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A Preliminary Evaluation of Heartland Head Start

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Abstract

Head Start, a federally funded preschool program for low-income families, works to nurture the children academically, socially, and nutritionally. In the past couple of years social critics and the federal government have begun questioning the efforts of Head Start, arguing that the children in the program do not progress enough in academic areas for the money spent on them. Heartland Head Start, the local chapter which manages thirteen preschool classrooms and 325-330 children annually, is mandated by the federal government to observe and test the children three times per year on multiple indicators to monitor their academic progress. This study, in collaboration with Heartland Head Start, evaluated their program using data collected over the years of 2002-2003, 2003-2004, and the fall of 2004. The data were used to evaluate the academic progress of the children between the different years and within the 2003-2004 year, and to review the effect of the children's native language and age on their progress in the 2003-2004 year. An analysis of the data highlighted the academic areas where the children excelled and the areas that were still problematic for them.

Introduction

The Head Start program began in 1965 as an eight-week federally funded summer program as a part of the War on Poverty under President Lyndon Johnson, and it attempted to close the educational gap between families in poverty and upper/middle class families (The Editors[1] 2003: 1). It hoped to close this perceived gap by providing free educational, emotional, social, mental, nutritional, and health care for preschoolers from low-income families. Since it was so successful during the summer, it soon became a permanent, year-round, partially funded federal program for low-income children. Today, it annually serves about 800,000 low-income preschool children of different racial and ethnic backgrounds and with varying levels of academic ability (FACES "Head Start Program..." 1998: 1). Over the years it has been evaluated as an effective program that makes a difference in the educational lives of the children who participate in it.

Today, Head Start faces the major problem of underfunding, and thus it only reaches approximately 60% of the preschool-age children eligible for it. There are waiting lists to get into each center (Niesslein 2003: 24). Children who are accepted into the program also suffer from the underfunding, because approximately one-half of them are limited to half-day sessions that operate only four days a week and nine months of the year. The children also do not receive a preschool education equivalent to other children because Head Start lacks the funds to compete with other preschools in income for college-educated teachers (The Editors 2003: 1). Thus, due to underfunding, Head Start does not reach its full potential in serving all eligible children and providing full-day services to these children.

[1] The Editors was the name provided by America Magazine for the authors of this article.

As a partially federally funded program, Head Start is highly affected by changes in the national administration and government acts such as the School Readiness Act of 2003 (The Editors 2003: 1). For example, the present administration of President George W. Bush has generally supported Head Start, yet criticized it for the number of Head Start graduates who lack readiness to enter Kindergarten. To improve the school readiness of the children, President Bush is suggesting new educational requirements for Head Start teachers and that the program concentrate mainly on the academic aspects (The Editors 2003: 1). The Republican Party is also recommending that state governments be held responsible for the funding and management of the Head Start program through the use of federal block grant money (Niesslein 2003: 24). Opponents to this idea argue that federal money will be directed from Head Start to state primary and secondary schools to help them meet the requirements of the No Child Left Behind Act which the states are currently mandated to implement (The Editors 2003: 1). To improve the school readiness of Head Start graduates, the federal government is implementing acts that focus on this area and changing the way Head Start is funded.

In addition to naming focus areas for Head Start, the federal government re-evaluates the program every three years to assess if it should continue to receive federal funds. As part of this assessment, Head Start is required to collect data on the progress of the children it serves on eight legislatively mandated indicators in the three main domains of language development, literacy, and mathematics.

For this paper, I was asked by the Head Start administrators to objectively analyze the federally required data of Heartland Head Start for the school years of 2002-2003,

2003-2004, and 2004-2005 (fall period only). The Heartland branch currently operates eight sites and thirteen classrooms in McLean and Livingston counties in central Illinois. Teachers and other staff in these classrooms assess the progress of each child on a number of different indicators three times per year and submit these results to the Heartland Head Start central office where the data are input into the "Work Sampling for Head Start" computer program. This program totals the information to produce statistics and information for the whole branch. These were the data I analyzed.

Before I began the analysis, I hypothesized that the:

1. Children will improve significantly throughout the year in the areas of mathematics, language development, and literacy.
2. Children will be consistent in these improvements between years.
3. Children will start with approximately the same proficiency level each year.
4. Three-year-olds and the four-year-olds will both improve throughout the year.
5. Children whose primary language is English will improve at a greater rate than the children whose primary language is not English.
6. Children who do not speak English as their primary language will significantly improve on all eight indicators throughout the year.

Recent Literature

Within the past three years many articles and studies have been published concerning the Head Start program, prompted by its return to the Congressional agenda for reauthorization to receive funding. As to the success of the Head Start program, these studies have produced mixed results.

According to "Helping Head Start," an article in America Magazine (The Editors 2003), a weekly national Catholic magazine, and to Jennifer Niesslein, Head Start's major problem was that it was underfunded, and because of underfunding, Head Start served only a limited percentage of children eligible for it (Niesslein 2003: 24). Of the children who did participate about half of them were limited to half-day sessions. Lack of resources seemed to be Head Start's major obstacle to a more effective program.

One argument for increasing Head Start funding in the short run was that preschool programs give children long term benefits that in the long run benefit society. The America Magazine editors stated that "[s]tudies have shown that graduates are less likely to run afoul of the law and more likely to graduate from high school and college than those who were not in the program" (Editors 2003: 4). Barnett and Hustedt also found these long term benefits in a study of preschool programs (2003).

The Barnett and Hudstedt (2003) study, as well as research by Katherine Magnuson, et. al. (2004), found that in addition to these long-term societal benefits, Head Start produces short term benefits for their graduates. They reported that "preschool education produces persistent gains on achievement test scores along with fewer occurrences of grade retention and placement in special education programs" (Barnett and Hudstedt 2003: 55). The conclusion seemed to be that the Head Start program gave children the academic skills they needed to succeed when they entered elementary school.

Yet, Krista Kafer (2004) was less convinced about the long and short term effects of Head Start. She found that although Head Start graduates were academically superior to their peers from the same social class for a couple years, the graduates did not retain

this advantage over time, returning to the same proficiency levels as children from low-income families who did not attend Head Start (Kafer 2004: 26). Head Start graduates over time slowly lost their academic advantage when they left the program and joined their peers in public schools.

Niesslein (2003) agreed, although she focused on the immediate effects for Head Start graduates upon entering Kindergarten. On Kindergarten entrance level tests, average Head Start graduates were more than 25% below average on basic skills such as naming shapes, colors, numbers, and letters (Niesslein 2003: 8). Despite participation in Head Start, the graduates of Head Start still began Kindergarten with inferior skills compared to their peers from more advantaged socioeconomic backgrounds.

