

**FAMILY BACKGROUND, TEACHER-CHILD INTERACTIONS, AND
ACHIEVEMENT GROWTH IN PRESCHOOL, EVIDENCE FROM THE 2001-2003
NCEDL DATA**

by

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Participation in high-quality early education programs has been linked to gains in children's cognitive and social-emotional readiness skills. This study uses data from the NCEDL Multi-State Study of Pre-Kindergarten, 2001-2003 to examine the association between process and structural features of state funded early education programs and children's academic and social-emotional development. This study also investigates the variation in program features and how that variation is associated with children's socioeconomic status. Findings are consistent with research that emphasizes the importance of positive teacher-child interactions in promoting children's school readiness. Children's academic and social-emotional skills were found to have positive associations with classroom ratings of emotional and instructional support. The results of the present study are also consistent with other recent research, demonstrating that structural features of a classroom show little relationship to children's outcomes.

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1.0 INTRODUCTION

Preschool attendance has been linked to gains in children's academic skills. Thus, it is important to explore early education programs to determine which program characteristics produce the greatest effects on children's academic skills. Moreover, it is often noted that socioeconomic status is a determinant of preschool participation. Children from low-income households tend to be enrolled in preschool programs less often than their wealthier peers (Mamedova & Redford, 2013). As a consequence, children are entering kindergarten with varying skills and experiences.

To combat this problem, many states have implemented their own programs. State funded pre-kindergarten programs have become a common initiative of many states, with established programs in forty states. In this study, state funded prekindergarten programs are defined as schools or center-based programs that serve four-year olds, have an explicit goal of improving school readiness, and are funded fully or partially by the state. According to the National Institute for Early Education Research (NIEER), 28% of four year olds were enrolled in pre-k during the 2012-2013 school year (Barnett, Carolan, Squires, & Clarke-Brown, 2013). The primary purpose of these programs is to promote children's school readiness, especially those at risk for school failure. As the number of children participating in these programs increases, it is important to determine the effects of these programs, as well as the classroom features that support these effects.

The National Center for Early Development and Learning: Multi-State Study of Pre-Kindergarten 2001-2003 investigated early education programs in six states to describe the variation in quality among state funded preschool programs as well as examines the relationship between variations in program quality and children's outcomes. Several studies have used this data to examine the effects of structural characteristics such as curriculum and teacher credentials on preschool children's academic outcomes (Early et al., 2007; LoCasale-Crouch et al., 2007). This analysis will also examine the effects of these characteristics on children's outcomes, as well as how they are associated with children's socioeconomic status. Other studies have found that teacher-child interactions are highly predictive of children's academic and social-emotional outcomes (Mashburn, Pianta, Hamre, Barbarin, Bryant, Burchinal & Howes, 2008; Pianta, Howes, Burchinal, Bryant, Clifford, Early, & Barbarin, 2008). This analysis will build on these findings by providing insight into the variation in classroom quality in relation to socioeconomic status as well as how particular characteristics influence children's academic and social-emotional outcomes.

1.1 SIGNIFICANCE AND PURPOSE OF STUDY

As access to state funded early education programs expands, an increasing number of children will be participating in these programs. Thus, it is important to explore the features of these programs that produce the greatest effects on children's academic and social outcomes. Further, variation exists among the quality of state funded preschool programs and it is important to investigate how this variation is associated with socioeconomic status.

The primary goal of this study is to examine the extent to which program features are associated with children's academic and social-emotional outcomes as well as how these features vary in regard to children's socioeconomic status. The results of this study may provide further support for the development of high quality early education programs as well as insight into key features of teacher-child interactions that are essential for the promotion of child outcomes. The present study aims to provide knowledge of how state funded pre-k programs are supporting children's cognitive and social-emotional development, as well as provide administrators and policy makers with information as to how specific classroom features relate to children's development.

This study addresses three primary research questions. (1) To what extent is a child's socioeconomic status related to structural features including type of curriculum used, teacher education, and a classrooms overall physical quality?, (2) to what extent is a child's socioeconomic status related to process features such as teacher-child interactions and (3) how are these features associated with the growth of children's language outcomes and social-emotional development?

2.0 LITERATURE REVIEW

This literature review examines research on early education programs in the United States and explores the following topics: (1) the importance of early learning environments, (2) the achievement gap, (3) effects of early education programs on children's cognitive and social-emotional development, (4) the characteristics that are related to classroom quality, (5) the association between program quality and children's socioeconomic status, and (4) the effects of investing in high quality early education programs.

2.1 THE IMPORTANCE OF THE EARLY YEARS

2.1.1 School Readiness

Positive and enriched early learning experiences build a strong foundation that enables children to succeed in school and throughout life (Shonkoff & Phillips, 2000). The development of cognitive, behavioral, literacy and language skills takes place early in life and significant differences in children's skill levels are evident by school entry (Sektan, McClland, Acock, & Morrison, 2010). School readiness refers to skills which include recognizing letters and

numbers, along with behavioral and attention skills, such as sitting still and following directions (Isaacs, 2012). Cognitive readiness and behavioral readiness fall under the broad construct of school readiness. Cognitive readiness refers to academic knowledge that represents proximal antecedent of early achievements in the domains of emergent literacy and numeracy skills, as well as cognitive reasoning and problem solving skills (Bierman, Torres, Domitrovich, Welsh, & Gest, 2008). Sektnan et al. (2010) define behavioral readiness as the ability to apply cognitive skills such as attention, working memory, and inhibitory control to behavior. The development of these skills is not only essential for a successful transition to school, but also for academic achievement in subsequent years, as these skills have been found to predict later school achievement (Duncan et al, 2007). Children with higher levels of school readiness at age five are more successful in grade school, are less likely to drop out of high school, and earn more as adults (Isaacs, 2012; Sektnan et al., 2010).

2.1.2 The Achievement Gap

There are significant disparities in school readiness skills between low-income and high-income children upon beginning kindergarten. By the start of kindergarten, low-income children have significantly lower achievement levels than their wealthier peers (Lee & Burkham, 2002). Results from the Early Childhood Longitudinal Study, Kindergarten Class found that at the beginning of kindergarten, 85% of high-income children were able to recognize letters compared

to 39% of low-income children (Coley, 2002). In regard to math, 77% of high socioeconomic kindergartners were proficient in counting beyond ten and recognizing patterns compared to only 31% of their low-income peers (Coley, 2002). Furthermore, low-income children are more likely to attend lower quality elementary schools, limiting opportunities for remediation (Lee & Burkam, 2002). These diverse skill sets between low and high income children sustain the achievement gap making it difficult to narrow. Moreover, children's academic trajectories are shaped early, causing a threat to low-income children's future achievement (Entwisle, 1993). Children who are behind in the early years of school are unlikely to catch up and risk falling further behind with each passing year (CED, 2006).

2.1.3 The Effects of Preschool

The early experiences children encounter upon the entrance to kindergarten greatly influence their school readiness as well as their subsequent academic achievement. Participation in early education programs has been positively linked to higher academic achievement, less grade repetition or requirement of special education classes, higher graduation rates, and enrollment in college (Barnett & Ackerman, 2006). These positive outcomes persist into adult years including increased earnings, decreased crime and delinquency, and better mental health (CED, 2006). Furthermore, to acquire the benefits of an early education, quality is a central component. Attending a high-quality program has been linked to greater cognitive, behavioral, and language skills (Boyd, Barnett, Bodrova, Leong, & Gomby, 2005). However, there are many children who do not participate in early education programs and enter kindergarten underprepared. Socioeconomic status is highly predictive of preschool participation; low-income children are

less likely to enroll in a program than their wealthier peers (Mamedova & Redford, 2013). Even when poor children do participate, they are more likely to attend programs of lower quality than their wealthier peers (Pianta et al., 2005). Low-income children experience lower quality programs for a variety of reasons. Many high quality early education programs are costly, which prohibits many families from enrolling their children. Furthermore, subsidized programs often have eligibility requirements based on income or only offer a select number of slots for enrollment (Barnett et al., 2013). Moreover, not all states offer subsidized programs, thus many families are left with the option of paying a high cost to send their child to preschool, or not to enroll them at all. Consequently, children who do not attend early education programs risk entering kindergarten without much needed skills and knowledge.

2.1.4 Early Home Learning Environments

Along with participating in high-quality early education programs, the quality of early home learning environments is just as vital in ensuring children enter school adequately prepared and ready to learn. Similar to early education program attendance, enriched home early learning environments also vary by family income. Educational opportunities in the home vary greatly for children living in poverty compared to wealthier children.

Low-income children tend to have significantly fewer educational materials and resources in the home, are exposed to fewer learning opportunities, watch more hours of television, are read to less often, and have fewer visits to the library (Lee & Burkham, 2002; Sektnan et al., 2010). Furthermore, enriched language interactions are often limited in low-

income households. By the age of three, low-income children have heard about 30 million fewer words than wealthier children (Hart & Risley, 1995).

The diverse early experiences of children create significant disparities in their academic readiness by the time they enter kindergarten. Exposure to high-quality experiences that allow children to adequately develop the skills needed to succeed when they arrive at school are often limited in low-income families. This has detrimental effects on their achievement outcomes. If adequate and effective investments in early education are not made, the achievement gap will continue to widen, leaving low-income children behind.

2.2 MEASURES OF EARLY EDUCATION

The quality of early education programs is associated with child outcomes such as academic achievement and social-emotional skills. A program that is found to promote children's learning and development is considered high quality. A program that produces negative outcomes for children is low quality. Program quality is generally measured on dimensions of *structural quality* and *process quality*. This section describes the instruments and specific features used to measure the quality of an early education program as well as how these features relate to children's academic and social outcomes.

