

**A Comparative Study of Low-Income Students Who Attended Preschool and Those Who
Did Not Attend Preschool on Their Academic Performance in Second Grade**

By: Gabrielle Mardis

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Major Professor:

Dr. Patrick Kariuki

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Abstract

The purpose of this study was to compare the academic achievement of low-income students who attended preschool and those who did not to determine if preschool attendance benefits low-income students academically. The participants of this study consisted of 2nd grade students from a local Title 1 elementary school in Johnson City, Tennessee. Data were collected using parents' questionnaire to obtain demographical data. Student's academic performance was determined by STAR test scores, ELA checkpoint scores, and Math scores from the beginning of the year. Data collection also included obtaining information from the district about which students qualified for free or reduced lunch to determine income level. The results of this study suggests that academic benefits of students who attend preschool over those who do not attend wanes as the students progress through the grade levels. The results indicated no significant difference between the students who attended preschool and those who did not attend on their scores in STAR test, ELA checkpoint and math.

Keywords: Preschool, academic achievement, second grade

Institutional Review Board Approval

Date: December 1, 2021

Principal Investigator: **Gabrielle Mardis**, Graduate Student, Milligan University
From: The Institutional Review Board (IRB) at Milligan University
Project: *A Comparative Study of Low-Income Students Who Attended Preschool and Those Who Did Not Attend Preschool on Their Academic Performance in Second Grade*
IRB Tracking Number: **2021-17**
Submission type: Expedited Review (**Initial** Approval)

On behalf of the Milligan University Institutional Review Board (IRB), we are writing to inform you that the above-mentioned study has been initially approved as expedited. You have yet to fulfill the IRB requirements for Milligan University for this study.

Final approval is contingent upon documentation from ALL institutions or organizations that you will use in your study. Please secure documentation of approval from the institutions or organizations that have the responsibility for your proposed study participants and forward these approvals to the Milligan IRB Committee.

If any cooperating institutions have questions or concerns about your study approval, please feel free to direct them to me, Trini Rangel, by email at IRB@milligan.edu or by phone at 423.461.8725.

Sincerely, and on behalf of the IRB Committee,

Trini Rangel, Ph.D.
Chair, Institutional Review Board
Milligan University
IRB@milligan.edu



Chapter 1

Introduction

Preschool attendance is a choice every parent makes. Whether or not a child attends preschool is determined by a plethora of outside factors; however, it is most commonly determined by income. Researchers argue a variety of outcomes in regards to preschool attendance and academic achievement. Consistently over time many researchers agree that preschool attendance allows children to start elementary school on an equal playing field; however, there is debate over the extent and length of positive academic effects. There are inconsistencies between reports of how long effects of preschool last due to research methods, contexts, and variables. (Lee & Loeb, 1995; Yoshikawa et al, 2016; Dickinson & Porche, 2011; Tucker-Drob, 2012; Fateel, 2021). No study is the same, yet each study connects to the other by addressing that there is some type of relationship between academic achievement in the early elementary years and preschool attendance, especially for low income students. Chapter two provides a more in-depth discussion of these studies. This study in particular focuses on comparing low income students who attended preschool to those who did not. This study analyzes the difference among students based on a number of assessments in second grade including STAR reading scores from the end of first grade and beginning second grade, spelling inventories, math pre-assessments, and curriculum-based measurements. These scores are analyzed with regard to socioeconomic status to determine if students from low income families are benefiting academically from preschool attendance. SHOULD BE 4 PAGES

Statement of the Problem

It is no question that there is a gap in academic achievement between students from low income families and their higher income peers. This achievement gap was more vividly brought to light with the creation of Head Start in 1965. Lyndon B. Johnson began Head Start as an eight-week summer program for families with children to fight the war on poverty. In 1966, this program was turned into a full school year program. This full school year program known as Head Start still remains today (*Head Start*). Head Start is just one type of preschool that is analyzed. Head Start and other preschool programs target low income students and are designed to close the achievement gap between income levels. As the name implies, Head Start gives low income students beginning kindergarten a head start on learning to give them a more even playing ground as their higher income peers. Since Head Start and other preschool programs are designed for the purpose of elevating the academic achievement of low-income students, it makes sense to assess if the purpose of these programs are coming to fruition in the lower elementary grades.

