

**Growth in Children's Literacy Skills in Head Start and Early
Elementary School:
Implications for Preschool Curricula¹**

Nicholas Zill, Gary Resnick, and Kevin O'Donnell

Westat

This report addresses the following research questions about the growth of young children's literacy skills:

- How does growth in cognitive development and emergent literacy that children show in preschool compare with the growth they exhibit once they reach elementary school?
- What is the relationship between the level of skill attained in preschool programs and the amount of growth children display in elementary school?
- How do growth patterns vary across different skill areas?

The research was meant to test at least partially three underlying hypotheses. The first was that children who leave preschool with more developed language and decoding skills will do better in elementary school and be further along the path to reading by the end of kindergarten. The second was that the amount of benefit children derive from a preschool program is directly proportional to the quantity and quality of language-related activities in the program. The third hypothesis concerned the compensatory qualities of preschool. This proposition was that children who have received less language stimulation at home stand to gain more from literacy-related activities in preschool.

Note that proponents of the whole language approach to reading, and more extreme proponents of Piagetian and discovery-learning approaches to the preschool curriculum would take exception to the first two hypotheses. These theorists see little importance in children acquiring specific literacy skills at early ages. They hold that children will rapidly acquire these skills and catch up once they are ready to learn them, which does not have to happen until elementary school. They emphasize the socialization functions of preschool and the value of activities that increase children's motivation to read, as opposed to the teaching of specific skills like letter recognition and phonics.

¹ Revised version of paper presented at the 2001 Biennial Meeting of the Society for Research in Child Development, Minneapolis, MN, April 19, 2001.

Our analysis examined how well these contrasting perspectives were supported by longitudinal data from the Head Start Family and Child Experiences Survey (FACES). The study followed a large national sample of children from low-income families from their entrance into Head Start through the end of their kindergarten year. Three kinds of skills are addressed in this report: word knowledge (receptive vocabulary); letter recognition; and early writing skills (tracing and copying letter-like shapes and actual letters; writing individual letters on demand). For children who spent more than one year in Head Start, cognitive growth rates in their first and second year are compared with each other and with growth rates in kindergarten.

METHODS

Study Sample

The study population consisted of children who participated in Head Start programs serving children aged 3 and older for the first time during the 1997-1998 school year. The sample universe included Head Start programs in the 50 States, Puerto Rico and the Territories of the United States. A stratified national probability sample of 40 Head Start programs was selected for the Head Start Family and Child Experiences Study (FACES). All selected programs cooperated with FACES.

A probability sample of 3,006 children new to Head Start in the fall of 1997 was selected from the 40 sampled programs. These children were spread over 181 centers and more than 500 classrooms. The children whose assessment data were analyzed in the present study were a subset of 1,613 children. These were children who were assessed in English in both the fall and spring of their first Head Start year. They were also children for whom parent interview data were available from either the fall or spring of the base year. Some 1,368 of these children (or 85 percent) were reassessed a year later; 725 in the spring of their kindergarten year and 643 in the spring of their second year in Head Start. (The former group was mostly four years old or older when they began Head Start, whereas the latter group was mostly three.) Weights were developed to adjust the longitudinal subsample for nonresponse and make it more representative of the overall population of Head Start children. The analyses reported here were conducted with weighted data.

Measures of Emergent Literacy

The instruments used in FACES were designed to reflect the Head Start Performance Measures objectives (Commissioner's Office of Research and Evaluation, ACYF, 2001) and to tap major components of school readiness as defined in the multi-domain framework recommended by the Technical Planning Group on School Readiness to the National Education Goals Panel (Goal One Technical Planning Group, 1991, 1993). Children's cognitive development, fine motor skills, 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 rating 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.

The FACES child assessment consisted of a series of tasks designed to appraise children's cognitive and perceptual-motor development in areas such as word knowledge, letter recognition and knowledge of book and print conventions. These tasks have been shown to be predictive of later school achievement, especially of later reading proficiency and oral language skills (Horn & Packard, 1985; Snow et al, 1995; Pianta & McCoy, 1997). The present analysis used three literacy-related measures as dependent variables, namely, the measures of:

- **receptive vocabulary knowledge** (the Peabody Picture Vocabulary Test, Third Edition (PPVT-III), (Dunn & Dunn, 1997);
- **letter recognition** (Letter-Word Identification task from the Woodcock-Johnson Psycho-Educational Battery-Revised (WJ-R); and,
- **early writing skills** (Dictation task from WJ-R).

In order to limit the assessment time for younger children, the WJ-R tasks were administered only to children four years old or older at the time of assessment. Those scores on these tasks were often not available for the younger children at both the start and the end of their first year in Head Start.

At the end of their kindergarten year, children in FACES were administered the Reading and General Knowledge assessments from the Early Childhood Longitudinal Study of a

Kindergarten Cohort (ECLS-K), conducted by the U.S. Department of Education (West, Denton, Germino-Hausken, 2000; Zill & West, 2000). This was done to allow comparisons with a large, nationally representative sample of U.S. elementary schoolchildren.

FINDINGS

Although there was no non-Head Start comparison group in FACES, the use of assessment measures with national norms permitted comparisons between the skills of children in the Head Start sample and children of the same ages in the norming samples.

