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Putnam County, Tennessee's Prekindergarten Program as Measured by Test Scores, GPA, Attendance, and Discipline Reports in 3rd, 7th, and 9th Grade

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by

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ABSTRACT

Putnam County, Tennessee's Prekindergarten Program as Measured by Test Scores, GPA, Attendance, and Discipline Reports in 3rd, 7th, and 9th Grade

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The purpose of this quantitative study was to determine if there is a significant difference in the academic and behavioral performance of students who had attended Putnam County's prekindergarten program and students who qualified for, but had not attended Putnam County's prekindergarten program. The researcher examined individual student data of specific students in three grade bands (elementary, middle, and high school). The grade levels included 3rd grade, 7th grade, and 9th grade. The data analyzed were students' individual GPA, ACT Explore scores, MAP Universal Screener scores, number of days absent, and number of discipline referrals of students who had attended Putnam County's prekindergarten program and students who qualified for Putnam County's prekindergarten program, but had not attended.

The population of this study consisted of 1,118 students in Putnam County, Tennessee. The researcher used end-of-year GPA, ACT Explore scores, fall and spring MAP universal screener scores in Math and Reading, absenteeism rates as defined by total number of days missed out of 180 instructional days, and end-of-year discipline referral rates. The researcher gathered this data from various resources such as individual student reports (MAP scores) and PowerSchool, which is Putnam County's Student Information System. The data was then analyzed using a series of independent sample t-tests. Significant differences were found in all grade levels in GPA, MAP Reading, and MAP

Math scores with students who had attended prekindergarten in Putnam County performing better than those who qualified for prekindergarten but had not attended. Significant differences were also found in 9th grade ACT Explore scores with students who had attended prekindergarten in Putnam County performing better than those who qualified for but had not attended. In regard to days absent and discipline reports, the only significant findings were found in 3rd grade with students who had attended prekindergarten in Putnam county missing fewer days than those who had not attended. This study concluded with recommendations that further specified focus should be applied to state-funded prekindergarten programs.

DEDICATION

This study is dedicated:

To my wife, Laura who has stood by me in the moments I was at my worst and weakest. You have always supported me in whatever my dreams are, including this one. I would have not made it through this journey without you. I love you.

To my children, Baylor and Maddox. I hope I have set an example to you both to always chase your dreams even though they may seem unattainable. I also hope I have provided the example to you to never stop trying, failing, and learning to do better the next time. You are my joy in life.

To my father, Bobby. Thank you for providing the childhood that most children dream of and always supporting me.

To my mother, Jennifer. Your example of how to endure through hard times was an amazing example of how women are truly stronger than men. I will always try and strive to the example you are for me. I can't thank you enough for everything you have done for me.

To my brother and sister, Kristy and Beau. I love you both.

To my mother in law Susan. Thank you for never giving up on me and always supporting me in the pursuit of my dreams.

To all others who have supported me while chasing this dream.

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INTRODUCTION

The lasting effects of prekindergarten have been widely studied in recent years due to the ongoing debate about the amount of state funds dedicated to prekindergarten education (Fienberg, Garwood, & Markova, 2016). The overall question of whether or not prekindergarten is effective has been a cornerstone of Tennessee Governor Bill Haslam's initiative to improve prekindergarten education across the state. Governor Haslam signed into law the Tennessee Prekindergarten Quality Act (HB1485/SB1899) to improve the current state of the prekindergarten system in Tennessee. This law addresses program quality and holds programs accountable, adding more rigorous standards mandated by the Tennessee State Department of Education. The law also requires elementary schools in conjunction with prekindergarten programs to formulate a plan for ensuring coordination between voluntary prekindergarten classrooms and elementary schools within the Local Education Agency (LEA) with the goal of ensuring that elementary instruction builds upon prekindergarten classroom experiences and engages parents throughout the school year (Tennessee Code Annotated 49-6-105 Section 3, 2016).

Vanderbilt University's Peabody Research Institute and Tennessee Division of School Readiness and Early Learning (2013) conducted a study that focused on prekindergarten and the effectiveness of universal prekindergarten in Tennessee. A primary goal of this study was to focus on the effectiveness of prekindergarten over a prolonged period regarding academic and behavioral achievement. The results of the study showed that prekindergarten was an effective program for students in the early

grades of elementary school, but in the upper grades of elementary school the impact of prekindergarten disappeared. The counterparts of the students who experienced prekindergarten in Tennessee passed their peers in academics, particularly in literacy. Studies conducted in Oklahoma and North Carolina yielded different outcomes from the Vanderbilt Study for prekindergarten students in upper grades. Those studies showed that prekindergarten students outperformed their counterparts at a much steadier rate (Dodge, Bai, Ladd, & Muschkin, 2017). The underlying factor in the North Carolina study showed that the importance of sustainability is not if prekindergarten is implemented, but how it is implemented. In a similar study performed in Oklahoma (Sanchez, 2016), the results showed that students tested in 7th grade who attended a state-funded prekindergarten program had higher scores on the state math test, were less likely to be retained, and were less likely to display chronic absenteeism.