Purpose of the Study

The purpose of this study is to compare the academic achievement of low-income students who attended preschool and those who did not to determine if preschool attendance benefits low-income students academically.

Significance of the Study

No matter the family income level, making a choice about preschool attendance is a decision parents must make. This decision can be even more daunting for lower income families who do not have many options. One thing that can help parents/guardians make this decision and feel more confident in their choice is knowing the effects of preschool attendance on their child's academic achievement in lower elementary grades. It is also important for preschool facilities to

know the impact they are having. Having this information can help preschools evaluate their curriculum and improve or continue their current curriculum based on the results of this study.

Limitations

1. This study only focuses on students from one school in one school district.
2. This study does not analyze the type of preschool attended by students or the type of curriculum used at each preschool attended.

Definitions

1. Academic Achievement- For the purpose of this study, academic achievement refers to the scores received on STAR reading scores from the end of first grade and beginning second grade, spelling inventories, math pre-assessments, and curriculum-based measurements.
2. Head Start- Lyndon B. Johnson began Head Start as an eight-week summer program for families with children to fight the war on poverty. In 1966, this program was turned into a full school year program. This full school year program known as Head Start still remains today (Early Childhood).
3. Title I- Title I of the Elementary and Secondary Education Act issues grants to schools who have at least 40% of their student population defined as low-income. This is determined by the U.S. department of education by statutory formulas that are based on census poverty estimates and cost of education in each state (Department of Education).
4. Socioeconomic Status- The social standing or class of an individual or group. This is measured by a combination of education, income, and occupation.
5. Low-income- For the purpose of this study low-income refers to if a student qualifies for free or reduced lunch and fee waiver through their school.

Overview

This study is made up of five chapters. Chapter one gives an introduction of the study; offers a statement of the problem, purpose, and significance of the study; describes the limitations; defines important terms; and offers an overview. Chapter two offers a review of the related literature. Chapter three explains the methodology and procedures of the study. Chapter four presents the data analysis. Chapter five analyzes the finding, concludes the study, and offers implications and recommendations of the research.

Chapter 2

Related Literature Review

Introduction

The effects of preschool attendance are a greatly debated topic in the world of education. Not only do educators and researchers have different views on the relationship between preschool attendance and academic success, but parents also want to know if and what type of relationship there is. To add on to this, educators and researchers also think there are more than just academic effects of preschool attendance. Many studies show academic effects as well as social and behavioral effects of attending preschool. In the studies discussed below each researcher takes a slightly different approach to studying the effects of preschool attendance. Some look strictly at academics and others look more holistically. The purpose of this study was to examine the academic achievement of low-income students as it pertains to preschool attendance. However, it is beneficial to understand related research that includes social and behavioral effects of preschool attendance as well.

This chapter focuses on the literature related to the purpose of this study which was to compare the academic achievement of low-income students who attended preschool and those who did not to determine if preschool attendance benefits low-income students academically. This chapter is divided into the following sections: a) introduction, b) short term advantages of preschool, c) long term advantages of preschool, d) academic achievement gaps between socioeconomic levels, e) non-academic effects of preschool attendance, and f) conclusion.

Short Term Advantages of Preschool

Some researchers have concluded that there are benefits for preschool attendees; however, the benefits are for only a short period of time. Lee and Loeb argue through a

conceptual framework in their article, “Where Do Head Start Attendees End up? One Reason Why Preschool Effects Fade out”, that preschool attendance allows children to start elementary school on an equal playing field; however, slowly the positive cognitive effects of preschool fade away due to lack of follow up compensatory education (Lee & Loeb, 1995). They argue that studies will show advantages to preschool attendance when examined within the restraints of K-3. Lee and Loeb conducted a study of the quality of schools eighth grade students who attended preschool are attending. Their results proved that students who attended Head Start are educated in lower quality middle schools than their peers who did not attend Head Start and compared to peers who attended other types of preschools. They used this to conclude that there may be advantages in academic performance in grades K-3; however, these advantages will fade out as students continue through school (Lee & Loeb, 1995).