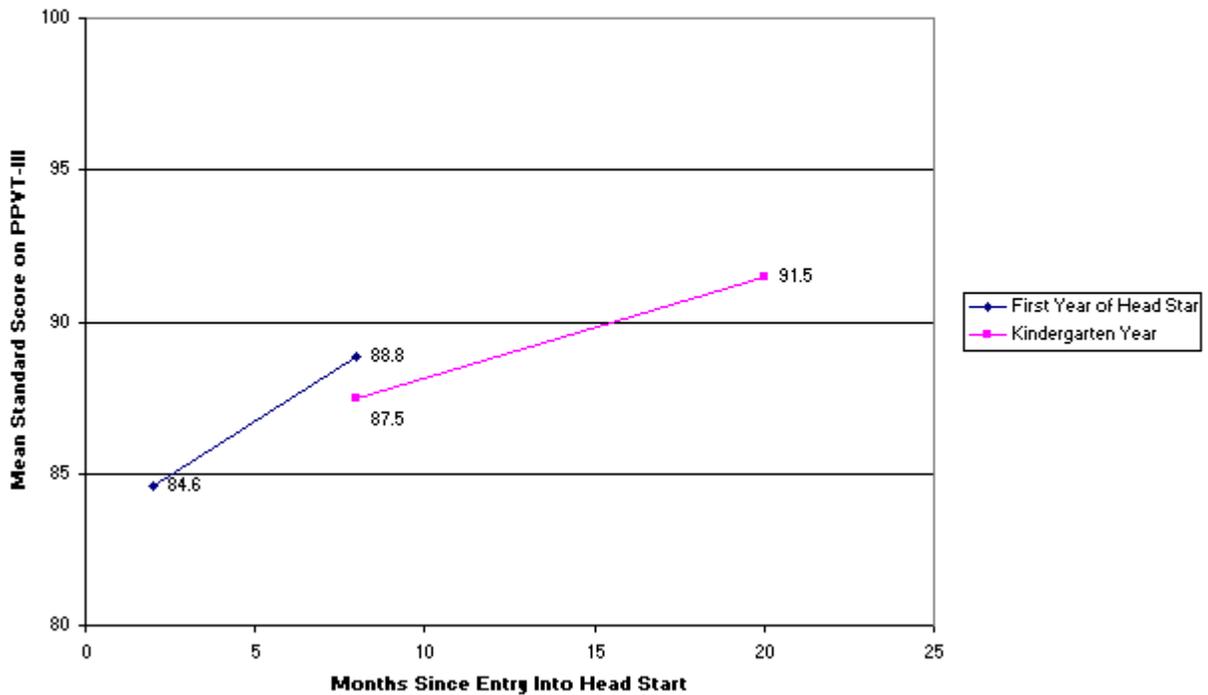
Majority Entered Head Start with Skills Below National Norms

The majority of children who entered Head Start came into the program with early literacy skills that were less developed than those of most children of the same age. This was to be expected with a group of young children who came from families with low parent education and income levels. The association between family background and children's achievement has often been demonstrated in education research. FACES found that Head Start entrants had a mean standard score of 84.6 on the Peabody Picture Vocabulary Test (PPVT-III). They had a mean standard score of 83.8 on the Dictation task of the Woodcock-Johnson Revised (WJ-R) achievement battery; and a mean standard score of 90.8 on the Letter-Word Identification task of the WJ-R. Standard scores are constructed to have an overall mean of 100 and a standard deviation of 15. Thus, the literacy skills that the average Head Start child brought to the program were from two-thirds of a standard deviation to a full standard deviation below national norms.

Gains in Vocabulary and Writing in Head Start and Kindergarten

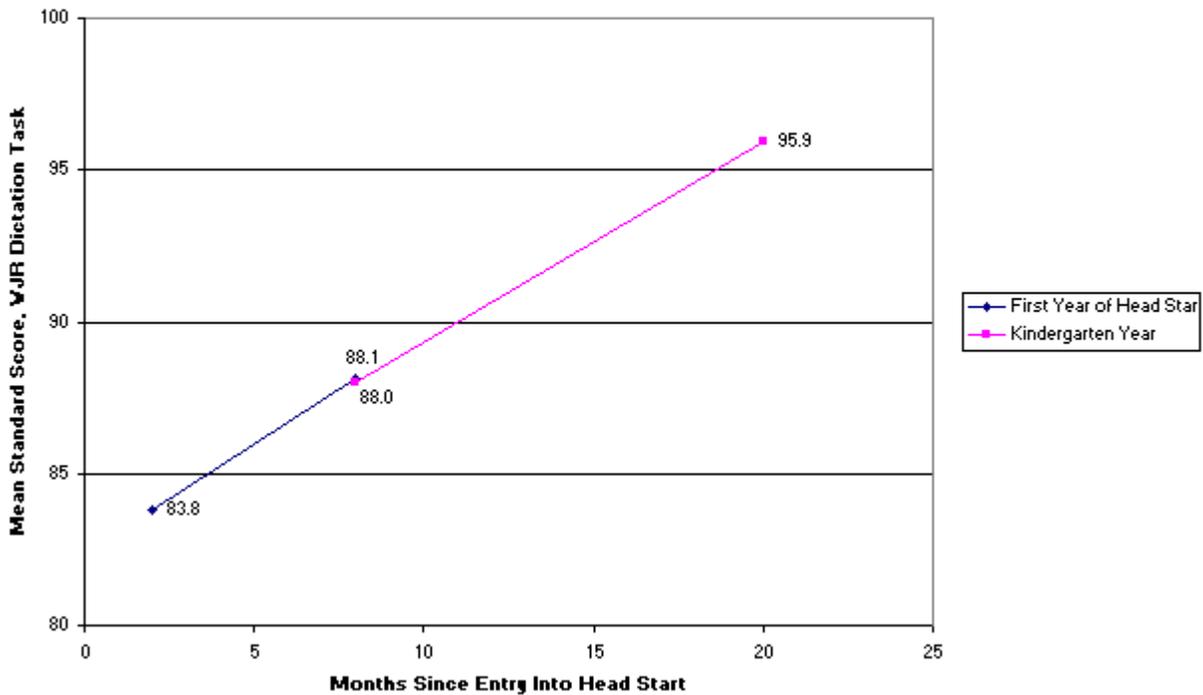
In two of the emergent literacy skill areas, vocabulary and early writing, children showed significant gains compared to national norms in both Head Start and kindergarten. The mean standard score on the PPVT-III went from 84.6 in the fall of the Head Start year to 88.8 in the spring ($n = 1,613$; $difference = 4.25$, $p < .001$). Between the spring of the Head Start year and the spring of kindergarten, the mean vocabulary scores of Head Start graduates who had progressed to kindergarten increased from 87.5 to 91.5 ($n = 725$; $difference = 3.98$, $p < .001$). (Figure 1).