Putnam County school system was awarded its first prekindergarten classes in the 2003-04 school year. The prekindergarten classes offered in Putnam County are "income based" for families who qualify for free and reduced-price lunches. Also families who qualify must have children who meet other at-risk criteria as established by the local Community Prekindergarten Advisory Council (C-PAC), which may include children living in single-parent homes or being raised by grandparents (Putnam County School System, 2015). Currently, 11 school campuses house prekindergarten programs. These include one classroom at Algood Middle School; two classrooms at Cane Creek Elementary School; one classroom at Capshaw Elementary School; two classrooms at Cookeville High School; two classrooms at Jere Whitson Elementary School; one classroom at Burks Elementary School; three classrooms at Northeast Elementary

School; two classrooms at Park View Elementary School; two classrooms at Prescott South Elementary School; one classroom at Sycamore Elementary School; and three classrooms at Baxter Primary School. Each classroom has one certified teacher with at least one assistant teacher. The maximum number of students per class is 20.

This study focused on the impact of Putnam County's prekindergarten program over a prolonged period with different groups of students in different grade bands. Specifically, the study focused on the academic and behavioral success of three different cohorts of students currently enrolled in elementary, middle, and high school in Putnam County. The researcher examined individual students' GPAs, ACT Explore scores, Measures of Academic Progress (MAP) Universal Screener scores, number of days absent, and number of discipline referrals. Data were compared to a group of peers who had not been through any type of state-funded prekindergarten program but were eligible to attend in Putnam County's prekindergarten program.

Statement of Problem

The purpose of this quantitative study was to determine if there is a significant difference in the academic and behavioral performance of students who attended Putnam County's prekindergarten program and the academic performance of students who qualified for, but did not attend Putnam County's prekindergarten program. The researcher examined individual student data of specific students in three grade bands (elementary, middle, and high school). The grade levels included 3rd grade, 7th grade, and 9th grade. The data analyzed were students' individual GPA, ACT Explore scores, MAP Universal Screener scores, number of days absent, and number of discipline referrals of students who attended Putnam County's prekindergarten program and

students who would have qualified for Putnam County's prekindergarten program, but did not attend.

Research Questions

The following five research questions guided this research:

1. Is there a significant difference in the GPAs of students who had attended Putnam County's prekindergarten program and the GPAs of students who qualified for but had not attended Putnam County's prekindergarten program?
2. Is there a significant difference in 9th grade ACT Explore scores of students who had attended Putnam County's prekindergarten program and the ACT Explore scores of students who qualified for but had not attended Putnam County's prekindergarten program?
3. Is there a significant difference in the MAP Universal Screener scores in Math and Reading of students who had attended Putnam County's prekindergarten program and the MAP Universal Screener scores of students who qualified for but had not attended Putnam County's prekindergarten program?
4. Is there a significant difference in the number of days absent of students who had attended Putnam County's prekindergarten program and the number of days absent of students who qualified for but had not attended Putnam County's prekindergarten program?
5. Is there a significant difference in the number of discipline referrals of students who had attended Putnam County's prekindergarten program and the number of

discipline referrals of students who qualified for but had not attended Putnam County's prekindergarten program?

Significance of Study

The findings of this study will help school districts to better understand the prekindergarten program specifically for Putnam County and if the program's participants show a significant difference from those who were eligible but had not attended prekindergarten in Putnam County. The findings may influence the financial resources allotted to early childhood education and the type of curriculum focus that should be determined for early childhood education in Putnam County. The findings can also help focus on nonacademic issues such as behavioral problems, absenteeism rates, and overall grade performances.

Definitions of Terms

The following definition of terms will help to ensure a clear understanding of the educational language presented in this study:

1. *American College Testing Explore (ACT)* - an exam that was originally taken by 7th graders to determine planning for their high school courses. This test was given to allow 7th and 9th graders to explore a broad range of options for their future while preparing them for the ACT test taken in 11th or 12th grade (American College Testing, 2013).

2. *Individuals with Disabilities Education Act (IDEA)* - a law ensuring services to children with disabilities throughout the nation. IDEA governs how states and public agencies provide early intervention, special education, and related services to more than

6.5 million eligible infants, toddlers, children, and youth with disabilities (U.S. Department of Education, 2016).

3. *Measurement of Academic Progress (MAP)* - a personalized assessment experience by adapting to each student's learning level—precisely measuring student progress and growth for each individual. Student progress is measured using the Rasch Unit scale (RIT) which allows educators, students and parents to compare achievement status and the changes in achievement status (growth) between assessments with other nationally-normed students (Northwest Evaluation Association, 2017).

