rosenthal & Rosnow, 1984), and is line with earlier findings on the immediate effects of Head Start on children's intellectual performance (Haskins, 1989, p. 277; McKey et al., 1985).

Growth in word knowledge occurred among children in the middle, top, and bottom of the Head Start student distribution, and the gains were of comparable magnitude -- about an 11-word gain in raw score. Although children in the lower quarter learned as many new words as those in the middle or upper quarter, the gap between the bottom and top quarters did not narrow significantly.

Figure 1. Four Year Olds in Head Start Show Gains In Word Knowledge Compared To National Norms



Source: Westat (1999). Analysis of data from Head Start Family and Child Experiences Survey (FACES), Fall 1997 and Spring 1998; 4- and 5-year-olds, English assessments only. Standard scores have a population mean of 100 and a standard deviation of 15.

Minimal Gains In Letter Recognition and Book Knowledge

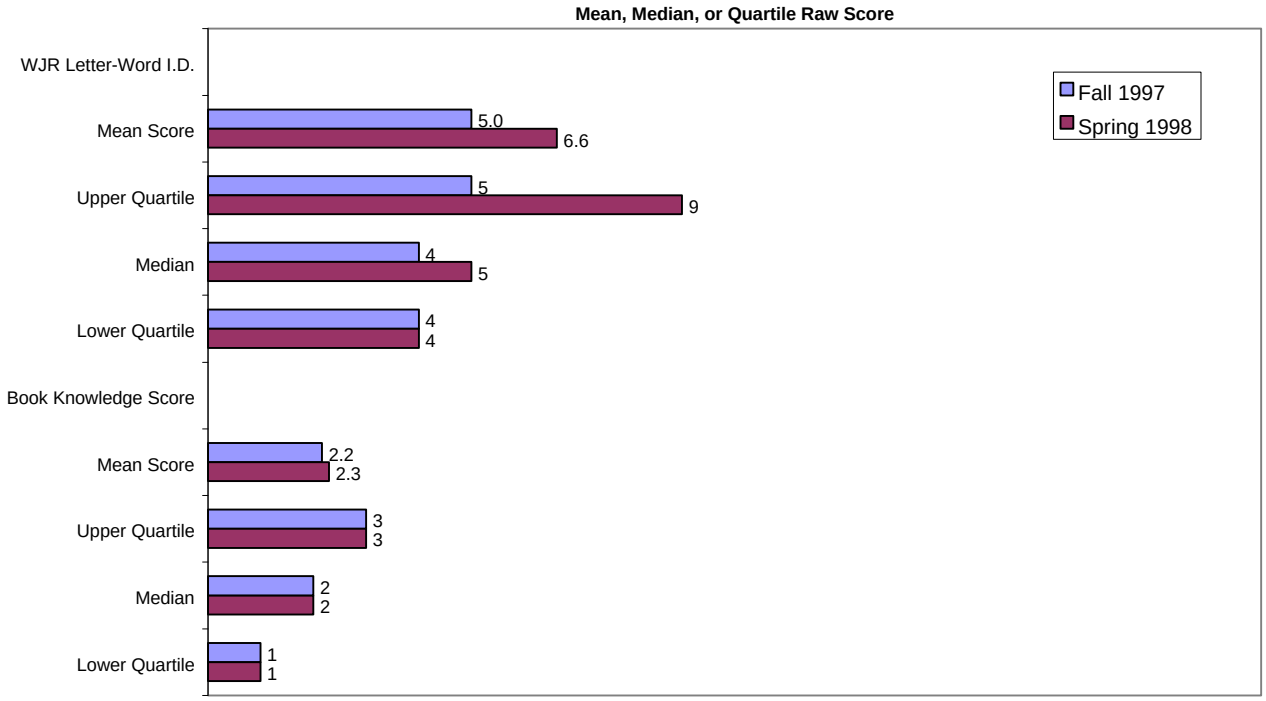
A different situation obtained with respect to their learning to recognize letters of the alphabet. At the beginning of the year, a typical 4 year old in Head Start achieved a raw score on the Woodcock-Johnson Letter-Word Identification task that signified that he or she could not identify a single letter of the alphabet by name. By the end of the Head Start year, the same child could identify one or two letters, but no more. Even those in the upper quarter of the Head Start population could only identify about half of the letters by the end of the program year.

When fall and spring raw scores were converted into standard scores, FACES found that Head Start students did not advance in comparison to national norms. A similar conclusion -- that Head Start students did not know their letters -- could be drawn from their year-end performance on the Woodcock-Johnson Dictation task. On this task, Head Start children could trace or copy letters, but not write one at the request of the assessor.

Head Start children demonstrated that they had some knowledge of book and print conventions. When asked, they could show the assessor the front of a storybook and open it to where the adult should start reading. But they showed no advance in this sort of book knowledge between the fall and the spring.

A probable reason why Head Start children are not learning early reading skills like letter recognition and print awareness is that many Head Start teachers are not teaching them. Interviews with lead teachers revealed that most do not give children's acquisition of these skills a particularly high priority in their curricular goals or daily activity plans.

Figure 2. Four Year Olds In Head Start Show Minimal Gains In Letter Recognition or Book Knowledge By End of Year



