

## RESEARCH ARTICLE

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### The Literacy Skills of Children with One versus Two Years of Head Start Attendance

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*Research Findings:* This quantitative study was designed to investigate whether children who attend a Head Start program for two years have better literacy skills than children with one year of attendance. Literacy skills of a statewide sample of children from rural, suburban, and urban centers were compared. The Language and Emerging Literacy Assessment (LELA) was used to assess literacy skills of 2,305 3- and 4-year-olds from 39 Head Start centers across Alabama. The results indicate that children with two years of attendance have higher literacy skills, but the effect differs depending on the center's location, the age of children in the center, and proportion of dual language learning children. *Practice or Policy:* The results indicate that policymakers should consider the benefits of more than one year of Head Start attendance. However, the benefits may be related to center quality and resources. The benefits of two years of Head Start attendance were higher in urban than rural locations.

*Keywords:* preschool assessment, Early Head Start, Head Start, early literacy

According to the National Center for Education Statistics, in 2015, 38 percent of American 3-year-olds attended an early childhood education program compared to 67 percent of 4-year-olds. These attendance rates have not changed appreciably since 2000, nor has public funding for free or affordable early childhood education for either age group (NCES, 2017). All forms of early care and education are expensive for middle-class and above families and cost prohibitive for low-income families. While preschool attendance has become relatively common for children of all income levels, positive effects of preschool are especially pronounced for low-income children, influencing their cognitive and social development (Bridges, Fuller, Rumberger, & Tran, 2004; Camilli, Vargas, Ryan, & Barnett, 2010; Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007). Therefore, should low and moderate families stretch their budgets to seek preschool attendance for their young children for several years, or is preschool for only the 4-year-old year sufficient? Should policy makers seek to expand publicly-funded preschool programs such that the rates of attendance for 3-year-olds match that of 4-year-olds? This study attempted to add to the limited research literature that addresses these issues.

Although scholars do not agree on the long-term effects that preschool attendance can have on low-income children, studies, such as the High Scope Perry Preschool Program in Michigan (1962 to 1967) and the Carolina Abecedarian Project (1972 to 1977), demonstrate that low-income children who begin their education in high-quality preschool programs tend to complete high school, and, consequently, are more successful academically and professionally (Campbell & Ramey, 1994). They also tend to have less criminal involvement (Ryan, Fauth, & Brooks-Gunn, 2006), which shows not just a long-term benefit for the child but also for society.

Both long and short-term benefits of preschool education have been shown to vary depending on the child's socio-economic circumstances. Earlier literacy intervention may have minor consequences on the cognitive development of middle- and high-income children, but low-income children who start preschool earlier, in some cases during infancy, have greater cognitive benefits (Bridges et al., 2004; Campbell & Ramey, 2004; Loeb et al., 2007). In fact, the gains in cognitive development are high during the infancy and preschool years, and they may persist through the earlier years of adolescence (Arteaga et al., 2013; Campbell & Ramey, 2004; Ryan et al., 2006). The question of what is the right age to start preschool is of great significance for parents from a variety of socio-economic backgrounds, but this question is particularly relevant for policymakers who also make decisions regarding funding for programs, such as Head Start and Early Head Start.

Despite suggestions in the research literature that offer evidence for the benefits of preschool attendance, the current literature does not offer a wide range of studies that provide an indication of the benefits of two years versus one year of attendance in a preschool program. Leow, Wen, and Korfmacher (2015) demonstrated an advantage for two years of Head Start program participation relative to one year of participation using a national sample of children and propensity score matching strategies. The effects were demonstrated across both literacy and mathematics outcomes measures.

Similarly, in the Chicago Longitudinal Study (CLS), one of the few studies to examine this effect, the long-term benefits of preschool attendance for children that participated in the Child-Parent Centers (CPC) for one or two years were evaluated (Arteaga, Humpage, Reynolds, & Temple, 2013) across two cohorts (1985, 1986,  $n=1,539$ ) of children. Children who had zero, one, and two years of participation in CPC were compared. The families were not randomly assigned to dosage levels, rather they self-selected years of enrollment in the program. The authors discussed the following as possible differences between the one-year and two-year cohorts: the centers may have given priority for two years enrollment for families that were at a higher risk, the state may have cutoff dates for enrollment according to birthdays, families likely had different values about education and preschool, and families had different accessibility to centers. However, in general the cohorts were considered equivalent, except for a few notable differences. Two-year participants were more likely to be African Americans, their mothers were more likely to have completed high school, and they were less likely to have been in the welfare system.

The CPC program is considered a high quality program (Arteaga et al, 2013). At that time, CPC was a part-time program for 3- and 4-year-olds, all teachers had college degrees, and class size tended to be less than 25 students. CPC provided free meals, health services, and social services, and parent involvement was highly important in the program. Arteaga and colleagues's (2013) results revealed that children who participated in the program for two years rather than one were less likely to be involved in juvenile crime and have a felony arrest by the age of 24, and they were less likely to be reported to child protective services for child abuse or neglect.