Standardized tests, like the Kindergarten entrance test to which Niesslein (2003) referred, have become common for children in elementary schools and even preschools. These tests were used to measure the progress and proficiency of Head Start children compared with other preschoolers. For this reason, Head Start children regularly took the Peabody Picture Vocabulary Test - III and the Letter-Word Identification, Applied Problems, and Dictation tasks from the Woodcock-Johnson Psycho-Educational Battery-Revised test (FACES "Head Start Program..." 9). Researchers generally consented that Head Start children were not performing well on these standardized tests. Kafer (2004), Niesslein (2003), the Head Start Bureau (2003) (operated by the Department of Health and Human Services), the second progress report by Family and Child Experiences Survey (FACES) (1998), and Magnuson et al. (2004), agreed that the academic skills of Head Start children improved throughout the year, but the children's test scores still fell below the national averages.

At the same time most of the articles also noted that although the average score of Head Start children fell below the national averages on standardized tests, Head Start children did perform better on these tests than other low-income children who were not enrolled in Head Start. Niesslein (2003), Magnuson et al. (2004), and the second progress report by FACES (1998) reported that when social class is controlled, Head Start children placed above the expected level on these tests. Head Start has succeeded in helping its children know more than other children from low-income families, but it was still working to narrow the gap between its students and children from wealthier families.

Since the federal government required assessments of the academic domains of language development, literacy, and mathematics, many studies have evaluated the academic performance of Head Start children in these specific areas. Among these was the Magnuson et al. study, which researched the effect of preschool programs in general on math and reading skills. They found "that children who attended a center or school-based preschool program... perform better on assessments of reading and math skills upon beginning kindergarten" (Magnuson et al. 2004: 115). Participation in any preschool program gave children an academic advantage.

The Family and Child Experiences Survey (FACES) specifically focused on Head Start in these three domains. The "Head Start Program Performance Measures: Second Progress Report" completed by FACES in June 1998 reported that Head Start children were proficient in identifying numbers, which was included the domain of mathematics. FACES did a follow-up report two years later called "Head Start FACES: Longitudinal Findings on Program Performance Third Progress Report." This follow-up study "showed that Head Start narrows the gaps between disadvantaged children and all

children in vocabulary and writing skills during the Head Start year" (FACES, "Head Start FACES..." 2000: i). Head Start children improved in vocabulary, which was in the domain of language development, and in writing skills, which was in the domain of literacy. These reports showed positive results for Head Start children in all three domains.

In these same reports FACES (1998 and 2000) also stated that Head Start children were missing alphabet and book knowledge, which with writing skills were indicators in the literacy domain. Kafer agreed with this FACES finding writing that, "[s]ome research found Head Start graduates could identify only one or two letters" (Kafer 2004: 26). Kafer and FACES (1998 and 2000) identified literacy as an area for Head Start to focus on in the future.

Another study that used research from the Family and Child Experiences Survey (FACES) (1998 and 2000) for their evaluation of Head Start was by Barnett and Hudstedt (2003). Unlike the findings reported by FACES, they found that Head Start children trailed in vocabulary (Barnett and Hudstedt 2003: 56). Unlike other studies which cited literacy as the problem domain, Barnett and Hudstedt (2003) reported that vocabulary in the domain of language development was the major problem for Head Start children.

In another study focusing on the domain of mathematics, Dobbs, Doctoroff, and Fisher (2003) found Head Start's main domain problem to be mathematics. In this study of Head Start teachers in eight classrooms, the researchers found that the teachers were not teaching mathematical skills to the children because they did not know how to do so and because they were unsure of what the children could understand (Dobbs et al. 2003: 20). They concluded that more training was needed to teach Head Start teachers how to

integrate mathematics into the classroom, and, by doing so, give the Head Start children better mathematical skills.

The "Head Start FACES: Longitudinal Findings on Program Performance Third Progress Report" (2000) also studied the effect of Head Start on children whose primary language was not English. FACES reported that "[l]anguage-minority children in Head Start show gains in school readiness and in their knowledge of English by the end of the Head Start year. By spring, most Spanish-speaking children... are able to perform a number of school-related tasks better in English than they had in Spanish in the fall, or at least as well" ("Head Start FACES..." 2000: iii). The report added that despite these gains, children who were not native English speakers still rated below native English speakers in proficiency on tasks that required a high level of English knowledge.

In summary, Head Start was a successful program, but had some crucial, ongoing problems. In the short-term, at least, the Head Start program improved children's academic skills and produced some long-term social benefits, including increased probability of finishing high school and decreased probability of juvenile delinquency (Editors 2003: 4). Like other early education programs, Head Start seemed important in the social and academic development of preschool age children. Despite these successes, however, problems such as underfunding and trying to counteract the demographic of poverty plagued the program. Also, due to low funding, Head Start centers could not reach everyone who was eligible for the programs or provide enough educational capital so Head Start children could meet the national averages on standardized tests.

Description of the Heartland Head Start Data

The data included in this study were for the children in the Heartland Head Start program in the school years of 2002-2003, 2003-2004, and fall period of 2004-2005. All the families included in Head Start had an annual income below the poverty line.

In 2002-2003 there were seventeen classes included in the program at eight different sites with a total of 191 children. Fifty-three of the children were three-year-olds and 138 of the children were four-year-olds. Of the three-year-olds, English was the primary language for 85% of the students, and the other 15% of the students spoke Spanish as their first language. English was the primary language of 89% of the four-year-olds, and the other 11% spoke Spanish as their primary language. These numbers remain constant for all three evaluation periods, fall, winter, and spring, despite inevitable changes in the program, such as children leaving the program for different reasons and children entering the program in the middle of the year to take the place of those who left.

In the 2003-2004 school year the Heartland Head Start program grew to include a total of nine centers. In this year the program served 349 children: 124 three-year-olds and 225 four-year-olds. For the three-year-olds, 75.8% (94) were English speaking, 7.3% (9) were Spanish speaking, 2.4% (3) spoke a primary language other than English or Spanish, and 14.5% (18) did not specify a primary language. Of the four year olds, 84.4% (190) spoke English as their primary language, 6.2% (14) spoke Spanish, 1.3% (3) spoke a primary language other than English or Spanish, and 8.0% (18) did not specify a primary language. Similar to the data for the 2002-2003 year, these numbers remained constant over all three periods.

During period 1 of 2004-2005, 330 children received services in eight Head Start centers. One hundred and eight children were three-years-olds and 222 children were four-year-olds. Amongst the three-year-olds, 78.8% (85) spoke English, 14.8% (16) spoke Spanish as their primary language, 1.9% (2) spoke a primary language other than Spanish or English, and 4.6% (5) did not specify a primary language. The primary language distribution for the four-year-olds was similar with 82.4% (183) speaking English, 9.0% (20) speaking Spanish, 2.7% (6) speaking a primary language other than English or Spanish, and 5.9% (13) children with an unspecified primary language.