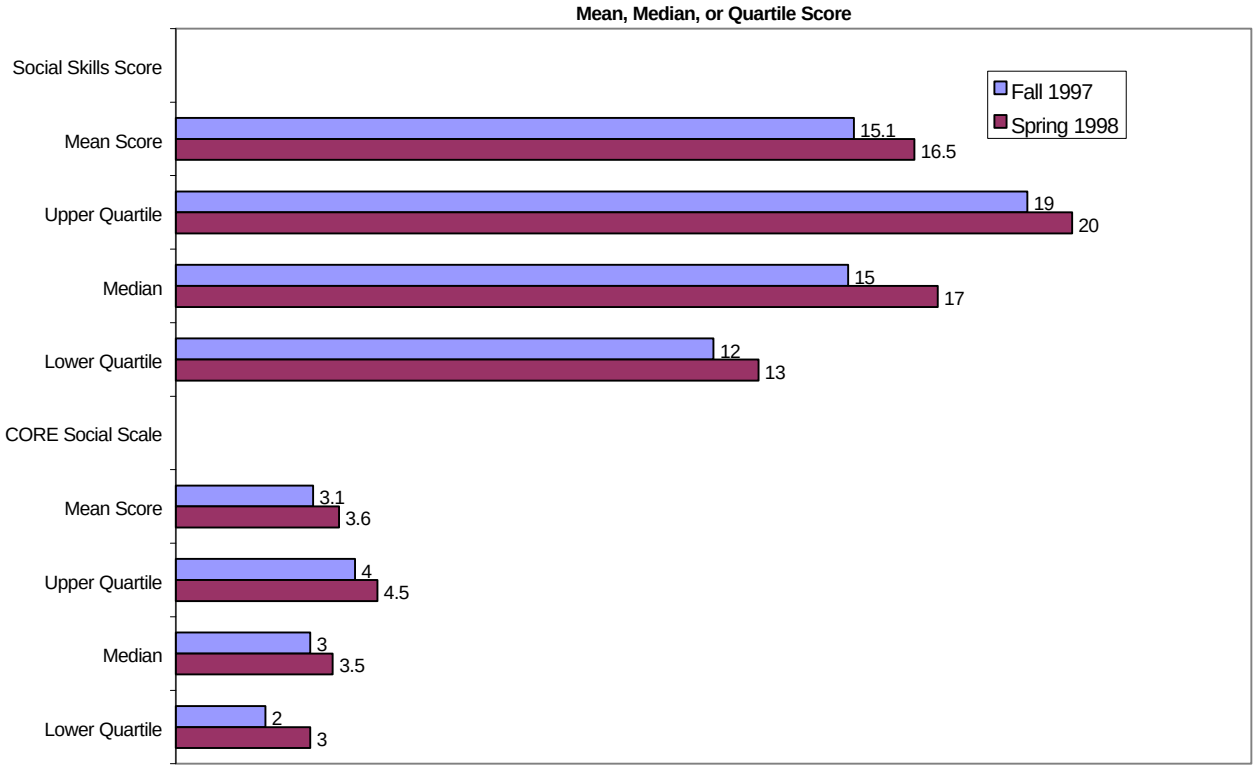
Source: Westat (1999). Analysis of data from Head Start Family and Child Experiences Survey (FACES), Fall 1997 and Spring 1998; 4- and 5-year-olds, English assessments only.

Gains In Social Skills

Head Start teachers were asked to rate individual children in the FACES sample on cooperative behavior and social skills, using the same rating scales in the fall and spring. The average student showed a significant gain in a social skills summary index based on 12 such items, with the median score going from 15 to 17 out of a possible 24 points.

Teachers also rated the quality of each child's social relationships in the fall and spring, using three criterion-referenced rating items from the Child Observation Record (COR) (High/Scope Foundation, 1992). The mean change in ratings from fall to spring was a statistically significant increase of 0.58 on a scale of 1 to 5, with the mean ratings going from 3.1 in the fall to 3.6 in the spring.

Figure 3. Teacher Ratings of Head Start Children Show Growth In Social Skills Across Program Year



Source: Westat (1999). Analysis of data from Head start Family and Child Experiences Survey (FACES), children aged 4 and 5, Fall 1997 and Spring 1998.

Lack of Change In Problem Behavior

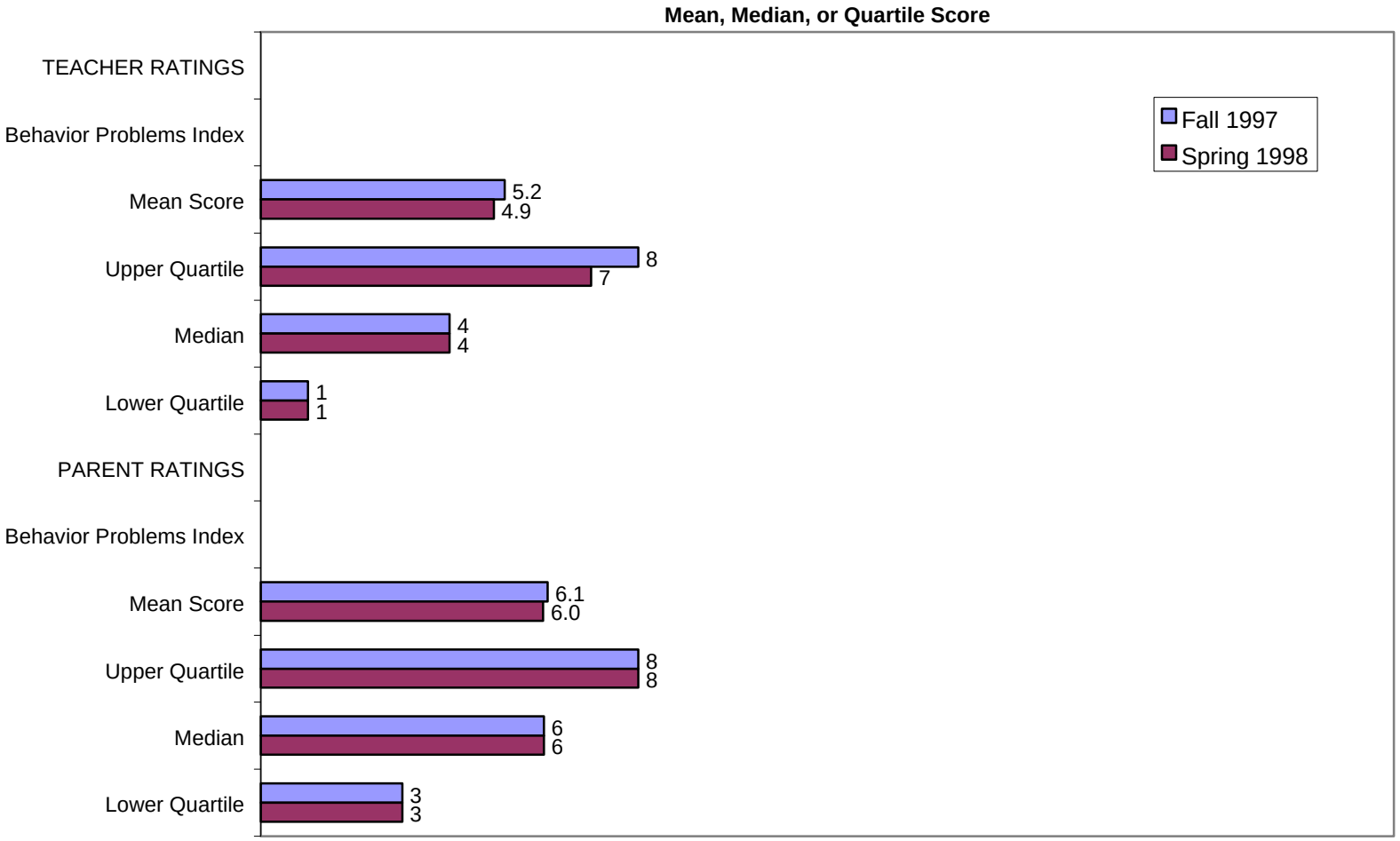
In contrast to the improvement in social skills, Head Start children did not show change from the beginning to the end of the program year in the frequency of emotional and conduct problems. Although only a minority of children showed such problem behavior with any frequency, the size of that minority did not diminish between fall and spring. Teachers and parents were asked to rate individual children in the FACES sample on a set of negative behaviors that are relatively common among preschool children and that are associated with adjustment problems in elementary school and receipt of psychological help. The items covered three domains: inattentive-overactive behavior, aggressive-disruptive behavior, and anxious, depressed, or withdrawn behavior.