4. *Socioeconomic Status (SES)* – a social standing or class of an individual or group often defined as a combination of education, income, and occupation. When viewed through a social class lens, privilege, power, and control are emphasized (American Psychological Association, 2017).

5. *Tennessee Value-Added Assessment System (TVAAS)* - the measure of impact schools and teachers have on their students' academic progress. TVAAS measures growth, not proficiency. Through the TVAAS website, educators are able to examine student data from state assessments such as TCAP and ACT scores (Tennessee Department of Education, 2017).

6. *Whole Child* - a student who is healthy, safe, engaged, supported, and challenged, sets the standard for comprehensive, sustainable school improvement, and provides for long-term student success (Association for Supervision and Curriculum Development, 2017).

Limitations and Delimitations

Some students in the population of the study may have moved out of Putnam County after going through the prekindergarten program. Therefore, attrition is a limitation. Also, some students in the population could have changed socioeconomic status after completing the prekindergarten program in Putnam County. Additionally, the quality of the prekindergarten program over time could differ. The quality that the 9th grade cohort had access to may not have been the same quality to which the 3rd grade cohort had access.

This study was delimited to the Putnam County school district in Putnam County, Tennessee. The study included three grade bands (3rd, 7th, and 9th grade) of students. Therefore, the results of this study will not necessarily be generalizable to other settings.

Overview of Study

This study is organized into five chapters. Chapter 1 includes an introduction that sets the background of the study, a statement of the problem, research questions, significance of the study, definitions of terms, and limitations and delimitations to the study. Chapter 2 reviews current literature on the history and philosophies of prekindergarten and multiple studies that have been conducted on prekindergarten from various areas around the United States. Chapter 3 includes the research questions and null hypotheses, the population of this study, instrumentation, and the data collection, and analysis procedures. Chapter 4 includes the findings of the study with a narrative that includes appropriate field notes, tables, figures, and graphs. Finally, Chapter 5 includes discussions and conclusions based on the findings of the research questions, as well as implications for practice and further research.

CHAPTER 2

REVIEW OF LITERATURE

Early History and Philosophies

The debate on how early is too early for educating a child influences how policy makers shift practices and funds towards combating a realistic economic problem and a realistic academic gap when students begin kindergarten. In the educational age where focus is placed on post-secondary education and the workforce, reading, math, and problem-solving skills are essential for success in those areas (Garciá & Weiss, 2015). Prekindergarten services have soared in number, and the aim of these services continues to be the acquisition of skills, knowledge, and behaviors that are associated with elementary school success. Gormley, Gayer, Phillips, and Dawson (2005) noted that the gap is very real and starts at birth. Before entering kindergarten, children who are born and raised in the highest socioeconomic homes have average cognitive scores that are 60% above students born in the lowest socioeconomic homes. In mathematics, African-American children face a 21% deficit in average national achievement scores as compared to White children, and Hispanics have a 19% deficit in national math achievement scores as compared to White children. According to the American Psychological Association (2017) socioeconomic status has a greater impact on education than any other factor, and children from different socioeconomic statuses perform at different levels. Schools in lower socioeconomic communities suffer from higher levels of unemployment, higher levels of migration of high quality teachers, and lower educational achievement (Muijs, Harris, Chapman, Stoll, & Russ, 2009). Students from

lower socioeconomic status acquire language skills more slowly, suffer from delayed letter recognition, are at a greater risk for reading difficulties, and enter high school 3.3 grade levels behind students from higher socioeconomic status (Aikens & Barbarin, 2008; Palardy, 2008). In this chapter, the researcher reviewed the literature about what influences early childhood education have on children and why early childhood education is important to the modern day educational system.

Historical figures have had a large influence on early childhood education (Gordon & Brown, 2010). One of the first historical influences on early childhood education was Martin Luther. With the Protestant Reformation being a religious endeavor, two of the main foci to appear directly from the Protestant Reformation were the needs of universal education and literacy (Morrison, 2011). These two concepts remain important today in any education system (Janks, 2012). Martin Luther's emphasis on reading the Bible was a part of the Catholic Church's belief that freedom towards salvation in people was found through biblical scriptures. After translations of the Bible became universal, Luther posited that the family institution was the most important factor to early education and that parents should educate their children by providing opportunities at home for religious instruction as early as possible (Gordon & Brown, 2010). Martin Luther also had a direct role in many religious early childhood education programs by influencing religious organizations to start prekindergarten programs as a part of their church, synagogue, and mosque teachings (Morrison, 2011).

The importance of universal education and reading became more focused when Comenius wrote the first picture book for children, *Orbis Pictus (The World of Pictures*) in 1658 (Morrison, 2011). Comenius posited that children can understand audible and

visual text but that learning is best achieved when sensory education is present. Comenius reported that sensory education should be learning experiences that involve all the five senses: seeing, touching, hearing, tasting, and smelling. Comenius stated that when teaching, the object should be present so that learners can experience the object using one of their senses while also hearing about it from an auditory text. Comenius suggested that children should be able to point to objects to check their understanding of what they know. Comenius outlined the importance of parental guidance in their children's education as early as possible. The illustration of books and the emphasis on sensory training are Comenius's two biggest contributions to early childhood education and are still widely used practices present in today's early childhood education programs.

