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Social and Emotional Development and Language Outcomes in Mixed Income Preschool Classroom Environments

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Social and Emotional Development and Language Outcomes in Mixed Income Preschool
Classroom Environments

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science in Human Environmental Sciences

by

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University of Arkansas
Bachelor of Science in Human Environmental Science, 2008

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Abstract

Two different publicly funded preschool programs exist within Arkansas: Head Start and the Arkansas Better Chance (ABC) program. Though philosophically similar, the different programs have dramatically different income eligibility guidelines resulting in classrooms with differing levels of economic diversity. Independent samples t-tests were conducted on initial, final, and growth scores in Personal and Social Development and in the area of Language and Literacy Development. The program with higher income guidelines had higher initial and final scores, but mixed growth scores. Multiple regression analyses indicated that starting score was the single greatest predictor of growth and of final scores. Growth was inversely but significantly linked to start score, while final score was significantly linked to start score. No single factor had greater predictive power than starting score. Neither the ABC classroom nor the Head Start classroom demonstrated a significant benefit in growth or final score outcomes at $p=0.05$.

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A special acknowledgement of gratitude goes out to my four children: Willow, River, Bear, and Shepherd. You are a source of so much joy in my life. Thank you for letting me use the computer in the evenings to finish this and for your genuine interest in this project. No achievement in my life would be possible without Clay Newcomb: my partner in this life and greatest source of support who challenges me to the strongest version of myself that I can be. He deserves at least half of the credit for every accomplishment I have.

Dedication

This thesis is dedicated to the faculty and staff of Prism Education Center who inspire me every day with their sacrifice and commitment to improving the lives of the families and children they serve.

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I. Introduction

A. Statement Of The Problem

Since the inception of Head Start in 1965, center based preschool programs for low-income children have become an important component in federal education policy. More recently, many states have adopted policies to provide early childhood education to low-income preschool students. In Arkansas, there are three primary forms of funding for low-income children to participate in subsidized preschool programs: Head Start, the Arkansas Better Chance Program, and Vouchers.

The intended purpose of these programs is to better prepare children who are at-risk for academic failure for school in order to increase the likelihood for their academic success. Therefore these subsidies are only provided to children who meet certain criteria and thus have identified risk factors. The most prevalent factor used to determine eligibility is income. The income guidelines associated with the Head Start program are drastically lower than the income guidelines associated with the Arkansas Better Chance Program (see Table 2).

Both Head Start funds and Arkansas Better Chance Program funds are distributed in such a manner that providers create classrooms or even entire centers for children receiving these subsidies. Consequently, the vast majority of the enrollees in these programs are enrolled in classrooms with almost exclusively other income-eligible participants. Thus the unintended consequences of these programs are classrooms that are segregated by income.

The majority of these subsidized preschool programs are philosophically rooted in an inquiry driven curriculum as most research indicates that preschool children learn best through play and inquiry-driven classrooms. Therefore, students spend a significant amount of their time interacting with their peers in these classrooms. Because of structure of these classrooms, it can be assumed that peer influence will be significant. Therefore, researchers and policymakers must consider whether classrooms designed to serve exclusively low-income, at-risk students are optimal for academic preparation.

It is unlikely that states or the U.S. as a nation will invest in preschool education for all children. Without such an investment is unlikely that wealthier parents will choose to enroll their children in childcare programs or preschools with lower-income children, in lower-income neighborhoods, simply to improve academic outcomes for low-income children. However, policymakers could be better informed when designing preschool programs if there was greater understanding of the level at which the concentration of poverty in a classroom began to diminish the program's effect on cognitive and non-cognitive outcomes for the students enrolled in those programs.

B. Statement Of Purpose

The purpose of this study is to identify the extent to which the level of poverty influenced student outcomes in preschool. Specifically the following hypotheses was posed:

- a) Incoming scores for participants in the Arkansas Better Chance program in both literacy and social emotional skills will be higher than fall scores for participants in the Head Start Program as measured by the Work Sampling System.

- b) End of year language outcomes, as measured by the work sampling system, will be higher for participants in the Arkansas Better Chance Program (with higher income eligibility guidelines) than the Head Start program.
- c) End of year Personal and Social Development, as measured by the work sampling system, will be higher for participants in the Arkansas Better Chance Program (with higher income eligibility guidelines) than the Head Start program.
- d) Growth, as measured by the difference in fall scores from spring scores, will be larger for participants in the Arkansas Better Chance program in both literacy and social-emotional skills as measured by the Work Sampling System.

II. Review Of The Literature

A. Theoretical Perspective

The role of play has long been studied as it relates to normal and healthy child development (Parten, 1932). Since the 70s and 80s the importance of play and peer interactions in early child educational environments has been increasingly emphasized (Christie & Johnsen, 1983; Fein, 1981). The majority of this research pulled upon Piaget's and Vygotsky's theoretical framework of cognitive development.

Piaget initially delineated a sequential pattern of play through which children progressed from less mature forms of play to more mature forms of play. Piaget (1962) outlined three successive stages of play: 1) practice play, 2) symbolic play, and 3) games with rules (as discussed in Rubin, Maioni, & Hornung, 1976; Piaget, 1962). Smilansky (1968) further developed Piaget's classification in to four stages of play by expanding Piaget's second stage, symbolic play, into two separate stages: constructive play and

dramatic play (Smilansky, 1968). Piagetian theorists emphasize the interaction of children with their environment in these forms of play (Sluss & Stremmel, 2004).

Practice play (or functional play as Smilansky labeled it) and constructive play are perceived as lower and less mature in the sequence of development than dramatic play and games with rules (Piaget, 1962; Rubin et al., 1976; Smilansky, 1968). In functional play or practice play, the child uses simple, repetitive muscle movements with or without objects. Constructive play requires objects and is described as play in which objects are used to create something, such as using blocks to build a castle. In dramatic play, play is centered on the substitution of imaginary things or situations. Finally, in the most mature form of play, games with rules, play is situated within the boundaries of prearranged rules (Smilansky, 1968 as cited in Rubin, Maioni, and Hornung, 1976).

Vygotsky used Piaget's theories to provide a baseline for expansion and contrast of his own theories of cognitive development (Cain, 2011). Unlike the Piagetian emphasis on the environment, Vygotsky's theory of cognitive development emphasized interactions with others in the developmental process (Sluss & Stremmel, 2004). One of the most important features of Vygotsky's theoretical framework is the concept of the Zone of Proximal Development. Vygotsky proposed that the processes associated with healthy development could only occur when child is interacting with others in his environment. According to Vygotsky, through these interpersonal interactions, the child internalizes the processes required to advance developmentally (Vygotsky, 1978).

Parten's (1932) classic study highlights the fact that social participation in play increases and becomes more complex as children mature. Parten's levels of social participation can be used in conjunction with Piaget's (1962) and Smilansky's (1968)

definitions of play. However, Parten’s six stages of play take on a more Vygotskian tone in that the stages are defined by the role others play as children progress through these various stages. These six types of play include: unoccupied behavior, then solitary play (the primary type of play from 2 - 2 ½ years of age), onlooker behavior, parallel play (primary type of play from 2 ½ - 3 ½ years of age), associative play (primary type of play from 3 ½ - 4 ½), and cooperative play (Parten, 1932; as discussed in Rubin et al., 1976). described by Parten (Parten, 1932; Piaget, 1962; Rubin et al., 1976; Smilansky, 1968).