Instruments used to measure program quality include the Early Childhood Environmental Rating Scale (ECERS) and the Classroom Assessment and Scoring System (CLASS). The ECERS is used to measure a classroom's structural or physical quality. These features include space and furnishings, personal care routines, language reasoning, activities, and program

structure (Mashburn et al., 2008). Use of the ECERS involves observations of classrooms by data collectors, and rating and scoring of the classrooms based on the ECERS features. The rating scale ranges from one to seven, with one indicating inadequate quality, and seven indicating excellent quality (Mashburn et al., 2008).

Unlike ECERS which focuses on the classrooms physical environment, CLASS targets the quality of teacher-child interactions (Mashburn et al., 2008). Teacher-child interactions are coded on three dimensions: emotional support, instructional support, and organizational support. Each dimension is then rated using a scale ranging from one to seven, with a one indicating low quality, and a seven indicating high quality.

2.2.1 Structural Quality

Structural quality refers to structural and teacher characteristics of a program, including teacher-child ratios, teacher credentials, specific curriculum used, and whether the program is full-day or half-day (Espinosa, 2002).

Studies examining state funded programs found that teacher attributes, such as degree level, or teacher-to-child ratios have little relation to program quality, or on children's academic, language, and social skills (Early et al., 2007; Mashburn et al., 2008; Pianta et al., 2005). In regards to curriculum, a randomized trial on the effects of curriculum found that the use of a curriculum with a strong emphasis on play-based activities can enhance learning and development, improving children's academic and social and academic outcomes. (Barnett, Junga, Yarosz, Thomas, Hornbeca, Stechuk, & Burns, 2008). Furthermore, Barnett and

Ackerman (2006) suggest that curriculums utilizing direct instruction rather than a child-oriented approach have positive short-term effects on children's cognitive test scores.

Early education programs vary in whether they offer full-day or half-day programs, and the research on the effects of these differences is inconsistent. One study found that children who attended full-day programs had greater learning gains than children who attended half-day programs (Mead, 2012). However, other studies have found that enrolling in a program at an earlier age produces larger learning gains, but did not necessarily find a full-day program to be more effective (Barnett, 2006). Pianta et al. (2005) also suggest that the length of the day has little effect on a program's quality. In one randomized study, low-income four-year-olds were randomly assigned to two programs (Robin, Frede, & Barnett, 2006). The study compared children assigned to an eight hour program to children assigned to a three hour program. Results indicated that children who attended the eight hour program experienced greater improvement in verbal and math scores compared to children who attended the half-day program.

2.2.2 Process Quality

Process quality refers to the experiences children encounter in the classroom such as teacher-child interactions, and the types of activities in which children engage in (Espinosa, 2002). Among process features, the strongest and most consistent predictor of children's development is positive interactions with their teacher that are sensitive and encouraging (NICHD, 2006). When these interactions are positive, children acquire social and emotional skills that contribute to their development of self-regulation skills, social behavior, and emotional understanding (Zinsler et al., 2013). Positive interactions reflect the sensitivity and responsiveness of teachers, as well as

how teachers help children promote their concept development and problem solving skills (Mashburn et al., 2008).

Positive and supportive teacher-child interactions are linked to an increase in children's self-regulation skills and achievement outcomes (Eisenberg, Valiente, & Eggum, 2010). Self-regulation refers to one's control of thoughts, feelings, and behavior, involving emotional and behavior self-regulation (McClelland & Wanless, 2012). Children who have strong self-regulation skills are found to have higher math and reading scores in the fall of prekindergarten (McClelland et al, 2012).

These results suggest that placing an emphasis on structural features such as requiring teachers to have a specific degree, or mandating small class sizes may not directly impact children's learning. Rather, it may be more effective and efficient for policies to focus on high-quality teacher-child interactions in order to foster children's school readiness.

2.3 PARTICIPATION IN HIGH QUALITY EARLY EDUCATION PROGRAMS

Recent trends show that participation in an early education program is a common experience for three and four-year-old children in the United States. From 1990 to 2012, the percentage of three to five-year-olds enrolled in early education programs increased from 59 to 64 percent (NCES, 2014). This section discusses the effects of participating in a high-quality early education program on children's academic and social development.

Participation in early education programs is associated with gains in children's academic and social-emotional skills (Pianta et al., 2005). These gains ensure that children enter

kindergarten with a solid learning foundation. However, for these programs to be beneficial, it is essential that they are high-quality. Children who attend a high-quality early education program are more successful in kindergarten and throughout life, both academically and socially (Espinosa, 2002).

2.3.1 Effects of High-Quality Programs

The National Institute of Health and Human Development conducted the Early Child Care and Youth Development Study (2006) to examine children's development in relation to their early child care experiences. Child care is defined in this study as any care provided on a regular basis by someone other than the child's parents (NICHD, 2006). The study began in 1991 and followed the development of more than 1,000 children from the time they were one month of age. The study concluded that high-quality early education programs were positively linked to both social and academic outcomes. Three-year-old children who experienced programs with positive teacher-child interactions were more cooperative and compliant, as well as slightly less aggressive (NICHD, 2006). Furthermore, higher quality child care also predicted positive interactions with other children (NICHD, 2006). In relation to academic outcomes, children who experienced high-quality programs, had greater school readiness at four and a half years of age, as reflected in standardized tests of literacy and number skills (NICHD, 2006). This research is consistent with Li, Farkas, Duncan, Burchinal, and Vandell's (2012) findings indicating that children who received high-quality child care obtained higher language, reading, and math scores at 54 months of age. These cognitive and social outcomes displayed in the early years extend into the elementary years (Peisner-Feinberg et al., 2001). A longitudinal study found that these

effects continue into the adolescent years as well. At 15 years of age, higher quality programs predicted greater cognitive and academic outcomes as well as less problem behaviors (Vandell, 2010).

2.4 VARIATION IN PARTICIPATION AND QUALITY BY SOCIOECONOMIC STATUS

Research indicates that children who attend high-quality early education programs are more likely to succeed in kindergarten than those who do not participate (CED, 2006). Furthermore, participation can provide short and long-term academic and social benefits (Barnett & Ackerman, 2006). However, not all children attend these programs; socioeconomic status is highly predictive of a child's participation (NCES, 2014). This section provides an overview on the participation rates of low-income children attending early education programs, as well as the quality of the programs they attend.

Not only are low-income children less likely to attend early education programs, quality is often lower in classrooms where there is a higher percentage of children from low-income households (Pianta et al., 2005; Reid & Ready, 2013). This continues in their subsequent years, as they enter kindergarten in low-quality classrooms (Lee & Burkham, 2002). As they progress through school, low-income children tend to have low academic achievement and be assigned to teachers that emphasize basic instruction, compared to higher achieving students that are assigned to teachers who emphasize more advanced instruction (Desimone & Long, 2010).

2.4.1 State Funded Early Education Programs

To improve the quality of early education programs that low-income children attend, many states have developed programs which allow eligible children to attend such programs for free or at a reduced cost. The goal is to ensure that children are attending high-quality early education programs regardless of their income. Low-income children can participate in a preschool program at a reduced cost through federally funded programs such as Head Start, and state funded programs. However, these programs are themselves remarkably diverse in their quality.

State funded pre-k programs are a primary source of early education for children. In 2012-2013, these programs served four percent of three-year-olds and 28% of four-year-olds (Barnett et al., 2013). However, enrollment in these programs varies widely from state to state. Some states such as the District of Columbia and Florida serve more than seventy percent of four-year-olds (Barnett et al., 2013). On the other hand, states such as Virginia and North Carolina serve less than half of their states four-year-olds (Barnett et al., 2013). Furthermore, ten states offer no program at all for low-income families.

Quality standards are used to evaluate a state's programs quality. The Quality Standards Checklist (NAEYC, 2006) allows states to compare their program standards against a checklist of 10 criteria that are research-based and found to be effective aspects that promote a child's development. These standards include the presence of comprehensive learning standards; teachers that have a BA; specialized training in pre-k; assistant teachers with a CDA or equivalent; at least 15 hours a year in-service; class sizes of 20 or lower; staff-child ratios of 1:10 or better; vision, hearing, and health support services; at least one meal provided; and site visits by state administrators. In the 2012-2013 school year, 41 percent of children enrolled were

served in programs that met fewer than five of these standards. Only four states met all 10 benchmarks (Barnett et al., 2013).

Among the states that fund preschool, spending varied from \$1.3 million to more than \$750 million (Barnett et al., 2013). Furthermore, only 15 states provided enough per child funding to meet all 10 benchmarks for quality standards. Thus, children are being served by state pre-k programs where funding is inadequate to provide a quality education. State funded early education programs have the potential to send low-income children to kindergarten prepared to learn. However, these programs vary in their enrollment rates and quality.

2.4.2 Variation of State Funded Program Quality

The National Center for Early Development and Learning (NCEDL) conducted the Multi-State Study of Pre-Kindergarten in 2001 to investigate the experiences children had in pre-kindergarten programs. Two hundred forty programs were randomly selected from six states: California, Illinois, New York, Ohio, Kentucky, and Georgia. The study aimed to describe the variations in the experiences of children in pre-k programs, as well as examine the relationships between variations in pre-k experiences and child outcomes.