Locke purported that children learn best from the environment around them. He theorized the concept of *tabula rosa* which states that children are born neutral, and they are "clean slates" on which experiences of parental guidance, societal issues, and educational experiences are written (Gordon & Brown, 2010). The concept of children learning something new in their own individual ways was Locke's theory. In modern educational systems, environmental issues are a precursor as to how an individual student may learn a new concept. Based on the child's environment, the concept must be taught in a way the child can understand it in his or her context. Locke also theorized that the overall society itself should shape what is being taught to children so that children will thrive in a working environment. In early childhood education, classrooms were teacher centered and controlled by the teacher. This concept mirrored society much like the labor force outside of school was controlled by a manager, and it was centered on what was being managed. There was less time for individualized instruction during that time.

Society “set” the educational curriculum, and teachers drove that message to the students unlike some modern classrooms where students drive instruction and teachers facilitate. Locke theorized that the needs of society were greater than the needs of the learner (Morgan, 2011).

Rousseau’s contribution to early childhood education is his theory that the teacher’s responsibilities are to encourage children to develop their own strengths in a natural learning environment and that the education of children should support their happiness, spontaneity, and curiosity (Morrison, 2011). As Morgan (2011) stated, “teachers who enable children to acquire knowledge are better able to provide productive foundations for children so that they exhibit intellectual resolve when faced with problems on their own” (p. 10). Rousseau posited that all children were naturally good and that education should reflect this goodness in children. By reflecting this goodness, Rousseau explained that teaching practices should reflect the spontaneous interest of the children. Rousseau’s influences still have an impact today in early childhood education. Rousseau’s naturalistic “free-play” ideology as defined by the National Association for the Education of Young Children (2014) stated that children are born to play and that play is a right that expands children’s creativity (Weisberg, Hirsh-Pasek, & Golinkoff, 2013). Play is motivating to children and allows them time to investigate, think, socialize, question, and problem solve without the judgement of adults. This model provides a place for children to investigate the environments around them, which allows for spontaneous interest to occur and grow (Gordon & Brown, 2010).

Pestalozzi was a Swiss educator whose influence is evident in the startup of a school called Neuhof (Morgan, 2011). Pestalozzi developed the idea that children do their

best learning through manipulative activities such as measuring, feeling, touching, and counting. He reported that multiage grouping was also an effective method in teaching children. Older children can learn a concept by teaching it to younger children and younger children can grasp that concept when taught by older peers. Pestalozzi, along with Rousseau, purported that nature was the educator and the senses are what develop learning processes. He also emphasized the importance of educating children at home in a family setting. That emphasis not only was important to children but also the mothers who were educating the children. Pestalozzi (1902) expressed that there would be a time when methods of teaching would be simple enough that each mother could not only teach her children but continue her own education at the same time.

Froebel is credited with founding what public education now knows as kindergarten. Kindergarten is a German word that means "children's garden." Like Pestalozzi and Rousseau, Froebel posited that nature was an important element in the educational process of early childhood development (Gordon & Brown, 2010). Froebel had an unpleasant childhood, which shaped his own philosophies toward why children need to have a pleasant childhood filled with learning from positive ideas. His ideas were radical in that he suggested children should have toys to play with, have open play, and be taught under specially trained teachers with certain qualifications that show expertise in the required field. These ideas are still used in classrooms today as well as instilling in children, through trained professional teachers, the ideas of self-confidence and self-esteem. Froebel also emphasized the difference in hands-on objects that children can relate to their own environments as well as subjects such as math and engineering. Froebel used for creation and exploration things that could be altered by the children

themselves such as clay, paper and scissors, drawing, and sewing, which are still widely used in modern kindergarten classrooms today (Morrison, 2011).

Montessori was the first female physician in Italy who opened a prekindergarten class for 2 to 5-year-olds. She initially began her career working with low socioeconomic children and children with intellectual disabilities (Kayili & Ari, 2011). The prekindergarten she founded fed children twice a day, gave baths, and provided medical treatment if necessary. Instead of seeking an interest in just the educational wellbeing of the child, Montessori took a physical and emotional interest in the wellbeing of the child. Modern educators now use these techniques to educate the "whole child." Based on these methods, Montessori taught children to use "self-correcting" strategies to help develop character and to have responsibilities entrusted to themselves. The Montessori Method is used in modern educational systems and states that human beings are innately bound for goodness, and their main aim is self-realization. There are five principles to early childhood learning according to the Montessori Method. Those principles are respect for the child, auto-education, prepared environment, sensitive periods, and an absorbent mind.