The teacher behavior problem ratings contained 14 items, and a summary index based on these items could range from zero to 28. The median Head Start student received an index score of 4 in both Fall 1997 and Spring 1998. The parent behavior problem ratings contained 12 items, and a summary index based on these items could range from zero to 24. The median Head Start child received an index score of 6 in both Fall 1997 and Spring 1998.

Head Start Graduates Show Substantial Progress In Kindergarten

One indication of how well Head Start prepares children for school is the amount of progress graduates of the program make during their kindergarten year. There were 1,137 children who were assessed both in the Spring 1997 field test of the Head Start FACES procedures, and in the Spring 1998 field test of the kindergarten follow-up instruments. Some 890 of these children were assessed in English on both occasions. (The remainder was assessed in Spanish on one or both occasions.) By comparing their assessment results in Spring 1997, at the end of their Head Start participation, with those in Spring 1998, toward the end of their kindergarten year, we get an indication of how much they learned in the interim. Results of the FACES kindergarten field test suggest that children leaving Head Start are indeed “ready to learn,” because they have, in fact, learned a great deal by the end of kindergarten.

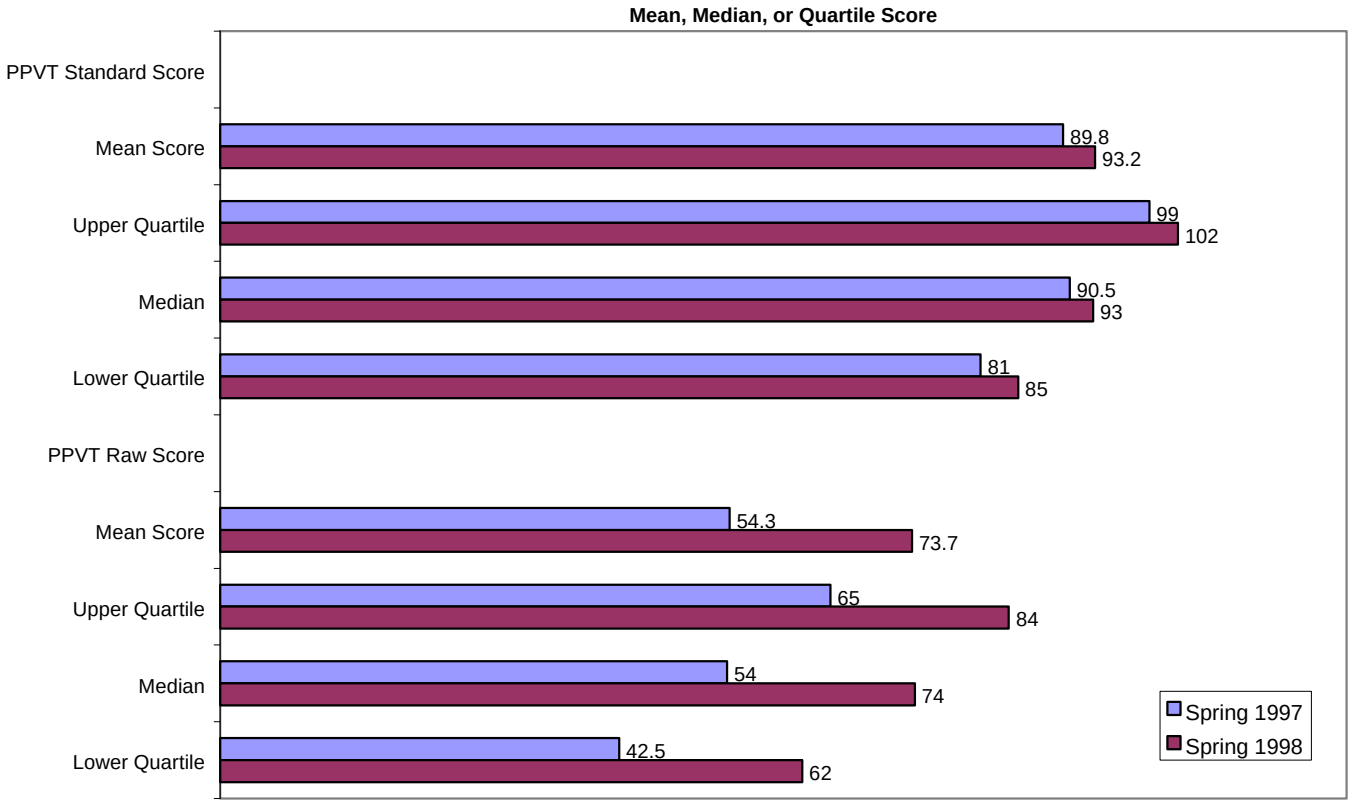
Figure 4. Teacher and Parent Ratings of Head Start Children Show No Change In Child Behavior Problems Across Program Year



Source: Westat (1999). Analysis of data from Head Start Family and Child Experiences Survey (FACES), children aged 4 and 5, Fall 1997 and Spring 1998.

In the Spring 1998 assessment, Head Start graduates could show they knew the meaning of almost 20 more words on the Peabody Picture Vocabulary Test than they had a year earlier. This was nearly twice as large a gain in raw score as they had made between the fall and spring of the Head Start year. In comparison to national norms, they showed a further gain, with an average increase in standard scores of 3.4, to a mean standard score of 93 in the spring of kindergarten.