Academically, the two-year participants were less likely to repeat a grade from first to eighth grade, to need special education services, and had higher test scores. However, benefits in adult educational attainment were not found.

## Head Start and Early Head Start Program

In 1965, the Head Start program was created as a way to decrease the social and educational gap between low and middle to high-income children. The program has as a mission to increase school readiness for children between three to five years old (Puma, Bell, Cook, & Heid, 2010). In 1994, the program expanded to Early Head Start, which serves children between 0 and 3-years-old. To participate in a Head Start or Early Head Start program, children have to meet family poverty guidelines, be homeless, or have a qualifying disability. An exception to these requirements is for foster children, who are eligible for the program despite their foster family's income.

The Early Head Start Evaluation (Love & Brooks-Gunn, 2010) states that Early Head Start programs have impact starting at the age of two on these areas: cognitive, language, and social-emotional development. This is also the age when poverty and family risk effects on cognitive development become evident (Barajas, Philipsen, & Brooks-Gunn, 2007; Ryan et al., 2006). Loeb et al.'s (2007) findings also indicate that children who start preschool between the ages of two and three have the highest effects on reading and math independent of income groups or race (African American, Caucasian, or Hispanic). However, Loeb et al. did not find cognitive benefits for children who started in a preschool program before the age of two.

Although long-term effects of preschool depend on the quality of K-12 schools and parent involvement (Loeb et al., 2007; Reynolds, 1995), researchers agree that preschool has the short-term benefit of preparing children to start school. Such benefit influences the academic development of children during elementary school. In addition, early intervention during infancy may reduce the effect of poverty on the cognitive development of a child, subsequently, reducing the learning gap between low-income children and children from other economic backgrounds (Ryan et al., 2006). Children who participate in an Early Head Start program are more likely to enroll in a preschool program for children who are older than two (Love & Brooks-Gunn, 2010).

The current study builds on the Head Start Impact Study Final Report (Puma et al., 2010) that describes and compares the effect that Head Start programs have on 3- and 4-year-olds. The Head Start Impact Final Report's data collection was conducted between 2002 and 2006 in 23 states, 383 randomly selected Head Start centers, and with 4,667 newly enrolled children: 2,559 were 3-year-olds, and 2,108 were 4-year-olds (Puma et al.). The children were randomly assigned to treatment and control conditions. In the treatment group, children had access to the services of a Head Start program. In the control group, children did not have access to a Head Start program, and parents could to choose enroll their children in another early childhood program. About 60% of the children in the control group were participating in another early childhood program. However, families of 3-year-olds in the control group had the option to transfer their child to a Head Start program for a second year of preschool once the child was 4-years-old.

The study assessed the following literacy skills using McCarthy Draw a Design, parent report, Comprehensive Test of Phonological Processing Second Edition (CTOPPP Elision), Peabody Picture Vocabulary Test (PPVT), and Woodcock-Johnson III (WJIII): color

identification, pre-writing (McCarthy Draw a Design), emergent literacy skills (parent report), letter naming, phonological processing (CTOPPP), receptive vocabulary (PPVT), letter-word identification (WTIII), spelling (WTIII), oral comprehension (WTIII), and pre-academic skills (WTIII). The final report showed that both groups benefited from the program in the following literacy areas: vocabulary, letter-word identification, letter naming, spelling, parent-report emergent literacy and pre-academic skills. Yet, 3-year-olds advanced more than 4-year-olds in phonological processing and non-emergent literacy areas, such as behavior and health. In addition, the Head Start Impact Final Report (Puma et al, 2010) revealed that there was a difference between urban and non-urban 3 year olds—3-year-old preschoolers from non-urban areas had a sustained cognitive impact on language and literacy through the end of the first grade. The report leaves an unanswered question for researchers: whether two years of Head Start would benefit children more than one year of Head Start. This question has become especially important for policymakers with the creation of Early Head Start in 1994, since some of the children may stay in this type of early intervention from 0 to 5-years-old.

In 1995, Reynolds researched the effect of two years versus one year in the Child Parent Center (CPC) preschool program. Reynolds explains that the CPC program is similar to the Head Start program in its emphasis to comprehensive service and parent involvement. But, different from Head Start, CPC provided up to six years of preschool, and follow-on service through grade 3 (Reynolds). He also clarified that “although the CPC program is not identical to Head Start, they have enough similarities to be extensions of one another” (p. 26). His study included 887 African American children, 425 boys and 462 girls, whose outcomes in cognitive readiness, teacher ratings in social/ school achievement, mathematics, world analysis (kindergarten), reading (grade 1 to 6), and parental school involvement (grade 1 to 6) were measured from kindergarten to grade 6. In the study, the Iowa Test of Basic Skills (ITBS) was administered for kindergarten in fall 1985 and spring 1986, and each April from grade 1 to grade 6.