Figure 1. Mean Vocabulary Scores of Head Start Children in Head Start and Kindergarten -- Standard Scores



Scores on the early writing assessment showed a similar pattern. Only children who were 4 years old or older received the WJR Dictation task. Among these children ($n = 836$), the mean standard score on the WJ-R Dictation task went from 83.8 in the fall of the Head Start year to 88.1 in the spring of the year ($n = 836$; $difference=4.3$, $p < .001$). Among children going on to kindergarten, the mean standard score increased from 88.0 in the spring of the Head Start year to 95.9 in the spring of the kindergarten year ($n = 709$; $difference = 7.9$, $p < .001$). (Figure 2).

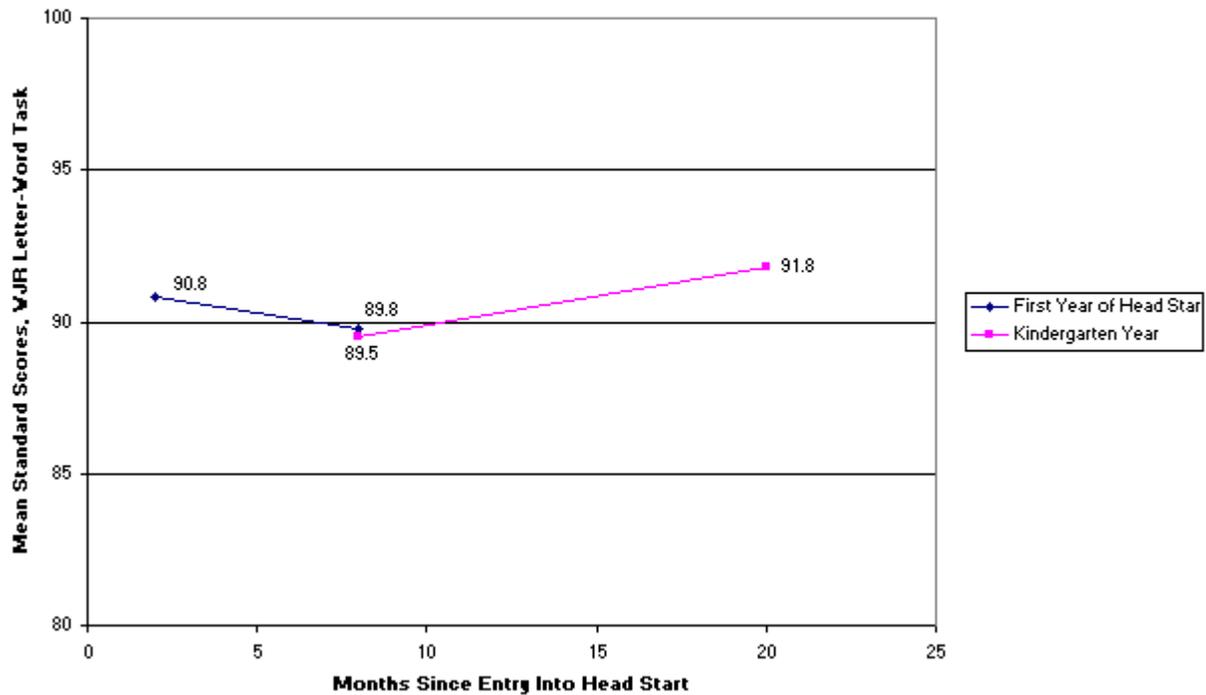
**Figure 2. Mean Early Writing Scores of Head Start Children in Head Start and Kindergarten
-- Standard Scores**



No Gain in Letter Recognition in Head Start, Gain in Kindergarten

In the skill of letter recognition skill, children showed increases in their raw scores during the Head Start year, but no increase in their standard scores. In fact, the children showed a slight but significant decline. These scores went from 90.8 in the fall to 89.8 in the spring ($n = 844$; $difference = -1.03, p = .008$). The change during kindergarten has to be estimated, because the ECLS-K reading assessment was substituted for the Letter-Word Identification task in the main FACES study. However, the WJ-R Letter-Word task had been administered to kindergartners as part of the field test of the kindergarten followup conducted in the spring of 1998. At the end of their kindergarten year, the mean standard score for the independent national sample of Head Start graduates studied in the FACES field test was 91.8. (Figure 3).