Table 1: Correlation of Piaget's Stages of Play with Parten's Stages of Social Participation

	Less Mature		→	Most Mature	
Piaget’s Stages of Play (1962)	Practice Play (or Functional Play)		Symbolic Play		Games with Rules
Smilansky’s Expansion of Piaget’s Stages of Play (1968)	Practice Play (or Functional Play)		Constructive Play	Dramatic Play	Games with Rules
Description of Play	Play that uses repetitive muscle movements with or without objects		Play in which objects are used to create something	Play wherein substitution of imaginary things or situations are used	Play within the boundaries of rearranged rules
Social Participation (Parten, 1932)	Unoccupied Behavior, Solitary Play		Onlooker Play, Parallel Play,	Associative Play Cooperative Play	Cooperative Play
Approximate Age (Parten, 1932)	2-2 ½ year of age		2 ½ to 3 ½ years of age	3 ½ to 4 ½	Kindergarten

The timing and sequence of these stages is important as there are implications for other aspects of development in children. As would be expected, younger preschool children typically engage in constructive and functional play and by Kindergarten advance to more mature forms of play such as dramatic play and games with rules (Parten, 1932; Rubin, Watson, & Jambor, 1978; Smilansky, 1968). Table 1 provides a synopsis of the Piagetian stages of play and how they correlate with the social interactions.

B. Social Interaction And Academic Achievement

The level of engagement and especially of social engagement in play is important as it serves as a precursor and an indicator of academic readiness. Symbolic play, when a child substitutes one object for another in dramatic play, is an important precursor to reading-related aspects of literacy as well as early writing of preschool children (Pellegrini & Galda, 1993). Furthermore, dramatic or symbolic play has been correlated to higher intelligence (Dansky, 1980), divergent thinking, and creativity (Johnson, 1976) and has been shown to enhance associative fluency (Dansky, 1980). Parten (1932) found a link between intelligence and the level of social participation in play. Preschoolers with higher cognitive functioning—as measured by spatial relational and classification skills—are more engaged in dramatic play and games with rules (Rubin and Maioni, 1975).

The correlation between academic readiness and social participation in play is more meaningful when one contrasts the maturity of play of low-income preschoolers and their more advantaged peers. The academic achievement gap can be predicted long before standardized test scores are published in grade school by

assessing the differences in each form of play. Lower income children engage in less constructive and more functional play and less dramatic or symbolic play than their middle class counterparts as preschoolers (Rubin, 1978; Rosen, 1974; Smilansky, 1968; Christie, 1983). When low-income children do engage in dramatic play, there are notable differences in the manner in which they engage in dramatic play.

Griffing (1974) observed a significant difference between low-income 3- and 4- year olds and their wealthier peers in the manner in which they engaged in each of the six components of dramatic play: imitative role play, make believe with objects, make believe with actions and situations, persistence in role-play, interaction, and verbal communication.

Other studies have shown that low-income children do engage in the same types of symbolic as their more advantaged peers, they just do so at a later time than would have been traditionally expected (Eiferman, 1971; Griffin, 1974). Eifermann's (1971) work on the cultural context of play hints that the distinction between low-income children and their more advantaged peers is not whether they engage in dramatic play, but *when* they engage in dramatic play. In Eifermann's study, low-income children engaged in the dramatic play closer to 2nd grade rather than in preschool (Eifermann, 1971).

Peers interactions have been shown to have an effect on the level of sophistication of play that children engage (Mounts & Roopnarine, 1987; Rubenstein & Howes, 1976). As early as the toddler years, peer maturity level has been found to directly influence the manner in which playmates explore their

environment and interact with the toys and materials in the environment (Rubenstein & Howes, 1976).

In mixed-age preschool classrooms with three- and four- year old students, younger children are less likely to engage in less sophisticated forms of play than their peers in classrooms with only three-year olds (Mounts & Roopnarine, 1987; Rubin et al., 1976). Regardless of the type of play younger children engage—solitary, parallel, or interactive—the play is more sophisticated when children are in a classroom with older children. Younger children engage in more interactive play when in classrooms with older children (Goldman, 1981) and dramatic play in these classrooms includes more advanced themes (Mounts & Roopnarine, 1987).

These findings demonstrate an effect based on the maturity level of the peers with whom children engage in play. Specifically, younger children show an increase in behaviors that are correlated to later academic achievement, creativity, divergent thinking, and cognitive development. By interacting with children who have already mastered certain developmental milestones in the progression of play, younger children may accelerate the rate at which they develop.

A natural succession of thought would be that children who engage in less sophisticated forms of play—including low-income children may also accelerate their rate of development and the mastery of skills correlated to later academic success if they interacted with children who engaged in more sophisticated forms of play. However, findings have shown that interactions with peers actually do differ based on socioeconomic status. Time spent interacting with peers in preschool programs with middle-income preschool children—specifically those who do not

attend preschool out of necessity, but rather for the purpose of learning social skills—results in positive academic gains for those students when compared to children of similar income levels who only spend time with their parents (Harper and Huie, 1986). This same effect is not observed in low-income children. In fact, time spent interacting with peers rather than adults in child care facilities results in lower long-term academic achievement (Harper and Huie, 1986). While low-income children are likely to be enrolled in play-based programs as a consequence of the rules that govern subsidized preschool program, it is concerning that the time spent interacting with children in these programs is correlated with lower later academic achievement.

C. Social Interaction And Language Development

These respective differences among children of different socioeconomic backgrounds are of particular interest as they relate to language. Peer interactions often include language and thus, the differences in language development and academic achievement (typically measured in math and literacy skills) should be noted. Language development as a whole is influenced by social interactions. Both interactions with peers and interactions with adults have been shown to influence student language development

Hart and Risley's (1995) landmark study found that there were significant differences in the home language experience of low-income preschoolers compared to their more affluent peers. Not only did low-income children hear fewer words, but the types of conversation and topics of conversation encountered by low-income children differed from their more affluent peers. Vocabulary and language

development at the preschool level accurately predicted literacy and language achievement at the 3rd grade (Hart and Risley, 1995).

Literacy skills and comprehension skills are linked to pretend play (Lilliard, et al., 2013). Not only is there a link, but some research has suggested that pretend play may precede literacy skills. However, it is difficult to separate the effects of play with social interaction—either parental or peer—as these often go hand in hand (Lilliard, et al. 2013). One of the primary goals of publicly funded preschool programs is to improve academic achievement as defined by math and literacy skills. Since a correlation between play and language development exists (Lilliard, et al., 2013) it would be expected that student language outcomes would improve in play-based environments.

D. Language Development And Classroom Context

However, student language outcomes in preschools are similar to what is observed in their homes: student outcomes decline as the level of poverty in a classroom increases. Evaluations of preschool programs infer that there may be negative peer effects in income-based preschool programs. Certainly some studies have demonstrated that these programs have resulted in increased academic achievement in the program participants (Currie, 2001; Lee et al., 1998; Zill, et al., 1998). However these same studies point to substantial variability both within these programs and even from classroom to classroom inside of the centers that house these programs (Currie, 2001; Lee et al., 1998; Zill et al., 1998). Outcomes in Title 1 preschool programs vary more between classrooms than within classrooms (Lee, Loeb, Lubeck, 1998).

Children who enter these programs more competent tend to gain more from the programs (Lee, et al. 1998). However, as the concentration of African-American children, children with disabilities, and children whose mothers have limited formal education in a classroom increase, average learning declines. Demographic factors have more of an effect on average classroom learning in preschool classrooms funded with federal Title 1 dollars than does average student ability (Lee, et al. 1998).

There is a negative correlation between classroom quality and the number of minority children or classrooms with very poor families (Lee et al., 1998; Zill et al., 1998). A survey of Head Start programs in the US observed that program quality is higher in those programs with higher average family income and those with fewer minorities. Furthermore, there are geographic distinctions. Head Start programs in the Northeast and Midwest have higher program quality than those in the south, where average education level is lower (Zill et al., 1998; Currie, 2001). Not only is program quality rated lower, but cognitive outcomes of students in these programs are lower. Vocabulary scores are lowest for children in Head Start programs in the south and in those with high minority populations (Zill et al., 1998).

These outcomes are not necessarily surprising as poverty itself is a function of multiple factors including educational attainment, family composition, geographic location, and ability. These same factors have been found to profoundly influence parenting style and are linked to familial stress, environmental and health factors (Laureu, 2003; McCloyd, 1998) and thus reasonably influence child development and cognitive outcomes.