During the fall and spring of pre-k, children were assessed using standardized tests such as the Oral and Written Language Scales (OWLS), and the Woodcock Johnson III Tests of Achievement (Bryant, Clifford, Early, Little, 2005). When tested in the fall, low-income children were found to be below average in language and math skills. During the spring, children were found to have made small but meaningful gains in these skills (Bryant et al.,

2005). Children's academic gains were related to the extent that teachers interacted positively with the children (Mashburn et al., 2008).

Classroom quality, as measured by ECERS and CLASS was lower when the classroom had a higher rate of low-income children, and when teachers did not have a Bachelor's level training in early childhood education (Bryant et al., 2005). Structural features such as teacher-child ratios and teacher education met the recommended standards for classroom quality. Although the structural quality of these classrooms was high, process features such as child-teacher interactions, was low. Researchers found that children's interactions with their teachers occurred minimally (Bryant et al., 2005). These low scores suggest that pre-k teachers had limited engagement with children, nor encouraged children to hypothesize, predict, and problem solve (Bryant et al., 2005).

Other research on state funded programs found that teachers were moderately responsive and sensitive, but were less successful in engaging children in learning specific skills (Burchinal et al., 2008). Furthermore, a study examining 135 pre-k teachers found that the quality of language and literacy instruction observed in these pre-k classrooms was low (Justice, Masburn, Hamre, & Pianta, 2008).

These results suggest that state funded programs have the potential to increase children's outcomes if they are of high quality. These studies describe how variable state funded programs are in their quality. While it is important to increase access to state funded programs for low-income children, in addition to expansion, resources focused on enhancing the quality of existing programs may provide even greater benefits.

2.4.3 Head Start

Head Start is a federally funded program designed to meet the needs of low-income children. Head Start was established in 1965, aimed at improving the educational outcomes of at-risk children. The program serves primarily economically disadvantaged children aged three to five. Head Start offers a broad range of services including the improvement of health and nutrition and providing services to parents and the community.

Although Head Start's mission aligns with that of state funded programs, there are differences in the design and implementation of each. Head Start's commitment to high-quality early education is embedded in their comprehensive services including educational, health, and nutritional services. Head Start's parental involvement effort is also a strong component of the program.

Both types of programs focus on enrolling children most at risk for academic difficulties. However, the standards required of Head Start often differ from those of State funded programs vary. For instance, all Head Start programs maintain a set of standards including teacher-child ratios and teacher qualifications. On the other hand, state funded programs vary in the mandates they require and the services they provide. Fifteen percent of participating classrooms in the NCEDL Study, which is the data analyzed in the present empirical study, were Head Start programs.

2.5 EVIDENCE OF HIGH-QUALITY PROGRAMS AND THE EFFECTS

Evidence indicates that high-quality early education programs have the potential to create experiences for children that prepare them for kindergarten, both academically and socially. In particular, low-income children who have the opportunity to attend well-designed, high-quality programs show lasting academic and social-emotional benefits and are adequately prepared to enter kindergarten. This section describes model programs that have had remarkable effects on the children who participated. The interventions discussed include the High/Scope Perry Preschool Program, the Chicago Child-Parent Center, and the Tools of the Mind Curriculum.

2.5.1 High/Scope Perry Preschool Program

The High Scope Perry Preschool Program was a randomized experiment carried out from 1962 to 1967 in Ypsilanti, Michigan. The study examined the short and long term effects of a high-quality early education program for low-income children. The sample consisted of 123 three and four-year-old low-income African-American children. Fifty eight children were assigned to a program group that received a high-quality preschool program, and sixty five children were assigned to a group that received no preschool program. The program had teachers with college degrees, a developmentally appropriate curriculum emphasizing social-emotional development, and promoted positive teacher-child interactions and parent engagement (Schweinhart, Montie, Xiang, Barnett, Belfield & Nores, 2005). A longitudinal study of Perry Preschool participants through age forty, found that the program had positive effects on children's academic and social-emotional development (Schweinhart, Montie, Xiang, Barnett, Belfield & Nores, 2005).

Children in the program group outperformed the control group on achievement tests, had better attitudes about school, and were more likely to graduate from high school.

2.5.2 Chicago Child-Parent Preschool Program

The Chicago Child-Parent Center (CPC) Program began in 1967 to provide comprehensive services to low-income children from age's three to nine. The program emphasizes parental involvement, comprehensive services including health and nutrition services, and a child-centered focus on the development of reading and language skills (Reynolds & Ou, 2010). The Chicago Longitudinal Study (CLS) is an ongoing investigation that follows 1,539 children who participated in the CPC Program, comparing them to children who did not participate in the program. Findings indicate that at age fifteen, participants had higher school achievement, lower rates of grade retention and placement of special education (Reynolds & Ou, 2010). At age twenty four, participants had a higher rate of high school completion and lower rates of incarceration (Reynolds & Ou, 2010).

2.5.3 Tools of the Mind Curriculum

The Tools of the Mind Curriculum focuses on the facilitation of children's self-regulation skills. The main components of Tools of the Mind include facilitating children's ability to regulate their own social and cognitive behaviors, promoting attention and memory skills, and encouraging dramatic play (Barnett et al., 2008). The effectiveness of the Tools of the Mind Curriculum was evaluated using randomized assignment in a low-income New Jersey school district. Participants

consisted of 88 preschool children receiving the Tools of the Mind Curriculum, and 122 children in the control group. Children in the control group received the school district's curriculum, the Balanced Literacy Curriculum. Teachers and students were randomly assigned to either treatment or control classrooms. Children who experienced the Tools of the Mind Curriculum were found to have better improvements in relation to social behavior, language, and literacy growth (Barnett et al., 2008).

2.6 SUMMARY

The High/Scope Perry Preschool Program, the Chicago Child-Parent Center, and the Tools of the Mind Curriculum provide evidence that well-designed interventions can produce positive effects for young children, especially those of low-income. These effects of increased academic achievement and social-emotional skills continue into adulthood, with participants committing fewer crimes and having lower rates of incarceration. The goal of each of these interventions is to promote children's school readiness so that all children are prepared to enter kindergarten, regardless of their socioeconomic status. Although these interventions are well-designed and may be costly to generalize to other settings, they provide evidence that specific features such as positive teacher-child interactions and a curriculum that emphasizes social-emotional development are effective in increasing children's academic and behavioral skills. In all, there is convincing evidence that there are numerous benefits of investing in the education of young children. Policies that expand access and improve the quality of early education programs will likely result in social and economic gains in the long-run.

Early education programs throughout the United States are delivered and implemented in a variety of ways, and access to these programs is highly unequal. Thus, each year upon the entrance to formal school, children begin kindergarten with diverse skill and knowledge, some with a strong foundation ready to learn, some who are struggling to keep up with their peers. At a young age, an achievement gap between high and low income students readily becomes apparent. The fundamental issue then, is how do we increase access to early education programs as well as effectively design them in ways that promote children's school readiness?

Early education programs that support children's social and emotional competence have the potential to increase children's school readiness, both academically and behaviorally. Standards related to teacher qualifications and class size are frequently mentioned in discussions of early education reform. These structural features are relatively easy to measure and mandate, more so than the quality of interactions between a teacher and child. Thus, they are typically focal points when designing early education policies. However, evidence suggests that these structural features do not directly impact children's learning, and instead policies should focus on supporting positive teacher-child interactions. Studies showcasing classrooms that support children's social and emotional development, and are filled with appropriate teacher-child interaction have illuminated the benefits of attending a high-quality preschool.

It is essential to equip teachers with the skills needed to provide high-quality emotional and instructional interactions. Policies that aim to improve the quality and effectiveness of early education programs should emphasize positive interactions between children and their teachers. Programs such as the High/Scope Perry Preschool Program and the Chicago Child-Parent Center provide concrete evidence that early education programs do have the opportunity to ensure that all children enter kindergarten with a solid foundation of skills. These programs strongly

emphasize positive teacher-child interactions and the development of social and emotional skills, which are both dimensions of high-quality early education programs. States should design policies that incorporate the foundations of these model programs to ensure that all children, regardless of their socioeconomic status are attending high-quality early education programs.

In order to realize the benefits stemming from positive teacher-child interactions, low-income students access to high-quality early education programs needs to be expanded. However, if polices focus solely on expanding access to early education programs without also strengthening the quality of these programs, progress will be limited. Expanding access as well as increasing the quality of early education programs will not only ensure that children are experiencing positive and supportive teacher-child interactions, but they will enter kindergarten better prepared both academically and behaviorally, which will ultimately narrow the achievement gap.

3.0 DATA AND METHODS

3.1 OVERVIEW OF THE STUDY

The present study uses data collected by the National Center for Early Development and Learning (NCEDL). The NCEDL conducted a study of state funded pre-kindergarten programs in six states in 2001-2002 (Early et al., 2005). The study provides descriptive data on pre-kindergarten classrooms, teachers, and children. The states studied were California, Illinois, New York, Ohio, Kentucky, and Georgia. The chosen states were randomly selected from among states that were shown to have devoted considerable resources to preschool initiatives.

The NCEDL study focused on the relationship between various features of classroom quality and children's developmental outcomes. The study examined the extent to which program, classroom, and teacher attributes were associated with instructional quality and teacher-child interactions. The NCEDL study had two primary research goals: (1) To describe the variation in the experiences of children in pre-kindergarten and kindergarten programs in school-related settings (public schools and state funded pre-k classrooms in community-based settings and (2) to examine the relationships between pre-kindergarten/kindergarten experiences and children's outcomes in early elementary school. Children and their classroom experiences

were assessed in the fall and spring of the pre-k year. For this study, pre-kindergarten refers to center-based programs for four-year olds that are fully or partially funded by state education agencies and that are operated in schools or under the direction of state and local education agencies.