Figure 3. Mean Letter Identification Scores of Head Start Children in Head Start and Kindergarten -- Standard Scores

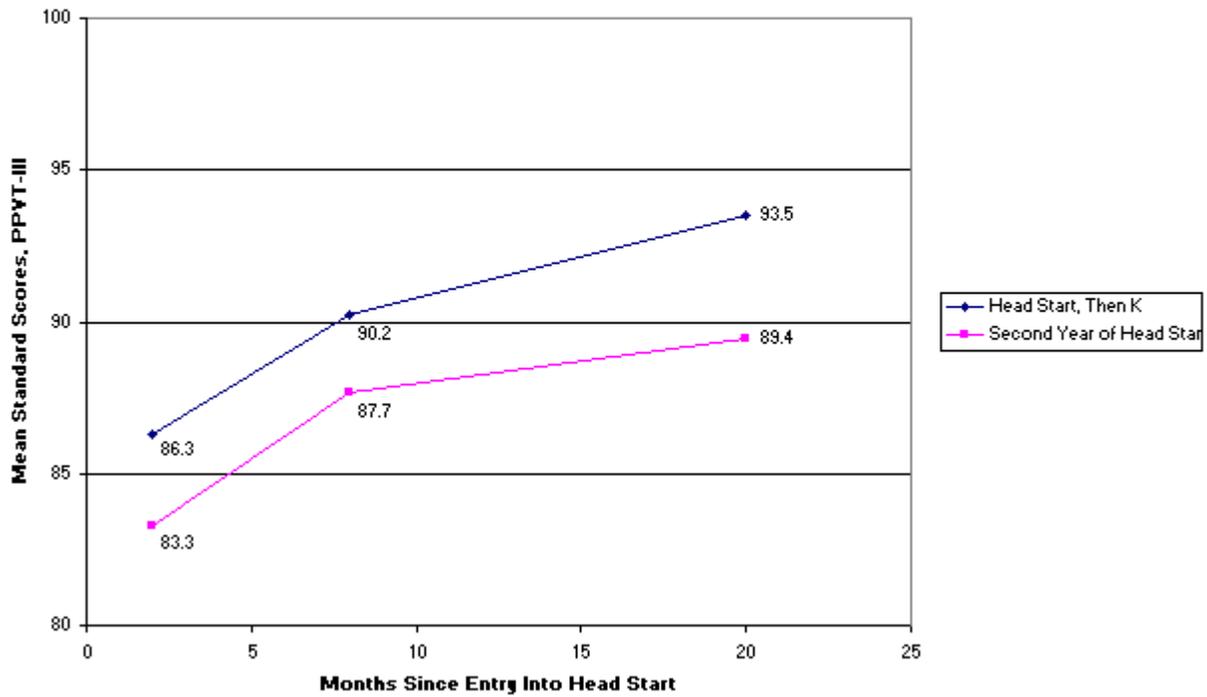


Both the Woodcock-Johnson task used in the field test and the ECLS-K Reading assessment used in the main study showed that a majority of Head Start graduates could identify most letters of the alphabet at the end of kindergarten.

Less Gain in Literacy Skills in Second Year of Head Start

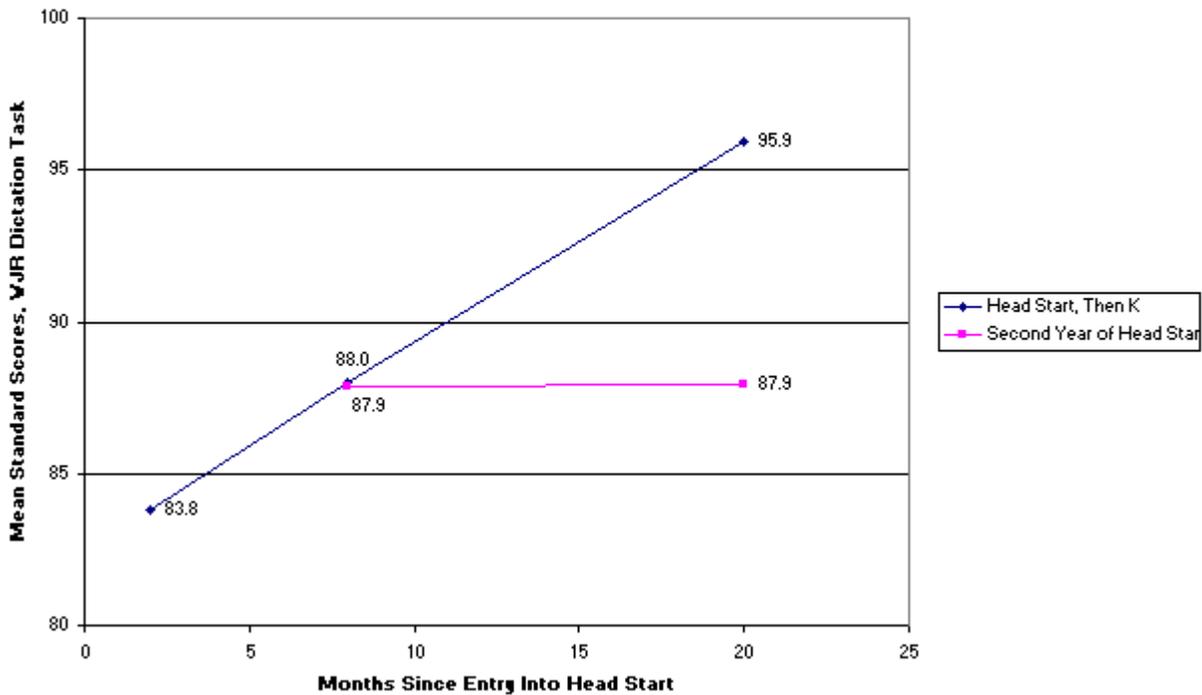
Although younger children who spent a second year in Head Start showed further increases in their average raw scores on the three literacy-related tasks, they showed less gain or no gain with respect to national norms. On the vocabulary task, the mean standard score during the second Head Start year went from 87.7 to 89.4 ($n = 643$; $difference = 1.74, p = .01$). This was a statistically significant increase, but it was significantly smaller than the increase during the first year for the same subgroup ($difference\ of\ differences = -2.64, p = .029$).