Reynolds (1995) found out that children with two years of the program had more stable and sustainable benefits on their cognitive development than children with one year of the program: they are more prepared for Kindergarten, they read better, they are less likely to be placed in special education up to grade four, they have lower rates of grade retention during elementary school, and their parents are more involved. However, statistically significant differences in long-term effects beyond elementary school between one and two years in the program were not found. Reynolds (1995) presumed that the differences between one and two years of program participation are not sustainable over time for two reasons. First, children have a peak in their performance during the first year and diminishing returns in their second year. Second, children with two years of program participation are often exposed to the same activities during their two years of participation, which may mean that the second year merely reinforces what was learned in the first.

Domitrovich et al. (2013) also researched the effect of two versus one year for 268 children in a preschool program that follows an integrated model between a public school and a Head Start program. The program follows the Head Start standards, but it was located in an elementary school. The quality of teaching may differ from a regular Head Start program, because in each classroom one of the teachers was required to have a bachelor’s degree and a teaching certificate. The other teacher was from a Head Start program, and he/she was only required to have completed high school. The study was conducted between 2002 and 2004 with 268 children: 117 started at age 3 and 151 started at age 4. Each year, between October and December, a team of researchers assessed the children in language, emergent literacy, letter-

naming, writing and numeracy, using the *Peabody picture Vocabulary Test-Third Edition* and the *Woodcock-Johnson Revised Test of Achievement*. Domitrovich et al. found that children who had two years in a Head Start program had higher receptive vocabulary scores, higher letter-word skills, and were able to name more letters at kindergarten than children who had one year in a Head Start program. However, they did not find any differences in early writing abilities for the two groups of children.

## The Current Study

The current study sought to examine the effects of two versus one year of Head Start program participation on the emergent literacy skills of young children. Emergent literacy skills include knowledge, attitudes, and skills that are the foundation for reading and writing (Lonigan, Burgess, & Anthony, 2000; Teale & Sulzby, 1986; Welsch, Sullivan, & Justice, 2003; Whitehurst & Lonigan, 2000). Emergent literacy development starts during preschool or infancy and can be associated with a child's exposure to an environment that stimulates learning and cognitive development. It can be especially important to focus on the development of emergent literacy before kindergarten, as those skills can influence children's reading abilities during kindergarten, elementary school, and throughout their academic life (Adams, 1990; Bailet, Repper, Piast, & Murphy, 2009; Lonigan, Burgess, & Anthony, 2002;).

One of the sources of emergent literacy skills development is the home literacy environment, which varies in low-income families (Payne, Whitehurst, and Angell, 1994; Rodriguez et al., 2009; Van Steensel, 2006). Rodriguez et al. (2009) describe factors related to the parents and to the children that may affect home literacy environment. Characteristics of the mother that are positively correlated to the quality of home literacy were maternal age (older mothers were more likely to have an enriched home literacy environment), maternal education, and maternal employment (mothers who were employed provided a superior home literacy environment). Characteristics of children that were associated with home literacy were children's gender (girls exceeded boys), and birth order (firstborn children had a better home literacy environment than later born children). Other factors that were also associated with the home literacy environment were father residence and race. Rodriguez et al. found that white mothers had the highest quality home literacy environment followed by English-speaking Hispanics, African Americans, and Spanish-speaking Hispanics. However, Rodriguez et al. observed that, although there is variability in the quality of home literacy environment, low-income children who have an enriched home literacy environment were "average when compared to norms established in the general population" (p. 691). This may be the case because low-income families have lower financial and educational resources than middle/high-income families (Harts, 2011).

There are seven major literacy skills that develop during the preschool years. First, language: vocabulary and oral expression (Lonigan, Burgess, & Anthony, 2000; Whitehurst & Lonigan, 2000). Second, conventions of print: directions in which print is to be read (left-to-right and top-to-bottom), understanding of what is the cover and what are the pages in a book, differentiation between pictures and print, and print structure such as words, sentences, spaces and punctuation (Lonigan et al., 2000; Whitehurst & Lonigan, 2000). Third, knowledge of letters: name and sounds of letters, and the ability to recognize them in upper and lowercase versions (Rosenberg, 2006; Whitehurst & Lonigan, 2000; Wood & McLemore, 2001).

Knowledge of letters is also closely related to phonemic awareness; children who recognize more letters have higher levels of phonemic awareness (Rosenberg, 2006).