3.2 DATA COLLECTION

Data collection for the NCEDL study was conducted from fall of 2001 to spring 2003. Data collection was comprised of questionnaires, classroom observations, child assessments, and interviews. Questionnaires were used to gather information about the demographics of teachers and children (race, age, and education), program characteristics (type of curriculum, teacher education, services provided, and instructional practices).

Classroom observations were used to assess the quality of classrooms as well as children's experiences in state funded classrooms. Two trained data collectors visited each classroom on two days each semester. One conducted child assessments on the first day and ECERS on the second day; the other observer completed CLASS assessments on both days. Child assessments were conducted in the fall and spring of 2001-2002. The same children were followed into kindergarten and assessed in the fall and spring of 2002-2003.

3.3 SAMPLE

The six states chosen for the NCEDL were selected based on their pre-kindergarten initiatives and the resources they committed to pre-k education. In total, 960 children in 240 classrooms were included in the NCEDL study. Classroom observations, child assessments, and questionnaires were collected from children, teachers, and classrooms. All children who had participated in the study during the fall of prekindergarten and were still enrolled at the same pre-kindergarten site participated in the spring of pre-kindergarten data collection. In the spring of the pre-k year (2002), children who had dropped out from their program ($n = 56$) were replaced with another randomly selected eligible child. Additional children were recruited in the spring in classes where fewer than four children participated in fall. In total, 76 children joined the study in the spring. This resulted in 960 children participating in the spring

3.3.1 State Selection

California, Illinois, New York, Ohio, Kentucky, and Georgia all participated in this study. NCEDL selected these states based on their commitment to early education through their distribution of resources to implement pre-kindergarten initiatives. Further, these states were chosen to represent diversity with the following dimensions: (1) geographic diversity, (2) program settings (in schools or in community settings), (3) intensity (length of day/year), and (4) educational requirements for teachers. Following state selection, random sampling of zip code, site, classroom, and children took place. Twenty zip codes from each state, two sites from each

selected zip code, one pre-k classroom from each selected site, and four pre-k children from each selected classroom were chosen.

3.3.2 Classroom Selection

In each participating state, a stratified random sample of forty state funded pre-k program sites was selected. Programs were selected in regard to diversity with the following: (1) location of program (programs in school buildings versus out of school), (2) intensity (full day versus part-day), and (3) teacher degree (Bachelor's degree versus no Bachelor's). In total, 240 pre-k classrooms participated in the study.

3.3.3 Child Selection

Within each of the 240 pre-k classroom, four children were randomly selected for individual assessment. In total, 940 children participated in the fall of pre-k data collection. During the spring assessments, 960 children participated. Eligible children consisted of those who (1) were old enough for kindergarten the following fall (2002), (2) did not have an Individualized Education Plan, and (3) spoke English or Spanish well enough to understand simple instructions according to the teacher. When it was possible, two girls and two boys were selected in each classroom. Selected children were assessed using a battery of individual instruments to measure language, literacy, mathematics, and related concept development, as well as social competence.

3.4 METHODS

3.4.1 Measures

Tables 1 and 2 describe the key child level and program variables used in the present study. Tables 3 and 4 present the descriptive statistics for each variable. The measures of interest for the present study are described below.

3.4.2 Child Characteristics

Families completed a questionnaire which included an item measuring their annual household income. Income was originally categorized into 18 groups:

1. \$5,000
2. \$5,001 - \$10,000
3. \$10,001 - \$15,000
4. \$15,001 - \$20,000
5. \$20,001 - \$25,000
6. \$25,001 - \$30,000
7. \$30,001 - \$35,000
8. \$35,001 - \$40,000
9. \$40,001 - \$45,000
10. \$45,001 - \$50,000
11. \$50,001 - \$55,000
12. \$55,001 - \$60,000
13. \$60,001 - \$65,000
14. \$65,001 - \$70,000
15. \$70,001 - \$75,000
16. \$75,001 - \$80,000
17. \$80,001 - \$85,000
18. \$85,001 or greater.

For the present study, family income is categorized into three groups: (1) extreme-poor, which is defined as \$5,000 - \$15,000, (2) poor which is defined as \$15,001 - \$35,000, and (3)

non-poor which is defined as \$35,001 or greater. These income categories were formed on the basis of the 2001 Federal Poverty Guidelines, which is used as a measure of poverty. The 2001 poverty guideline for a family of three was \$14,630 (United States Department of Health and Human Services, 2010). Therefore, the category of extreme-poor included yearly household incomes at or below \$15,000. Categories of poor and non-poor were then formed. State funded pre-k programs primarily target lower income populations; thus, it is important to capture the experiences of children from the lowest income households that participate in these programs.

Control variables used in this study are children's race and gender. Child's race is categorized into three groups: (1) White, (2) African American, and (3) other. Gender is categorized into two groups: (1) male, (2) female.

3.4.3 Program Characteristics (Structural Level)

3.4.3.1 Overall Quality of Classroom Participating classrooms were assessed on their overall quality using the Early Childhood Environmental Rating Scale-Revised (ECERS-R, Harms & Clifford, 1983; Harms, Clifford, & Cryer, 1998). The ECERS-R is used primarily in classrooms that serve children two and a half to five years of age, and is used to measure classrooms structural features including space and furnishings, personal care routines, language reasoning, activities, and program structure (Mashburn et al., 2008).

Classroom observations took place once in the fall and once in the spring of pre-k. Scoring ranges from one to seven with 1 indicating "inadequate" quality, 3 indicating "minimal" quality, 5 indicating "good" quality, and 7 indicating "excellent" quality. The ECERS-R is comprised of two factors, Teaching and Interactions, and Provisions for Learning. Teaching and

Interactions consists of eleven items: Greeting/Departing, Encouraging Children to Communicate, Using Language to Develop Reasoning Skills, Informal Use of Language, Supervision of Gross Motor Activities, General Supervision of Children, Discipline, Staff-Child Interactions, and Interactions among Children, Free Play and Group Time. The second factor, Provisions for Learning, consists of twelve items: Room Arrangement, Space for Privacy, Gross Motor Equipment, Fine Motor, Art, Blocks, Sand/Water, Dramatic Play, Nature/Science, Schedule, Free Play, and Group Time. For the present study, ECERS-R scores were categorized into three groups, (1) low range indicating scores from 1-3, (2) mid-range indicating scores from 3-5, and (3) high range indicating scores greater than 5.

3.4.3.2 Teacher Education Teachers completed questionnaires which provided information on demographic characteristics such as their race, age, education, as well as their beliefs about children. For the present study, teacher's highest level of education is the primary focus. Teacher's education level originally consisted of twelve categories: (1) eighth grade or less, (2) some high school, but no diploma, (3) HS Diploma or equivalent, (4) HS Diploma and training certificate, (5) some college but no degree, (6) Associates Degree, Associates of Science Degree, Two-Year Degree, (7) Bachelor's Degree, (8) at least one year past BA (9) Master's Degree, (10) Education Specialist or Professional Degree, (11) Doctoral Degree, and (12) other. For the present study, four categories were formed: (1) less than Associates, (2) Associates (3) Bachelors, and (4) more than Bachelors.

3.4.3.3 Curriculum Program administrators (principals, directors) completed questionnaires which provided information on whether the program was half-day or full day, the services

provided by the program, and the type of curriculum used. For this specific study, the type of curriculum that was used in their center or school is the primary focus. Four categories were originally formed: (1) High Scope Curriculum, (2) Creative Curriculum, (3) named, and (4) no name. For the present study, two categories were created: (1) High Scope or Creative Curriculum, and (2) other. The High Scope Curriculum and the Creative Curriculum were both created based on research regarding children's development and focuses on dimensions of social-emotional development. Each curriculum uses an assessment to track children's growth in the classroom. Both are commonly used in state funded programs, and therefore were combined to form one category.

3.4.4 Program Characteristics (Process Level)

3.4.4.1 Teacher-Child Interactions Each participating pre-k teacher was assessed on the quality of his or her teacher-child interactions using the Classroom Assessment Scoring System (CLASS, La Paro, Pianta, Hamre, & Stuhlman, 2002). CLASS is an observational assessment used to rate teacher-child interactions in the classroom on dimensions of emotional and instructional support. Unlike the ECERS-R, which measures a classroom's physical features, CLASS assesses the overall environment of the classroom, specifically targeting the quality of teacher-child interactions.

CLASS assesses two global dimensions of the quality of teacher-child interactions within pre-k classrooms, Emotional Support and Instructional Quality. Observers rated each classroom twice in the fall and twice in the spring of pre-k. Seven scales from CLASS assessment were used in this study. Each dimension is rated along a one to seven scale, with 1 or 2 indicating the

classroom is low on that dimension, a 3, 4, or 5 indicating that the classroom is in the mid-range, and a 6 or 7 indicating the classroom is high on that dimension. The CLASS assessment includes two factors, Emotional Climate, composed of Positive Climate, Negative Climate, Teacher Sensitivity, Over-control, and Behavior Management. The second factor, Instructional Climate, is composed of Productivity, Concept Development, Quality of Feedback, and Instructional Learning Formats. For the present study, CLASS scores were categorized into two groups: (1) low-mid range indicating scores from 1-5 and (2) high range indicating scores greater than 5.

3.4.5 Children's Achievement Skills

3.4.5.1 Receptive Language Scores Children were assessed on their receptive language skills at the beginning and end of the pre-k year using the Peabody Picture Vocabulary Test, 3rd edition (PPVT-III) (Dunn & Dunn, 1997). During the administration of this test, children are shown a card with four pictures, and are asked to select the picture that best corresponds to the meaning of a word spoken by the examiner. Raw scores were converted into standardized scores ($M = 100$, $SD = 15$) that reflect each child's performance relative to the expected performance of children in the population who are the same age.