Figure 5. Head Start Graduates Show Gains In Word Knowledge By End of Kindergarten

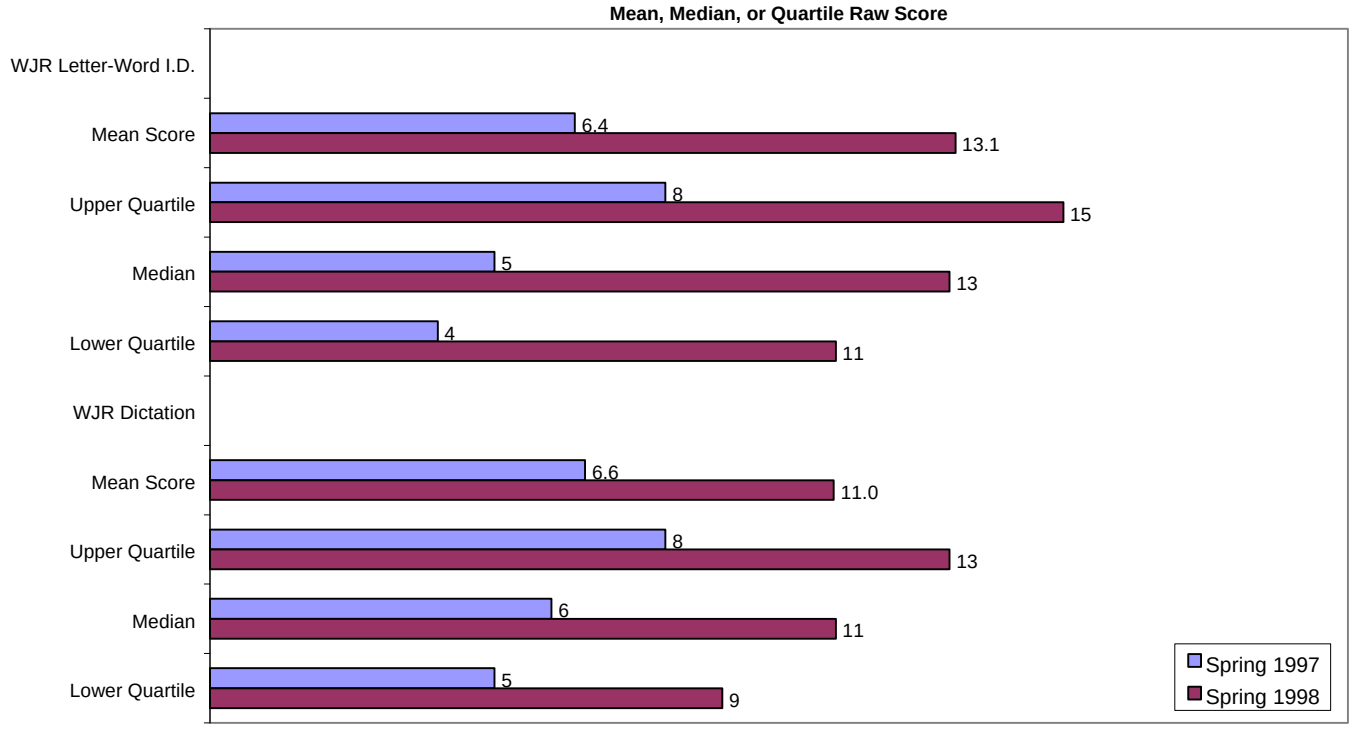


Source: Westat (1999). Analysis of data from Head Start Family and Child Experiences Survey (FACES), Spring 1997 (HS) and Spring 1998 (K), English assessments only. Standard scores have a population mean of 100 and a standard deviation of 15.

Whereas typical Head Start children could only recognize one or two letters of the alphabet in the spring of the Head Start year, by the spring of kindergarten they achieved a score on the Woodcock-Johnson Letter-Word Identification task indicating that they could recognize most or all letters of the alphabet. Their raw scores on the letter recognition task increased by an average of nearly 7 points, as opposed to the one-to-two point gain they showed during Head Start. They were also able to write letters on request in the Woodcock-Johnson Dictation task, whereas they were not

able to do this while still in Head Start. Their raw scores on the Dictation task increased by an average of more than 4 points. In a related task, virtually all the graduates could write their first names by the end of kindergarten.

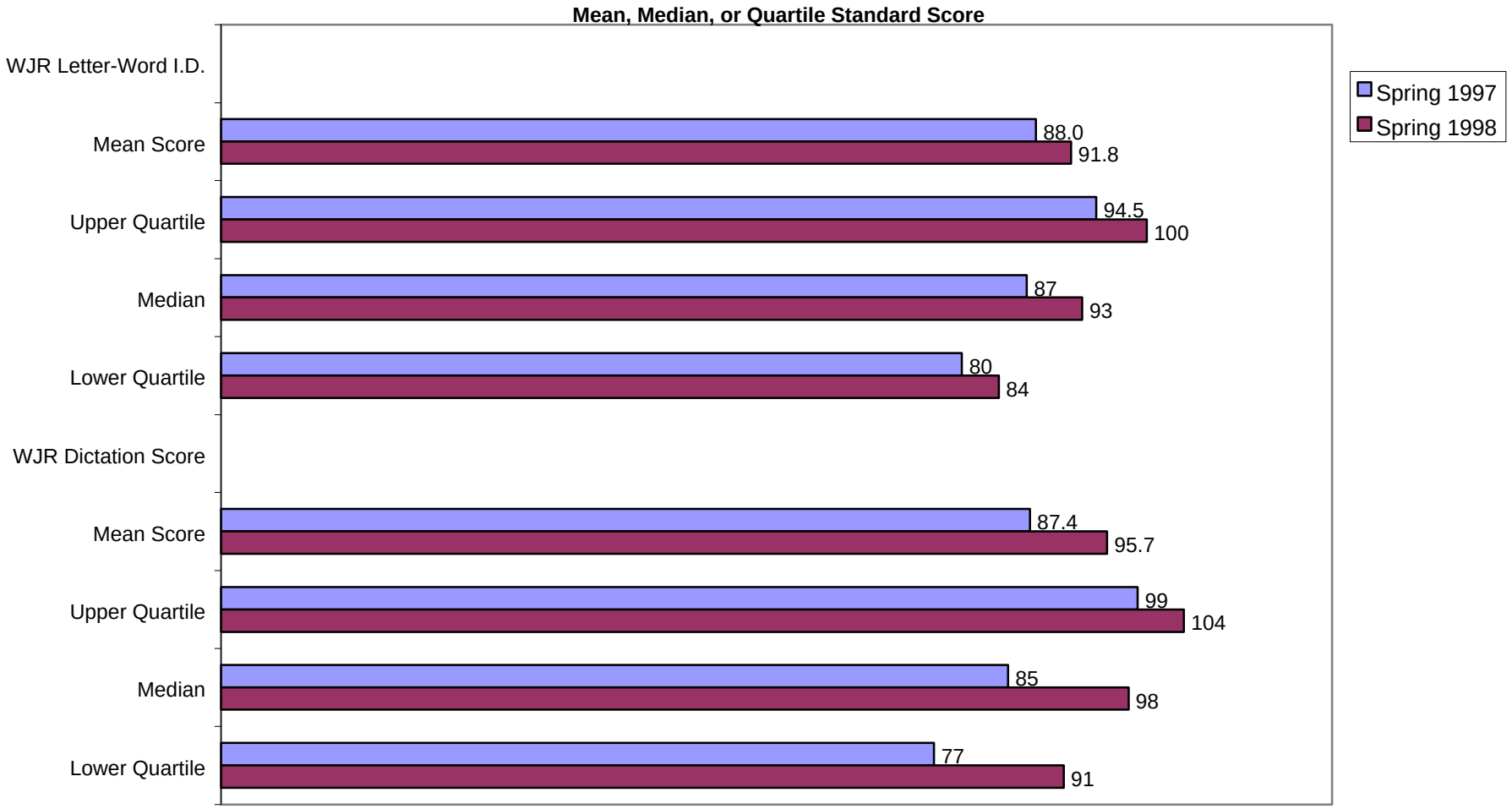
Figure 6. Head Start Graduates Show Substantial Gains In Letter Recognition and Writing Skills By End of Kindergarten