Perhaps one of the most influential ideas in modern education still in use today is Bloom's taxonomy (McDaniel, 2017). Bloom was an educational psychologist who developed the idea of taxonomy that organizes experiences and questions into hierarchy ranging from recall to creating and making judgments. This taxonomy leads teachers to direct questions based on what they know and what their experiences have been with students in their classrooms (Brewer, 2007). The basic competence level in Bloom's hierarchy is knowledge. Bloom demonstrated these skills by having children complete

simple observations where they would be able to recall information they did not know previously. Bloom explained these ideas as children having a simple knowledge of major events where they might be able to list, tell, show, or identify (Morrison, 2011). The next level is comprehension. Bloom stated that at this level children are able to grasp comprehension and translate knowledge into new concepts. Children are able to summarize and discuss at this level. The third level is application and involves solving problems that require children to use previous skills and knowledge in new situations. At this level children are ideally able to illustrate, show, and solve. The fourth level is analysis, and at this level children are able to see patterns and recognize hidden meanings. Bloom explained that children are able to demonstrate that they can classify, arrange, and compare at this level of his hierarchy. The fifth level is synthesis. At this level children are able to generate their own new ideas based on previous ideas they might have had. Bloom also thought children should be able to generalize after being given a set of facts. The skills demonstrated at this level revolved around formulation, generalization, and creating. The last level of Bloom's taxonomy is evaluation. At this level children are able to compare and differentiate between ideas and to make choices based on a reasoned argument. The skills demonstrated on this level center on recommending, convincing, and judging. The taxonomy was revised in the 1990s and is now known as Revised Bloom's Taxonomy. Teachers still use this model to design classroom curricula and assessment models in preschool classes. According to the National Association for the Education of Young Children (McDaniel, 2017.), prekindergarten students can understand abstract concepts such as analyzing and evaluating. Not all will be able to fully grasp the concepts of Bloom's taxonomy at a 3 or

4-year-old level though teachers can still generate higher-order thinking questions for preschool assessments to use in classes to prepare students for higher grade level expectations (Mufson & Strasser, n.d.).

Gordon and Brown (2010) identified other innovators, philosophies, and influential names that have shaped early childhood education including John Dewey, Patti Smith, and Lucy Sprague Mitchell. These innovators and philosophers had a direct influence on how prekindergarten teachers use mixed methods, such as teacher-centered and student-centered approaches, to administer classroom instruction. Both Dewey and Smith purported that children base their learning on individualized experiences in their own lives and how they relate to those experiences. Many methods are still used in early childhood education such as successfully working with others to examine a problem and find common solutions. Mitchell helped to shift focus from the approach of theory only to a combined approach of theory and practice. Mitchell's influence was getting teachers to understand how children learn and what part the teacher plays in advancing that learning for the individual child. Mitchell wanted teachers to witness the learning process so they could better refine their own skills to strengthen the process.

Early Studies on Head Start

The modern prekindergarten movement began from growing interest in the early 1960s when 10% of the nation's 3 and 4-year-olds were enrolled in an educational classroom setting. By the late 1960s and early 1970s, 30% of the 4-year-olds in the United States were enrolled in a prekindergarten program (Barnett, Hustedt, Robin, & Schulman, 2005). The need for prekindergarten education grew from developing trends in a postmodern war era that required mothers to meet the demands of the postmodern

war workforce. These trends moved mothers away from homes and children during the workday and into workforce labor that required mothers to amass proper placements for daytime childcare. The demands of these post-war jobs also required the federal government to act in good faith by providing federal funding to programs for assisted childcare (Crumm, 2011). When President Lyndon Baines Johnson declared a *War on Poverty* in 1964, he presented to the federal government the need for a comprehensive approach to childcare to meet the needs of children in low socioeconomic communities. According to the United States Department of Health and Human Services (1964), the government's process on combating poverty was directly influenced by emerging research on the lasting effects of poverty. A portion of the research found a direct link in the effects to children born into poverty and the impact that has on education. The research also showed that poverty had lasting effects on the educational learning processes of students. The research suggested that the government had an obligation to help socioeconomic groups suffering from poverty. Along with government-assisted programs that helped families, Head Start was a direct result of the obligation to break the cycle of poverty, providing preschool children of families suffering from poverty a program that met their emotional, social, health, nutritional, and psychological needs. The desired outcome was that education would lead children out of poverty, and the cycle would be broken (United States Department of Health and Human Services, 2006).