Fourth, linguistic/ phonological awareness: includes syllables, rhymes, and phonemic awareness (Lonigan et al., 2000; Rosenberg, 2006; Whitehurst & Lonigan, 2000; Wood & McLemore, 2001). Yet, Rosenberg (2006) and Adams (1990) consider phonemic awareness, which is the understanding of words and its parts (the phonemes), as the most important aspect in phonological awareness related to reading development. Fifth, phoneme-grapheme correspondence: knowing the connection between phonemes and alphabet letters, including knowledge of combination of letters (Whitehurst & Lonigan, 2000, Wood & McLemore, 2001). Sixth, emergent reading and writing: recognition of print in labels, for example, and pretending or beginning to write (Whitehurst & Lonigan, 2000). Seventh, name writing (Haney, 2002; Welsch et al. 2003).

The current study attempted to address many of these emergent literacy skills while also identifying and comparing 3 and 4-year-old children from two groups. The first group of children had two years of program participation in that they had enrolled in a Head Start or Early Head Start for one year prior to the study year. The second group consisted of newly enrolled children. The children were not randomly assigned to the one or two years of program participation conditions. Program participation levels were due to parental choice and program eligibility. The study focused on two questions: Do children with two years of program participation perform better than children who are newly enrolled and may or may not have participated in another preschool program? Does the effect of two years of program participation vary by center location (i.e., urban, suburban, and rural)?

## METHOD

### Sample and Participants

The sample includes 2,305 children from 39 centers who were enrolled in five Alabama Head Start programs. The children were identified as attending the Head Start or Early Head Start program for a second year or as newly enrolled. The researchers were able to obtain information about whether the child with two years of Head Start participation returned to the same program from following a previous year of participation, but not total years of participation in an Early or Head Start program. It was possible that a child could have attended a different program prior to the two years of participation in their current program at the time of the study. The study did not include children who attended Head Start as three year olds and then did not return for a second year of program participation. It was known that the newly enrolled children were participating for the first time. This study only includes 3- and 4-year-olds: 36.6% were 3-year-olds, and 63.4% were 4-year-olds. Among the 3-year-olds, 11.1% were returning students from an Early Head Start program. Among the 4-year-olds, 49.4% were returning students. The sample included 2.7% children who had an IEP, and 1.6% for whom English was their second language. The current study defined rural, suburban (urban-cluster) and urban locations based on the Census 2010—rural: less than 2,500 people, suburban (urban-cluster): from 2,500 to 49,999 people, urban: 50,000 or more people.

This study was a subset from a larger study that analyzed data collected using the Language and Emerging Literacy Assessment (LELA), an instrument developed by a partnership of researchers and practitioners from the Jefferson County Committee for Economic

Opportunity. The larger study extended the existing literature regarding the measurement properties of the LELA including validity and reliability (Lambert, Abbott-Shim, & Hicks, 2000). The full sample had 5,727 preschoolers in 50 Head Start centers from seven Head Start Programs accessed through a dataset collected by the Alabama Head Start Association. The study utilized two different versions of LELA, one that included questions regarding years of program participation, IEP and ESL status, and another without that information. The current study used the first version and had a sample of 2,305 children who were assessed using the LELA in the first two months of the Fall semesters 2006, 2007 and 2008, in 39 Head Start centers from five Head Start Programs in Alabama—4 centers were located in an urban region, 25 in a suburban region, and 10 in a rural region. This study, therefore, involved secondary data analysis and was limited to the variables available from the source.

## Outcome Measure

The LELA has two sections. Section I: Book Knowledge, Expressive Language, Beginning Sounds, Phonemic Awareness and Rhyming; section II: Uppercase Letter Recognition, Lowercase Recognition and Name Writing (only first name). Although name writing is included in LELA, since children have different name lengths, and our sample had a variation from 2 to 12 letters in a name, we excluded Name Writing from our evaluation.

Section I has five parts, and each item in each division has a score value of one. First, Book Knowledge (nine items): assessors gave a book to children and asked them to show (by pointing) a letter, a word, the name of the book, the name of the book's author, the name of the book's illustrator, where the assessor should start reading and in what direction (left to right, top to bottom), and where the story ends. Second, Expressive Language (five items): assessors asked children to tell the story in the book. Children had five elements to include: beginning of the story, setting, characters, sequence and ending of the story.

Third, Beginning Sounds (eight items): assessors showed three images to children, for example, a "rake", a "paintbrush" and a "hammer". Then, assessors said a word, for example, "ruler", and asked children which image/ word starts with the same sound. This exercise was repeated eight times with eight different words to identify eight different beginning sounds: ruler, bus, monkey, sun, hat, ladder, dog and kite. Fourth, Phonemic Awareness (four items): assessors said a word dividing it into syllables, (for example: Ti ger), and children needed to complete the word (tiger). Fifth, Rhyming (four items): assessors said a word, for example, cat, and other two words (showing the images) to children, for example, "rat" and "chair", and children needed to identify which word sounds like cat.