Source: Westat (1999). Analysis of data from Head Start Family and Child Experiences Survey (FACES), Spring 1997 (HS) and Spring 1998 (K); English Assessements only.

The standard scores of the Head Start graduates also showed significant increases on the Letter-Word and Dictation tasks, with a 4-point gain in the former task, to a mean of 93, and an 8-point gain in the latter task, to a mean standard score of nearly 96.

Figure 7. Head Start Graduates Show Gains In Letter Recognition Compared To National Norms By End of Kindergarten



Source: Westat (1999). Analysis of data from Head Start Family and Child Experiences Survey (FACES) Spring 1997 (HS) and Spring 1998 (K), English assessments only. Standard scores have a population mean of 100 and a standard deviation of 15.

Head Start graduates showed gains as well in a phonemic analysis task, which tested children's awareness of word sounds by requiring them to say one part of a compound word without the other part. (E.g., "Say 'mailbox; ...Now say it without 'mail'.") Typical children at the end of Head Start could not do this task at all. But at the end of their kindergarten year, the graduates achieved a mean score of 9 (out of a possible 14) on this task, and a median score of 11. The graduates also showed significant progress in familiarity with book and print conventions, listening comprehension, early math problem solving skills, and ability to recite basic facts about themselves such as first and last name, age, and birthday.

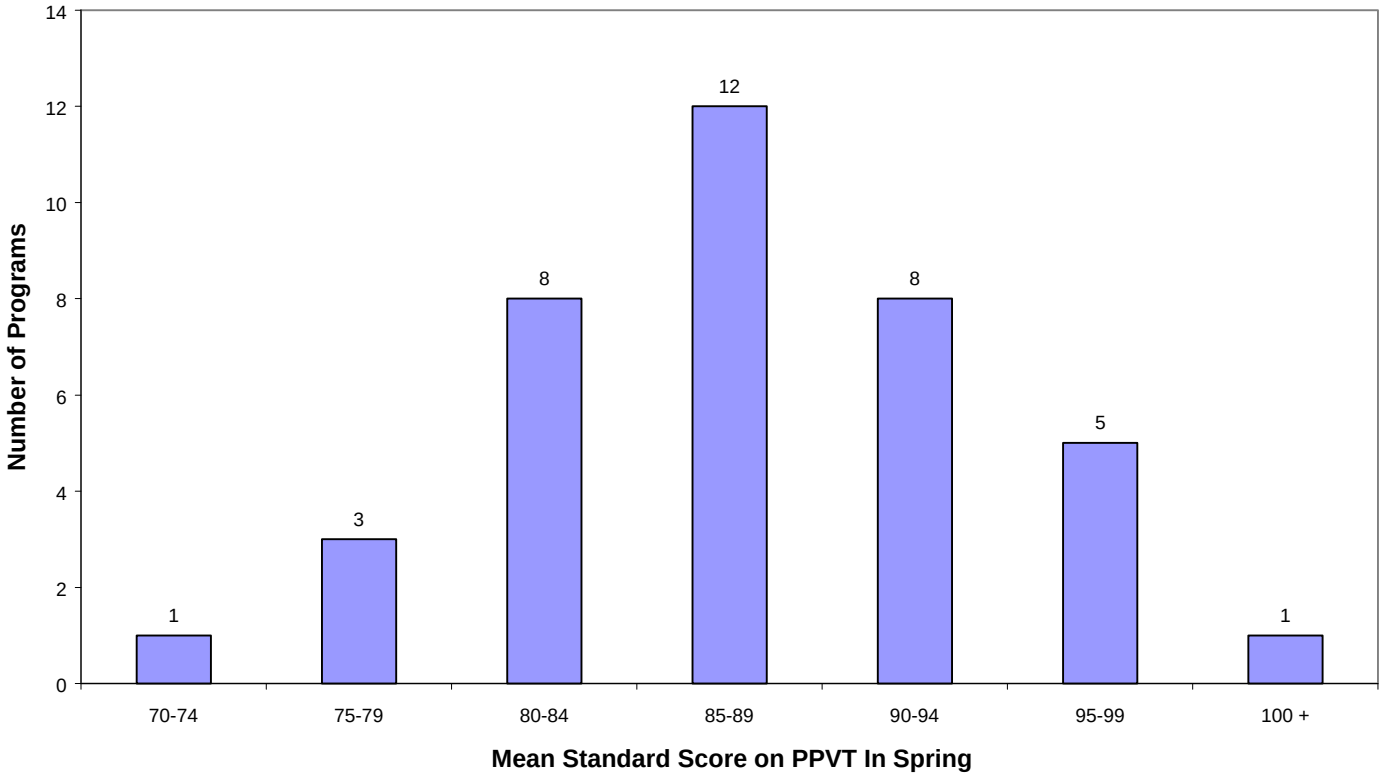
Despite the substantial progress they made in kindergarten, Head Start graduates continued to score below national norms on most tasks for which norms were available. The gaps were smaller, but they were still there. For example, whereas typical Head Start graduates could recognize most letters, their performance on the Woodcock-Johnson Letter-Word Identification task indicated that they could not yet read simple sight words. However, the test norming data showed that the majority of children nearing the end of kindergarten *could* read a few simple words by sight. As was the case at the end of Head Start, the top quarter of program graduates achieved scores in kindergarten that were at the national norm. But the majority did not.