Head Start is the United States' largest federally-funded program that specifies interventions in early childhood development (Bell, Greenfield, Bulotsky-Shearer, & Carter, 2016). Head Start mandates that classrooms use multiple strategies including experimentation, inquiry, observation, play, and exploration to support a child's cognitive

and language skills. Head Start's primary target was low-income families and families with special needs. In 2013, Head Start was appropriated 8 billion dollars and served almost 1 million children (Walker, 2014). Head Start served approximately 42% of eligible children in 2013. Of those children served, the majority of them received health insurance from a federal program. The demographics of the children in Head Start in 2013 were 41% White, 31% African American, and 36% Hispanic. Seventy-two percent of children in Head Start programs were in homes where the primary language spoken was English, and 23% were in homes where the primary language spoken was Spanish. In 2013, 96% of Head Start programs were center-based with an onsite facility, with 2% being home based. This home-based program included weekly visits and socialization activities similar to the activities at the center-based programs. Fifty-nine percent of families who participated in a Head Start program were from a single-parent household, and 41% included both parents in the household. Most families had access to at least one supportive service in 2013. Parenting education and health education were the most frequently accessed. Sixty-seven percent of the staff in Head Start programs earned a bachelor's degree or higher in childhood education or a related field, which was a 5% increase from 2012.

The success of Head Start is highly debated regarding the sustainability of progress through all grade levels. Aikens, Klein, Tarullo, and West (2013) found that children make progress in the norms of language, literacy, and math. Aikens et al. (2013) also found that Head Start children have better social skills, impulse control, and approaches to learning. Head Start children demonstrate decreased problem behaviors such as aggression and hyperactivity. Lipscomb, Pratt, Schmitt, Pears, and Kim (2013)

also found positive results from Head Start. Their research examined the impact of Head Start on children living in nonparental care. The findings of the study revealed that students do have more positive school readiness outcomes at the end of their preschool year than children not assigned to Head Start programs, including better pre-academic skills and teacher-student relationships.

Throughout K-12 schooling, Head Start children performed better in kindergarten in social-emotional and cognitive measures and had fewer negative behaviors exhibited than their counterparts (Zhai, Brooks-Gunn, & Waldfogel, 2011). Zhao and Modarresi's (2010) study of Montgomery County Public Schools in Maryland revealed that Head Start participants were more likely to meet reading benchmarks by the end of kindergarten and required half as many special educational services per week as their peers without Head Start experiences. Another study conducted in Tulsa, Oklahoma, found that students participating in Head Start had higher math scores in 7th grade and were less likely to be chronically absent (Phillips, Gormley, & Lowenstein, 2016). Head Start also shows positive impacts on social-emotional functioning that last through 5th grade (Vogel, Xue, Moiduddin, Kisker, & Carlson, 2010).

As adults, Head Start participants continue to show success compared to counterparts. According to Bauer and Schanzenbach (2016) Head Start children have a higher likelihood of having higher GPAs, graduating high school, attending college, and receiving some type of post-secondary degree or certificate. Among the children who attended Head Start in the 1960s and 1970s, White children were 28% were more likely than their siblings to complete high school and 28% more likely to attend college. Also among African-American children who attended Head Start in those same decades, 12%

were less likely to be arrested or charged with a crime compared to their siblings (Garces, Thomas, & Currie, 2002). Head Start has a direct impact on the economy and health care costs in the United States. As adults, Head Start participants are 19% less likely to smoke than their counterparts. The savings from the reduced health care cost are equal to 36-141% of the program cost (Anderson, Foster, & Frisvold, 2010).

The HighScope Perry Preschool Study through Age 40 examined effective prekindergarten programs (Schweinhart et al., 2005). Schweinhart et al. (2005) claimed that the HighScope Perry Preschool study had the greatest impact on early childhood education in the 1960s. According to the HighScope Perry Preschool Study, at the age of five, 67% of the students enrolled in the program had an IQ score of 90 or above, and 28% not enrolled performed at the same level. The results showed that students enrolled in the early childhood program made closer to a median income than those who were not. By the ages of 27, the median income for a student who participated in a preschool program was $12,000 vs. a student not enrolled in a preschool program who earned a median income of $10,000. At the age of 40, those incomes had significantly increased with a median income of $20,800 for a program participant and $15,300 for a non-program participant. Seventy-seven percent of the participants who completed a preschool program graduated high school vs. the 60% who graduated high school but did not participate in a preschool program. At the age of fourteen, 49% of those who participated in a preschool program passed the basic achievement test for that age group vs. the 15% of students who passed that had no preschool program. Of those arrested five or more times, 36% participated in preschool compared to 55% who did not. The lasting results showed that the students enrolled also were more likely to hold a job for a

prolonged period. The outcome of the study concluded that one student enrolled in an early childhood program saved the public almost $200,000. The HighScope Perry Preschool study also found that quality preschool programs for children living in poverty can contribute to their social and intellectual development and can have a significant effect on their school success, adulthood success, and overall economic success.