Arya Ansari and Robert Pianta conducted research that compliments Lee and Loeb’s research. They noticed that preschool programs yield mixed results regarding long term effects of attendance. To help decipher mixed results from other studies they looked into how preschool attendance can affect academics based on subsequent quality of education. They found that preschool benefits persist only for children who attend a quality elementary school after attending preschool (Ansari & Pianta, 2018). They found that three-fourths of the short term benefits they saw from preschool attendance faded out quickly for children who attended lower quality elementary schools (Ansari & Pianta, 2018).

While Lee and Loeb specifically researched Head Start, Yoshikawa agrees in her article, “When Does Preschool Matter?”, that long term effects may not be prevalent, but reports evidence that preschool, as a broader term than Head Start, does boost children’s language, literacy, and math skills in the short term (Yoshikawa et al, 2016). Yoshikawa states attending

preschool helps close the income-based gaps when beginning school. Through her examination she found that as schooling progresses these gaps don't tend to get larger, so intervening before children begin school is the best time to intervene through the attendance of preschool (Yoshikawa et al, 2016). According to the Census Bureau Current Population Survey, 66 percent of four-year-olds and 43 percent of three-year-olds were enrolled in preschool in 2010 (Yoshikawa et al, 2016). Results from a meta-analysis of quantitative research synthesized over several decades showed that one year of preschool had an average cognitive impact that was comparable to three months of additional learning (Yoshikawa et al, 2016). Another experimental evaluation reviewed by Yoshikawa showed preschool attendance reduces grade retention and special education placement (Yoshikawa et al, 2016).

In a study conducted by Carolyn Hill, her results were different than the previous ones mentioned. The purpose of her study was to investigate the persistence of short-term effects of preschool programs in Tulsa, Oklahoma (Hill, 2015). She studied two cohorts of third grade students in Tulsa, Oklahoma who attended preschool and who did not attend preschool. She used boosted regression and propensity score methods to compare the two groups of students who went to preschool versus those who did not. She found that early gains attained from preschool persisted in math for boys but not for girls. She found that early gains from preschool did not persist for reading (Hill, 2015).

Kathryn Taylor and colleagues conducted a comparative study of preschool attendance and kindergarten readiness in Georgia. They studied 171 students. 81 of these students attended preschool and 90 did not attend preschool (Taylor et al, 2000). They used the Georgia Kindergarten Assessment Program as the data for their study. Students who attended preschool had higher overall school readiness, higher physical scores, and higher personal scores than those

who did not attend preschool (Taylor et al, 2000). Their results showed no difference between students who attended preschool based on the type of preschool attended. Their results showed one gender difference. Girls from both groups scored higher on the social measure (Taylor et al, 2000). This seems to be unrelated to preschool attendance.

A study conducted by Regena Nelson analyzed preschools as well as home child care to see if both could have positive effects on kindergarten readiness. The purpose of her study was to determine if the environment a child is in before starting kindergarten is a “ready environment” (Nelson, 2009). She described ready environments as “environments that provide opportunities for cognitive and social growth through culturally and developmentally appropriate activities, interactions, and materials” (Nelson, 2009). She used kindergarten assessments and questionnaires from the Early Childhood Longitudinal Study-Kindergarten Cohort database. She analyzed 10,000 kindergarten children to determine if their home or preschool attendance had an impact on kindergarten readiness. The results showed that students who stayed at home had a positive learning approach, but lower achievement. Students who attended preschool had significantly higher reading and math achievement (Nelson, 2009).

Long Term Advantages of Preschool

While some researchers mentioned above have concluded there are only short-term advantages for preschool attendees, many researchers have also found long term advantages. Dickinson and Porche conducted a longitudinal study of the relationship between language experiences in preschool classrooms and kindergarten and fourth grade language and reading abilities (Dickinson & Porche, 2011). In their article, “Relation Between Language Experiences in Preschool Classrooms and Children's Kindergarten and Fourth-Grade Language and Reading Abilities”, there is considerable evidence in their study that language support in preschool has

lasting effects on later reading comprehension (Dickinson & Porche, 2011). They conducted a study of 83 children who attended preschool dispersed among 65 classrooms. They gathered tape recordings of what was said in their preschool classrooms and developed a word list of low frequency words and how often they were heard or used in the classroom. When these students were in kindergarten and again in fourth grade, they were given tests to examine growth in language and literacy. They established four criteria to determine significant relation between preschool measures and grade four outcomes, kindergarten assessment and preschool measures, kindergarten and grade four assessments, and the relation between preschool measures and grade four outcomes. Their results showed an association between low frequency word conversations in preschool and grade four reading comprehension assessments (Dickinson and Porche, 2011).