On the positive side, the skills that typical Head Start graduates *could* demonstrate, such as letter recognition, expanded word knowledge, phonemic awareness, and knowledge of book and print conventions, have been shown to be positive predictors of learning to read. The signs are that most Head Start graduates at the end of kindergarten are well on their way to becoming readers in first or second grade.

Variation In Children's Cognitive Development Across Head Start Programs

FACES found that there was significant variation in the average assessment performance of children from different Head Start programs. For example, Figure 9 presents a histogram showing the mean standard scores on the PPVT-III for all children who were assessed in English in both the fall and spring (total N = 2,124), in each of 38 Head Start programs (two programs in which all children were assessed in Spanish have been excluded). The scores shown are those children achieved at the end of the program year, in Spring 1998. (The program means are based on an average of 56 children per program, with a range of from 9 to 177.) The mean vocabulary score for the average Head Start program was 88. In the six highest-scoring programs, children's vocabulary scores standardized for age averaged 95 to 102. These scores were at or close to the national average for all children, including those from non-poverty backgrounds. On the other hand, in the four lowest-scoring programs, children's standard scores averaged 75 to 79, more than twenty points below the population average.

Figure 8. Distribution of Head Start Programs By Mean Vocabulary Scores



Source: Westat (1999). Analysis of data from Head Start Family and Child Experiences Survey (FACES), Spring 1998, 3-, 4- and 5-year-olds, English assessments only.

A significant portion (16 percent) of the total variance in children's standardized vocabulary scores was attributable to differences across programs. An additional but considerably smaller portion of the total variation (4 percent) was attributable to differences across centers within programs. The vast majority of the variation in vocabulary scores (75 to 80 percent) occurred across children within programs and centers. These findings, which are parallel to those frequently obtained in educational research in the higher grades (Bryk & Raudenbush, 1992; Singer, 1999), imply that most of the variation in children's word knowledge is attributable not to what happens in Head Start classrooms, but to family background factors (including learning activities at home) and individual differences in children's talents and experiences. We used two-level models to examine the contribution of individual, family, program, and community factors to variations in children's assessment performance. We constructed separate models predicting to: a) the *level* of knowledge children had attained in the spring of the Head Start year; and, b) the *gain* in knowledge children achieved between the fall and spring assessments.

Predicting to the Level of Vocabulary Knowledge At the End of Head Start

Seventy-eight percent of the cross-program variance in children's vocabulary scores could be predicted from socioeconomic characteristics of the families in the community in which the Head Start program operated. These characteristics were represented by three program-level variables: the percentage of parents in the program who had some college education or more; the percentage

of families with incomes at the upper end of the poverty range (monthly incomes of $1,200 or more); and, the percentage of non-minority children in the program. All three of these program characteristics were positively related to children's vocabulary scores.

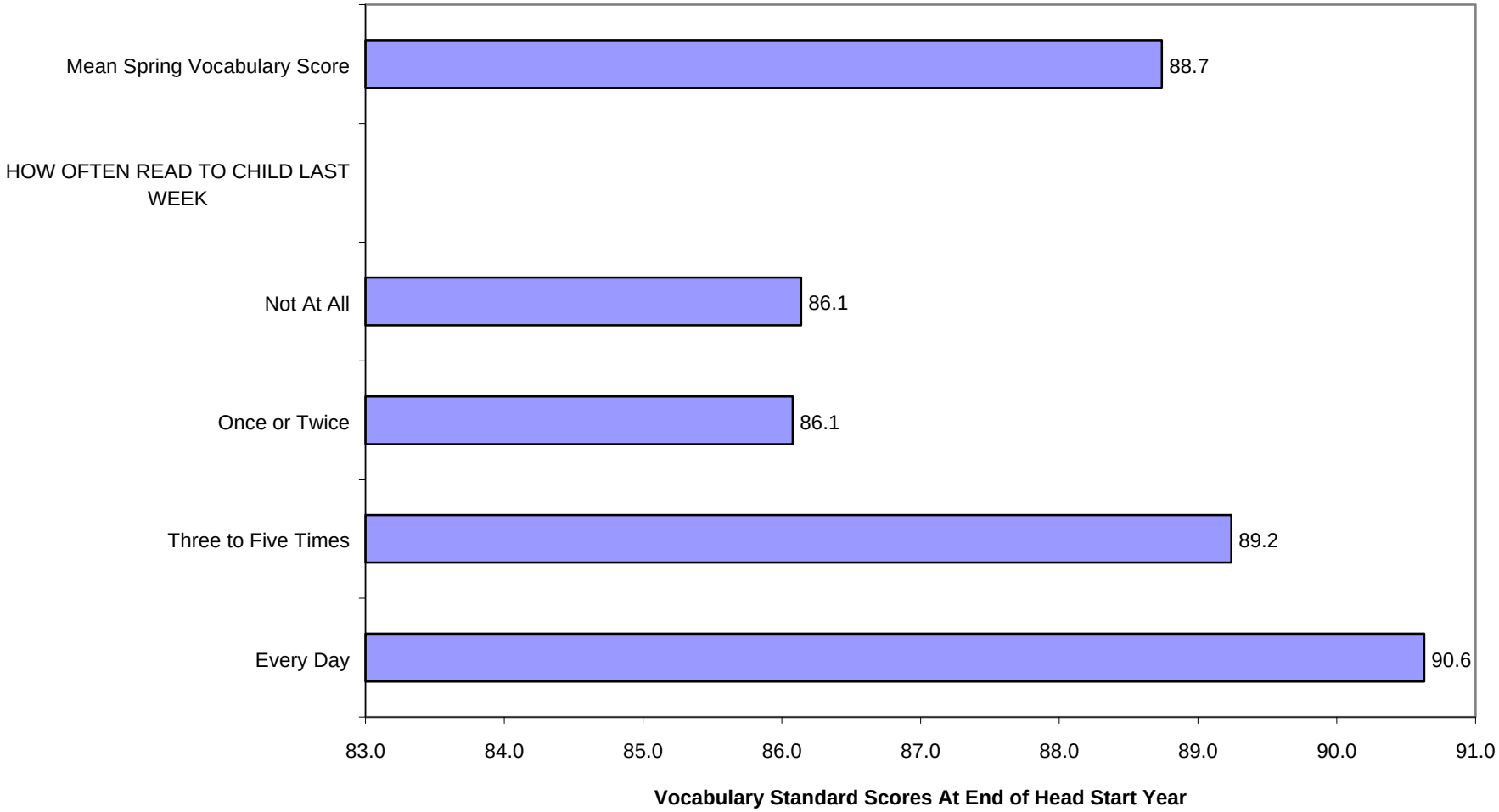
Geographic differences. Once these socioeconomic characteristics of families in the community were taken into account, differences in vocabulary scores across regions of the country and in urban as opposed to rural areas were no longer significant.