Figure 4. Mean Vocabulary Scores of Head Start Children -- Kindergarten versus Second Year of Head Start



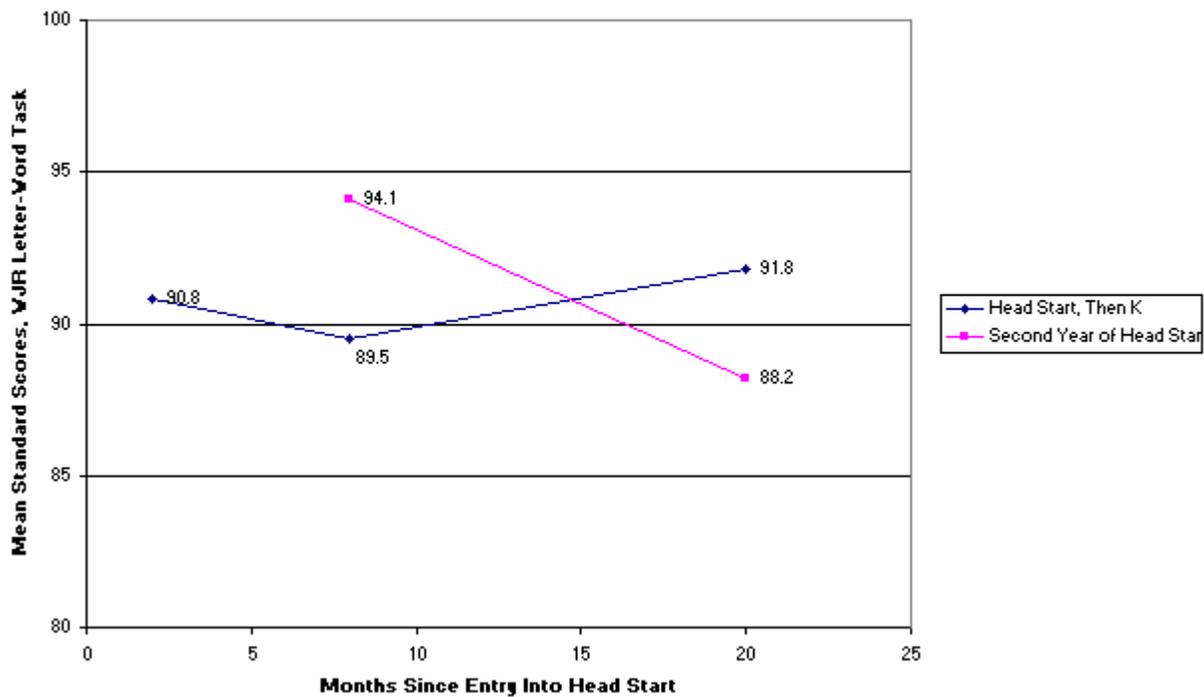
On the early writing task, the younger subgroup that was given the Dictation task at the end of their first Head Start year and at the end of their second year ($n = 505$) had mean standard scores of 87.9 on both occasions. (*Difference of differences* = -7.71, $p = .012$). (Figure 5).

Figure 5. Mean Early Writing Scores of Head Start Children -- Kindergarten versus Second Year of Head Start



On the letter recognition task, the group given the WJ-R tasks at the end of the first and second years of Head Start had mean standard scores of 94.1 and 88.2, respectively ($n = 486$; $difference = -5.9, p < .001$). The decline in the second year was significantly greater than the decline showed by the Head Start-kindergarten group in their year of Head Start ($difference\ of\ differences = -4.87, p = .001$). (Figure 6).

Figure 6. Mean Letter Identification Scores of Head Start Children -- Kindergarten versus Second Year of Head Start



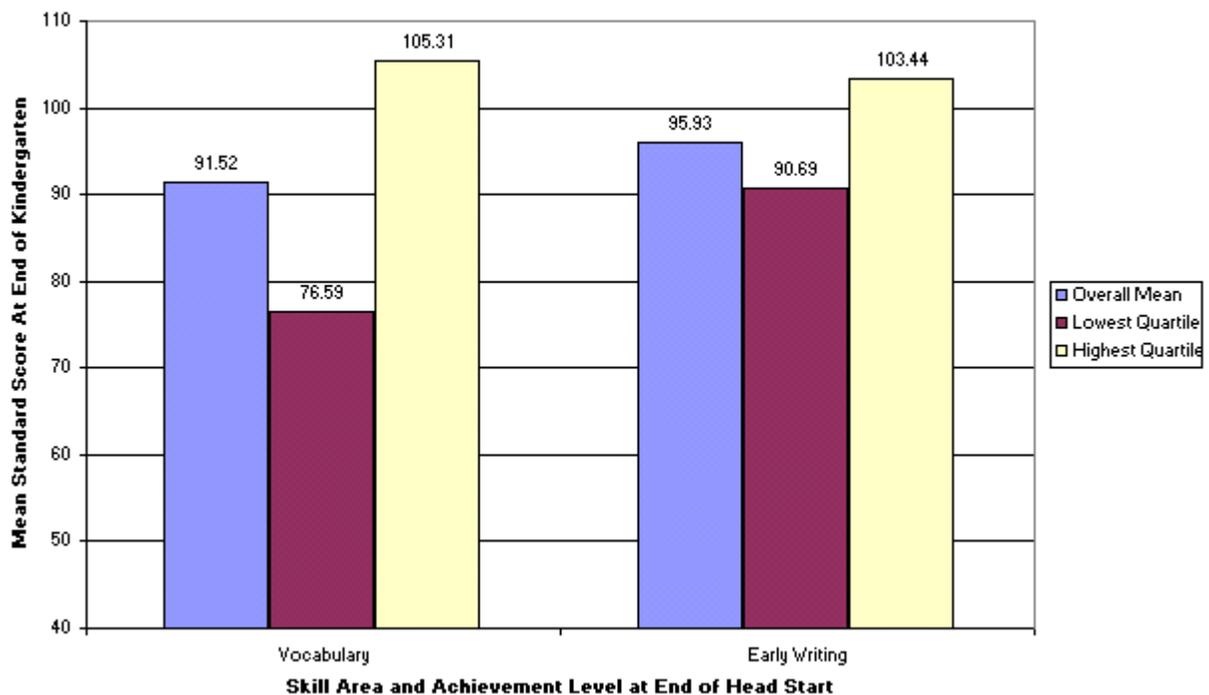
Children Finishing Head Start with Greater Skills Are More Advanced at End of Kindergarten