3.4.5.2 Expressive Language Scores The Oral and Written Language Scale (OWLS, Carrow-Woolfolk, 1995) was used to assess children's expressive language skills at the beginning and end of the pre-k year. During the assessment, the examiner reads a verbal stimulus aloud while the child looks at a board containing one or more pictures. Children respond orally by answering

a question, completing a sentence, or creating a new sentence. Raw scores were converted into standardized scores ($M = 100$, $SD = 15$).

3.4.5.3 Children’s Social-emotional Skills Teachers completed the Teacher–Child Rating Scale (TCRS, Hightower et al., 1986) once during the fall and spring of pre-k. The Teacher-Child Rating Scale is a teacher-reported behavior rating scale assessing children’s social competence and problem behaviors. Features of social competence include “participates in class discussions,” “friendly towards peers,” and “completes work.” Teachers score children using a five-point scale to indicate how well statements describe the child: (1) not at all, (2) a little, (3) moderately well, (4) well, and (5) very well. Features of problem behaviors include “difficulty sitting still,” “aggressive towards peers,” “disruptive,” and “difficulty following directions.” The scale for problem behavior item was: (1) not a problem, (2) mild, (3) moderate, (4) serious, and (5) very serious problem.

4.0 RESULTS

Based on data from the National Center for Early Development and Learning's (NCEDE) Multi State Pre-Kindergarten Study, the present study examines perceived indicators of classroom quality, specifically type of curriculum, teacher education, and observed classroom quality in relation to children's academic and social-emotional outcomes.

Questions analyzed in the current study are as follows: (1) To what extent is a child's socioeconomic status related to structural features including type of curriculum used, teacher education, and a classrooms overall physical quality? (2) To what extent is a child's socioeconomic status related to process features such as teacher-child interactions. (3) How are these features associated with the growth of children's language outcomes and social-emotional development?

These questions were examined using several analytic approaches. Chi-square and Analysis of Variance tests were used to address questions related to how program features vary by children's socioeconomic status. Multivariate regression analysis was used to address the question of the effects of program features on children's academic and social-emotional outcomes. Collectively, I analyzed how features of state funded preschool programs may be associated with children's socioeconomic status, as well as the influence they have on children's academic and social-emotional development.

The first question analyzed was: are children from low-income families exposed to different classroom resources and classroom climates than high income children? To explore this, chi-square tests were used to consider several classroom features.

Chi-square analyses were conducted to compare children's socioeconomic status with various classroom features, including the classroom's emotional environment, physical environment, type of curriculum used, and teacher education level. Specifically, chi-square analyses compared children of three categories of income: (1) extreme-poor, (2) poor, and (3) non-poor.

The results of the chi-square analysis indicate that children's socioeconomic status appears to be statistically associated with all features of state funded classrooms, except for the type of curriculum used.

Table 5 shows the relationship between child's socioeconomic status and CLASS assessment ratings of the emotional climate of the classroom in the fall and spring. Compared to non-poor children, children of extreme-poor households were more likely to be in lower quality classrooms based on emotional support during fall $P=.020$ and spring $P=.012$. A similar relationship also appears in regard to ratings of instructional quality in the fall $P<.001$ as seen in table 6. This suggests that the lowest income children were receiving less positive teacher-child interactions during their pre-k year. Compared to extreme-poor children, non-poor children were more likely to experience classrooms where teachers were more sensitive, more enthusiastic, and more encouraging. Further, non-poor children were more likely to be in classrooms where teachers promoted higher order thinking and creativity.

Classroom quality based on structural dimensions also varied by children's socioeconomic status, as seen in Table 7. Classrooms rated low on the ECERS-R factor of Teaching and Interactions had a higher percentage of extreme-poor children compared to non-poor children in the fall $P < .001$, as well as the spring, $P < .001$. Table 8 shows the results for the second factor, Provisions for Learning, which appeared to have a significant relationship in the spring $P < .001$. Compared to extreme-poor children, non-poor children were more likely to experience classrooms where teachers interacted with children with encouragement and respect, as well as had appropriate learning materials and equipment.

In regards to curriculum, results indicated that there was an insignificant relationship between children's socioeconomic status and the type of curriculum used in the classroom, $P = .759$, as seen in Table 9. This suggests that children of all socioeconomic backgrounds were exposed to various types of curriculum. A teacher's education level appeared to have a significant relationship with children's socioeconomic status, $P < .001$. As seen in Table 10. A higher proportion of non-poor children were taught by teachers with more advanced degrees, compared to extreme-poor children.

Results indicated small comparisons between poor children and extreme-poor as well as non-poor children. This suggests that across dimensions of classroom features, children from poor families appeared to be equally distributed in classrooms with perceived dimensions of high quality.

The results from the chi-square analyses indicate that features of state funded classrooms vary based on children's socioeconomic background. Children from the lowest income families were more likely to experience classrooms in which teacher-child interactions were less

supportive, less access to appropriate learning materials, and teachers with less advanced degrees.

The second question analyzed was: do children from low-income families score lower on tests of receptive and expressive language skills, and receive lower social competence ratings than high income children? To explore this, a one-way between subjects Analyses of Variance (ANOVA) is used to consider the differences between children's socioeconomic status and outcomes of language and social competence. Children were compared on academic and social-emotional outcomes, including receptive and expressive language skills, social skills, and problem behaviors.

Results indicated that academic and social-emotional outcomes appear to be significantly different among children of various socioeconomic statuses. In order to reveal differences in outcomes among specific income groups, the Bonferroni adjustment was used. For instance, low-income children were compared to middle and high income children.

Results from the ANOVA analysis on outcomes of receptive and expressive language indicated significant differences. Receptive language scores were significantly different among children of various socioeconomic groups, $F(2,801) = 43.74, P < .001$. The top panel of Table 11 shows the mean differences in spring receptive language scores between extreme-poor, poor, and non-poor children. The bottom panel provides an analysis of variance. Children of extreme-poor and poor families appear to have lower scores on tests of receptive language than non-poor children $P < .001$.

Expressive language scores were also significantly different among all groups of children, $F(2,796) = 27.03, P < .001$. The top panel of Table 12 shows the mean differences in

spring expressive language scores between extreme-poor, poor, and non-poor children. The bottom panel provides an analysis of variance. Children from extreme-poor and poor families received lower scores on tests of expressive language than high income children, $p < .001$.

Results from the one-way ANOVA on outcomes of social competence indicated significant differences as well. Teacher ratings of children's social skills ($F(2,888) = 4.73$, $P=.009$) and problem behaviors ($F(2,885) = 3.52$, $P=.030$), were found to be significantly different among children of various socioeconomic groups, as seen in Tables 13 and 14. Children from extreme-poor families appear to have received lower ratings on dimensions of social skills ($P=.012$) and higher ratings of problem behaviors ($P=.033$) than non-poor children. This suggests that teachers were more likely to rate non-poor children with having better relationships with their peers and being better organized than lower income children. Moreover, teachers were less likely to rate non-poor children as being disruptive in class or being poorly motivated than lower income children.

The third question analyzed was: what classroom and child characteristics predict the growth of children's language outcomes and social-emotional development at the end of their pre-k year? Multivariate regression models were used to explore this relationship. The bivariate associations among the predictor and outcome variables were also examined using correlations, shown in Table 15.

Income appears to be positively related to all features. Classroom ratings of CLASS and ECERS-R were both positively related to children's spring language achievement, as well as children's ratings of social competence. Structural features including curriculum and teacher's level of education appeared to have little association to children's spring language achievement

or their rating of social skills and problem behaviors. Ratings of ECERS-R appear to have some association with CLASS ratings. This indicates that children who were in classrooms with higher ratings of appropriate learning materials were also in classrooms with higher ratings of teacher child interactions. There appears to be modest associations between structural features of classrooms, and classroom ratings on assessments of ECERS-R and CLASS. This indicates that the use of a specific curriculum or a teacher with a higher level of education had minimal influence on observed classroom quality as measured by ECERS-R and CLASS.

To examine the extent to which various classroom features predicted children's achievement on tests of receptive and expressive language tests, OLS regression was used. The regression statistics of the predictors for language achievement are reported in Table 16.

In model one, children's income and control variables were entered to show the relationship to spring language achievement. Income appears to be significantly and negatively predictive of spring language outcomes. Compared to non-poor children, children from extreme-poor and poor families scored much lower on tests of receptive and expressive language assessments. For instance, on tests of receptive language, children from extreme-poor families scored 7.49 points less than children from poor and non-poor families. Children's race also appears to be significantly related to spring language achievement. White children achieved 8.5 points higher on tests of receptive language, compared to children of other races.

In model two, children's fall language scores were entered into the regression along with their fall ratings of social skills and problem behaviors. Results indicate that once these variables are included, the effect of children's income remains the greatest predictor of children's language achievement. Children's fall baseline scores were also significantly and positively predictive of children's spring achievement on assessments of receptive and expressive language. Teacher

ratings of children's social skills were found to be positive predictors of language achievement on both measures of receptive and expressive language. Children who were rated as having friendly relationships with peers and being well-organized were achieved higher scores. Problem behavior ratings were found to be a negative predictor of children's spring language achievement. These ratings appeared to have a stronger effect on receptive language outcomes than expressive outcomes. This suggests that children who were rated as being disruptive in class or being poorly motivated achieved lower scores.