Section II has three parts. First, Uppercase Letter Recognition: alphabet letters are in a random order in the uppercase format. Assessors circled the letters that children recognized. Second, Lowercase Letter Recognition: alphabet letters are in a random order in the lowercase format. Assessors circled the letters that children recognized. Each letter has a score value of one. Third, Name Writing: children wrote first their name, and we compared how many letters they wrote correctly. However, because some children had 2 or 3 letters in their names, while others had 11 or 12, we do not use this section in this study.

We used Cronbach's alpha to evaluate the internal consistency reliability of the eight LELA scores generated from the current sample: Book Knowledge ( $\alpha = .80$ ), Expressive Language ( $\alpha = .78$ ), Beginning Sounds ( $\alpha = .76$ ), Phonemic Awareness ( $\alpha = .89$ ), Rhyming ( $\alpha =$

.77), Total Emergent Literacy ( $\alpha = .90$ ), Uppercase Letter Recognition ( $\alpha = .96$ ), Lowercase Letter Recognition ( $\alpha = .95$ ) and Name Writing ( $\alpha = .95$ ). The Total Emergent Literacy was produced through adding all scores of Book Knowledge, Expressive Language, Beginning Sounds, Phonemic Awareness and Rhyming together.

## Statistical Analyses

Two level hierarchical linear models (HLM) were used to explore the effects of two years versus one year of Head Start participation, and the differences between skills of children in rural, suburban and urban centers. Children attend Head Start within centers and the children in this sample were nested within their respective centers. The Level I models, the child level, examined relationships between child level predictors and assessment scores. The Level II models, the center level, examined between center variability in child outcomes, relationships between center characteristics and outcomes, and between center variability in the relationships between Level I predictors and outcomes. At Level I, we examined four predictors: status as a two participant or not (uncentered), age in months (group mean centered), IEP—Individualized Education Program—(uncentered), and ESL—English as Second Language learner—(uncentered). Children were nested within their respective Head Start centers. Therefore, the Level I intercepts represented the average score for each center for each outcome for newly enrolled children who do not have an IEP, are not an ESL learner, and are the average age of children in the center. Slopes of the Level I model captured the relationships between each of four predictors and each outcome measures. The Level I model was tested as follows:

$$Y_{ij} = \beta_{0j} + \beta_{1j}(2 \text{ YEAR}) + \beta_{2j}(\text{AGE}) + \beta_{3j}(\text{IEP}) + \beta_{4j}(\text{ESL}) + r_{ij}$$

where  $Y_{ij}$  represents the score on each outcome measure for child  $i$  within center  $j$ .

At Level II, two separate models were used. The first model aimed at explaining the intercepts, or center means, from the Level I model. The second model attempted to examine the distribution of slopes across centers for the effect of two years of program participation. These slopes represented the difference between two years of program participation and one year for each center. The slopes as outcomes models examined whether the scores of children with two years of participation relative to other children in their center who had only one year of program participation, differ in rural, suburban and urban center locations.

Three contextual control variables were added to the Level II models to account for potential differences between centers. These three contextual variables were the proportion of children who have an IEP (IEPPERC), proportion of children who are ESL learners (ESLPERC), and average age of all children (AGE\_MEAN), which were all centered on their grand mean. The Level II models were specified as follows:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{SUBURBAN}) + \gamma_{02}(\text{RURAL}) + \gamma_{03}(\text{IEPPERC}) + \gamma_{04}(\text{ESLPERC}) + \gamma_{05}(\text{AGE\_MEAN}) + u_{0j}$$

$$\beta_{1j} = \gamma_{00} + \gamma_{01}(\text{SUBURBAN}) + \gamma_{02}(\text{RURAL}) + \gamma_{03}(\text{IEPPERC}) + \gamma_{04}(\text{ESLPERC}) + \gamma_{05}(\text{AGE\_MEAN}) + u_{0j}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

$$\beta_{4j} = \gamma_{40}$$

## RESULTS

Two years of program participation and child age were both positively associated with higher scores on all outcome measures. The results in Table 1 indicate that children with two years of participation recognized, on average, 5.17 more uppercase letters, and 3.72 more lowercase letter than newly enrolled children. They also scored, on average, 1.43 higher in Book Knowledge, 0.71 higher in Expressive language, 1.12 higher in Beginning Sounds, 0.47 higher in Phonemic Awareness, 0.06 higher in Rhyming, and 11.22 higher in Total Emergent Literacy on the LELA than newly enrolled children. For each additional month of age, children recognized, on average, 0.35 more uppercase letters, and 0.29 more lowercase letters. They also scored, on average, 0.11 higher in Beginning Sounds, 0.06 higher in Expressive Language, 0.06 higher in Beginning Sounds, 0.05 higher in Phonemic Awareness, 0.06 higher in Rhyming, and 0.34 higher in Total Emergent Literacy on the LELA for each additional month in their age.