An earlier report of FACES findings showed that children who began Head Start with more advanced literacy skills tended to be more advanced than their peers at the end of the program year (Commissioner's Office of Research and Evaluation, ACYF, 2001). The same relationship was found with respect to achievement by the end of kindergarten. Children who finished Head Start with more developed vocabulary and writing skills scored higher on assessments of these skills at the end of kindergarten. Among 725 children for whom vocabulary assessments were available at the end of Head Start in spring 1998 and at the end of kindergarten in spring 1999, the overall mean standard score on the vocabulary assessment was 91.5 at the end of kindergarten. Among 183 children who scored in the top quartile at the end of Head Start, the mean standard score in spring 1999 was 105.3. The mean for the top quartile group was significantly higher than the overall mean (*difference = 13.79, p<.001*) and the mean for the lowest quartile (*difference = 28.72, p<.001*). Among 190 children who scored in the bottom quartile at the end of Head Start, the mean standard score in spring 1999 was 76.6. The mean for the bottom quartile was significantly lower than the overall mean (*difference = 14.93,*

$p < .001$). (Figure 7, bars on left).

Among 709 children for whom early writing assessments were available at the end of Head Start in spring 1998 and at the end of kindergarten in spring 1999, the overall mean standard score on the Dictation task was 95.9 at the end of kindergarten. Among 178 children who scored in the top quartile at the end of Head Start, the mean standard score in spring 1999 was 103.4. The mean for the top quartile group was significantly higher than the overall mean ($\text{difference} = 7.51, p < .001$) and the mean for the lowest quartile ($\text{difference} = 12.75, p < .001$). Among 194 children who scored in the bottom quartile at the end of Head Start, the mean standard score in spring 1999 was 90.7. The mean for the bottom quartile was significantly lower than the overall mean ($\text{difference} = 5.24, p < .001$). (Figure 7, bars on right).

Figure 7. Mean Vocabulary and Writing Scores of Head Start Graduates By End of Kindergarten By Level of Achievement At End of Head Start

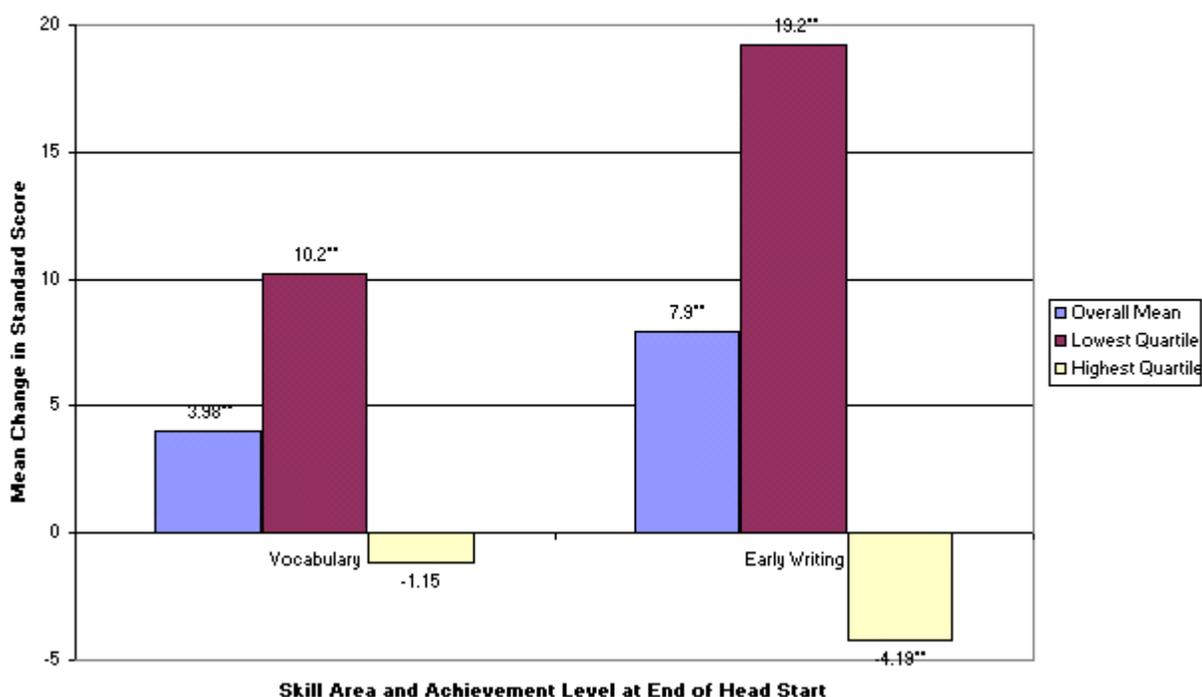


Children Finishing Head Start with Lesser Skills Show More Gain in Kindergarten

The earlier report of FACES findings showed that children who began Head Start with less developed literacy skills tended to make greater gains by the end of the Head Start year, even though they did not catch up with their peers. The same relationship was found with respect to gains of Head Start graduates by the end of kindergarten. Children who finished Head Start with lower vocabulary and writing skills made greater gains than their peers who