Measurement

On September 13, 2002 Training and Technical Assistance Services (T/TAS) at Western Kentucky University held a regional Head Start workshop, "Calling for Quality: The Written Child Outcomes Plan: Where Does It Fit?", to assist Head Start programs in data collection and analyses. The published pamphlet from this conference suggests that the child outcomes for each program should include four areas of research, which were:

- Compare progress beginning when children enter Head Start, at mid-point in program year, and when they complete the program year.
- What are trends in outcome data from year to year in terms of stability and change in pattern of progress and levels of accomplishment?
- What are the patterns of progress and accomplishments for groups of kids in different domains and indicators of learning and development?
- What are patterns of outcomes for kids in different program options, forms of service and service areas? (Taylor 2002: 5)

With the assistance of Debra O'Connell, the Child Health and Development Content Leader at Heartland Head Start, I defined these four areas more specifically. The four areas, which functioned as control variables, were:

- evaluating the progress of the Head Start students in one year

- comparing the progress and proficiency of the three-year-olds versus the four-year-olds
- comparing the progress of children whose first language is English to those whose primary language is not English
- evaluating trends from year to year.

After controlling for these demographic breakdowns, the children's progress was evaluated over time. The children's progress, therefore, was the dependent variable, and time was the independent variable. I received data on these four areas from the records of Heartland Head Start in order to do my research.

Three times per year the teachers and staff in the Heartland Head Start classrooms filled out a simple checklist evaluation of each student in the domains of social and emotional development, approaches to learning, language development, literacy, mathematics, science, creative arts, and physical health and development. The United States Congress legislatively mandates that data on language development, literacy, and mathematics be collected and analyzed, so that was my focus. These three domains were evaluated using eight Work Sampling for Head Start Indicators (WSHS). The indicators differ slightly for three and four year olds, but there were eight indicators for each age group. The eight indicators for three-year-olds were:

1. Gains meaning by listening
2. Speaks clearly enough to be understood by most listeners
3. Uses expanded vocabulary and language for a variety of purposes
4. Shows beginning phonological awareness
5. Shows appreciation for books

6. Shows interest in letters and words
7. Uses scribbles and unconventional shapes to write
8. Shows interest in solving mathematical problems

The eight indicators for four-year-olds were:

1. Gains meaning by listening
2. Speaks clearly enough to be understood without contextual clues
3. Uses expanded vocabulary and language for a variety of purposes
4. Demonstrates phonological awareness
5. Shows appreciation for books and reading
6. Shows beginning understanding of concepts about print
7. Begins to develop knowledge about letters
8. Shows beginning understanding of number and quantity

For both the three-year-old and the four-year-old groups, indicators 1-3 measure language development; indicators 4-7 measure literacy; and indicator 8 measures mathematics.

The Head Start teaching staff rated the children using the ordinal scale of Not Yet (NY), In Process (IP), or Proficient (P). Also available to teachers were Not Applicable (N/A), which meant that the teacher did not yet offer this in the curriculum, and Did Not Observe (DNO), which meant that the teacher did not have an opportunity to observe this.

I performed a secondary analysis of the Heartland Head Start data. The Work Sampling for Head Start® computer program, into which the data were entered, produced the totals, percentages, and some statistical measures and bar charts to represent the data.

This computer program kept the data from the current year and from the year before in its files, which in this case involved the data from 2003-2004 and the fall of 2004.

The 2002-2003 data were saved in the archives of Head Start, but only in the form of the percentages of children who received the ratings of "proficient," "in process," and "not yet" for the indicators during each time period. Although it was possible to see the progress of the children by comparing percentages of children who were rated in each category throughout the year, it was impossible to calculate an accurate gamma without the actual numbers of children at each rating. Since the percentage of children receiving each rating and the total number of children in the program were known, the actual number of children at each rating would be approximated to calculate an approximate gamma. This measure, however, would still be inaccurate because the number of children receiving the ratings of "did not observe" and "not applicable" was unknown. For this reason, my study focused mainly on the 2003-2004 data for which the exact number of children receiving each rating was accurate, and only used the less precise 2002-2003 data for the evaluation of trends between years.

Data Analysis

Analysis was done using the aggregate data that Head Start collected on the children in their program. I created cross-tabulations for each relationship that I studied. Cross-tabulations are "a technique for analyzing the relationship between two variables that have been organized in a table" (Frankfort-Nachmias and Leon-Guerrero 2002: 201). For most of the cross-tabulations, I had to combine the information on the three and four-year-olds because this information for each age group was kept separately. For each

control variable, such as all the children, by age, by primary language, or by a different year, I constructed cross-tabulations of the children's progress ("proficient," "in process," and "not yet") versus the time period for each of the eight Head Start indicators in the three legislatively mandated domains of language development, literacy, and mathematics. There were three time periods during which the children were evaluated each year – fall, winter, and spring.

I used gamma to measure the statistical significance of the correlation in each cross-tabulation. Gamma, a measure of the statistical significance of the association between variables measured on the ordinal level, ranges from –1.0 to +1.0 (Frankfort-Nachmias and Leon-Guerrero 2002: 267). A positive coefficient corresponds with a positive correlation, and a negative coefficient corresponds with a negative relationship between the variables. A 0.0 represents no relationship between the variables, and ± 1.0 represents a perfect positive/negative relationship (See Appendix A).

I evaluated the success of the Head Start program based on two factors – the children's progress over time and the overall proficiency level of the children. The children's progress over time was studied through the calculation of gamma, and the overall proficiency of the children was studied through an analysis of the ending percentages of children "proficient" in each indicator.

Table 1: Progress of the Head Start children, in percentages, by time periods in the 2003-2004 school year

Time Period		**Fall**	**Winter**	**Spring**	
Totals (N=)		293	307	243	
Indicator	**Rating**[2]	**%**	**%**	**%**	**Gamma**
1. Gains meaning by listening	P	30.4	48.9	63.4	.449
	IP	57.3	49.8	36.2	
	NY	12.3	1.3	0.41	
2. Speaks clearly[3]	P	39.0	56.4	66.7	.368
	IP	45.2	38.1	30.8	
	NY	15.8	5.5	2.5	
3. Uses expanded vocabulary and language for a variety of purposes	P	14.3	36.5	57.2	. 576
	IP	46.4	54.1	38.3	
	NY	39.2	9.4	4.5	
4. Shows phonological awareness[4]	P	6.9	23.1	42.4	.669
	IP	41.2	66.1	53.1	
	NY	51.9	10.7	4.5	
5. Shows appreciation for books[5]	P	37.5	65.1	76.9	.528
	IP	52.6	34.2	23.1	
	NY	9.9	0.7	0.0	
6. Shows interest in letters and words / Shows understanding of concepts about print[6]	P	16.8	37.1	58.2	.608
	IP	51.4	58.3	41.3	
	NY	31.8	4.6	.4	

[2] P = Proficient, IP = In Process, NY = Not Yet
[3] Speaks clearly enough to be understood by most listeners / Speaks clearly enough to be understood without contextual clues
[4] Shows beginning phonological awareness / Demonstrates phonological awareness
[5] Shows appreciation for books / Shows appreciation for books and reading
[6] Shows interest in letters and words / Shows beginning understanding of concepts about print

Time Period		Fall	Winter	Spring	
Totals (N=)		293	307	243	
Indicator	**Rating**	**%**	**%**	**%**	**Gamma**
7. Uses shapes to write / Begins to develop knowledge about letters[7]	P	16.2	34.8	57.0	.574
	IP	54.5	61.2	40.9	
	NY	29.3	3.9	2.1	
8. Mathematics[8]	P	16.2	32.0	46.3	.463
	IP	54.5	56.2	49.1	
	NY	29.3	11.8	4.5	

Table 1 contains the cross-tabulations of all the three and four-year-olds together in the 2003-2004 school year with no demographic breakdown. For each of the eight Head Start indicators the percentage of children receiving each rating is shown in correlation with the three time periods in the year. The amount of progress of the children throughout the year is shown by the gamma value.