Schweinhart et al. (2005) discussed how the HighScope Perry Preschool study can be applied to Head Start. In the HighScope Perry Preschool study, teachers had bachelor's degrees and certificates in the educational field. In 2000, only 28% of Head Start teachers held a bachelor's degree, while 19% held an associate's degree. By 2013 that number had increased to 67% of teachers holding a bachelor's degree and 95% of Head Start teachers holding at least an associate's degree (Walker, 2014). Twenty percent of Head Start programs report using the HighScope educational model, while 39% report using the Creative Curriculum model (Zill et al., 2006). The HighScope curriculum model focuses on self-directed child learning with large and small group activities mixed in. Teachers set up the classroom and the daily routine for the children. Classroom teachers model their lessons in experiences to help children better understand personal initiative, social relations, creative representations, movement, music, logic, mathematics, and literacy (Schweinhart et al., 2005). According to the Foundation for Early Childhood Education, Creative Curriculum focuses on social, emotional, cognitive, and physical areas of development and develops goals and strategies to enhance learning for each child. Zill et al. (2006) also found that Head Start students gained on average a total of 4 points on their Peabody Picture Vocabulary Test as compared to the HighScope Perry Preschool study which showed students with an 8 point gain their first year and a total of

14 within their first two years. As Zill et al. (2006) stated, on average Head Start programs are achieving some success, but a gap exists between what that success actually is and what potential success could be. As Schweinhart et al. (2005) alluded to, the results of the HighScope Perry Preschool study do not typically apply to Head Start or state-funded prekindergarten programs. The HighScope Perry Preschool study proved that quality education that takes place in an imperfect environment could positively produce significant results. The quality of education has changed which has negatively impacted current findings as compared to the HighScope Perry Preschool Study.

The Chicago Longitudinal study (Reynolds, 1999; Reynolds, Bezruczko, & Hagemann, 1997) investigated the educational and social development of a cohort of 1,539 low-income, minority children who grew up in high-poverty neighborhoods in Chicago. The study also investigated 1,150 children who attended or received services from 20 Child-Parent Centers in preschool in 1983-1985 or kindergarten in 1985-1986. Of the total cohort, 389 children of the same age participated in all-day kindergarten programs in five public schools in similar neighborhoods in Chicago. All children in the cohort were eligible for, and participated in, government-funded early childhood programs (Reynolds, 1999). This study was conducted in a highly concentrated poverty setting, with 67% of students in the attendance area representing low-income families. The children of this study were followed for 19 years and ended when the students were 24 years of age. Data are available for 91% of the original CPC group and 89% of the comparison group which consisted of 389 children who did not received CPC services.

Multiple variables were used in the Chicago Longitudinal study including the Iowa Test of Basic Skills (ITBS), grade retention information, graduation rates, behavior

and special educational placements, and arrest and conviction records (Reynolds, 1999). The short-term effects of the CPC program found that children who attended preschool significantly outperformed those in a comparison group. The study found that preschool had the largest effect on cognitive readiness at school entry with children gaining approximately three months performance (Reynolds, 1999). By the end of 3rd grade, 7% of the preschool group received Special Education (SPED) services as compared to 12% receiving SPED services of the group who did not attend preschool. In school performance, the CPC preschool participation group exhibited a composite score national rank in the 47th percentile on the Kindergarten Readiness ITBS test. This was compared to the non-participating group who scored in the 27th percentile nationally on the Kindergarten Readiness ITBS test. Both groups tested at age 5. By the end of kindergarten, the CPC preschool participation group scored in the 63rd percentile on the ITBS Word Analysis section and in the 50th percentile on the ITBS Math Achievement section. The comparison group scored in the 47th percentile on the ITBS Word Analysis section and in the 35th percentile on the ITBS Math Achievement section. In the later years of the study, of these variables measured, grade retention, reading and math scores, graduation rates, and arrest and convictions, the CPC group showed an overall effectiveness at improving the range of child and adolescent outcomes, with the largest benefits coming from the CPC preschool program. There were no significant differences found in areas of convictions and arrests in the 12-year follow-up, but a significant difference was found in the 15-year follow-up when the preschool participants were 18-21 years old. The difference found stated that those who participated in the preschool program were more likely to have lower conviction and arrest rates than those who did

not participate (Collett, 2013). It was determined that youth who participated in the CPC program had higher reading and math scores at the age of 15 than those in the comparison group. Also, students who participated in the CPC program passed the life-skills competency test (Minimum Proficiency Skills Test) at a higher rate than non-participants (62% to 50%) (Reynolds, 1999). Students who participated in the CPC program were less likely to have SPED services. By the age of fifteen, 16% of CPC participants were receiving SPED services as compared to 21% receiving SPED services that had not participated in the CPC program. In the last follow-up to the study (ages 23-24), the CPC preschool program participants had higher high school completion rates, higher grade completion rates, higher 4-year college attendance rates, fewer number of months having received public aid, and less depressive symptoms than those who did not participate in the CPC preschool group (Collett, 2013). There were, however, no significant differences found between the groups in full-time employment, teen births, or substance abuse (Reynolds, Temple, Robertson, & Mann, 2002).