Arthur Reynolds and his colleagues at Cambridge University conducted a three-study analysis of the paths of effects of preschool attendance to educational attainment at age 21 (Reynolds et al, 2010). They found that the most consistently observed long term effect of preschool is educational attainment. They mentioned that other effects including economic well-being, parenting behaviors, health status, and mental health were also observed; however, the most consistent finding was that preschool attendance increased the likelihood of higher educational attainment. They concluded this by studying high school completion rates, years of education, college attendance, and other higher education attainment (Reynolds et al, 2010). Suh-Ruu Ou and Arthur Reynolds conducted another study that favored these same results. In this study they examined several model preschool programs. They found that High/Scope Perry Preschool Program attendees had higher rates of high-school graduation (Ou & Reynolds, 2004). Another model they studied was the Abecedarian Project. Attendees from this model were found to have a higher rate of attending four-year universities (Ou & Reynolds, 2004). Another preschool

model they studied was the Chicago Child-Parent Center. These attendees showed higher rates of school completion. One model they studied that showed mixed results was the Head Start program (Ou & Reynolds, 2004).

Similar to Carolyn Hill's study mentioned in the section about short term effects, Lousie Miller and Rondeall Bizzell conducted a study on long term effects that resulted in findings different for males and females. They conducted a study of students in sixth, seventh, and eighth grade who attended different types of preschool programs (Miller & Bizzell, 1983). The IQ and school achievement of these students was analyzed. They found that IQs did not differ significantly across programs. However, they did find that reading and math scores differed based on the type of preschool attended and gender. Males who attended nondidactic programs were significantly higher in achievement than males from the didactic programs (Miller & Bizzell, 1983). Females from didactic programs were slightly higher than females who attended nondidactic programs. Males who attended Montessori programs were the highest achieving students studied (Miller & Bizzell, 1983).

The High/Scope Perry Preschool Study is a famous study and one of the first studies of the effects of preschool for children born in poverty. This study followed 123 African American children randomly selected in two groups (Schweinhart, 2003). One group consisted of preschool attendees and the other group was non-preschool attendees. This study is famous because it followed these 123 children from age three to forty-one. The study found evidence for the conclusion that preschool has both short term and long-term benefits. It concluded that preschool attendance effects children's readiness for school at an early age as well as effects their future educational success, economic success, and criminal arrests (Schweinhart, 2003). This study saw very distinct effects of preschool; however, there were limitations to this study. One reason they

might have seen such a distinct difference in preschool attendance is due to the fact that they catered a preschool program specifically for this study. All students randomly chosen who were part of the preschool attendee group went to the same preschool designed for this study. It is hard to compare this study to other preschool programs not designed for the purpose of a study. The strength of this study is how long the participants were studied. It is rare to have a study of this length that follows individuals from age three to forty-one.

Academic Achievement Gaps Between Socioeconomic Levels

Between the literature reviewed so far there have been some varying perspectives. Lee, Loeb, and Yoshikawa would agree that ultimately there are early positive academic effects that fade out over time. On the other hand, Dickinson and Porche would argue that their study showed lasting effects up to their variable of fourth grade. Another researcher, Elliot Tucker-Drob at the University of Texas adds to the conversation with his article, “Preschools Reduce Early Academic-Achievement Gaps: A Longitudinal Twin Approach”. He conducted a longitudinal study using twins to show that preschools reduce the early academic achievement gaps (Tucker-Drob, 2012). His research resulted in a major finding that preschool enrollment at age four is associated with substantially reduced family-level influence on early reading and math skills. He studied 1,200 twins from 600 families to separate disparities in achievement associated “between family environments” from disparities in achievement associated with the unique “within family environment” and with genes (Tucker-Drob, 2012). In this study, 15% of the twins were enrolled in a Head Start program, 61% in other forms or center based preschool care, and 26% were not enrolled in any center-based care (Tucker-Drob, 2012). Due to the unique nature of his study and the participants in his study, Tucker-Drob was able to examine what others are explaining in their literature; however, unlike some, Tucker-Drob did not study

past early elementary years (Tucker-Drob, 2012). His findings are most similarly consistent with Yoshikawa's findings on short term academic effects of preschool.