However, these statistics are concerning as they indicate that student level factors—ethnicity, socioeconomic status, presence of disability, and parent education level—not only predict the outcomes for each respective child, but also influence the classroom quality as measured by program ratings and cognitive outcomes for the class as a whole (Currie, 2001; Lee et al., 1998; Zill et al., 1998). The level of poverty and the educational level of families enrolled in preschool classrooms are correlated to student language outcomes. As level and concentration of poverty increases, language outcome decrease for the entire classroom.

This highlights the obvious and important influence of peers and peer interactions within publicly funded programs. Program designs that place exclusively low-income children who are more likely demonstrate lower language competence may be hindering efforts to break the academic achievement gap by replicating the social environments that contribute to these gaps initially. It is clear that the placement of children who are more likely to have experienced environments with limited language enrichment—such as those described by Hart and Risley (1995)—exclusively with children who have had similar life experiences in a classroom is less than optimal as it relates to cognitive outcomes. It is less clear, however, the point at which concentration of poverty begins to result in lower quality or less effectiveness in terms of language development.

This is an important consideration for individuals who design programs intended to improve outcomes for low-income children . Policies could be developed to create more economically diverse classroom as such diversity could mitigate some of the factors associated with poverty more effectively. Such diversity

has the potential to introduce the language, vocabulary, varying levels of sophistication in play, and even experiences that economically disadvantaged children may lack through peer interactions. Furthermore, more economically diverse classrooms could also introduce supports that often exist in classrooms with more educated parents such as positive parental advocacy, material resources, and parental support and engagement (Lareau, 2003; McCloyd, 1998) Conversely, programs who exclusively enroll students who are similarly situated in less than optimal life circumstances, may unintentionally create an environment that perpetuates an environment correlated with lower quality ratings, lower average language skills, and less sophisticated forms of play.

Low-income children are rarely enrolled in preschool programs with middle-income or wealthy peers and thus may have limited interactions with peers who have demonstrated strong language skills and more sophisticated forms of play that serve as precursors to such skills. Residential patterns in most cities often result in geographical separation of families of different economic backgrounds and thus separation of childcare centers. Programs accessible to wealthier families are cost-prohibitive for poor families. Furthermore, low-income children are often enrolled in preschool programs funded by state and federal agencies that have income eligibility requirements. The design of these programs often prohibits socioeconomic integration in the preschool classroom through such requirements. These requirements unintentionally create environments without supports and social interactions that benefit peers enrolled in classrooms with higher overall socioeconomic status.

E. **Classroom Context Of Programs In Arkansas**

There are two income-based programs in the state of Arkansas that have dramatically different income eligibility requirements: the Arkansas Better Chance Program (ABC Program) and the Head Start Program. As can be observed in Table 2, the income eligibility requirements for the ABC program and the Head Start program are dramatically different. The Head Start program prioritizes extreme poverty and only accepts families who fall below 100% of the federal poverty level. The ABC program admits students who fall below 185% of the federal poverty level. Families who are above the median household income of \$40,768 are still eligible for participation in the program. Consequently participants in the ABC program come from both low- and middle- income families, while participants in the Head Start program come from homes in extreme poverty (Arkansas Better Chance Program Manual, 2009).

The ABC program and the Head Start program have similar requirements in terms of curriculum, lead teacher qualifications, professional development, and student teacher ratios. Both programs also require students to be assessed each year. All ABC programs and some Head Start program utilize the Work Sampling System (WSS). Both programs require an inquiry driven, play-based program. Therefore, it is expected that the environmental dynamics in a Head Start classroom would be similar to those in an ABC classroom. However, the socioeconomic backgrounds of students might vary widely due to the differing income guidelines.

Table 2: Comparison of Income Guidelines for Federal and State Early Child Programs

FAMILY SIZE	Head Start Eligible (10% of Federal Poverty Level)	Free-Reduced Lunch Eligible (185% Federal Poverty Level)	ABC Eligible (200% of Federal Poverty Level)
1	\$10,830	\$20,036	\$21,660
2	\$14,570	\$26,955	\$29,140
3	\$18,310	\$33,874	\$36,620
4	\$22,050	\$40,793	\$44,100
5	\$25,790	\$47,712	\$51,580
6	\$29,530	\$54,631	\$59,060

Adapted from the Arkansas Better Chance Program Manual found at:
<http://www.arkleg.state.ar.us/education/prek/ARBetterChancePrgDocLib/ABC%20Program%20Manual.pdf>

The higher income eligibility guidelines in the ABC programs have the potential to create more economically diverse classrooms than those permitted under the Head Start guidelines. It is theoretically possible that such diversity will contribute to more positive development in both language and social development as compared to the Head Start classrooms due to the potential introduction of more sophisticated forms of play and higher skill levels in both language and play demonstrated by students with higher socioeconomic backgrounds. Such language and social interactions might provide positive benefits for students from poorer homes and yield improved outcomes for the classroom as a whole.

F. Hypotheses

- a) Incoming scores for participants in the Arkansas Better Chance program in both literacy and social emotional skills will be higher than fall scores for participants in the Head Start Program as measured by the Work Sampling System.

- b) End of year language outcomes, as measured by the work sampling system, will be higher for participants in the Arkansas Better Chance Program (with higher income eligibility guidelines) than the Head Start program.
- c) End of year Personal and Social Development, as measured by the work sampling system, will be higher for participants in the Arkansas Better Chance Program (with higher income eligibility guidelines) than the Head Start program.
- d) Growth, as measured by the difference in fall scores from spring scores, will be larger for participants in the Arkansas Better Chance program in both literacy and social-emotional skills as measured by the Work Sampling System.

III. Method

A comparison study was used to determine if there was a significant difference between students in the Head Start classrooms and students in the ABC classrooms. Given the similarities of the programs—with the exception of the income eligibility guidelines—a difference in outcome might indicate that the economic diversity of the ABC classroom influenced classroom outcomes in a positive way when compared to Head Start. Student initial scores, final scores, or growth in Literacy and Language Development and Personal and Social Development as measured by the Work Sampling System (WSS) were analyzed for both groups. An independent samples t-test was conducted to determine whether student outcomes in both language and literacy and personal and social development differed by classroom placement at the beginning of the program year, the end of the program year, or in growth over the course of the year. The independent samples t-test

yielded results that provoked additional questions related the true driver in the differences observed between classrooms. To answer these additional questions, multiple regression analyses were conducted to delve deeper into student level factors to identify whether classroom placement or other factors resulted in the differences observed between classrooms.

A. Subjects

Students included in the study were part of an existing population of children enrolled in either a Head Start classroom or an ABC classroom in the 2010-11 school year. Individual student data was provided by Pearson¹ who stewarded this data through a contract with the Arkansas Department of Human Services Division of Childcare. This study is a secondary analysis of existing data. All ABC programs in Arkansas utilize WSS to measure student performance, however, not all Head Start programs are mandated to do so. Therefore, solely those Head Start programs that elect to use the WSS are compared in this study.

All incomplete records were removed from the dataset. If students did not have data for both the initial assessment period and the final period, their records were considered incomplete. Additionally, if student records were incomplete for any one subtest, the record was considered incomplete and removed. In all, over 2,800 incomplete student records were removed from the dataset. Table 3 summarizes the incomplete records.

A chi square analysis was conducted to determine if there were notable differences between the students who were removed from the study compared to those whose

¹ The Work Sampling System is a product sold and distributed solely by Pearson. Data for publicly funded programs is managed digitally through Pearson.

remained in the study in order to ensure that there were no confounding factors influencing the study outcomes. There was no significant difference found between the two groups with regard to gender or ethnicity in either of the classroom settings.

Table 3: Summary of Incomplete Records

Number Incomplete Records Removed		
P3	ABC Classroom	947
P3	Head Start Classroom	88
P4	ABC Classroom	1696
P4	Head Start Classroom	90

Remaining students were classified by classroom type and by funding level. Students included in the study were enrolled in either a Head Start classroom or an ABC classroom. Because level of poverty is such an important aspect of this study, students were classified by funding level. Student participation and enrollment in these classrooms was funded in one of ten possible ways: ABC State Funded, Even Start, EC Special Education, Head Start, Private Pay, 21st Century Community Learning Center, Title I, Poverty Funds (SGR), Voucher/Subsidized Care, and Medically Oriented. Funding sources were categorized and coded by likely level of poverty as determined by income guidelines.