Model three included the primary explanatory variables, ECERS-R ratings, CLASS ratings, use of curriculum, and teacher education. Children's income remains a negative predictor of language scores. The effects of children's demographics seem to decrease in this model. Structural features of the classroom appeared to have modest to significant relationships with children's language outcomes. Observed ratings of a classrooms physical quality as measured by ECERS-R were found to be moderately predictive of children's language achievement. The Teaching and Interactions factor appeared to have a greater effect than the Provisions for Learning factor, on both language assessments. This suggests that of the dimensions of ECERS-R, features of classroom interactions had more influence on children's achievement more so than having appropriate learning materials. The effects of curriculum and teacher education varied. On tests of receptive language, using the High Scope or Creative Curriculum had a negative relationship compared to using another type of curriculum. However, on expressive outcomes, the use of the High Scope or Creative Curriculum revealed to be a predictor of children's achievement. Children who were taught with either the High Scope or Creative Curriculum scored .65 points higher on expressive language assessments than children who did not experience these types of curriculum. Teacher's education level also appeared to

have modest effects on children's receptive achievement. Compared to teachers with higher education levels, those with less than an associate's degree negatively predicted children's achievement on receptive tests. In contrast, teachers with less than an associate's degree was positively predictive of children's achievement on expressive tests compared to teachers with higher degrees. Children who were taught by teachers having less than an associate's degree scored 1.14 points higher on tests of expressive language.

Classroom ratings of supportive emotional environments as well as supportive instructional environments were found to be positively related to children's receptive language achievement. Children exposed to rich emotional and instructional environments achieved .70 and .56 points higher than children who were not exposed to these environments. There is a similar pattern for expressive language achievement, children in classroom's where teachers were sensitive and encouraging achieved .78 points higher, as well as .40 points higher when in classrooms where teachers promoted higher order thinking and creativity.

Teacher ratings of children's social competence were found to be positive predictors of language achievement on both measures of receptive and expressive language. On expressive language assessments, children who were rated as having friendly relationships with peers and being well-organized achieved 1.27 higher points than children who were rated low on these skills. Problem behavior ratings were found to be a negative predictor of children's spring language achievement. These ratings appeared to have a stronger effect on receptive language outcomes than expressive outcomes. This suggests that children who were rated as being disruptive in class or being poorly motivated achieved .81 points less than children who displayed these behaviors less often.

To examine the relationship between classroom features and children's social-emotional outcomes, Ordered Probit Regression was used. This regression model was used because teacher ratings of children's social skills and behavior problems were rank ordered on a 1-5 scale. The regression statistics of the predictors for social-emotional development are reported in Table 17.

Model one includes children's income and control variables. Results show that income has a negative and significant effect on children's ratings of social skills. Compared to poor and non-poor children, children from extreme-poor families scored .30 points less on ratings of social skills, and .28 points higher on ratings of behavior problems.

In model two, children's fall ratings of social competence as well as their fall language scores were entered into the regression. Fall ratings of social competence appear to have a significant effect on children's spring social competence. Income and other child demographics appear to have modest effects.

Model three included the primary explanatory variables, ECERS-R ratings, CLASS ratings, use of curriculum, and teacher education. Children from extreme-poor families received lower ratings on dimensions of social skills than their higher income peers. Positive effects appear for a classroom's rating of their emotional environment. Having teachers who were more sensitive and encouraging resulted in a .17 point increase in children's social skill ratings. Furthermore, having a supportive instructional environment where teachers promoted creative thinking resulted in a .13 point increase in children's social skill ratings.

Observed ratings of a classroom's physical quality were found to be moderately predictive of children's social skill ratings. Compared to other types of curriculum, the use of the High Scope or Creative Curriculum revealed small effects on children's social skill ratings.

Moreover, compared to teachers with more advanced degrees, teachers having less than an associate's degree negatively predicted children's social skill ratings.

In regards to children's spring problem behavior ratings, supportive teacher-child interactions decreased children's ratings of having a problem behavior by .10 points. Exposure to rich instructional environments also decreased children's ratings of having a problem behavior by .10 points. Observed ratings of the physical structure of the classroom, the use of the High Scope or Creative Curriculum, and having a higher educated teacher appeared to have small effects on decreasing children's problem behavior ratings.

5.0 DISCUSSION

The present study analyzed data from the NCEDE Multi-State Study of Pre-k, 2001-2002. The analyses focused on two central issues: (1) the variation of classroom quality among children of various socioeconomic backgrounds, and (2) what classroom features predict children's academic and social-emotional outcomes. To investigate these issues, three research questions were formed: (1) To what extent is a child's socioeconomic status related to structural features including type of curriculum used, teacher education, and a classroom's overall physical quality?, (2) to what extent is a child's socioeconomic status related to process features such as teacher-child interactions, and (3) how are these features associated with the growth of children's language outcomes and social-emotional development.

The goal of the current study was to expand on research that links student achievement to high-quality teacher-child interactions. The current study built on previous research by examining the effects of classroom features including teacher-child interactions, teacher education, and curriculum on children's academic and social-emotional achievement.

Research Question 1: To what extent is a child's socioeconomic status related to structural features including type of curriculum used, teacher education, and a classroom's overall physical quality?

Results from the present study indicate that socioeconomic status is related to exposure to high-quality classroom resources, as measured in these data. For instance, compared to non-poor children, children from extreme-poor and poor families were more likely to experience classrooms that were rated low on dimensions of emotionally supportive environments, physical surroundings and teachers with less years of education. There was little difference between income groups in regard to exposure to a particular type of curriculum. Compared to non-poor children, extreme-poor and poor children were just as likely to be taught by teachers utilizing the High Scope or Creative Curriculum. This is not surprising due to many state funded programs requiring the use of these particular types of curriculum.

Research Question 2: To what extent is a child's socioeconomic status related to process features such as teacher-child interactions?

The present study reveals that exposure to high quality teacher-child interactions and instructional support as measured by CLASS varies by children's socioeconomic status. Compared to poor and non-poor children, children from extreme-poor families were less likely to be in classrooms with teachers who were observed as being enthusiastic and promoting creative thinking. Findings also indicate that children from poor families experienced these types of interactions more than extreme-poor and non-poor children. State funded programs primarily aim to serve lower income families; therefore, this does come as some good news that state funded programs are exposing children from poor backgrounds to supportive teacher-child interactions. More importantly, this also suggests that children from the lowest income families rarely encountered positive teacher-child interactions. This may guide further research in examining state funded classrooms which serve the highest proportion of children from the lowest income families.

Research Question 3: How are these features associated with the growth of children's language outcomes and social-emotional development?

The findings of the present study align with null findings in other recent research, demonstrating that structural features such as teacher education level and curriculum show little relationship to children's outcomes. In each of the regression models, income appears to be negatively predictive of children's expressive and receptive language achievement as well as their social-emotional development, indicating that income does explain some of the variation with these scores. Results from the regression analyses emphasize the importance of positive teacher-child interactions. Children's academic and social-emotional skills were highly associated with classroom ratings of emotional support. Classrooms that were rated as having positive teacher-child interactions were found to be related to children's academic and social-emotional skills. Children who were in these types of classrooms achieved higher scores on tests of receptive and expressive language, higher ratings of social skills, and lower ratings of problem behaviors.

5.1.1 Limitations

First, the study is limited by the emphasis on specific states that have above-average levels of investment in pre-k education. The sample only included state funded pre-k programs. Further, the selected programs were chosen based on their goal of kindergarten readiness. Thus, the presented results do not provide a representative picture of all early education programs.

Another limitation deals with data collection methods of the study. Information was obtained from children, parents, teacher and administrators using surveys, observations, and interviews.

In each of these methods of data collection, there is some concern with measurement error. Administrations and parents may have misread or misinterpreted questions on surveys, leading to inaccurate interpretation. Further, classroom quality was based on observations. Thus, there may be a chance for error in regards to reliability and validity. During the two years of the study, data collectors remained with the project. Prior to pre-k data collection, data collectors were trained on measures used. For the ECERS-R assessment, data collector's mean weighted kappa was .65. For the CLASS assessment, Data collector's mean weighted kappa was .67 on their final test (Early et al., 2005).

5.1.2 Policy Implications

State funded pre-k programs are rapidly expanding, with participation becoming a common occurrence for young children. Therefore, identifying specific program features that contribute to children's achievement outcomes is essential. The present study finds that gains in children's academic and social-emotional development vary as a function of classroom features, particularly the emotional and instructional climate of the classroom. These findings have implications for state and program development efforts.

The results from this study are consistent with research demonstrating the importance of supportive emotional classroom environments. Although the effects of structural features such as teacher education, type of curriculum, and physical quality of a classroom on children's academic and social-emotional outcomes were null in these data, I do not infer that these features are irrelevant to educational outcomes more broadly. Rather, my primary interpretation is that it is more efficient and effective to direct resources towards professional development regarding

emotionally supportive classrooms and teachers. Policy makers and program administrators should consider incorporating professional development into state funded pre-k programs that would encourage and promote positive teacher-child interactions. Support for these efforts has the potential to positively impact children's language and social-emotional development. Further research could be conducted to examine the effectiveness and implementation of professional development efforts regarding positive teacher-child interactions in state funded pre-k classrooms.

A primary goal in state initiatives of early education programs is to foster and promote children's development, ultimately preparing them for kindergarten. The present study finds little evidence that requiring the use of a specific type of curriculum or having a teacher with more years of education will help achieve this goal. The findings of the current study pose a need for more in-depth research regarding the relationship of structural quality and process quality in state funded pre-k classrooms. While expansion of these programs is indeed vital to ensuring that more children are participating in early education programs, the current emphasis on structural features may not adequately promote children's school readiness. To achieve the goal of state funded pre-k programs, it is crucial that the importance of high quality teacher-child interactions be emphasized.