Program quality. Measures of classroom quality were associated with the level of children's vocabulary scores. Children's scores were higher in programs with better quality language activities (ECERS language scale) and those with lower adult-child ratios. However, classroom quality was also associated with the socioeconomic characteristics of families in the programs. ECERS language scales were higher in programs with higher average family income and adult-child ratios were lower in programs with higher proportions of non-minority children. Once socioeconomic characteristics of families in the programs were taken into account, the correlations between classroom quality measures and vocabulary scores were no longer significant. Nonetheless, the addition of the quality measures to the multilevel model did raise the total amount of variance accounted for. With the addition of these measures, 79 percent of the cross-program variation in vocabulary scores was explained.

Family and child factors. Even within the low-income Head Start population, differences in children's vocabulary knowledge were related to family socioeconomic factors and child characteristics. A child-level multiple linear regression model accounted for 19 percent of the variance in children's PPVT standard scores (R = .44). Significant individual predictors were: parent education level (positively related to vocabulary score), family income level (positively related), African-American child (negatively related), language-minority family (negatively related), and child's disability status as reported by parent (negatively related). When a predicted vocabulary deviation score based on the child-level regression was introduced into the two-level model, the model accounted for 9.9 percent of the within-program variance.

Parental reading to children. The frequency with which parents reported reading to their children made a difference for children's word knowledge, even when other family factors were taken into account. (See Figure 10). After addition of a variable representing parental reading frequency, the child-level regression model accounted for 21 percent of the variance in children's PPVT standard scores (R = .46). When a predicted vocabulary deviation score based on the child-level regression with the addition of parental reading frequency was introduced into the two-level model, the model accounted for 11.5 percent of the within-program variance.

Figure 9. Head Start Children Whose Parents Read To Them More Often Have Higher Vocabulary Scores At End Of Year



Source: Westat (1999). Analysis of data from Fall 1997 and Spring 1998 Head Start Family and Child Experiences Survey. Vocablulary scores adjusted for parent education, income, race/ethnicity, language, minority status, and child's disability status.

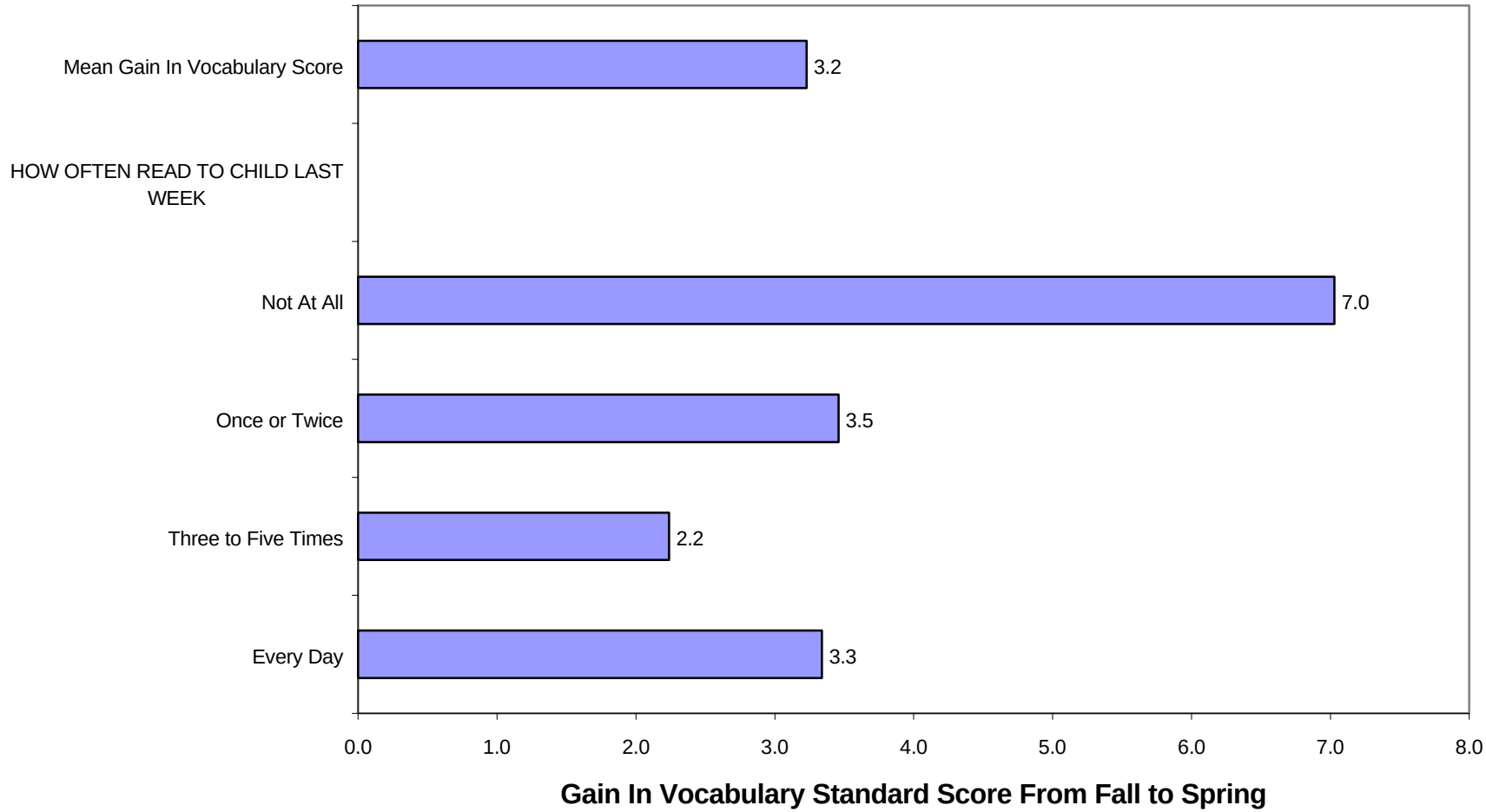
Predicting to Gain in Vocabulary Knowledge From Fall to Spring