The cross-tabulations of the three and four-year-olds together show that the children made progress over the year on each of the eight Head Start indicators. The most progress, based on the highest gamma, was made by the children in *phonological awareness*[9] and *showing interest in letters and words/showing beginning understanding of concepts about print*. Head Start children made the least progress in *speaking clearly*.

The amount of progress on each indicator, however, was often related to how the children ranked on these skills in the fall. For example, the children made significant

[7] Uses scribbles and unconventional shapes to write / Begins to develop knowledge about letters
[8] Shows interest in solving mathematical problems / Shows beginning understanding of number and quantity
[9] Words in italics indicate a legislatively mandated Work Sampling for Head Start Indicator.

progress in *phonological awareness* (strong gamma of .669), but they began with over half the children starting in the "not yet" ranking category.

In evaluating the children in regards to the percentage of children who end the year rating "proficient," the problem areas were very different from the ones that were discovered when evaluating the children according to progress made. The areas in which the most children became "proficient" were *showing appreciation for books and/or reading* (76.9% proficient), *speaking clearly* (66.7% proficient), and *gaining meaning by listening* (63.4% proficient). It was very interesting that, in looking at the final percentages of children rating "proficient," the area where the children made the least progress, *speaking clearly*, ends with one of the highest percentages of children rating "proficient." The indicators on which the children ended with low levels of proficiency were *phonological awareness* (42.4% proficient) and *mathematical skills* (46.3% proficient). *Phonological awareness* was an area of great progress for the children over the year, but, even with this progress, only 42.4% of the children were "proficient" in the spring.

The results and problem areas for Head Start children vary depending on whether success was evaluated on progress or on final proficiency level. For instance, although Head Start children make substantial gains in *phonological awareness*, more gain was needed to achieve a proficiency level equal to that of their other skills. On the other hand, the children made little progress in *speaking clearly*, but they still achieved very high proficiency on this indicator. Taking into account both progress and proficiency level in the third period, more gains needed to be made in *phonological awareness* and *mathematics*. In *phonological awareness* only 42.4% of the children were rated

"proficient" by the end of the year. The result was similar in *mathematics*, which was low in both progress and ending proficiency. In the spring less than half of the children (46.3%) were rated "proficient" in *mathematics*.

Similar to the findings in recent literature about Head Start, I discovered that Head Start does consistently improve the language development, literacy, and mathematics skills of the children it serves. Niesslein (2003), the Head Start Bureau (2003), and the Family and Child Experiences Survey (FACES) (1998 and 2000) in their progress reports, concurred with this conclusion. The Head Start program was succeeding in reaching its goal of helping preschool children from low-income families improve their academic skills.

Despite this overall success, the literature argued that Head Start did have some problem areas. The literature disagreed about whether language development, literacy, or mathematics was the most problematic domain, and some articles cited all three domains as problem areas. In my data analysis, I discovered that the indicators of *showing interest in solving mathematical problems / showing beginning understanding of number and quantity* and *showing phonological awareness* were the biggest problems for Heartland Head Start.

Instead of citing specific indicators as problem areas, most of the articles on Head Start cited general domains as problem areas. My study found that it was an over-simplification to refer to whole domains as problem areas, since all the domains, except the mathematics domain, include too many indicators to be accurately described in this manner. Obviously, the *mathematics* indicator was in the mathematics domain, and since it was the only indicator for the mathematics domain, it could be stated that the

mathematics domain was a problem area. On the other hand, it was harder to refer to the other problem indicator, *phonological awareness*, by its domain. Literacy, the domain that includes *showing phonological awareness*, *showing appreciation for books*, *showing interest in letter and words/showing understanding of concepts of print*, and *using shapes to write / beginning to develop knowledge of letters*, was harder to generalize as a problem area because it included all of these indicators. In this manner, it is both possible to agree and disagree with the recent literature that cited literacy as a problem domain, because, although the literacy domain included the indicator of *phonological awareness*, which had the lowest percent of children rating "proficient," it also included *showing appreciation for books*, which had the highest percent of children rating "proficient" in the spring.

Table 2: Progress of the children, in percentages, over the time periods in 2003-2004, by age (3-year-olds vs. 4-year-olds)

Time period		**Fall**		**Winter**		**Spring**	
Age group		**3**	**4**	**3**	**4**	**3**	**4**
Totals (N=)		94	199	95	212	81	162
Indicator	**Rating**[10]	**%**	**%**	**%**	**%**	**%**	**%**
1. Gains meaning by listening	P	17.0	36.7	34.7	55.2	55.5	67.3
	IP	58.5	56.8	64.2	43.4	43.2	32.7
	NY	24.4	6.5	1.1	1.4	1.2	0.0
Gamma		3 yr: .583		4 yr: .404			
2. Speaks clearly[11]	P	26.9	44.7	41.1	63.2	54.3	72.8
	IP	44.1	45.7	46.3	34.4	40.7	25.9
	NY	29.0	9.5	12.6	2.4	4.9	1.2
Gamma		3 yr: .394		4 yr: .383			
3. Uses expanded vocabulary and language for a variety of purposes	P	5.3	18.6	26.3	41.0	45.7	63.0
	IP	33.0	52.8	52.6	54.7	43.2	35.8
	NY	61.7	28.6	21.1	4.2	11.1	1.2
Gamma		3 yr.: .640		4 yr: .600			
4. Shows phonological awareness[12]	P	5.4	7.6	20.0	24.5	30.9	48.1
	IP	24.7	49.0	68.4	65.1	65.4	46.9
	NY	69.9	43.4	11.6	10.4	3.7	4.9
Gamma		3 yr: .724		4 yr: .648			

[10] P = Proficient, IP = In Process, NY = Not Yet

[11] Speaks clearly enough to be understood by most listeners / Speaks clearly enough to be understood without contextual clues

[12] Shows beginning phonological awareness / Demonstrates phonological awareness