Effective ways to ensure that children are experiencing rich and supportive teacher-child interactions may involve efforts that promote the design and implementation of professional development programs that highlight positive interactions. Studies have shown evidence that teachers who receive training and coaching on teacher-child interactions improve their practices, and children in these classroom's display gains in academic, social, and self-regulatory development (Hamre, 2014).

An example of an effective professional development strategy is MyTeachingPartner (MTP), a web-based initiative. The framework for MTP is that effective professional development for pre-k teachers requires opportunities for (1) access to video exemplars of high-quality teacher–child interactions that are tied to specific dimensions of the CLASS assessment and (2) a consultation process that provides regular, ongoing, targeted feedback to pre-k teachers through a standardized protocol that focuses on specific dimensions of teachers’ emotional, organizational, and instructional interactions with children (Pianta, Mashburn, Downer, Hamre, Justice, 2008). All observations of classroom interactions, as well as feedback and support for teachers are based upon the CLASS assessment.

The effects of MyTeachingPartner were investigated in a two year experimental study. Researchers assigned 113 state-funded pre-k teachers to two groups. One condition consisted of receiving access to videos of high-quality interactions and on-line consultation and feedback. The other condition only received access to videos of high-quality interactions. Teachers in each group videotaped themselves conducting an activity in their classroom, submitting the video every two weeks. Teachers in the consultation group were contacted by consultants to review their videos. Interactions between teachers and consultants focused on (1) observing and identifying a teacher’s behaviors with students and their effects; (2) problem-solving to identify and implement alternative approaches as needed and receiving feedback on such attempts; and (3) establishing a non-judgmental and non-evaluative supportive relationship with a knowledgeable individual (Pianta et al., 2008). The quality of these interactions shown on each video was rated using dimensions of the CLASS assessment.

The findings of this study revealed that teachers who were assigned to receive on-line consultation and feedback regarding their interactions showed greater increases in their ratings of

the quality of interactions than those who only received access to on-line videos (Pianta et al., 2008). A crucial finding is that the positive effects of the on-line consultation were especially evident in classrooms with high proportions of children from high poverty backgrounds. This implies that strategies incorporating consultation and feedback for teachers in high-risk classrooms may be an effective way to improve both teachers' interactions with the children as well as an overall promotion of children's learning and development.

The results of this study indicate that the quality of state-funded pre-k teachers' social and instructional interactions with students can improve with effective professional development programs that are focused on such interactions. Support is provided for professional development initiatives designed for teachers in state-funded pre-k classrooms that are focused on their interactions in the classroom and providing individualized feedback and support. Given the strong effects of teacher-child interactions on children's development as seen in the present study as well as other recent research, the use of professional development programs that focus on supporting positive classroom interactions can be a critical feature to ensuring that state-funded pre-k programs achieve their goal of combating the achievement gap and fostering children's development, particularly for children most at-risk of early school failure.

APPENDIX

Table 1. Independent Variables and Measures

Variables	Measures
Child Characteristics	
Family Household Income	Yearly income (Extreme-poor/Poor/Non-poor)
Program Characteristics (Structural Level)	
Overall Quality of Classroom Teaching and Interactions (Factor1) Provision for Learning (Factor 2)	Early Childhood Environmental Rating Scale (ECERS)
Teacher Education	Highest level of education (Less than Associates/ Associates/ Bachelors/ More than Bachelors)
Curriculum	Type of curriculum used (High Scope or Creative Creative/Other)
Program Characteristics (Process Level)	
Teacher Child Interactions Emotional Climate (Factor 1) Instructional Climate (Factor 2)	Classroom Assessment Scoring System (CLASS)

Table 2. Dependent Variables and Measures

Variable	Measure
Children's Achievement Outcomes	
Receptive language scores Spring 2002	Peabody Picture Vocabulary Test 3 rd edition (PPVT-III)
Expressive language scores Spring 2002	Oral & Written Language Scale (OWLS)
Children's Social-emotional Outcomes	
Social competence score Spring 2002	Teacher Child Rating Scale (Hightower)
Problem behavior score Spring 2002	

Table 3. Descriptive Statistics for Child Level Characteristics

Variable	OBS	Mean	SD	Range
Gender				
Male	496			
Female	519			
Race				
African American	240			
Asian American	14			
Latino	250			
Native American	5			
Multiracial	82			
White	404			
Income				
Extreme-poor	298			
Poor	386			
Non-poor	269			
Child Outcomes (Language)				
PPVT-III fall scores	805	92.30	14.02	32-134
PPVT-III spring scores	855	94.89	13.63	48-137
OWLS fall scores	789	91.07	12.24	52-131
OWLS spring scores	850	93.76	12.59	58-135
Child Outcomes (Social-emotional)				
Social Competence fall scores	927	1.68	.47	1-2
Social Competence spring scores	949	1.75	.43	1-2
Problem behavior fall scores	927	1.18	.39	1-2
Problem behavior spring scores	946	1.14	.35	1-2

Table 4. Descriptive Statistics for Program Level Characteristics

Variable	Obs	Mean	SD	Range
Program Characteristics (Structural Level)				
Overall Quality of Classroom				
ECERS-Teaching and Interactions (Fall)	962	4.42	1.29	1.36 - 7
ECERS-Provisions for Learning (Fall)	962	3.80	.95	1 - 6.25
ECERS-Teaching and Interactions (Spring)	1015	4.45	1.22	1.18 - 6.73
ECERS-Provisions for Learning (Spring)	1015	3.81	.88	1.08 - 6.33
Teacher education				
Less than Associates	232			
Associates	184			
Bachelors	182			
More than Bachelors	411			
Curriculum				
High Scope/Creative Curriculum	520			
Other	474			
Program Characteristics (Process Level)				
Teacher-Child interactions				
CLASS Emotional Climate (Fall)	965	5.23	.76	2.49 - 6.83
CLASS Instructional Climate (Fall)	965	2.48	1.11	1 - 5.78
CLASS Emotional Climate (Spring)	1015	5.34	.75	2.35 - 6.64
CLASS Instructional Climate (Spring)	1015	1.95	.82	1 - 4.33

Table 5. Chi-Square Values for CLASS Factor 1: Comparisons of Fall and Spring Emotional Climate Ratings by Children’s Socioeconomic Status

Income	CLASS Emotional Fall		CLASS Emotional Spring	
	Low-Mid Range	High range	Low-Mid Range	High Range
<u>Extreme-poor</u>				
Observed	114	163	100	198
%	35.08%	27.91%	38.61%	28.53%
Expected	99	178	81	217
<u>Poor</u>				
Observed	133	236	94	292
%	40.92%	40.41%	36.29%	42.07%
Expected	131	237	104	281
<u>Non-poor</u>				
Observed	78	185	65	204
%	24%	31.68%	25.10%	29.39%
Expected	94	169	73	195
$\chi^2=$	7.7865		8.9194	
Significance	<i>P=.020</i>		<i>P=.012</i>	

Table 6. Chi-Square Values for CLASS Factor 2: Comparisons of Fall and Spring Instructional Climate Ratings by Children’s Socioeconomic Status

Income	CLASS Instructional Fall		CLASS Instructional Spring	
	Low-Mid Range	High range	Low-Mid Range	High Range
<u>Extreme-poor</u>				
Observed	236	41	260	38
%	33.19%	20.71%	31.90%	27.54%
Expected	216	60	254	43
<u>Poor</u>				
Observed	287	82	326	60
%	40.37%	41.41%	40%	43.48%
Expected	288	80	330	55
<u>Non-poor</u>				
Observed	188	75	229	40
%	26.44%	37.88%	28.10%	28.99%
Expected	205	57	230	39
$\chi^2_{=}$	14.9666		1.1047	
Significance	<i>P<..001</i>		<i>P=..576</i>	

Table 7. Chi-Square Values for ECERS-R Factor 1: Comparisons of Fall and Spring Teaching and Interactions Ratings by Children’s Socioeconomic Status

Income	ECERS-R Interactions Fall			ECERS-R Interactions Spring		
	Low Range	Mid Range	High Range	Low range	Mid Range	High Range
<u>Extreme-poor</u>						
Observed	82	114	87	54	158	86
%	46.33%	29.16%	25.59%	45.38%	32.71%	24.50%
Expected	55	121	106	37	151	109
<u>Poor</u>						
Observed	76	148	139	47	195	144
%	42.94%	37.85%	40.88%	39.50%	40.37%	41.03%
Expected	70	156	135	48	195	142
<u>Non-poor</u>						
Observed	19	291	114	18	130	121
%	10.73%	32.99%	33.53%	15.13%	26.92%	34.47%
Expected	51	112	98	33	136	99
$\chi^2=$	42.8911			25.4755		
Significance	<i>P<.001</i>			<i>P<.001</i>		

Table 8. Chi-Square Values for ECERS-R Factor 2: Comparisons of Fall and Spring Provisions for Learning Ratings by Children’s Socioeconomic Status