The results were very different when we attempted to model the gain in vocabulary standard scores that children showed between the fall and spring of the Head Start year. To begin with, only three percent of the overall variation in gain scores could be attributed to differences across programs. The vast bulk of the variation occurred within programs. Socioeconomic characteristics of communities were of little use in accounting for the cross-program variation. There were some significant geographic variations in gain, with programs in the Northeast showing slightly larger gains than those in other regions and those in urban areas showing slightly greater gains than those in rural areas. These factors accounted for 24 percent of the variation across programs.

Likewise, family socioeconomic factors and child characteristics were of little use in accounting for differences in vocabulary gain scores within programs. There was one child-level variable that did help account relate to vocabulary gains, and that was parental reading to the child. A child-level multiple linear regression model including parental reading frequency accounted for 1.1 percent of the variance in gain scores ($R = .11$). The only individual predictor that was statistically significant was the frequency of parental reading. Interestingly, it was children whose parents did *not* read to them in the previous week who showed the larger gain in vocabulary scores. (See Figure 10).

A possible explanation of this finding is that reading stories to children is one of the major vocabulary-building activities that nearly all Head Start teachers engage in, as interviews with the teachers revealed. It stands to reason that children with parents who do not read stories to them regularly would show greater benefit from Head Start than those who are read to regularly at home. This finding shows that Head Start is indeed functioning in a compensatory fashion, making up for intellectual stimulation that children are not getting at home.

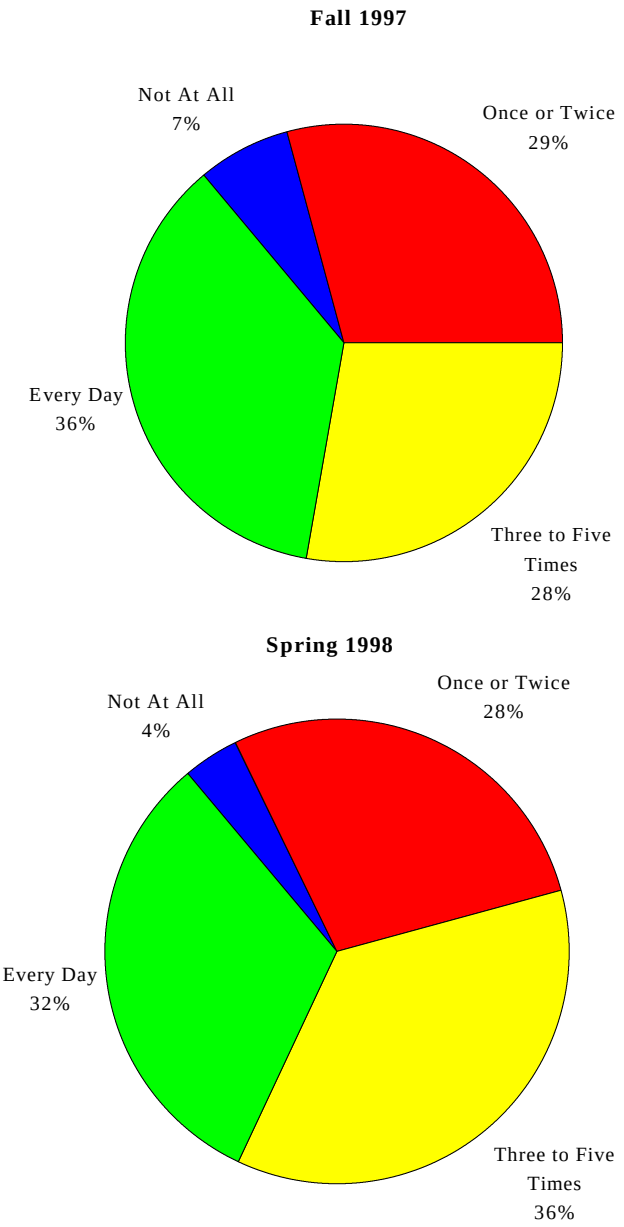
Figure 10. Children Whose Parents Rarely Read To Them Show More Gain From Head Start



Source: Westat (1999). Analysis of data from Fall 1997 and Spring 1998 Head Start Family and Child Experiences Survey. Vocabulary scores adjusted for parent education, income, race/ethnicity, language, minority status, and child's disability status.

Given the link between parental reading and children's vocabulary knowledge, interview findings regarding the frequency of parental reading to children in fall and spring were somewhat troubling. (See Figure 11). The proportion of parents who did not read to their children at all in the previous week did decline from fall to spring, and more than two-thirds of Head Start parents reported reading to their children at least three to five times a week. But the proportion who said they read to their children every day did not increase. It would appear that Head Start programs could be doing more to encourage regular reading by parents.

Figure 11. How Frequently Head Start Parents Read to Child Last Week



Source: Westat (1999). Analysis of data from Head Start Family and Child Experiences Survey (FACES), Parent Interviews from Fall 1997 (N=2,712) and Spring 1998 (N=2,685).

Conclusions

Assessments of a national sample of Head Start children in the fall and spring of the program year showed that, by the end of the year, Head Start children possess academic knowledge and social skills that indicate a readiness to learn when the children reach kindergarten and first grade. Assessments of a national sample of Head Start graduates at the end of kindergarten showed further that these children have made substantial gains in word knowledge, letter recognition, writing skills, and phonemic awareness during the course of kindergarten.

At the same time, the FACES child assessments suggest several areas in which the Head Start program might be strengthened. Children in Head Start showed significant gains in word knowledge over the Head Start year, but minimal gains in letter recognition or book knowledge. They showed significant gains in social skills, but little or no change in problem behavior. Children's word knowledge was related to the frequency of parental reading to their children, but parent interviews showed no increase from fall to spring in the proportion of parents who reported reading to their children every day. The FACES findings suggest that Head Start children and families might benefit from more classroom activities aimed at nurturing early literacy skills and more counseling for parents on the importance of reading to children and other literacy activities at home. Programs should also focus more on services for children with behavior problems.