Time Period		Fall		Winter		Spring	
Age group		**3**	**4**	**3**	**4**	**3**	**4**
Indicator	**Rating**	**%**	**%**	**%**	**%**	**%**	**%**
5. Shows appreciation for books[13]	P	25.5	43.2	48.4	72.6	67.9	81.4
	IP	51.1	53.3	50.5	26.9	32.1	18.6
	NY	23.4	3.5	1.1	0.4	0.0	0.0
Gamma	3 yr: .579			4 yr: .534			
6. Shows interest in letters and words / Shows understanding of concepts about print[14]	P	12.8	18.7	28.4	41.0	37.0	68.9
	IP	30.8	61.1	62.1	56.6	63.0	30.4
	NY	56.4	20.2	9.5	2.4	0.0	0.6
Gamma	3 yr: .618			4 yr: .638			
7. Uses shapes to write / Begins to develop knowledge about letters[15]	P	20.2	17.2	37.9	33.5	59.3	55.9
	IP	48.9	54.5	61.1	61.3	39.5	41.6
	NY	30.9	28.3	1.0	5.2	1.2	2.5
Gamma	3 yr: .585			4 yr: .559			
8. Mathematics[16]	P	8.5	19.9	20.0	37.4	27.2	55.9
	IP	23.4	69.4	53.7	57.3	64.2	41.6
	NY	68.1	10.7	26.3	5.2	8.6	2.5
Gamma	3 yr: .601			4 yr: .457			

In Table 2, age was controlled for, and for each indicator the percentage of children rating at each level of proficiency was cross-tabulated with the time periods during the 2003-2004 school year. This allows comparisons to be made between the three-year-olds and four-year-olds in each period. The gamma values show the progress

[13] Shows appreciation for books / Shows appreciation for books and reading
[14] Shows interest in letters and words / Shows beginning understanding of concepts about print
[15] Uses scribbles and unconventional shapes to write / Begins to develop knowledge about letters
[16] Shows interest in solving mathematical problems / Shows beginning understanding of number and quantity

of the three and four-year-olds separately on each indicator, so the values can be compared as to which group made the most progress during the year.

When comparing the children by age, the three-year-olds and four-year-olds placed very similarly in the amount of progress each group made on the eight Head Start indicators, with the three-year-olds slightly out-progressing the four-year-olds most of the time. This was true for the five indicators of *speaking clearly*, *using expanded vocabulary and language*, *phonological awareness*, *showing appreciation for books*, and *using scribbles and shapes to write/developing knowledge of letters*. The biggest difference in progress between the three and four-year-olds was on the first and last indicators. The three-year-olds made much greater progress in *gaining meaning by listening* than the four-year-olds, with the three-year-olds having a moderate to strong gamma of .583 and the four-year-olds having a moderate gamma of .404. Similarly, in *mathematics* the three-year-olds had a strong gamma of .601 and the four-year-olds had a moderate gamma of .457. For certain indicators, however, such as *showing appreciation for books* and *developing mathematical skills*, less progress was made by the four-year-olds because they started with more children rating "proficient" in these skills than the three-year-olds.

While the three-year-olds progressed more than the four-year-olds, on the above indicators, on one indicator, the four-year-old children did progress more than the three-year-old children. Though the difference was only slight, this indicator was *showing interest in letters and words* for the three-year-olds and *showing beginning understanding of concepts about print* for the four-year-olds. The difference between the gamma for the four-year-olds, .638, and the gamma for the three-year-olds, .618, was only .02.

Additionally, even though the three-year-olds regularly out-progressed the four-year-olds, the four-year-old children achieved higher final proficiency ratings than the three-year-olds. A case in point, on the indicator of *speaking clearly*, the four-year-olds ended with 72.8% of the children rating "proficient" while the three-year-olds ended with only 54.3% of their population "proficient." Also, in *showing interest in letters and words*, only 37.0% of the three-year-olds achieved the "proficient" level while on the comparable indicator for the four-year-olds, *showing beginning understanding of concepts about print*, 68.9% of the four-year-olds achieved the "proficient" level.

Both the three and four-year-olds followed the same trends as to the areas where they had the highest percentage of children "proficient" and where they had the least children "proficient." The three-year-olds and four-year-olds both excelled in the area of *showing appreciation for books*, with 67.9% of the three-year-olds "proficient" and 81.4% of the four-year-olds "proficient." Likewise, both groups had a similar problem area, *phonological awareness*: only 38.1% of the four-year-olds and 30.9% of the three-year-olds were "proficient" in *demonstrating phonological awareness* by the end of the year. Both groups also were low in *mathematics* where only 27.2% of the three-year-old children rated "proficient" and 55.9% of the four-year-olds rated "proficient."

This trend of similar ratings on indicators does not hold true for indicator 7, *uses shapes to write* for three-year-olds and *begins to develop knowledge about letters* for four-year-olds. The three-year-olds had 59.3% of their population "proficient" on this indicator in the spring, which was the second highest percent of the three-year-olds rating "proficient" on any indicator. The four-year-olds, on the other hand, only had 55.9% of their population "proficient" on this indicator, which was the second lowest percent of the

four-year-olds rating "proficient" on any indicator. The difference between how the groups performed could be due to the change in indicator from *uses scribbles and unconventional shapes to write* as a three-year-old to *begins to develop knowledge about letters* as a four-year-old.

This data analysis, when age was controlled, suggests that there was no single learning area where one age group was significantly below the other. The three and four-year-olds progressed about the same amount on each category during the year, which implies that they both were receiving equal amounts of learning in these areas. The four-year-olds ended the year with a higher percentage of children "proficient" in most categories than the three-year-olds, which indicates that there was a difference in the age groups; however, it makes sense that more of the four-year-olds would be "proficient" than the three-year-olds due to the fact that they were a year older.

The recent literature examined in this study did not specifically cover the differences in the children's progress by age. Yet, my study found that even when the data were categorized by age the same trends apply as when the children were evaluated as a whole. Similar to the findings of the literature about the three and four-year-olds together, the three and four-year-olds separately made progress over the year, but both groups had trouble in the areas of *phonological awareness* and *mathematics*.

Table 3: Progress of the children, in percentages, over the time periods in 2003-2004, by native language (native English speakers versus native speakers of other languages)

Time Period		**Fall**		**Winter**		**Spring**	
Language		**Eng.**	**Other**	**Eng.**	**Other**	**Eng.**	**Other**
Totals (N =)		231	29	249	28	202	25
Indicator	**Rating**[16]	**%**	**%**	**%**	**%**	**%**	**%**
1. Gains meaning by listening	P	31.2	3.4	52.2	10.3	66.3	36.0
	IP	57.6	65.5	46.2	86.2	33.2	64.0
	NY	11.2	31.0	1.6	3.4	0.5	0.0
Gamma		Eng.: .463		Other: .795			
2. Speaks clearly[17]	P	40.7	0.0	57.9	3.6	60.7	36.0
	IP	43.4	55.2	36.6	78.6	36.0	60.0
	NY	15.9	44.8	5.5	17.9	3.4	4.0
Gamma		Eng.: .290		Other: .781			
3. Uses expanded vocabulary and language for a variety of purposes	P	14.3	0.0	36.9	7.1	59.4	24.0
	IP	48.9	20.7	54.2	71.4	37.1	60.0
	NY	36.8	79.3	8.8	21.4	3.5	16.0
Gamma		Eng.: .606		Other: .756			
4. Shows phonological awareness[18]	P	7.0	0.0	23.3	7.1	45.5	12.0
	IP	44.5	17.2	65.9	75.0	49.5	88.0
	NY	48.5	82.7	10.8	17.9	5.0	0.0
Gamma		Eng.: .661		Other: .904			
5. Shows appreciation for books[19]	P	39.0	3.4	68.7	28.6	79.1	64.0
	IP	53.2	62.1	30.5	71.4	20.9	36.0
	NY	7.8	34.5	0.8	0.0	0.0	0.0
Gamma		Eng.: .541		Other: .854			