Funding such as vouchers, poverty funds, and Title I are exclusive to low-income children. Private paying students are more likely to be associated with children from families with household incomes that exceed eligibility for any of the subsidized programs. Funding sources for students in ABC classrooms was more diverse than Head Start Classrooms as can be seen in table four.

It's important to note that students in the Head Start classrooms were almost exclusively funded with Head Start funds. However, in addition to having higher income

guidelines, students in ABC classrooms had slightly more diversity in terms of funding sources including private pay, vouchers, Title I funds, 21st Century Community Learning Centers, and funds for students with special needs. Therefore, it is possible for students to be enrolled in an ABC classroom, but not be funded through ABC funds.

Table 4: Income Categories and Codes for Student Funding Sources included in Study

Funding Code and Number	Income Categories Included	Description
0=Private Funding	Private Pay Students	Least likely to be low income since student did not receive subsidized funding sources
1=ABC Funding	Arkansas Better Chance Program	Income guidelines set at 200% federal poverty level, higher than most programs
2=Mixed Funding	EC Special Education, Even Start, 21 CCLC, Title I Funds, Medically Oriented	Funding guidelines inconclusive, but often aligned with Free and Reduced Lunch program,
3=HS or Vouchers	Head Start, Vouchers	Both programs use very similar income guidelines based on very high level of poverty.

The majority of students in both Head Start and ABC classrooms are economically disadvantaged. There are a larger number of 4-year olds (13,531) participating in subsidized programs in Arkansas than 3-year olds (7,145). Head Start students are more likely to be white than are students in the ABC Program. Students in the ABC program have more diverse funding sources. Private paying students are more likely to be present in ABC programs than in Head Start programs, but the majority of students in either classroom is more likely to be income-eligible for subsidized preschool funding.

Table 5: Student Demographic Data

	<i>n</i>	% of Classroom	% White	% Non-White	% Not identified
Preschool 3-year old					
Total ABC Classroom	6811		55.22	42.52	2.26
ABC Eligible	6580	96.61			
Private Pay	210	3.08			
Other Poverty-Related Funding	21	0.31			
Head Start Classroom	334		64.67	32.34	2.99
Head Start Eligible	319	95.51			
ABC Eligible	15	4.49			
Preschool 4-year old					
Total ABC Classroom	13059		55.33	42.05	2.63
ABC Eligible	12461	95.42			
Head Start Eligible	3	0.02			
Private Pay	450	3.45			
Other Poverty-Related Funding	145	1.11			
Head Start Classroom	472		67.37	30.72	1.91
Head Start Eligible	365	77.33			
ABC Eligible	106	22.46			
Private Pay	1	0.21			

B. Measures

In Work Sampling System (WSS,) students are assessed three times each year using observations and portfolios developed by lead teachers in 7 different domains: personal and social development, language and literacy, mathematical thinking, scientific thinking, social studies, the arts, and physical development (Meisels, Law, Dorfman, & Fails, 1995). The WSS can function as a pre-test and a post-test as student performance is measured three times each year including once at the beginning of the year and again at the end. In assessments of the WSS, researchers have found it to be a reliable and valid tool to measure preschool student performance and growth (Meisel, Xue, Shablott, 2008; Meisels, Liaw, Dorfman, & Nelson, 1995). A moderate to high level of reliability across the school year

was demonstrated by Cronbach alphas and correlations (Meisels et al., 1995). Correlations between fall and winter (.89) and between winter and spring (.69) were strong. Internal consistency among the five different domains of the checklist at all three points (Alphas ranging between .87 to .94) demonstrated the high internal reliability of the WSS checklist (Meisels et al., 1995). Concurrent validity has been demonstrated between the checklist and other assessments with high correlations ($r_s = .75$ for the fall and $.66$ for the spring) (Meisels et al., 1995). High correlations (r_s from $.67$ to $.76$) demonstrated predictive validity. Inter-rater reliability was demonstrated once again with high correlations between two independent raters ($r = .88$) and between each of the raters and the teachers ($.73$ and $.68$ for the total score) (Meisels et al., 1995).

WSS data is collected three times each year by lead teachers of both the ABC program and the selected Head Start programs. For each performance indicator, teachers rate their students with a score of either 1 for “Not Yet”, 2 for “In Progress” or 3 for “Proficient” depending on his or her relative mastery of that skill as determined by the WSS rubrics. Both ABC and Head Start teachers are required to undergo training in observation and data collection procedures for the WSS. Rubrics are provided to assist teachers in developing accurate assessments of student development. For the purposes of this study, the set of data recorded in the fall were identified as “Initial Scores” and the data recorded at the end of the school year were identified as “Final Scores”.

Only two domains were analyzed in this study: personal and social development, and language and literacy development. Each domain has multiple performance indicators. Head Start has a WSS developmental checklist that slightly differs from the checklist used by ABC programs. Though all of the same performance indicators are assessed in the same

way, they are reported in a different order. Some of the performance indicators for Head Start students were not included in the dataset provided by Pearson. Therefore, only those indicators that were reported for *both* students in ABC classrooms and students in Head Start were used in this study. Those performance indicators are outlined in Table 6 and 7 for each domain analyzed.

The scores for all of the performance indicators under each category for the ABC students were averaged into one number in the fall and in the spring. The difference between the spring and fall average for each domain was represented as the “growth score” for each respective category.

Therefore each student has six scores: personal and social development score, spring personal and social development score, personal and social development growth score, fall language and literacy development, spring language and literacy development, and spring growth score.

Table 6: Performance Indicators for Preschool-3

WSS HS3	WSS ABC3	<i>Personal and Social Development</i>
II.B.1	I.A.1	Demonstrates self-confidence
II.C.1	I.B.1	Follows simple classroom rules and routines with guidance
II.C.2	I.B.2	Manages transitions
III.A.1	I.C.1	Shows eagerness and curiosity as a learner
III.B.1	I.C.2	Attends briefly and seeks help when encountering a problem
III.A.2	I.C.3	Approaches tasks with flexibility and inventiveness
II.A.1	I.D.1	Interacts with one or more children
II.A.2	I.D.2	Interacts with familiar adults
<i>Language and Literacy Development</i>		
V.A.1	II.A.1	Gains meaning by listening
V.B.1	II.B.1	Speaks clearly enough to be understood by most listeners
VI.B.1	II.C.2	Demonstrates beginning phonological awareness
VI.A.1	II.C.3	Shows appreciation and some understanding of books
IV.B.1	II.D.1	Represents stories through pictures, dictation, and play
VI.E.1	II.D.2	Uses scribbles and unconventional shapes to write

Table 7: Performance Indicators for Preschool-4

WSS HS4	WSS ABC4	<i>Personal and Social Development</i>
II.A.1	I.D.1	Interacts easily with one or more children
II.A.2	I. D.2	Interacts with familiar adults
II.B.1	I.A. 1	Demonstrates self-confidence.
II.C.1	I.B.1	Follows simple classroom rules and routines.
II.C.2	I.B.2	Manages transitions
<i>Language and Literacy Development</i>		
V.A.I	II.A.1	Gains meaning by listening
V.B.1	II.B.1	Speaks clearly enough to be understood without contextual clues
VI.B.1	II.C.2	Demonstrates phonological awareness
VI.A.1	II.C.3	Shows appreciation and understanding of books and reading.
VI.A.2	II.C.4	Recounts some key ideas and details from text
IV.B.1	II.D.1	Represents ideas and stories through pictures, dictation, and play

Other student level factors were considered in some of the analyses. Unfortunately, ethnicity was inconsistently coded and a large number of students did not have ethnic demographics entered. Therefore, it was not possible to use this as a student level factor. The other factors that were considered included whether a child was considered Preschool 3-years of age or Preschool 4-years of age, had an IEP or an identified disability, funding source, classroom category (ABC or Head Start), and gender.