TABLE 1  
Level I Models for Each Outcome Measure

Outcome Measure		Intercept	2 Year Effect	Age in Months	IEP Status	ESL Status
Uppercase Letter Recognition	Coef.	5.02***	5.17**	0.35***	-2.43*	-0.57
	SE	1.33	1.46	0.05	1.25	1.11
Lowercase Letter Recognition	Coef.	3.70**	3.72***	0.29***	-2.44**	0.23
	SE	1.14	1.02	0.04	0.96	1.12
Book Knowledge	Coef.	3.99***	1.43***	0.11***	-1.28***	-0.63
	SE	0.27	0.22	0.01	0.32	0.39
Expressive	Coef.	1.48***	0.71***	0.06***	-0.44**	-0.23

Language	SE	0.21	0.12	0.01	0.16	0.19
	Coef.	2.48 <sup>***</sup>	1.12 <sup>***</sup>	0.06 <sup>***</sup>	-1.14 <sup>***</sup>	-0.80 <sup>*</sup>
Beginning Sounds	SE	0.55	0.22	0.01	0.23	0.33
	Coef.	1.59 <sup>***</sup>	0.47 <sup>**</sup>	0.05 <sup>***</sup>	-0.71 <sup>*</sup>	-0.77 <sup>***</sup>
Phonemic Awareness	SE	0.34	0.16	0.01	0.37	0.22
	Coef.	11.22 <sup>***</sup>	4.32 <sup>***</sup>	0.34 <sup>***</sup>	-4.01 <sup>***</sup>	-2.99 <sup>***</sup>
Total Emergent Literacy	SE	1.44	0.55	0.03	0.59	0.23

Note. Coef=Coefficient, \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < 0.05$ .

Children with an IEP status scored lower in all outcomes measured in this study. They recognized 2.43 fewer uppercase letters, and 2.44 fewer lowercase letters than non-IEP status children. In addition, they scored, on average, 1.28 lower in Book Knowledge, 0.44 lower in Expressive Language, 0.80 lower in Beginning Sounds, 0.71 lower in Phonemic Awareness, 0.52 lower in Rhyming, and 4.01 lower in Total Emergent Literacy on the LELA than non-IEP status children. ESL children also scored lower in most of the outcomes than other children, but the differences were only statistically significant for four of the outcomes: Beginning Sounds (-0.80), Phonemic Awareness (-0.77), Rhyming (-0.57), and Total Emergent Literacy (-2.99; Table 1).

The results from the level II models do not indicate any statistically significant differences in average scores among the three center location types. Children with two years of program participation scored higher in 38 centers, and lower in just one (red line in Figure 1). However, the effect of two years of program participation varied for the centers depending on their location type (see Table 2). Rural locations had lower effects than urban locations for Uppercase Letter Recognition (-4.34), Lowercase Letter Recognition (-3.43), Book Knowledge (-1.09), Beginning Sounds (-1.05), Rhyming (-0.49), and Total Emergent Literacy (-2.73). Suburban locations had lower two year effects than urban locations for Book Knowledge (-.79), Expressive Language (-0.38), and Total Emergent Literacy (-1.81). Although both rural and suburban centers had lower two-year effects than urban centers in Total Emergent Literacy, the difference between rural and urban (-2.73) was greater than the difference between suburban and urban (-1.81) (see Table 2).