[16] P = Proficient, IP = In Process, NY = Not Yet

[17] Speaks clearly enough to be understood by most listeners / Speaks clearly enough to be understood without contextual clues

[18] Shows beginning phonological awareness / Demonstrates phonological awareness

[19] Shows appreciation for books / Shows appreciation for books and reading

Time Period		Fall		Winter		Spring	
Language		**Eng.**	**Other**	**Eng.**	**Other**	**Eng.**	**Other**
Indicator	**Rating**	**%**	**%**	**%**	**%**	**%**	**%**
6. Shows interest in letters and words / Shows understanding of concepts about print[20]	P	16.1	0.0	37.8	10.7	59.2	40.0
	IP	54.3	34.5	58.2	78.6	40.3	60.0
	NY	29.6	65.5	4.0	10.7	0.4	0.0
Gamma	Eng: .616			Other: .897			
7. Uses shapes to write / Begins to develop knowledge about letters[21]	P	18.3	3.4	36.1	7.1	60.7	20.0
	IP	53.5	31.0	59.4	89.3	36.8	80.0
	NY	28.3	65.5	4.4	3.6	2.5	0.0
Gamma	Eng.: .580			Other: .853			
8. Mathematics[22]	P	16.2	0.0	32.7	7.1	49.3	12.0
	IP	55.9	50.0	57.2	60.7	47.3	72.0
	NY	27.9	50.0	10.1	32.1	3.5	16.0
Gamma	Eng: .493			Other: .495			

Table 3 contains the cross-tabulations of the children's progress over the time period, 2003-2004, controlling for native language. Under the variable of language the children were split into two groups, native English speakers and non-native English speakers, so comparisons could be made about the progress and proficiency of the children in each group. The value of gamma was a measure of the amount of progress each group made during the 2003-2004 year.

The children whose primary language was not English made significantly greater progress in all areas, except *mathematics*, than the children whose primary language was

[20] Shows interest in letters and words / Shows beginning understanding of concepts about print
[21] Uses scribbles and unconventional shapes to write / Begin to develop knowledge about letters
[22] Shows interest in solving mathematical problems / Shows beginning understanding of number and quantity

English. Other than on the *mathematics* indicator, the gamma for each indicator of the non-native English speaker cross-tabulations was above .75, showing significant progress on these indicators. The native English speakers, on the other hand, had a mean gamma of .531, which shows moderate progress. The lowest gamma for native English speakers was .290 in *speaking clearly* and the highest was .661 *in showing phonological awareness*. This suggests the non-native English speakers progressed more than the English speakers overall.

On one indicator, which showed little progress by either group, *mathematics*, the gamma values for both groups were very close (.493 for native English speakers and .495 for non-native English speakers). The similarity between these gamma values indicated that the native language of the children does not seem to affect the progress of the children in *mathematics*.

Although the native speakers of other languages out-progressed the native English speakers, when evaluating the starting points for each group of children, the non-native English speaking children started lower on all indicators in the percentage of children rating "proficient" in the fall than the native English speakers. For each indicator the non-native speakers started the year with only 0% to 3.4% of their population "proficient," whereas, the native English speakers began with 7.0% to 40.7% of its population already "proficient" at the beginning of the year. Also, the non-native English speaking children started with a higher percentage of children rating "not yet" in the fall on all indicators than the native English speakers started. The children whose primary language was not English had 31.0% to 82.7% of its population rating "not yet" on each indicator during the fall. The native English speakers, on the other hand, had significantly lower

percentages of their population in this category during the fall. The highest percentage of native English speakers rating "not yet" in the fall was 48.5% in *phonological awareness*. Similarly, the native Spanish speakers started with 82.7% of their population rating in "not yet" on this indicator. The lowest percentage of native English speaking children rating "not yet" was 7.8% on *showing appreciation for books*. Native English speakers began the year with a higher percentage of their population rating "proficient" and a lower percentage of their population rating "not yet" on all indicators than the percentages with which the non-native English speakers began.

A similar trend was shown in the end of the year results with the native English speakers ending with a higher percentage of children rating in the "proficient" category than did the speakers whose primary language was not English. The native English speakers finished the year with at least half of their population rating "proficient" on all indicators except *mathematics* (49.3% of the children "proficient") and *phonological awareness* (45.5% of the children "proficient"). The speakers of other languages, however, ended with the range of percentages of children rating "proficient" between 12% and 64%. On the low end was *phonological awareness* and *mathematics* with only 12% of the children "proficient" by the spring. At the high end of the range *shows appreciation for books* was at 64.0% of the non-native English speakers "proficient." The final percentages of children "proficient" on each indicator vary greatly for non-native English speakers, but were more uniform for the native English speakers.

Interestingly, the indicators with the highest and lowest percentages of children "proficient" in them were the same for children whose primary language was English and children whose primary language was not English. Both groups of children ended the

year with the highest percentage of proficiency in *showing appreciation for books*. The native English speakers had 79.1% of their population "proficient" and the non-native English speakers had 64.0% of their population "proficient." Conversely, the lowest percentages were seen for both languages in *phonological awareness* and *mathematics*. In *phonological awareness* the native English speakers ended the year with only 45.5% of these children rated "proficient" and the native Spanish speakers had only 12.0% of the children rated as "proficient" by the spring. Likewise, in *mathematics*, only 49.3% of the native English speakers were "proficient" in the spring and 12.0% of the non-native English speakers were "proficient." This suggests that *phonological awareness* and *mathematics* were problem areas for all students despite differences in English language acquisition.

Although my findings did not support my hypothesis because I expected the native English speakers to make more progress than the native speakers of other languages, the data did support the findings of recent literature. FACES (2000) in their progress report found that children whose native language was not English made significant progress during the year, but that they still lagged behind their native English speaking counterparts. This study came to the same conclusion that the non-native English speakers made excellent progress during the year, but still ended the year with a lower percentage of children "proficient" on each indicator.