C. Procedures

The data used for this study were provided by Pearson after permission was given by the Arkansas Department of Human Services Division of Childcare and Early Childhood Education. Personal student data was kept confidential and no identifying information was provided in the dataset. IRB protocols were followed for this study.

Students' initial and final scores for Head Start and ABC classrooms in the area of personal and social development were compared in both Personal and Social Development and in Language and Literacy using independent samples t-test. Finally the growth

scores of students enrolled in Head Start and ABC classrooms for both categories by using an independent samples t-test.

Subsequently a regression analysis was also conducted to further examine the relationship of various student factors with outcomes. The following factors were included in the analysis: gender, IEP status, whether a student was classified as Preschool 3 or Preschool 4, classroom category (ABC or Head Start) and funding source. In the regression analyses for “Growth Scores” and “Final Scores”, student starting score was also introduced to the analysis.

IV. Results

An independent samples t-test was conducted to compare period 1 (initial scores), period 3 (end-of-year scores), and growth scores for both Language and Literacy Development and Personal and Social Development in Head Start classrooms and in ABC classrooms. The outcomes of each of these are listed below. Table 8 demonstrates the outcomes of language and literacy development.

The first hypothesis proposed that incoming scores for participants in the Arkansas Better Chance program (ABC) in both literacy and personal and social development would be higher than fall scores for participants in the Head Start program as measured by Work Sampling System (WSS). In order to determine the outcome of the first hypothesis, an independent samples t-test was conducted to compare Period 1, in the area of Language and Literacy development in ABC funded classrooms and Head Start funded classrooms. There was a significant difference in the scores for period 1 in ABC classrooms ($M=2.04$, $SD=0.25$) and Head Start classrooms ($M=1.75$, $SD=0.20$); $t(888)=17.87$, $p=0.00$. As can be

seen in Table 9., outcomes in the Personal and Social Development category followed similar trends. There was a significant difference in the scores for period 1 in ABC classrooms (M=2.18, SD=0.24) and Head Start classrooms (M=1.90, SD=0.21); $t(885)=16.91, p=0.00$. The first hypothesis was accepted. In both categories—Personal and Social Development and Language and Literacy Development—ABC students had significantly higher incoming scores than did students enrolled in Head Start programs.

Table 8: Language and Literacy Development (t-tests assuming unequal variances)

	n	Mean	SD	t Stat	t-crit two- tail	df	p
<i>Initial Scores</i>							
ABC	19,870	2.04	.25	17.87	1.96	888	0.00
Head Start	806	1.75	.20				
<i>Final Scores</i>							
ABC	19,870	2.70	.16	8.75	1.96	854	0.00
Head Start	806	2.55	.21				
<i>Growth Scores</i>							
ABC	19,870	.66	.21	(7.90)	1.96	861	0.00
Head Start	806	.80	.25				

A second independent samples t-tests was conducted in order to determine the outcome of the second and third hypotheses. The second and third hypotheses proposed that end of year scores, as measured by WSS would be higher for ABC participants (with higher income eligibility guidelines) than participants in the Head Start program. The

second hypothesis examined these language scores and the third hypothesis examined personal and social development. There was a significant difference in the scores for Language and Literacy Development in period 3 in ABC classrooms ($M=2.70$, $SD=.16$) and Head Start classrooms ($M=2.55$, $SD=.21$); $t(854) = 8.75$, $p = 0.00$. In both, Period 1 and Period 3, ABC students scored higher in the area of Language and Literacy Development. With respect to personal and social development, again, there was a significant difference in the scores in period 3 in ABC classrooms ($M=2.76$, $SD=0.12$) and Head Start classrooms ($M=2.60$, $SD=0.19$); $t(848) = 10.00$, $p = 0.00$. The second and third hypotheses were also accepted. End of year language outcomes, were significantly higher for students enrolled in the ABC program than students enrolled in the Head Start program. Fall scores in the personal and social development category were higher, significantly so, for students enrolled in ABC programs than for those enrolled in Head Start programs.

A final independent samples t-test was conducted to determine the outcome of the fourth hypothesis. This hypothesis examined growth and stated that growth, as measured by the difference in fall scores from spring scores, would be larger for participants in the ABC program in both literacy and social-emotional skills as measured by WSS.

With regards to growth, results were significant but in the opposite direction. In language and literacy development, there was a significant difference in the scores for growth in ABC classrooms ($M=.66$, $SD=.21$) and Head Start classrooms ($M=.75$, $SD=.30$); $t(20,202) = (-3.77)$, $p = 0.000$. Though ABC students on average scored higher in both periods, students in Head Start Classrooms demonstrated more growth over the course of the year in the program than did ABC students. Similarly, in both, Period 1 and Period 3, ABC students scored higher in the area of Personal and Social Development. With regards

to growth, however, results were significant but in the opposite direction. There was a significant difference in the scores for period 1 in ABC classrooms (M=0.58, SD=0.20) and Head Start classrooms (M=0.65, SD=0.26); $t(343)=-2.26, p = 0.03$. Again, though ABC students on average scored higher in both periods, students in Head Start Classrooms demonstrated more growth over the course of the year in the program than did ABC students—though not to the same degree of power. For each category—personal and social development and language and literacy development—the hypothesis is rejected. Students enrolled in Head Start programs consistently grew more than those in ABC programs. However, the growth was not observed with the same degree of power.

Table 9: Personal and Social Development (t-tests assuming unequal variances)

	n	Mean	SD	t- Stat	t-crit two- tail	df	p
<i>Initial Scores</i>							
ABC	19,870	2.18	0.24	16.91	1.96	885	0.00
Head Start	807	1.90	0.21				
<i>Final Scores</i>							
ABC	19,870	2.76	.12	10.00	1.96	848	0.00
Head Start	807	2.60	.19				
<i>Growth Scores</i>							
ABC	19,870	.58	.20	(6.71)	1.96	859	0.00
Head Start	807	.71	.26				

In summary, the t-tests demonstrated that the students in the ABC classroom enter the school year and end the school year at a higher level than students in Head Start

classrooms. These differences are observed in both in Language and Literacy and Personal and Social Development—though with greater power in the category of Language and Literacy. Conversely, students in Head Start programs demonstrate greater growth than students enrolled in the ABC program.

The extent of the difference in starting scores of ABC participants as compared to Head Start participants raised additional questions. The entry scores demonstrated that there was a significant difference in the “starting place” for students who enrolled in Head Start programs than ABC programs. The different income guidelines resulted in classrooms that had notable differences in student composition. On first glance, the growth scores indicated that students enrolled in Head Start classrooms, grow more over the course of the year than students who enroll in ABC classrooms. Initially, it would appear that classroom context does not influence outcomes—or at least that the introduction of students with higher incoming scores did not result in overall improved growth. However, to truly understand whether this was the case, one would have to examine how the students in the ABC program who had similar starting points as the Head Start students grew relative to their counterparts in the Head Start classrooms. It is possible that the students who started lower in both classrooms benefit more from these public preschool programs regardless of the classroom students were enrolled.

In order to better understand what actually drove the growth in these classrooms, several multiple regression analyses were conducted. Because starting scores were significantly different, the first regression conducted sought to determine what factors predicted starting scores for Personal and Social Development and Literacy and Language Development. The results are highlighted in Table 10.