finished Head Start with higher skills. The overall mean gain in vocabulary standard scores was 3.98 points, from 87.5 at the end of Head Start to 91.5 at the end of kindergarten. Children who were in the lowest quartile at the end of Head Start showed a mean gain of 10.2 points, from 66.4 to 76.6 ($p < .001$). Children who were in the highest quartile at the end of Head Start showed no gain in their mean standard score, going from 106.5 in spring 1998 to 105.3 in spring 1999 ($\text{difference} = -1.15, p = .129$). The gain of children in the lowest quartile was significantly larger than the mean gain ($\text{difference of the differences} = 6.22, p < .001$) and the mean gain was significantly larger than the change (or lack of change) in the highest quartile group ($\text{difference of the differences} = 5.13, p < .001$). A similar pattern was found with respect to early writing skills. (Figure 8).

Figure 8. Mean Gains in Vocabulary and Writing During Kindergarten By Level of Achievement At End of Head Start



Despite the larger gains shown by children in the lowest quartile, their levels of achievement by the end of kindergarten remained below those of the average Head Start graduate and well below those of children in the highest quartile. This was true with respect to both vocabulary and writing skills.

Head Start Children Learn Their Letters in Kindergarten

Analysis of data on first-time kindergartners in the Early Childhood Longitudinal Study

of a Kindergarten Cohort (ECLS-K) showed that in the fall of 1998, a majority of U.S. kindergartners (66 percent) were able to recognize most letters of the alphabet by name when they entered school (West, Denton, & Germino-Hausken, 2000; Zill and West, 2000). By contrast, data from FACES showed that, at the end of Head Start, most Head Start children could not identify most letters presented in the WJR Letter-Word Identification task. However, the FACES longitudinal data also demonstrated that most Head Start graduates had mastered their letters by the end of kindergarten. This was established by giving the FACES children at the end of their kindergarten year the same Reading assessment that had been used in ECLS-K. The Reading assessment results showed that 83 percent of the Head Start graduates in FACES were able to pass the cluster of items that defined the first reading proficiency level (letter-recognition) in ECLS-K. Indeed, the assessment showed that a 53-percent majority of the Head Start graduates had gone beyond letter recognition and were able to associate letters with beginning sounds of words (the second reading proficiency level).