Table 4: Fall ratings of the children's progress, in percentages, for the school years of 2002-2003, 2003-2004, and 2004-2005

Year		**Fall 2002**	**Fall 2003**	**Fall 2004**
Totals (N=)		191	293	331
Indicator	**Rating**[23]	**%**	**%**	**%**
1. Gains meaning by listening	P	14.6	30.4	20.5
	IP	73.2	57.3	74.3
	NY	12.2	12.3	5.1
Gamma: .109				
2. Speaks clearly[24]	P	26.9	39.0	32.7
	IP	51.7	45.2	57.2
	NY	21.3	15.7	10.1
Gamma: .106				
3. Uses expanded vocabulary and language for a variety of purposes	P	16.2	39.0	32.7
	IP	54.0	45.2	57.2
	NY	29.9	15.7	10.1
Gamma: -.0551				
4. Shows phonological awareness[25]	P	6.7	6.9	1.5
	IP	58.9	41.2	52.9
	NY	34.5	51.7	45.6
Gamma: -.124				
5. Shows appreciation for books[26]	P	22.8	37.5	17.9
	IP	64.2	52.6	72.1
	NY	13.0	9.9	10.0
Gamma: -.0865				

[23] P = Proficient, IP = In Process, NY = Not Yet

[24] Speaks Clearly enough to be understood by most listeners / Speaks clearly enough to be understood without contextual clues

[25] Shows beginning phonological awareness / Demonstrates phonological awareness

[26] Shows appreciation for books / Shows appreciation for books and reading

Year		Fall 2002	Fall 2003	Fall 2004
Indicator	**Rating**	**%**	**%**	**%**
6. Shows interest in letters and words / Shows understanding of concepts about print[27]	P	10.3	16.8	10.6
	IP	72.7	51.4	68.2
	NY	17.0	31.8	21.1
Gamma: -.0194				
7. Uses shapes to write / Begins to develop knowledge about letters[28]	P	6.3	17.6	9.7
	IP	68.3	53.1	70.1
	NY	25.4	29.3	20.2
Gamma: .0798				
8. Mathematics[29]	P	6.3	16.2	6.6
	IP	66.8	54.5	64.0
	NY	26.8	29.3	29.3
Gamma: -.0445				

Table 4 contains the cross-tabulations of the fall proficiency ratings for the Head Start children in the years of 2002-2003, 2003-2004, and 2004-2005. This analysis was done to determine if the children start each year with approximately the same percentage of children "proficient" for each indicator. The value of gamma indicates the progress in the start points of the children between years. A value of 0.0 indicates that the Head Start children began each year with the same level of proficiency on that indicator. A negative coefficient for gamma indicates that a higher percentage of children began the year "proficient" in 2002-2003 than they did in 2004-2005. A positive coefficient indicates

[27] Show interest in letters and words / Shows beginning understanding of concepts about print
[28] Uses scribbles and unconventional shapes to write / Begins to develop knowledge about letters
[29] Shows interest in solving mathematical problems / Shows beginning understanding of number and quantity

that the children began the 2004-2005 year with a higher percentage of children "proficient" than they did in the 2002-2003 year.

Because of the lack of funding and space in the Heartland Head Start program, most children participated only for a year, usually when they were four-years-old. For this reason, there was a big turnover in children every year, thus high academic success from the year before would not transfer into higher fall starting percentages of "proficient" children. There were some three-year-old children in the program that returned to the program as four-year-olds, which implies that the percentages of four-year-olds who were "proficient" or close to "proficient" would increase because the returning children would most likely have made progress as a three-year-old. The percentages of returning children, however, remain approximately constant from year to year, so these higher ratings for returning children would also be consistent from year to year. In other words, I expected the children to enter the program with approximately the same proficiency on each indicator as the other years. This area was studied, therefore, to see if there was a year in which the children started significantly more or less "proficient," which would be cause for further investigation as to the reason for this influx.

All the gamma values on this chart were less than ± .125, which means the starting skill levels of the children were approximately the same each year. The lowest gamma was -.0194 on the indicator of *showing interest in letters and words / showing beginning understanding of concepts about print.* This indicates that during each year, the starting point on this indicator was very close to the other years. The biggest change in starting level was in *phonological awareness* with a gamma of -.124. This suggests that

each year the children begin the school year with less *phonological awareness* than the year before; however, since the gamma was not significant enough to even equate to a weak relationship (see appendix A), there was little significance to the idea that the children were regressing on this indicator.

A comparison of the percentages with which the children began each year shows a similar finding to that of the gamma values, but gives more detail about the high middle year, 2003-2004. On many of the indicators the children began each year with approximately the same percentage of children rating "proficient." However, for each indicator in the fall of 2003, the children began with a higher percentage of children rating "proficient" than in the fall of either 2002 or 2004. There was an especially large difference in the percentages of children rating "proficient" in *showing appreciation for books* between the years. In the fall of 2003, 37.5% of the children were "proficient," the next closest year was 2002 with 22.8% of the children "proficient," and then 17.9% of the children "proficient" in the fall of 2004. For most of the indicators the percentages of children "proficient" in fall did not vary much, but the percentages for the fall of 2003 were always higher than for the other two years.

Table 5: Spring ratings of the children's progress, in percentages, for the school years of 2002-2003 and 2003-2004

Year		**Spring 2003**	**Spring 2004**
Totals (N=)		191	243
Indicator	**Rating**[30]	**%**	**%**
1. Gains meaning by listening	P	69.4	63.4
	IP	29.9	36.2
	NY	0.7	0.4
Gamma: -.130			
2. Speaks clearly[31]	P	66.6	66.7
	IP	30.8	30.9
	NY	2.9	2.5
Gamma: .00938			
3. Uses expanded vocabulary and language for a variety of purposes	P	58.9	57.2
	IP	35.2	38.3
	NY	5.9	4.5
Gamma: -.0190			
4. Shows phonological awareness[32]	P	50.6	42.4
	IP	43.0	53.1
	NY	6.5	4.5
Gamma: -.0120			
5. Shows appreciation for books[33]	P	76.3	76.9
	IP	23.2	23.1
	NY	0.5	0.0
Gamma: .0196			

[30] P = Proficient, IP = In Process, NY = Not Yet

[31] Speaks clearly enough to be understood by most listeners / Speaks clearly enough to be understood without contextual clues

[32] Shows beginning phonological awareness / Demonstrates phonological awareness

[33] Shows appreciation for books / Shows appreciation for books and reading

Year		Spring 2003	Spring 2004
Indicator	**Rating**	**%**	**%**
6. Shows interest in letters and words / Shows understanding of concepts about print[34]	P	67.1	58.3
	IP	31.6	41.3
	NY	1.3	0.4
Gamma: -.176			
7. Uses shapes to write / Begins to develop knowledge about letters[35]	P	57.6	57.0
	IP	38.2	40.9
	NY	4.2	2.1
Gamma: .00795			
8. Mathematics[36]	P	57.5	46.3
	IP	37.3	49.2
	NY	5.2	4.5
Gamma: -.189			

Table 5 contains the cross-tabulations of the spring proficiency ratings for Head Start children in the years of 2002-2003 and 2003-2004. Since the spring data for the 2004-2005 year were not in yet, this analysis only covers the spring of 2003 and spring of 2004. Similar to the previous table the value of gamma is a measure of the progress of the children between years.