Table 10: Regression Model for Initial Scores in a Preschool Classroom

	Personal and Social Development			Language and Literacy Development		
	<i>Coefficients</i>	<i>Standard Error</i>	<i>P-value</i>	<i>Coefficients</i>	<i>Standard Error</i>	<i>P-value</i>
Intercept	2.068	0.019	0.000	1.928	0.019	0.000
GENDER	-0.118	0.007	0.000	-0.125	0.007	0.000
IEP/IFSP	-0.101	0.012	0.000	-0.191	0.012	0.000
ABC funding	0.048	0.044	0.269	0.072	0.044	0.099
Other funding	-0.047	0.058	0.419	-0.059	0.058	0.313
Private funding	0.194	0.048	0.000	0.280	0.048	0.000
PK_3 ABC Classroom	-0.241	0.007	0.000	-0.221	0.007	0.000
	0.205	0.041	0.000	0.186	0.041	0.000
Adjusted r ²	0.086			0.092		

The adjusted r² value indicates that there is very little predictive power in this model. The variation that can be predicted in this model is mostly explained by very predictable factors: gender, IEP status, and whether the child is younger. The starting scores of students placed in an ABC classroom are higher—and significantly so—than students placed in a Head Start classroom. This is true for both Personal and Social Development and Language and Literacy Development, though less so for Language and Literacy Development. Students who were funded by ABC funds had a higher starting score overall in both categories, but not significantly so. This indicates the students enrolled in the ABC classroom may have had higher initial starting scores for reasons related to the students enrolled in the classroom who were not funded with ABC dollars—namely, private paying families. Not surprisingly, private funding—linked to wealthier families—is the only funding source that has predictive power of starting scores in this model.

A second regression analysis was conducted to determine the extent to which different factors predicted end-of-year scores. In this case, however, the model also controls for initial scores. This model has a higher adjusted r^2 . In this model, gender, IEP, age, whether a child was privately funded and initial scores were all significant for Personal and Social Development and Language and Literacy were significant. Enrollment in an ABC classroom is positive for Personal and Social Development, but negative for Language and Literacy. Although in neither case is the difference significant at a $p < .05$ level.

These results indicate that the most significant factors that influence a student's final scores are the factors that a student brings with them when they start: gender, presence of a disability, private funding (typically associated with wealthier students), and the student's initial scores. Unlike the first model, once these factors are controlled for, classroom placement is not as predictive. In other words, placement in an ABC classroom does not provide a significant benefit to students relative to Head Start. The differences that are observed are inconsistent with Personal and Social Development being higher for students in the ABC classroom and Language and Literacy Development being higher for students in the Head Start classroom. No single factor is more predictive of a student's end point as where the student begins.

A regression analysis on growth scores further validated the other results. The adjusted r^2 is very strong for this model—largely because the growth score and the start score are directly related. But these scores once again demonstrate that no factor is more likely to predict a student's growth as where the child begins. It is the single most predictive factor.

Table 11: Regression Model for Final Scores in a Preschool Classroom

	Personal and Social Development			Language and Literacy		
	<i>Coefficients</i>	<i>Standard Error</i>	<i>P-value</i>	<i>Coefficients</i>	<i>Standard Error</i>	<i>P-value</i>
Intercept	2.104	0.015	0.000	2.036	0.017	0.000
GENDER	-0.050	0.004	0.000	-0.065	0.005	0.000
IEP/IFSP	-0.059	0.008	0.000	-0.108	0.009	0.000
ABC funding	0.011	0.029	0.688	0.094	0.032	0.003
Other funding	0.057	0.038	0.131	0.139	0.042	0.001
Private funding	0.066	0.031	0.033	0.134	0.035	0.000
PK_3 ABC	-0.088	0.005	0.000	-0.125	0.005	0.000
Classroom	0.049	0.027	0.068	-0.055	0.030	0.065
Initial Scores	0.300	0.005	0.000	0.345	0.005	0.000
Adjusted r ²	0.239			0.266		

Table 12: Regression Model for Growth in Outcomes

	Personal and Social			Language and Literacy		
	<i>Coefficient</i>	<i>Standard Error</i>	<i>P-value</i>	<i>Coefficients</i>	<i>Standard Error</i>	<i>P-value</i>
Intercept	2.104	0.015	0.000	2.036	0.017	0.000
GENDER	-0.050	0.004	0.000	-0.065	0.005	0.000
IEP/IFSP	-0.059	0.008	0.000	-0.108	0.009	0.000
ABC funding	0.011	0.029	0.688	0.094	0.032	0.003
Other Funding	0.057	0.038	0.131	0.139	0.042	0.001
Private Funding	0.066	0.031	0.033	0.134	0.035	0.000
PK_3	-0.088	0.005	0.000	-0.125	0.005	0.000
ABC Classroom	0.049	0.027	0.068	-0.055	0.030	0.065
Initial Scores	-0.700	0.005	0.000	-0.655	0.005	0.000
Adjusted r ²	0.542			0.452		

It is notable that initial scores are negatively related to growth. In other words, the lower a student starts, the more a student grows. This could indicate that these programs are most beneficial to students who need preschool experiences the most. However, it is also largely a function of the mathematical equation used to determine the correlation. Since the growth score for each student is the difference between the end score and the starting score, the starting score is mathematically bound to be negative in this model. A different type of analyses would have to be done to determine if in fact, growth and starting scores are inversely related.

Participants in the Head Start program—presumably from lower income households—started at a lower level in both measures of Personal and Social Development and Language and Literacy Skills. However, Head Start students grew more than students in the presumably more economically diverse ABC classrooms. At first glance, these results indicate that there is limited benefit in terms of growth for students in the Head Start classroom. However, this benefit dissipates when other factors are considered. The regression analyses indicates that there is some benefit in being in an ABC classroom for the Personal and Social Development growth, but more of a benefit for Head Start students as it relates to Language and Literacy Development. Though these differences between classrooms exist, the predictive power is not significant.

The only factors that predict growth or influence end scores in a statistically significant way, are those factors that are unrelated to the intervention or the ones that students bring with them to the classroom: age, ability or disability, gender, and funding source—which is closely linked to household income.

V. Discussion

A. Conclusions and Future Research

This study demonstrates that the leniency in income eligibility requirements in the ABC program produced differences within the classroom. Not only do these income guidelines influence the level of poverty within the classroom, there was also a different in starting scores for both outcomes measured. The average starting scores of the students in both language and literacy (Head Start mean: 1.56; ABC mean: 2.04) and in personal and social development (Head Start mean 1.78; ABC mean: 2.18) was significantly lower for Head Start classrooms as compared to ABC classrooms. This is likely a function of the poverty level in Head Start classrooms that exists as a consequence of dramatically lower income-eligibility guidelines in the Head Start classrooms as compared to the ABC classroom.

This study does not necessarily demonstrate that differing income eligibility criteria create additional benefit for students within the classroom. It isn't clear from this study that being in a classroom with lower average starting scores negatively influences student outcomes. Conversely, there is no evidence from this study that being in a classroom with a higher initial ability benefits students as it relates to end scores in personal and social development or language and literacy. In fact, classroom context (whether a student was in an ABC classroom or a Head Start classroom) was not correlated with ending scores or with growth scores. The only way in which classroom context was predictive was initial scores: students enrolled in an ABC classroom were more likely to have higher starting scores in both categories than students in the Head Start classroom.

The only characteristics that appeared to influence outcomes in terms of growth or final scores in the classroom were the factors that a student brought into the classroom when they started. Gender was a significant factor for initial scores, growth scores, and final scores with boys doing less well in both categories in all three measures. Students with IEPs—or with the presence of a disability—fared less well in terms of initial scores, final scores, and growth scores in both categories. Not surprisingly, three-year old demonstrated lower development in initial, final, and growth than 4-year olds.

Funding source is correlated to student outcomes. All funding sources are more likely to predict growth than Head Start funding. Being funded with ABC funds or private funds as opposed to any of the other subsidized sources of funding was positively correlated with growth and final scores in language and literacy but not initial scores. In other words, students who were privately funded (and thus more likely to be wealthy) and students who were on the upper end of the low-income range demonstrated a greater benefit from the classroom than those funded by sources that are linked to lower levels of household income. This is consistent with other studies (Lee et al., 1998) that have shown that students who most benefit from subsidized preschool programs are those who have more supportive household factors that such as higher parental education and income. As relative wealth in the household increased, benefit also increased. This difference was significant in the area of language and literacy in all categories for both growth and final scores. It was not, however, significant as it related to personal and social development in any category but private funding. Private funding is assumed to be a function of wealth.