In the article, "The Interaction between Socioeconomic Status and Preschool Education on Academic Achievement of Elementary School Students", Fateel conducted a quantitative study of 402 students in grades one through six. Fateel first determined what the level of academic achievement is for different socioeconomic levels. Then, he determined if there was any significant interaction between preschool education and socioeconomic status on academic achievement. His results concluded that achievement gap between socioeconomic groups cannot be eliminated; however, preschool is one of the variables that can help decrease this gap. The results of this study showed that students who attended preschool had better academic achievement than those who did not attend preschool (Fateel, 2021).

Katherine Magnus and colleagues examined the academic achievement gap between socioeconomic levels and the impact it has on kindergarten readiness. They analyzed the effect of preschool attendance on reading and math skills in kindergarten and first grade. Their data showed that the biggest impact of preschool attendance was on disadvantaged groups. They found that disadvantaged groups are less likely to be retained in kindergarten if they attended preschool (Magnus et al, 2004). They used their results to make a case for how policies promoting preschool enrollment for low income families is helping narrow the school readiness gap created by socioeconomic status (Magnus, 2004).

Non-Academic Effects of Preschool Attendance

While this study was not designed to investigate the non-academic effects of preschool attendance, many researchers have found behavioral and social benefits stemming from preschool attendance. In a study conducted by Marcon, three different preschool models were

evaluated in an urban school district. Self-help, social, motor, and adaptive development along with basic skills were assessed. The study included 721 four-year-old children (Marcon, 1999). Children who attended child-initiated play preschools demonstrated higher mastery of basic skills than those attending preschools where academics were the focus. Children in the combination preschool that involved academics as well as child-initiated play did better with self-help skills and development of social coping skills. Girls mastered all skills at a higher level than boys in all areas except gross motor skills (Marcon, 1999).

Another study by Asha Spivak and Dale Farran linked first graders social competence with their preschool classroom interpersonal skills. They studied 862 ethnically and racially diverse children who attended public preschool. They observed 60 preschool classrooms to quantify teacher and student behaviors. They also had preschool and first-grade teachers provide reports of social behaviors (Spivak & Farran, 2016). Multi-level analyses indicated that at the end of first grade students who attended preschool with teachers that were positive and had cooperative interactions with peers had fewer problem behaviors in first grade. This study proved that not only attending preschool has lasting effects on social development, but more specifically preschool teacher's behavior and interactions have lasting effects on social development (Spivak & Farran, 2016).

A study done by Ayra Ansari in 2018 that used data from the Early Childhood Longitudinal Study Kindergarten Cohort of 1998 examined long and short-term academic effects as well as psychosocial effects of preschool (Ansari, 2018). The most interesting finding of this study was in terms of psychosocial effects. When comparing children who attended informal care at age four to those who attended preschool, preschool attendees did better academically from age five through adolescence; however, the preschool attendees had less optimal

psychosocial skills. When examined closer, the study found that negative behavior exhibited by preschool attendees seemed to be concentrated among students who attended preschool for 20 or more hours per week (Ansari, 2018).

Conclusion

From the above discussion, it is clear that most research shows there is, in some way, an academic advantage to attending preschool. The question is, how long does this academic advantage remain prevalent? There are inconsistencies between reports of how long effects of preschool last due to research methods, contexts, and variables. One of these variables is socioeconomic status, which was considered in the majority of studies. Another variable is the type of preschool attended. Lee and Loeb focused on one specific type of preschool known as Head Start. This context gave a more extreme conclusion that eventually all positive effects of preschool fade out (Lee & Loeb, 1995). Yoshikawa used statistical data to set a concrete number, three months, for how much learning growth is seen in early elementary due to preschool attendance (Yoshikawa, 2016). Dickinson and Porche conducted a more unique research design that involved taping conversations in preschool that contained low frequency words and linking it to achievement in kindergarten and fourth grade (Dickinson & Porche, 2011). This research contradicted Lee and Loeb who argue effects would have already faded away by fourth grade (Lee & Loeb, 1995). Tucker-Drob agrees with the other researchers that preschool does have a positive effect on early academic achievement. More specifically, he conducts research about the socioeconomic academic achievement gap reduced by preschool attendance (Tucker-Drob, 2012). No study is the same, yet each study connects to the others by addressing that there is some type of relationship between academic achievement in the early elementary years and preschool attendance. Findings from this related literature help drive the purpose of this study.