I predicted that the children would end each year with approximately the same percentage of children rating "proficient," since the children follow approximately the same teaching schedule each year. If this were not the case and the children ended higher in one year than another, that finding would lead to a more detailed study as to what influenced this change in the children's progress.

[34] Shows interest in letters and words / Shows beginning understanding of concepts about print
[35] Uses scribbles and unconventional shapes to write / Begins to develop knowledge about letters

Table 4 showed that the children began the year with approximately the same percentages of children "proficient" as the children in the year before them. Similarly, most of the gamma values on this table indicate that there was no difference in the ending proficiency of the children in different years. This was especially true for the indicators of *speaking clearly*, *using expanded vocabulary and language*, *phonological awareness*, *showing appreciation for books*, and *using scribbles and unconventional shapes to write / developing knowledge of letters.*

This trend of ending each year with approximately the same percentage of children "proficient" is evident when comparing the percentage of children rating at each level. For instance, for *speaking clearly* most of the values of the percentage of children rating at a "proficient" level were only one-tenth of a percent off the value in the other year: the percentage of children "proficient" in 2002-2003 was 66.6% and in 2003-2004 it was 66.7%, the percentage of children "in process" in the spring of 2003 was 30.8% and the percent "in process" in the next year was 30.9%. In the "not yet" category the spring 2003 percent (2.9%) was only four-tenths off the spring 2004 percent (2.5%). On most indicators the Head Start children ended each year with similar percentages of children at each level of proficiency.

Another trend, though only slight, shows a decrease in proficiency between the 2002-2003 and 2003-2004 years on three indicators, *gains meaning by listening* (gamma = -.130), *shows interest in letters and words / shows understanding concepts about print* (gamma = - .176), and *mathematics* (gamma = -.189). The gamma values for these three indicators suggest that Head Start children were in fact becoming less "proficient" on

[36] Shows interest in solving mathematical problems / Shows beginning understanding of number and quantity

these indicators than in previous years, but the difference between the years is hardly significant.

The *mathematics* indicator had the strongest negative gamma value of all the indicators, a gamma of -.189, suggesting that a higher percentage of students ended the 2002-2003 year "proficient" than the percentage in the 2003-2004 year. Upon studying the individual percentages for this indicator, however, the difference in percentages was insignificant. In the spring of 2003 the children had 57.5% of them rating "proficient," but only 46.3% of the children were "proficient" in the spring of 2004, which was a difference of approximately 11%. On the other hand, the percentage of children rating "in process" at the end of spring 2003 (37.3%) was about 12% less than the percentage of children rating "in process" in 2004 (49.2%). In fact, at the end of the 2003-2004 year, a smaller percentage of children were rated "not yet" (4.5%) than were rated that at the end of the 2003 year (5.2%). Although fewer children rated "proficient" during the spring of 2004 than during the spring of 2003, the 2003-2004 year ended with fewer children rated "not yet" and more children rated "in process" than the percentages with which the 2002-2003 year ended.

A trend similar to that seen for the *mathematics* indicator can be found for the *showing interest in letters and words / understanding concepts about print* and the *gains meaning by listening* indicators. Although the percentage of children ending the year "proficient" was higher in the 2002-2003 year than in the 2003-2004 year, the 2003-2004 year had a high percentage of children rating "in process" than the other year. In fact, on each of these indicators the percentage of children rating "not yet" was lower in the spring of 2004 than in the spring of 2003.

The slight advantage with which the children in 2003-2004 began the year did not carry over to produce a higher percentage of children ending the year rating more "proficient." The children in 2003-2004 ended the year with approximately the same percentage of their population "proficient" as the children in 2002-2003. Unfortunately, the percentages for the 2004-2005 year were not in yet, so the final comparison between the fall and spring of the three years could not be made. Yet, if this trend of ending at approximately the same percentages as the year before continues, then it can be assumed that the children in Head Start during the 2004-2005 year will end at about the same place as the children from the years before them.

Conclusion

Like all studies, my research had validity and reliability problems, especially since I was doing a secondary analysis. As with any secondary analysis, the validity of my study was reduced because I could not know if the indicators measured exactly what I thought they measured. There were additional problems with the validity and reliability of my data. The control variables had higher reliability and accuracy than the dependent variable of the children's progress. Still, a few of the control variables required self-reporting on the part of the parents as for demographic characteristics such as language spoken at home, which could cause problems of validity.

The dependent variable of children's progress was based solely on teacher observation and was very subjective. The reliability was low because different teachers have different standards as to what it means for a child to be proficient. Also, validity was questionable because the teachers might have rated their students higher than what was

accurate to have their classrooms appear better and in hopes of receiving a raise, which were given out partially based on student performance. Validity also suffered in that teachers might not have seen a child performing a specific action even though the child might have done it regularly when the teacher was not paying attention. Similar to the control variables, there was also the possibility of incorrect data entry.

Like many studies, my data analysis was limited by time. I studied the effect of the control variables of age and native language on the percentages of children "proficient" for each of the eight Work Sampling for Head Start Indicators. However, there were many more control variables that would be relevant such as ethnicity, gender, and half day versus full day students.

An additional challenge with this secondary data was that since it was kept in aggregate form and not in raw data, statistical programs such as SPSS could not be used to analyze the data. For this reason all the calculations were done by hand making the process more time consuming and increasing the possibility of inaccurate calculations.

My research was also limited by the extent of aggregate data that Head Start kept in their database. The 2003-2004 year and fall of the 2004-2005 year had the progress of the children in actual numbers of children receiving each rating, which was necessary for calculating gamma. The information for the 2002-2003 year, on the other hand, was kept in percentages of children receiving each rating, but not in actual numbers. This means that knowing the number of total children in the program for that year it was possible to create approximate numbers for the children receiving each rating, but these numbers were only approximate due to the fact that in each time period there were always some children who did not get rated because of problems like absences or late entry into the

program. The information about how many children were rated for each indicator in each time period was not kept by the Head Start database after one year, so it was impossible to re-create exact data for the 2002-2003 year.

A logical line of future research on this topic would be to continue what this data analysis has begun. Obviously, new numbers and percentages for the winter and spring of 2004-2005 will be available soon, and these data will need to be analyzed. A continuation of this study would create more longitudinal research that would allow Head Start to make more comparisons between the years, and to see if the interventions they are implementing to improve the children's skills in certain problem areas, such as phonological awareness and mathematics, are creating the desired results.

Appendix A

A Guide to Interpretation of Gamma

-1.00	Perfect negative relationship
-.80	Very strong negative relationship
-.60	Strong negative relationship
-.40	Moderate negative relationship
-.20	Weak negative relationship
.00	No relationship at all
+.20	Weak positive relationship
+.40	Moderate positive relationship
+.60	Strong positive relationship
+.80	Very strong positive relationship
+1.00	Perfect positive relationship

(Frankfort-Nachmias and Leon-Guerrero 2002: 253)

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