Within an ABC classroom, a student could be funded by ABC funds, Head Start funds, private funds, or other sources of funds. Most students enrolled in Head Start classrooms,

however, were solely funded by Head Start sources. While funding source mattered, classroom context did not matter in terms of growth or final standing as it related to either Personal and Social Development or Language and Literacy Development. Students enrolled in ABC classrooms were more likely to enter their classrooms at a higher level, but enrollment in an ABC funded classroom did not predict where a student ended after controlling for funding sources and other demographic factors. In fact, a student's final scores in language and literacy were negatively correlated to enrollment in an ABC classroom after controlling for funding source—but again, this relationship was not statistically significant.

Funding source—in this study—primarily served as a proxy for level of poverty. That funding source has more of an impact on final scores than classroom context underscores the importance of the student-level factors that fall outside of the influence of these preschool classrooms. However, nothing underscores the importance of student level factors more than the correlation of initial scores with final scores or with growth scores. No single factor predicts growth in these publicly funded preschool programs more than a student's starting score. Gender, IEP status, funding source, age, and classroom context (ABC or Head Start), are less predictive than a student's initial starting score in both language and literacy and personal and social development. Students with higher starting scores had higher ending scores.

When measuring growth scores, there was a negative correlation between student's initial scores and total growth. This indicates that students who entered the classroom at lower points demonstrated greater growth throughout the year. While hopeful, this interpretation should be used with extreme caution—if at all—because growth scores are

calculated as the difference between ending scores and beginning scores and are thus guaranteed to be negative in this instance. This undermines the use of growth scores for all factors in general using the regression analysis.

One of the most notable takeaways from this study is the predictive power of student context outside of these classrooms. If the goal of subsidized early child development programs is that students will demonstrate growth and thus be closer to a specific point of proficiency before entering Kindergarten classrooms, then this study demonstrates that such progress is being made. Students in both programs demonstrate growth. However, if the goal is that all students enter a pre-determined level of “proficiency”, much more work will need to be done to improve the outcomes of participants in these programs. Since the greatest predictor of student’s final score is a student’s initial score, the most logical point of focus to improve student outcomes is to improve student’s initial score. Policymakers and leaders in the field of early child development should consider what factors would improve initial scores.

This study demonstrates that by age 3, there were significant differences in incoming scores of students enrolled in programs with different income eligibility criteria. Starting scores are a function of life context. Poverty is not simply the absence of money. Poverty is linked to a set of circumstances that interact to create a context that often introduces negative factors such as harsh disciplinary practices, stressors, and health risks, while simultaneously restricting opportunities such as high quality educational experiences, language rich early childhood experiences, access to public and private services (McCloyd, 1998; Lareau, 2003; Hart & Risley, 1995). Student context in terms of both neighborhood and household income influence developmental and academic

outcomes in the first three years of life (Klebanov et al., 1998). As these risk factors compound, IQ scores decrease (Sameroff, Seifer, Baldwin & Baldwin, 1993; Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987).

While subsidized preschool programs may be a component of addressing these challenges, current interventions may be initiated too late. The sheer difference in the number of 4-year old participants (13,531) in this study as compared to 3-year old participants (7,145) indicates that a disproportionate amount of public resources may be going toward older students. The variation observed of starting points between these two programs, and the level at which starting point influences final outcomes, indicates that it may be worthwhile to focus attention on improving outcomes earlier than age three. An area of potential future research that could be conducted is the age at which interventions have the greatest impact and whether age of initial intervention influences long-term outcomes.

Furthermore, preschool resources are primarily targeted at improving outcomes for preschool children when this study demonstrates that in many ways, student outcomes are linked to circumstances beyond the reach of the classroom. Additional research could be conducted to determine whether it would be more effective to include greater parent or household outreach in conjunction with these preschool programs or instead of these preschool programs.

B. Limitations

This study examined the interaction of classroom context and funding source with preschool outcomes in language and literacy development and in personal and social

development. The study found that there are distinct differences in classroom average starting ability in both of these measures in two publicly funded programs that have different income eligibility requirements. The study also found that a student's starting scores and funding source (linked to poverty level) had greater predictive power on final scores than did classroom type.

Additional data could have improved upon the study. Specifically, data that provide exact income of each participating family would have improved the ability of the researchers to more specifically understand the relationship of income level and student outcomes. Within this study, the extent of the variance of poverty within each classroom is still somewhat ambiguous since that data was unavailable. This study assumes the ABC classroom is a more economically diverse classroom since it has higher income guidelines, and indeed, the starting scores of the students support that hypothesis. But the exact variance is unknown.

The state maintains a database that includes household income of individuals who participate in state and federally funded program, however, this information was not available to the researchers nor was it connected to student performance indicators. It would be beneficial to future research if student level financial information was collected alongside with student level performance data to enable researchers the opportunity to more clearly pinpoint the extent to which income or classroom type predicts student outcomes. Doing so might allow policymakers clearer information when developing rules for previously approved programs.

This study is further limited by the fact that the data for the Head Start program is limited as not all Head Start programs use the Work Sampling System, whereas all ABC

programs do use the Work Sampling System. This resulted in a somewhat imbalanced dataset with a large number of participants in the ABC program and a relatively small number in the Head Start program. It is uncertain—though unlikely—whether a difference exists in the Head Start program data that is available as compared to the Head Start data as a whole.

This comparison study examines academic outcomes based on funding and classroom placement. It did not conclusively resolve whether one particular stream of funding or classroom composition improved outcomes as much as it highlights the contextual challenges that participants in these programs encounter before they ever enroll in one of these classrooms. These inherent difficulties implore researchers to further investigate how to address the multi-faceted contextual issues related to poverty. One particular limitation in all such research is whether the measured outcomes accurately or effectively demonstrate impact.

For example, recent federal studies have shown that the academic effects of the Head Start program fade by the time a child reaches 3rd grade (Puma et al., 2012). The ABC program has demonstrated academic effects in 1st and 2nd grade in math and literacy, but only in literacy by 3rd grade (Jung, Barnett, Hustedt, 2013). Such results would appear discouraging if it weren't for other studies that link subsidized preschool programs to future economic prosperity and decreased rates of incarceration—arguably worthwhile outcomes (Heckman, Pinto, Saveyey, Yavitz, 2010). By one measure—academic achievement—early child development programs have little to no impact by the 3rd grade. However, decreased incarceration rates would certainly justify investment in social programs both from a quality of life standpoint and from a financial cost-benefit analysis

(Heckman, et al., 2010). Similar challenges are found at all levels of education research. Patrick Wolf and colleagues found enrollment in private schools by means of publicly funded vouchers increased education attainment—as measured by college enrollment—but not education achievement—as measured by scores on standardized tests (Wolf et al., 2010).

The study of poverty-related factors that contribute to the variance in starting points of participants in early childhood education programs is inherently complex. Equally complex measures of effectiveness should be employed to determine how to most effectively and efficiently improve outcomes for the most at-risk students. This is part of a much larger conversation of the limitations of all education research that is not solely limited to this study, but should certainly be considered within any future research related to the classroom design for low-income preschool students.

VI. References

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VII. Appendix

a) IRB Protocol Form

IRB Project Number

UNIVERSITY OF ARKANSAS INSTITUTIONAL REVIEW BOARD
PROTOCOL FORM

The University Institutional Review Board recommends policies and monitors their implementation, on the use of human beings as subjects for physical, mental, and social experimentation, in and out of class. . . . Protocols for the use of human subjects in research and in class experiments, whether funded internally or externally, must be approved by the (IRB) or in accordance with IRB policies and procedures prior to the implementation of the human subject protocol. . . . Violation of procedures and approved protocols can result in the loss of funding from the sponsoring agency or the University of Arkansas and may be interpreted as scientific misconduct. (*see Faculty Handbook*)

Supply the information requested in items 1-14 as appropriate. **Type** entries in the spaces provided using additional pages as needed. In accordance with college/departmental policy, submit the original **and** one copy of this completed protocol form and all attached materials to the appropriate Human Subjects Committee. In the absence of an IRB-authorized Human Subjects Committee, submit the original of this completed protocol form and all attached materials to the IRB, Attn: Compliance Officer, ADMN 210, 575-2208. Completed form and additional materials may be emailed to irb@uark.edu. The fully signed signature page may be scanned and submitted with the protocol, by FAX (575-3846) or via campus mail.