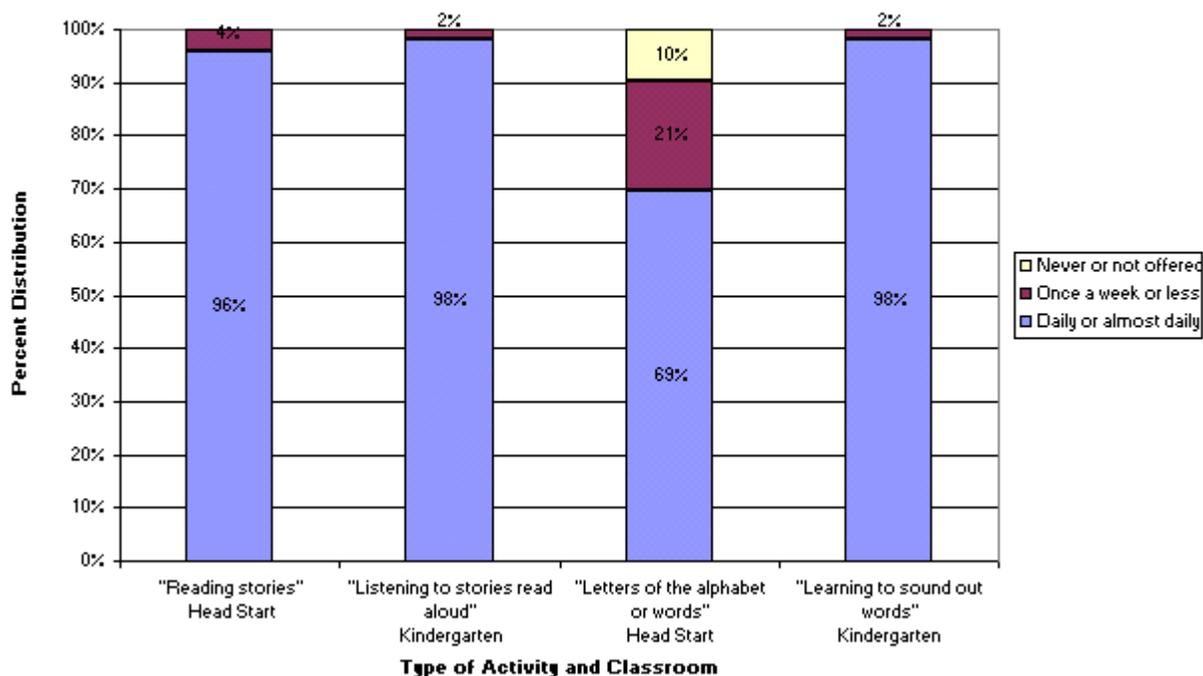
DISCUSSION

The FACES results lend support to the three hypotheses posed at the beginning of this paper. Head Start children who finished Head Start with more advanced vocabulary and pre-writing skills were further along the path to reading and writing by the end of kindergarten. Also, growth in literacy-related skills seemed to reflect the kind of instructional activities that programs have children engage in. In two domains (vocabulary and early writing), Head Start children demonstrated gains compared to national norms in both Head Start and kindergarten. In another domain (letter recognition), children showed no gain versus national norms in Head Start, but gains in kindergarten. The latter area tends to be one that is emphasized in most kindergarten curricula, but less likely to be emphasized in the learning activities practiced in most Head Start programs (at least until recently). In response to interviews and questionnaires administered by FACES staff to Head Start and kindergarten teachers, kindergarten teachers were more likely to report having their classes engage in activities explicitly designed to teach children letters and their sounds.

As shown in Figure 9, both Head Start teachers in the FACES sample and kindergarten teachers interviewed in the kindergarten followup to FACES reported nearly universally that

they engaged in reading stories to their classes on a daily basis. Among kindergarten teachers, virtually all said they also engaged in activities aimed at teaching their pupils to sound out words on a daily basis. By contrast, only about two-thirds of Head Start teachers said they taught children about letters and words on a daily basis. While this was a majority of the teachers, it was considerably smaller than the large majorities who reported daily book reading, art, or free play activities. The remaining proportion reported teaching about letters less frequently and about 10 percent said they never included such activity in their classroom schedules.

Figure 9. Teacher Reports of Frequency of Literacy-Related Classroom Activities in Head Start and Kindergarten



A result that seemed consistent with a developmental perspective was the finding that children who were behind in a specific skill area showed considerable "catching up" in elementary school. Although most Head Start children could not identify most letters of the alphabet at the end of Head Start, they could by the end of kindergarten. The majority of Head Start graduates could also associate letters with beginning sounds of words by the end of kindergarten. Furthermore, Head Start children who scored in the lowest quartile in vocabulary and writing assessments at the end of Head Start showed greater gains in these skills during kindergarten than did children who were in the middle or top quarter of the Head Start

distribution. However, the lowest-quartile children did not fully overtake other Head Start children by the end of kindergarten. Nor did Head Start children in general overtake the literacy skills of kindergartners from families that were not below the official poverty line.

The finding that children showed greater gains in literacy-related skills in the first year of Head Start than in a second year is perhaps best understood through an explanation offered by David Dickinson (Dickinson & Tabors, 2000). Dickinson suggests that children who come from relatively impoverished home-language environments first gain from exposure to the new terms and activities they are asked to engage in Head Start. However, those words and activities are much the same in the second year of Head Start. By contrast, children who go on to kindergarten are now exposed to a somewhat new set of terms and activities, those that go with a more academic, school-like environment. This interpretation is supported by the FACES finding that children who enter Head Start with literacy skills close to the national norm show little or no advancement vis-a-vis those norms.

The longitudinal findings from FACES support current efforts by the national program to strengthen literacy-related activities in Head Start and to make these activities more responsive to the developmental needs and capabilities of individual children.

References

Commissioner's Office of Research and Evaluation, Administration on Children, Youth and Families. (2001). *Head Start FACES: Longitudinal Findings on Program Performance. Third Progress Report*. Washington, DC: U.S. Department of Health and Human Services.

Dickinson, D.K., & Tabors, P. O. (Eds.) (2001, in press). *Beginning literacy with language: Young children learning at home and school*. Baltimore: Brookes Publishing.

Dunn, Lloyd M., & Dunn, Leota M. (1997). *Peabody Picture Vocabulary Test, Third Edition. Examiner's manual and norms booklet*. Circle Pines, MN: American Guidance Service.

Goal One Technical Planning Group. (1991). The Goal One Technical Planning Subgroup report on school readiness. In National Education Goals Panel (Ed.), *Potential strategies for long-term indicator development: Reports of the technical planning subgroups* (Report No. 91-0, pp. 1-18). Washington, DC: National Education Goals Panel.

Goal One Technical Planning Group. (1993). *Reconsidering children's early development and learning: Toward shared beliefs and vocabulary. Draft report to the National Education Goals Panel*. Washington, DC: National Education Goals Panel.

Horn, W.F., & Packard, T. (1985). Early identification of learning problems: A meta-analysis. *Journal of Educational Psychology*, 77, 597-607.

Pianta, R.C., & McCoy, S.J. (1997). The first day of school: The predictive utility of early school screening. *Journal of Applied Developmental Psychology*, 18(1), 1-22.

Snow, C.E., Tabors, P.O., Nicholson, P.A., & Kurland, B.F. (1995). SHELL: Oral language and early literacy skills in kindergarten and first-grade children. *Journal of Research in Early Childhood Education*, 10(1), 37-48.

West, J., Denton, K., & Germino-Hausken, E. (2000). *America's Kindergartners: Findings from the Early Childhood Longitudinal Study, Kindergarten Class of 1998-99, Fall 1998*. (NCES 2000-070). Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Woodcock, R.W., & Mather, N. (1989, 1990). WJ-R Tests of Achievement: Examiner's manual. In: R.W. Woodcock & M.B. Johnson, *Woodcock-Johnson Psycho-Educational Battery—Revised*. Chicago: Riverside.

Zill, N., & West, J. (2000). Entering kindergarten: A portrait of American children when they begin school. In U.S. department of Education, National Center for Education Statistics, *The Condition of Education*, NCES 2000-602, Washington, DC: U.S. Government Printing Office.