Chapter 3

Methodology and Procedures

Introduction

The purpose of this study was to compare the academic achievement of low-income students who attended preschool and those who did not to determine if preschool attendance benefits low-income students academically. This chapter focuses on how this study was conducted including the methodology and procedures. This chapter is divided into the following sections: a) introduction, b) population c) sample d) instrument, e) data collection procedures, and f) research questions and hypotheses.

Population

The population for this study was comprised of students from a public elementary school in Johnson City, TN. This is a Title I school. There were 402 students that attend this school. 48% of the school population was on free or reduced lunch. The median household income for students at this school was \$41,682. 1.3% of students were gifted. The student to teacher ratio was 14:1. 71.1% of the population was white. 10.4% was Hispanic, 8% is Multiracial, 6.5% was African American, and 4% was Asian.

Sample

The participants of this study consisted of 2nd grade students from a local elementary school in Johnson City, Tennessee. Prior to contacting potential subjects, approval was obtained from Milligan University Institutional Review Board and Johnson City Schools. All the parents/guardians of four 2nd grade classes at the local elementary school received a letter asking for participation in this study. This letter provided an outline of the study as well as informed

consent. Only the data of students who returned the informed consent were included in this study.

Instrument

The proposed study is a comparative design that used questionnaire, data collection, and data analysis. A questionnaire and informed consent were given to parents/guardians via their student's folder they take home every Wednesday. First, they answered whether or not their child attended preschool. If their child did attend preschool, they wrote which preschool their child attended. Then, if informed consent was given, the researcher gathered income data from the school district about students who were eligible for free or reduced lunch. The researcher used this questionnaire and data to compare the academic achievement data of low-income students who attended preschool to those who did not attend preschool.

Data Collection Procedures

Permission was sought from the Milligan University IRB and the school district. When all permission was obtained, the study began. Student participation was sought out through paper informed consent in students' green folders. After a majority of students returned signed consent forms, data collection began. Students who returned a signed consent form were then sent home with a parent questionnaire to fill out and return to school. Once students returned their parent questionnaire form which indicated their preschool attendance, the researcher gathered data from the school district to determine which students are eligible for free or reduced lunch. The researcher generated a list of students who qualify for free/reduced lunch to indicate those are the low-income students who were the focus of the study. Next, the researcher divided that list into students who attended preschool and those who did not. The researcher gathered STAR reading

scores, spelling inventories, math assessment scores, and curriculum-based assessments from first grade and second grade for all the low-income students participating in the study. This was compiled in an electronic spreadsheet to compare the students who attended preschool versus those who did not.

Research Questions and Related Hypothesis

Research Question 1: Is there a significant difference in STAR reading level of low-income students who attended preschool versus those who did not?

Research Hypothesis 1: There is a significant difference in STAR reading level of low-income students who attended preschool versus those who did not.

Null Hypothesis 1: There is no significant difference in STAR reading level of low-income students who attended preschool versus those who did not.

Research Question 2: Is there a significant difference in the beginning of the year ELA checkpoint scores of low-income students who attended preschool versus those who did not?

Research Hypothesis 2: There is a significant difference in the beginning of the year ELA checkpoint scores of low-income students who attended preschool versus those who did not.

Null Hypothesis 2: There is no significant difference in the beginning of the year ELA checkpoint scores of low-income students who attended preschool versus those who did not.

Research Question 3: Is there a significant difference in math assessment scores of low-income students who attended preschool versus those who did not?

Research Hypothesis 3: There is a significant difference in math assessment scores of low-income students who attended preschool versus those who did not.

Null Hypothesis 3: There is no significant difference in math assessment scores of low-income students who attended preschool versus those who did not.