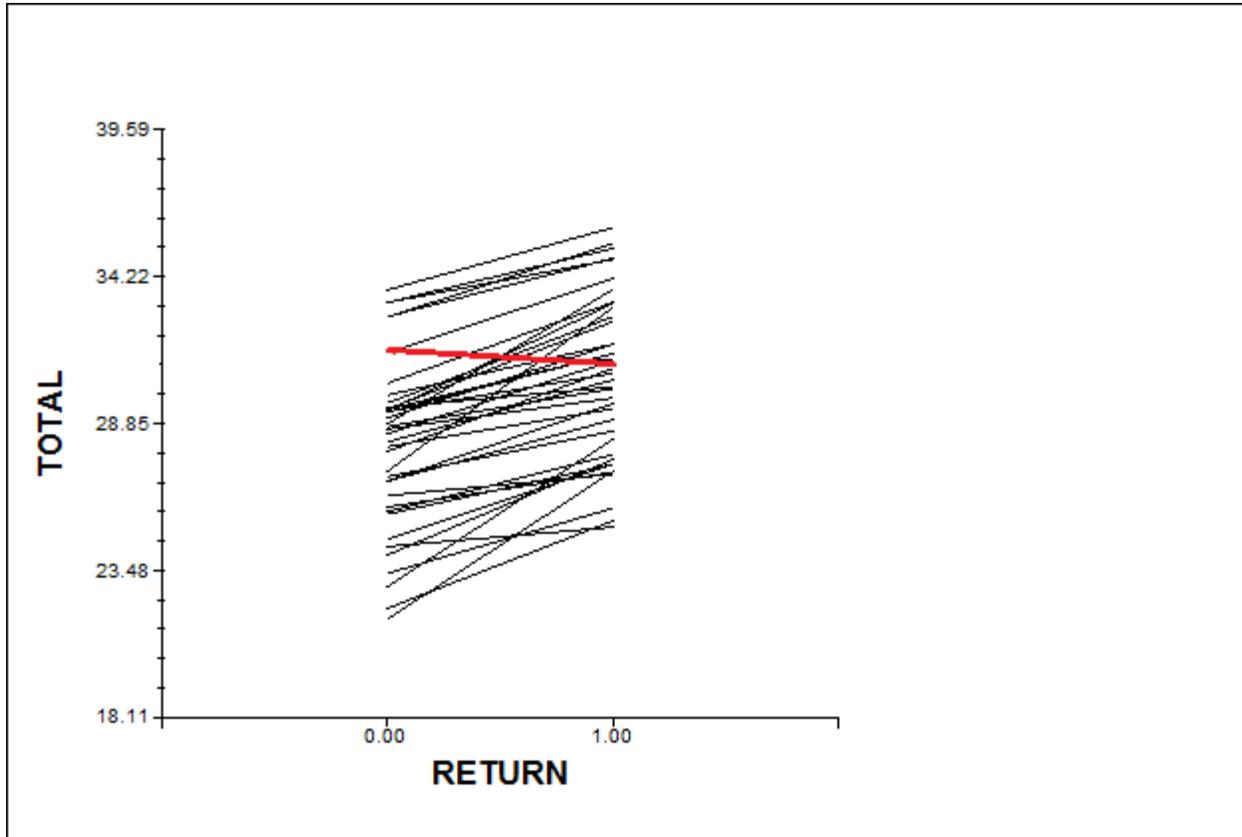


Figure 1. Return Effect Model

TABLE 2  
Level II Models Coefficients

Predictors			Suburban	Rural	Prop. IEP	Prop. ESL	Average Age
Uppercase Letter Recognition	Level I	Coef.	-0.21	0.15	9.81*	-2.76	0.43**
		SE	1.35	1.42	4.51	2.22	0.13
	2 Year	Coef.	-2.06	-4.34**	5.18	17.51**	-0.09
		SE	1.48	1.69	14.15	6.63	0.24
Lowercase Letter Recognition	Level I	Coef.	-0.44	0.05	10.70**	-1.50	0.31**
		SE	1.15	1.20	3.62	2.70	0.10
	2 Year	Coef.	-1.18	-3.43**	6.60	12.32**	-0.14
		SE	1.06	1.17	10.12	4.60	0.19
Book Knowledge	Level I	Coef.	0.41	0.36	8.70**	-1.69	0.17**
		SE	0.33	0.33	3.08	1.06	0.07
	2 Year	Coef.	-0.787**	-1.09*	0.99	1.82	-0.16*
		SE	0.249	0.33	4.39	1.86	0.07
Expressive	Level I	Coef.	0.06	0.02	1.02	-0.01	0.06*

Language	$\beta_0$	SE	0.25	0.26	2.26	-1.75	0.11
	2 Year	Coef.	-0.38**	-0.13	1.59	2.70	-0.07
	$\beta_1$	SE	0.15	0.20	1.84	1.70	0.05
Beginning Sounds	Level I	Coef.	-0.23	-0.06	7.90*	-2.64	0.16
	$\beta_0$	SE	0.58	0.64	3.46	1.55	0.09
	2 Year	Coef.	-0.41	-1.05***	-3.58	4.13**	-0.20**
Phonemic Awareness	$\beta_1$	SE	0.25	0.32	2.81	1.50	0.07
	Level I	Coef.	-0.12	-0.38	0.02	0.03	0.02
	$\beta_0$	SE	0.38	0.28	0.02	0.02	0.07
Rhyming	2 Year	Coef.	-0.01	-0.12	-0.01	0.02	-0.01
	$\beta_1$	SE	0.18	0.33	0.03	0.03	0.09
	Level I	Coef.	0.02	0.10	2.41	-0.63	0.12*
Total Emergent Literacy	$\beta_0$	SE	0.33	0.36	1.82	1.10	0.05
	2 Year	Coef.	-0.24	-0.49*	0.26	1.76*	-0.08*
	$\beta_1$	SE	0.24	0.29	2.10	0.78	0.04
Literacy	Level I	Coef.	0.11	0.05	19.11	-5.65	0.63*
	$\beta_0$	SE	1.59	1.70	9.87	4.06	0.27
	2 Year	Coef.	-1.81**	-2.73***	0.31	4.44*	-0.57**
	$\beta_1$	SE	0.67	0.85	8.50	2.84	0.19

Note. Coef.=Coefficient, \*\*\* $p < .001$ , \*\* $p < .01$ ,  $p < .05$ .