Income	ECERS-R Provisions Fall			ECERS-R Provisions Spring		
	Low Range	Mid Range	High Range	Low range	Mid Range	High Range
<u>Extreme-poor</u>						
Observed	75	180	28	76	203	19
%	36.79%	29.56%	29.47%	43.68%	29.81%	19.39%
Expected	63	189	29	54	212	30
<u>Poor</u>						
Observed	79	244	40	63	282	41
%	38.73%	40.07%	42.11%	36.21%	41.41%	41.84%
Expected	81	243	38	70	275	39
<u>Non-poor</u>						
Observed	50	185	27	35	196	38
%	24.51%	30.38%	28.42%	20.11%	28.78%	38.78%
Expected	58	175	27	49	192	27
$\chi^2_{=}$	4.6642			22.4248		
Significance	<i>P= .324</i>			<i>P< .001</i>		

Table 9. Chi-Square Values for Comparisons of Curriculum used and Children’s Socioeconomic Status

Type of Curriculum			
Income		High Scope / Creative Curriculum	Other Curriculum
<u>Extreme-poor</u>			
	Observed	150	136
	%	30.67%	30.20%
	Expected	148	136
<u>Poor</u>			
	Observed	204	179
	%	41.72%	40.04%
	Expected	200	182
<u>Non-poor</u>			
	Observed	135	133
	%	27.61%	29.75%
	Expected	140	128
$\chi^2=$		0.5528	
Significance		<i>P=.759</i>	

Table 10. Chi-Square Values for Comparisons of Teacher’s Education Level and Children’s Socioeconomic Status

Teachers Highest Level of Education					
Income		Less than Associates	Associates	Bachelors	More than Bachelors
<u>Extreme-poor</u>					
	Observed	83	68	43	99
	%	38.43%	39.08%	25.29%	25.58%
	Expected	66	53	52	119
<u>Poor</u>					
	Observed	88	74	71	152
	%	40.74%	42.53%	41.76%	39.28%
	Expected	87	70	69	157
<u>Non-poor</u>					
	Observed	45	32	56	136
	%	20.83%	18.39%	32.94%	35.14%
	Expected	61	49	48	109
$\chi^2=$		31.2829			
Significance		<i>P<.001</i>			

Table 11. ANOVA Table and Descriptive Statistics of Spring Receptive Language Scores by Children's Socioeconomic Status

Income Level	<i>n</i>	<i>M</i>	<i>SD</i>		
Extreme-poor	223	91.12	13.08		
Poor	328	92.93	12.71		
Non-poor	253	101.30	13.32		
Source	SS	DF	MS	F	P
Between Groups	1496.668	2	7398.334	43.74	<.001
Within Groups	135493.705	801	169.155		
Total	150290.373	803	187.116		

Table 12. ANOVA Table and Descriptive Statistics of Spring Expressive Language Scores by Children's Socioeconomic Status

Income Level	<i>n</i>	<i>M</i>	<i>SD</i>		
Extreme-poor	222	91.08	11.15		
Poor	325	92.38	12.31		
Non-poor	252	98.60	12.96		
Source	SS	DF	MS	F	P
Between Groups	807.006	2	4035.003	27.03	<.001
Within Groups	118810.842	796	149.259		
Total	126880.849	798	158.998		

Table 13. ANOVA Table and Descriptive Statistics of Spring Teacher Ratings of Children's Social Skills by Children's Socioeconomic Status

Income Level	<i>n</i>	<i>M</i>	<i>SD</i>			
Extreme-poor	270	3.52	.76			
Poor	362	3.56	.75			
Non-poor	259	3.71	.76			
Source	SS	DF	MS	F	P	
Between Groups	5.476	2	2.738	4.73	0.009	
Within Groups	513.753	888	.578			
Total	519.230	890	.583			

Table 14. ANOVA Table and Descriptive Statistics of Spring Teacher Ratings of Children's Problem Behaviors by Children's Socioeconomic Status

Income Level	<i>n</i>	<i>M</i>	<i>SD</i>			
Extreme-poor	269	1.52	.56			
Poor	361	1.49	.52			
Non-poor	258	1.40	.50			
Source	SS	DF	MS	F	P	
Between Groups	1.987	2	.993	3.52	0.030	
Within Groups	250.110	885	.282			
Total	252.098	887	.284			

Table 15. Correlations between Dependent and Independent Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1.Spring Receptive Score	1.00												
2.Spring Expressive Score	.65	1.00											
3.Spring Emotional Climate	.17	.12	1.00										
4.Spring Instructional Climate	.20	.10	.33	1.00									
5.Spring Teaching and Interactions	.19	.12	.68	.39	1.00								
6.Spring Provisions for Learning	.15	.11	.43	.26	.65	1.00							
7.Spring Competence	.23	.25	.10	.05	.09	.01	1.00						
8.Spring Behavior	-.18	-.20	-.11	.01	-.04	.01	-.67	1.00					
9.Income	.32	.30	.19	.10	.17	.13	.13	-.13	1.00				
10.Curriculum	.01	-.01	.06	.10	-.06	-.25	.03	-.03	.07	1.00			
11.Teacher Education	.06	.01	.01	.17	-.02	-.20	.04	-.08	.11	.20	1.00		
12.Child Gender	-.00	.06	.01	-.01	-.01	.01	.17	-.18	-.04	-.01	-.01	1.00	
13.Child Race	.34	.26	.15	.07	.18	.09	.06	-.07	.25	.08	.02	.01	1.00

Table 16. Multiple Regression Analysis for Variables Predicting Children’s Spring Receptive and Expressive Language Achievement (N=960)

	Model 1		Model 2		Model 3	
	Receptive Coeff (SE)	Expressive Coeff (SE)	Receptive Coeff (SE)	Expressive Coeff (SE)	Receptive Coeff (SE)	Expressive Coeff (SE)
Extreme-poor	-7.49 (1.16)***	-5.98 (1.12)***	-1.28 (.91)	-.54 (.84)	-1.09 (.95)	-.67 (.88)
Poor	-6.59 (1.05)***	-5.27 (1.01)***	-1.68 (.81)**	-.99 (.74)	-.68 (.84)	-.67 (.77)
Female	.36 (.43)	1.11 (.42)**	-.49 (.34)	-.04 (.31)	-.61 (.35)	-.03 (.32)
White	8.5 (1.06)***	6.81 (1.02)***	1.60 (.84)*	.16 (.78)	1.38 (.89)	-.37 (.82)
African American	-.98 (1.18)	2.1 (1.12)	-1.26 (.92)	.92 (.85)	1.36 (.98)	.59 (.91)
Fall Receptive Scores			.53 (.03)***	.19 (.03)***	.51 (.03)***	.57 (.03)***
Fall Expressive Scores			.22 (.03)***	.57 (.03)***	.30 (.03)***	.20 (.03)***
Fall Social Skills			1.06 (.61)	1.15 (.56)*	1.14 (.64)	1.27 (.59)*
Fall Problem Behaviors			-.85 (.88)	-.49 (.81)	-.81 (.91)	-.28 (.84)
CLASS Emotional					.70 (.56)	.78 (.52)
CLASS Instructional					.56 (.35)	.40 (.32)
ECERS Teaching & Interactions					.47 (.43)	.36 (.40)
ECERSR Provisions & Learning					.37 (.49)	-.00 (.45)
High Scope/Creative					-.20 (.70)	.65 (.65)
Less than Associates					-.31 (.96)	1.14 (.89)
Associates					-.04 (.50)	.01 (.46)
Bachelors					-.09 (.32)	.32 (.29)
	R ² =.20	R ² =.12	R ² =.60	R ² =.57	R ² =.60	R ² =.58

* $P < .05$ ** $P < .01$ *** $P < .001$

Table 17. Ordered Probit Regression Analysis for Variables Predicting Children’s Spring Social Competence (N=960)

	Model 1		Model 2		Model 3	
	Social Competence Coeff (SE)	Behavior Problems Coeff (SE)	Social Competence Coeff (SE)	Behavior Problems Coeff (SE)	Social Competence Coeff (SE)	Behavior Problems Coeff (SE)
Extreme-poor	-.30 (.10)**	.28 (.09)**	-.10 (.10)	.10 (.10)	-.13 (.11)	.03 (.11)
Poor	-.30 (.10)**	.28 (.08)**	-.10 (.09)	.10 (.09)	-.10 (.09)	.02 (.19)
Female	.17 (.03)***	-.21 (.03)***	.07 (.04)	-.09 (.04)**	.07 (.04)	-.10 (.04)*
White	.08 (.08)	-.01(.08)	-.10 (.10)	.14 (.10)	.15 (.10)	.20 (.10)
African American	-.05 (.08)	.14 (.09)	-.12 (.10)	.27 (.11)**	.33 (.11)	.35 (.11)
Receptive Scores			-.01 (.07)	-.01 (.01)	.02 (.01)	-.02 (.01)
Expressive Scores			.01 (.07)***	-.01 (.01)***	.08 (.01)	-.02 (.01)
Social Skills			1.06 (.07)***	1.47 (.11)***	1.13 (.08)***	1.43 (.11)***
Problem Behaviors			-.35 (.10)	-.24 (.07)	-.35 (.10)***	-.27 (.07)***
CLASS Emotional					.17 (.06)	-.10 (.06)
CLASS Instructional					.13 (.04)	-.10 (.04)
ECERS Teaching & Interactions					.05 (.05)	-.05 (.05)
ECERSR Provisions & Learning					.03 (.05)	-.07 (.05)
High Scope/Creative					.08 (.03)	-.02 (.08)
Less than Associates					-.22 (.11)*	.09 (.11)*
Associates					.05 (.05)**	.03 (.06)
Bachelors					.08 (.03)	.02 (.03)
	Pseudo R ² =.01	Pseudo R ² =.01	Pseudo R ² =.07	Pseudo R ² =.09	Pseudo R ² =.08	Pseudo R ² =.09

P* <.05 ** *P* <.01 * *P* <.001

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