Chapter 4

Data Analysis

Introduction

The purpose of this study was to compare the academic achievement of low-income students who attended preschool and those who did not to determine if preschool attendance benefits low-income students academically. This chapter focuses on the data analysis from this study. This chapter is divided into the following sections: a) introduction, b) data collection c) research questions and related hypotheses, and d) results based on analysis.

Collection of Data

The population of this study came from an elementary school in Northeast Tennessee. This is a Title 1 school with a 38% economically disadvantaged population. Seventy two individuals were asked to be part of this study and twenty four individuals consented and met the qualifications to be part of the sample of this study. The parents of these participants signed and returned an informed consent as well as a survey stating if their child attended preschool. Income level data were collected to make sure the sample were students who qualified for free/reduced lunch. Eleven of these participants attended preschool and thirteen did not attend preschool. Twelve participants were female and twelve were male. Whether or not the student attended preschool was the independent variable and their assessment data from STAR test, CBM math scores, and ELA checkpoint scores from the beginning of the year were dependent variables.

Research Questions and Related Hypotheses

To guide the analysis of the data collection of this study, three research questions were considered. Each question was followed by a research hypothesis. SPSS software was used to

analyze the data collected from this study. Data were analyzed using a 0.05 level of significance. The results of the analysis for each of these research questions is below.

Research Question 1: Is there a significant difference in STAR reading level of low-income students who attended preschool versus those who did not?

Research Hypothesis 1: There is a significant difference in STAR reading level of low-income students who attended preschool versus those who did not.

Null Hypothesis 1: There is no significant difference in STAR reading level of low-income students who attended preschool versus those who did not.

Research Question 2: Is there a significant difference in the beginning of the year ELA checkpoint scores of low-income students who attended preschool versus those who did not?

Research Hypothesis 2: There is a significant difference in the beginning of the year ELA checkpoint scores of low-income students who attended preschool versus those who did not.

Null Hypothesis 2: There is no significant difference in the beginning of the year ELA checkpoint scores of low-income students who attended preschool versus those who did not.

Research Question 3: Is there a significant difference in math assessment scores of low-income students who attended preschool versus those who did not?

Research Hypothesis 3: There is a significant difference in math assessment scores of low-income students who attended preschool versus those who did not.

Null Hypothesis 3: There is no significant difference in math assessment scores of low-income students who attended preschool versus those who did not.

Results Based on Analysis

In order to answer research question one, an independent samples t-test was conducted to compare the mean scores of STAR reading levels of low income students who attended preschool versus those who did not. Levene's test for equality of variances indicated that variances were assumed equal ($p = .970$). No significant difference between the means of the two groups ($t(24) = .395, p > .05$) was found. The mean STAR score for the students who attended preschool was not significantly higher ($M = 2.4455, sd = 1.36$) than the mean STAR score for the students who did not attend preschool ($M = 2.2154, sd = 1.46$). An effect size of .162 was realized. The results are displayed in Table 1.

Table 1

Independent -Samples t-test on STAR Test Scores

Pre-K Attendance	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>ES</i>
Attended	2.4455	1.36	24	.395	.970	.162
Did not attend	2.2154	1.46				

Note. $P > .05$

In order to answer research question two, an independent samples t-test was conducted to compare the mean scores of beginning of the year ELA checkpoint scores of low income students who attended preschool versus those who did not. Levene's test for equality of variances indicated that variances were assumed equal ($p = .778$). No significant difference between the means of the two groups ($t(24) = .082, p > .05$) found. The mean ELA checkpoint

score for the students who attended preschool ($M = 78, sd = 20.66$) was not significantly higher than the mean ELA checkpoint score for the students who did not attend preschool ($M = 78.69, sd = 20.73$). An effect size of .033 was realized. The results are displayed in Table 2.

Table 2

Independent -Samples t-test on ELA Checkpoint Scores

Pre-K Attendance	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>ES</i>
Attended	78.0	20.66	24	.082	.778	.033
Did not attend	78.69	20.73				

Note. $P > .05$

In order to answer research question three, an independent samples t test was conducted to compare the mean CBM math scores of low income students who attended preschool versus those who did not. Levene's test for equality of variances indicated that variances were assumed equal ($p = .570$). No significant difference between the means of the two groups ($t(24) = .816, p > .05$) was found. The mean math CBM score for the students who attended preschool ($M = 66.90, sd = 28.80$) was not significantly higher than the mean math CBM score for the students who did not attend preschool ($M = 57.46, sd = 27.7$). An effect size of .334 was realized. The results are displayed in Table 3.