The Level II models also considered the percentage of children with an IEP or ESL status, and the average age of the children in the centers. Higher proportions of children with an IEP were positively associated with recognition of more uppercase and lowercase letters and higher scores for Book Knowledge and Beginning Sounds. Centers with higher proportions of children with ESL status showed a stronger benefit for two years of program participation for uppercase and lowercase letter recognition, Beginning Sounds, Rhyming, and Total Emergent Literacy (see Table 2). The coefficients in the Table 2 represent the difference between a center proportion of children of with an IEP of ESL status of 0 and 1. Therefore, the expected increase in the effect of two years of program participation for every percentage point increase in the concentration levels of these subgroups of children could be obtained by dividing the coefficients by 100.

Average center child age was, as expected, positively associated with higher scores on the LELA. Age was measured in months, for each month increase on the average age in the center, uppercase letter recognition had a 0.43 increase, and lowercase letter recognition had a 0.31 increase. Statistically significant positive associations between average center LELA scores and average age in months were found for: Book Knowledge (0.17), Expressive Language (0.06), Rhyming (0.12), and Total Emergent Literacy (0.63). The effect of two years of program participation was negatively associated with average age in months, suggesting that two years of participation had larger effects in centers with higher concentrations of younger children. Average child age in the center was negatively associated with the two-year effect for: Book Knowledge (-0.16), Beginning Sounds (-0.20), Rhyming (-0.08), and Total Emergent Literacy on the LELA (-0.57).

## DISCUSSION

The results reveal benefits from more than one year of Head Start and are consistent with The Head Start Impact Final Report (Puma et al., 2010), as well as other studies such as Domitrovich et al. (2013). Children who have a second year of program participation in Head Start scored higher on the LELA than newly enrolled children. This effect differed by center depending on the location, concentration of children with special needs, and average age of children. The two-year effect for urban locations was higher than for suburban and rural locations. This indicates that there may have been differences in program quality between suburban, rural, and urban centers that may have influenced children's learning. Consequently, a second year in a rural or suburban Head Start center may not be as beneficial as a second year in an urban Head Start center. Further research is needed to address the question of differences in center locations related to teaching quality and other program and community resources that may differ by urbanicity of center location (Maher, Frestedt, & Grace, 2008).

Regarding the two-year effect in centers with higher concentrations of children with ESL status, they have statistically significant higher effects for five of the eight outcomes. Two of the higher return effects—Beginning Sounds and Rhyming—are outcomes in which ESL children scored lower. Note that both Beginning Sounds and Rhyming are part of phonological awareness. Phonological structure varies from language to language. Thus, it is understandable that ESL children will have more difficulties in this area because they are learning a new language. Yet, we also expect that ESL children who are returning to a Head Start program had more exposure to English than ESL children who are newly enrolled.

Despite this finding that more than one year of Head Start may benefit ESL children through more exposure to English, the percentage of ESL children in the sample was lower than the national level. The low number is probably related to the fact that Alabama has only 4.1% of its population identifying as Hispanic or Latino (Census, 2012), and only 1.2% as Asian (Census, 2012). States such as Texas and California, for example, both have 38.2% (Census, 2012) of its population identifying as Hispanic or Latino, and 4.2% and 13.9% as Asian (Census, 2012). For centers with relatively higher proportions of children with an IEP status, there is no statistically significant difference in the two year effect. Nevertheless, these centers have statistically significant higher average scores in four of the eight outcomes. Although we would need more information about the quality of teaching in those centers, we presume that centers with a more diverse population, for example more IEP children, may be using more specialized and individualized teaching strategies, which would benefit not only children with an IEP, but also all other children.

Finally, although older children score higher than younger children, and centers with more 4-year-olds than 3-year-olds have a higher average score in six of the eight outcomes. Age is inversely related to the two year effect in four of the eight outcomes. This indicates that there may be more benefits to two years of program participation for relatively younger children.

These results tend to confirm the Head Start Impact Final Study Report (Puma et al., 2010), in which 3-year-olds had positive outcomes in phonological processing, but 4-year-olds did not. However, the Head Start Impact Study (Puma et al.) measured the effect of a second year in a Head Start program in a related but not identical way, identifying the effect of starting earlier in a Head Start program, at age three rather than at age four. The results of the current study were realized through a cross-sectional study design. Even though our data reflects a snapshot of three cohorts, Fall 2006, 2007 and 2008, a longitudinal study may be more

appropriate to further analyze the benefits of longer early childhood interventions and make any in depth causal inferences. Additional research is necessary to further answer questions such as: why two year effects are different in rural and urban centers, what are the benefits of returning from an Early Head Start rather than a Head Start program and teaching differentiation in centers that have more children with an ESL or IEP status.

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