1. Personal and Social Development and Language Outcomes in Mixed Income Preschool Environments
2. (Students **must** have a faculty member supervise the research. The faculty member must sign this form and all researchers and the faculty advisor should provide a campus phone number.)

Name	Department	Email Address	Campus Phone
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Principal Researcher Misty Newcomb, HESC, mistynewcomb@gmail.com,

Co-Researcher

Co-Researcher

Co-Researcher

Faculty Advisor Dr. Jennifer Henk, HDFFS, jhenk@uark.edu, (479) 575-7538

3. Researcher(s) status. Check all that apply.

Faculty Staff Graduate Student(s) Undergraduate Student(s)

4. Project type

Faculty Research Thesis / Dissertation Class Project Independent Study /
 Staff Research M.A.T. Research Honors Project Educ. Spec. Project

5. Is the project receiving extramural funding? (Extramural funding is funding from an external research sponsor.)

No Yes. Specify the source of funds

IRB Project Number

6. Brief description of the purpose of proposed research and all procedures involving people. Be specific. Use additional pages if needed. (Do not send thesis or dissertation proposals. Proposals for extramural funding must be submitted in full.)

Purpose of research:

The purpose of the research project is to determine if preschool student outcomes are different for those enrolled in Head Start versus the Arkansas Better Chance Program. Head Start and the Arkansas Better Chance Program follow a similar preschool program design. However student income eligibility criteria differs significantly. Some studies have shown that higher concentrations of poverty are correlated with less growth in the preschool environment. Also, incoming student variables differ by income level with poverty being a predictive factor for low incoming ability. Using publicly available preschool data this study will analyze students outcomes in both language and personal and social development to see if those outcomes differ by program type. It is hypothesized that fall scores will be lower for Head Start participants than Arkansas Better Chance program participants. It is also hypothesized that growth in scores will be greater for Head Start participants than Arkansas Better Chance program participants.

Procedures involving people:

The graduate student is using a secondary data set that was made available by the Department of Human Services. Arkansas Better Chance and Head Start Teachers collect le data regarding student progress in multiple areas as a part of this program for the sole purpose of measuring student growth. Teachers collect data on students who participate in the Arkansas Better Chance program and the Head Start program in Arkansas through observations three times each year. Teacher assessments are an implicit component of these programs. This data will be analyzed by the graduate student. The student will not be collecting data This data is entered into a portal managed by Pearson on behalf of the Division of Childcare in the Department of Human Services. No data will identify individual students.

7. Estimated **number of participants** (complete all that apply)

25,000 Children under 14 _____ Children 14-17 _____ UA students _____ Adult non-students
(18yrs and older)

8. Anticipated dates for contact with participants: NA

First Contact _____ Last Contact _____

9. Informed Consent procedures: The following information must be included in any procedure: identification of researcher, institutional affiliation and contact information; identification of Compliance Officer and contact information; purpose of the research, expected duration of the subject's participation; description of procedures; risks and/or benefits; how confidentiality will be ensured; that participation is voluntary and that refusal to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled. See *Policies and Procedures Governing Research with Human Subjects*, section 5.0 Requirements for Consent.

- Signed informed consent will be obtained. **Attach copy of form.**
- Modified informed consent will be obtained. **Attach copy of form.**
- Other method (e.g., implied consent). **Please explain on attached sheet.**
- Not applicable to this project. **Please explain on attached sheet.**

10. Confidentiality of Data: All data collected that can be associated with a subject/respondent must remain confidential. Describe the methods to be used to ensure the confidentiality of data obtained.

No data will be collected. The data analyzed will only be disaggregated by subgroup but will contain no personally identifiable information.

11. Risks and/or Benefits:

Risks: Will participants in the research be exposed to more than minimal risk? F Yes **F No** Minimal risk is defined as risks of harm not greater, considering probability and magnitude, than those ordinarily encountered in daily

life or during the performance of routine physical or psychological examinations or tests. Describe any such risks or discomforts associated with the study and precautions that will be taken to minimize them.

Benefits: Other than the contribution of new knowledge, describe the benefits of this research.

This research could better inform policymakers about the potential benefits of expanding income guidelines for preschool children in publically funded preschools.

12. Check all of the following that apply to the proposed research. Supply the requested information below or on attached sheets:

- A. Deception of or withholding information from participants. Justify the use of deception or the withholding of information. Describe the debriefing procedure: how and when will the subject be informed of the deception and/or the information withheld?
- B. Medical clearance necessary prior to participation. Describe the procedures and note the safety precautions to be taken.
- C. Samples (blood, tissue, etc.) from participants. Describe the procedures and note the safety precautions to be taken.
- D. Administration of substances (foods, drugs, etc.) to participants. Describe the procedures and note the safety precautions to be taken.
- E. Physical exercise or conditioning for subjects. Describe the procedures and note the safety precautions to be taken.
- F. Research involving children. How will informed consent from parents or legally authorized representatives as well as from subjects be obtained? This is data was collected by teachers as a mandated part of the Arkansas Better Chance Program and Head Start program. It is managed by Pearson for the Department of Human Services and is publicly available. No consent required
- G. Research involving pregnant women or fetuses. How will informed consent be obtained from both parents of the fetus?
- H. Research involving participants in institutions (cognitive impairments, prisoners, etc.). Specify agencies or institutions involved. Attach letters of approval. Letters must be on letterhead with original signature; electronic transmission is acceptable.
- I. Research approved by an IRB at another institution. Specify agencies or institutions involved. Attach letters of approval. Letters must be on letterhead with original signature; electronic transmission is acceptable.
- J. Research that must be approved by another institution or agency. Specify agencies or institutions involved. Attach letters of approval. Letters must be on letterhead with original signature; electronic transmission is acceptable.

13. Checklist for Attachments

The following are attached:.
<input type="checkbox"/> Consent form (if applicable) or
<input type="checkbox"/> Letter to participants, written instructions, and/or script of oral protocols indicating clearly the information in item #9.
<input type="checkbox"/> Letter(s) of approval from cooperating institution(s) and/or other IRB approvals (if applicable)
<input type="checkbox"/> Data collection instruments

14. Signatures

I/we agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects/respondents are protected. I/we will report any adverse reactions to the committee. Additions to or changes in research procedures after the project has been approved will be submitted to the committee for review. I/we agree to request renewal of approval for any project when subject/respondent contact continues more than one year.

Principal Researcher [redacted] Date 6/11/15
Co-Researcher _____ Date _____
Co-Researcher _____ Date _____
Co-Researcher [redacted] Date _____
Faculty Advisor [redacted] Date 6-30-15

Misty Newcomb
IRB Approval Form
Attachment

Additional Information provided for Question #9:

Student assessment is an implicit part of all academic programs and mandated for participants in the Head Start and Arkansas Better Chance program. Arkansas Better Chance Program and Head Start teachers receive initial training and technical assistance throughout the year to ensure accuracy in assessments. Teachers input this data in a portal managed by Pearson on behalf of the Division of Childcare Unit in the Department of Human Services. With the Division of Childcare's permission, Pearson provided four years of student data. This data is confidential and no individual information that identifies students will be used. The data will be analyzed and results will be communicated in aggregated form.



UNIVERSITY OF ARKANSAS

Office of Research Compliance
Institutional Review Board

July 10, 2015

MEMORANDUM

TO: Misty Newcomb
Jennifer Henk

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 15-06-784

Protocol Title: *Personal and Social Development and Language Outcomes in Mixed Income Preschool Environments*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 07/10/2015 Expiration Date: 06/28/2016

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<https://vpred.uark.edu/units/rscp/index.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 25,000 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.