Table 3

Independent -Samples t-test on Math CBM Scores

Pre-K Attendance	<i>M</i>	<i>SD</i>	<i>df</i>	<i>t</i>	<i>p</i>	<i>ES</i>
Attended	66.90	28.80	24	.816	.570	.334
Did not attend	57.46	27.7				

Note. $P > .05$

Chapter 5

Introduction

This chapter contains a summary of the findings, discussion of findings, conclusions, recommendations for further research, and recommendations for practice.

Summary of Findings

The purpose of this study was to compare the academic achievement of low-income students who attended preschool and those who did not to determine if preschool attendance benefits low-income students academically. The first research question focused on STAR reading levels of students who attended preschool versus those who did not. The results indicated there was no significant difference; therefore, a null hypothesis was retained. Research question two focused on ELA checkpoint scores of students who attended preschool versus those who did not. There was no significant difference; therefore, a null hypothesis was retained. Research question three focused on math assessment scores of students who attended preschool versus those who did not. There was no significant difference; therefore, a null hypothesis was retained.

Discussion of Findings

The purpose of this study was to compare the academic achievement of low-income students who attended preschool and those who did not to determine if preschool attendance benefits low-income students academically. All three research questions resulted in retaining of null hypotheses. No significant results were found in regards to research question one. This suggests that students who attended preschool did not show significantly higher STAR reading scores than students who did not attend preschool. Low income students in second grade who attended preschool had an average STAR score of 2.4; whereas, low income students in second grade who did not attend preschool had an average STAR score of 2.2. This is most likely

because there has not been compensatory education for these low income children in kindergarten, first, and second grade. This is consistent with the review of literature that stated that the effects of preschool fade out over time. Another reason this could be is because of the pandemic. Low income children have had more adverse effects from schools being shut down. No significant results were found in regards to research question two either. This means that students who attended preschool did not have a significantly higher ELA checkpoint score. The mean ELA checkpoint score for those who attended preschool was 78%. The mean ELA checkpoint score for those who did not attend preschool was 78.69%. These scores are very close for the two groups. Again, these scores are most likely how they are because of a lack of compensatory education for low income children. The gaps have to be continued to be filled as students age in school, not just through preschool. Lastly, no significant results were found for research question three. This means a significant difference was not seen for math scores of students who attended preschool versus those who did not in second grade. Although it was not considered significant, the mean math assessment score for students who did attend preschool was higher than those who did not. The mean for those who did attend preschool was 66.9 and the mean for those who did not attend preschool was 57.46. This is most likely due to the same reason that there was not a significant difference in STAR scores and ELA checkpoint scores. Low income students need to be continued to be given rigorous curriculum and instruction in order to keep the gap between their peers small.

The insignificant findings of this study support the literature and research conducted by Lee and Loeb (Lee & Loeb, 1995). They argue that preschool attendance allows children to start elementary school on an equal playing field; however, slowly the positive cognitive effects of preschool fade away due to lack of follow up compensatory education (Lee & Loeb, 1995). This

aligns with the results of this study, since there were no significant differences found for any of the research questions when conducted in a second-grade class.

Conclusions

As a result of this study, it is concluded that preschool attendance academic effects do fade out before second grade. STAR readings scores, ELA checkpoint scores, and math assessment scores were all not significantly higher for those who attended preschool. It can be inferred that academic benefits may be seen in kindergarten and possibly first grade for students who attended preschool; however, low income students in second grade need more compensatory education to uphold any academic benefits from attending preschool.

Recommendations for Further Research

1. Research needs to be conducted with a larger sample size. A school district's entire second grade would be better compared to only one school of second graders.
2. Research needs to be conducted where there are equal numbers of students who attended preschool and those who did not.
3. More accurate income data needs to be available for better research.

Recommendation for Practice

1. To continue to close the achievement gap for low income students, compensatory education must be provided for low income students as they journey through elementary school.
2. To continue to close the achievement gap for low income students, parents must read and talk to their children about school at home.

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