Head Start

Since 1998, Oklahoma has offered high-quality prekindergarten on a voluntary basis to 4-year-olds. The quality aspect of a prekindergarten program is defined by strong teacher qualifications which distinguish it from many other states' prekindergarten programs (Gormly, Hill, Adelestein & Willemin, 2012). As per Gilliam and Ripple (2004), only 12 of the 33 states with state-funded prekindergarten programs, Oklahoma being one, required teachers to possess a Bachelor of Arts in Early Childhood Education or a related field and a teaching certificate. Oklahoma childcare center lead teacher

requirements also mandate the teacher be at least 19 years of age, have a high school diploma or GED, and have at least 12 college credit hours of training in early education or related field. Oklahoma's prekindergarten program has stringent requirements on student-teacher ratios. By law, a prekindergarten classroom in Oklahoma can have no more than 20 students, and the child to staff ratio cannot exceed 10:1 as compared to child care centers in Oklahoma that can staff up to a 15:1 child-to-staff ratio and have a maximum group of 30 students. Strict program requirements that have high quality standards show that children progress at a faster rate than those of their counterparts in classrooms with smaller child-to-staff ratios, smaller group sizes, and teachers who are well educated, well trained, and well paid (Love, Schochet, & Meckstroth, 1996).

A study conducted by the National Institute for Early Education Research by Rutgers University (2005) on the effects of state prekindergarten programs on young children's readiness in five states found that state-funded prekindergarten produces an increase in children's vocabulary of nearly four raw points, which equates to a 31% annual growth in children's average vocabulary scores. The study also found that children who attended state-funded prekindergarten scored higher on tests in early math skills such as basic number concepts, simple addition and subtraction, telling time, and counting money. Children who attended a state-funded prekindergarten program knew more letter-sound associations and were more familiar with words and book concepts than their counterparts who did not attend a state-funded prekindergarten program. However, there was no significant finding on children's phonological awareness. Children performed well on this test whether they had been subjected to a state-funded prekindergarten program or not (Lamy, Barnett, & Jung, 2005).

Children in Oklahoma were assessed in receptive vocabulary, early literacy, and early math skills (Barnett et al., 2005). The results yielded statistically strong evidence that children are positively impacted by Oklahoma's state-funded prekindergarten program in vocabulary, print awareness, and math skills. The effects of this study provide evidence that state-funded prekindergarten that provides high-quality rigor can produce significant gains in early childhood and developmental learning processes (Barnett et al., 2005).

A more recent study conducted in Oklahoma (Anderson, Gormley & Phillips, 2016) examined the effects of the Tulsa's Community Action Project (CAP) Head Start Program on middle school academic outcomes and progress. The effects of CAP Head Start in academic achievement revealed that students who attended CAP Head Start received higher math scores, but not reading scores, than the comparison group on the Oklahoma Core Curriculum Test (OCCT). There were no significant differences between the CAP Head Start group and the comparison group in GPA, honors classes, or gifted status. The study also determined that students who attended CAP Head Start were less likely to be retained in a grade prior to 7th grade by six percentage points. CAP Head Start participants were also less likely to be chronically absent by three percentage points than those who did not attend CAP Head Start. No significant differences were found in in-school suspensions or out-of-school suspensions.

In more recent studies, the effects of prekindergarten were also evident in other state-funded programs. For example, in Virginia, a study conducted by Haung (2015) examined the causal impact of attending state-funded prekindergarten. The results showed that students who attended the Virginian Preschool Initiative (VPI) had better

recognition skills when identifying their alphabet and had better letter name knowledge than those who had not attended a prekindergarten program.

Another study from the National Center for Analysis of Longitudinal Data in Education Research examined the lasting effects of preschool benefits in North Carolina. The results indicated that students who attended preschool programs had higher test scores, lower grade retention status, and fewer numbers of students in special education placements (Dodge, Bai, Ladd, & Muschkin, 2017). The result of this study concluded that preschool services can be sustained and effective for at least 5 years.

An additional study from North Carolina examined the sustainability of prekindergarten over a period of time (Feinberg & Schaaf, 2010). The results revealed that students who attended prekindergarten showed significant growth over 2 years in almost all areas including language, math, general knowledge, and behavior as compared to the norm. There was no significant effect of classroom quality on children's growth in language, math, general knowledge, or behavior problems and very little effect on social skills. Children who were less proficient in English scored lower than children with higher proficiency levels in prekindergarten but made greater progress over a sustained amount of time.

In Georgia, a study examining children's outcomes and classroom quality from prekindergarten through kindergarten explored the findings for a second year of a longitudinal study (Peisner-Feinberg, Garwood, & Mokrova, 2016). The results showed that students who attended prekindergarten in Georgia showed significant growth in most domains of learning from prekindergarten to kindergarten. The students made significant gains specifically in literacy, language, math, self-knowledge, and social skills. The

norm-referenced measure showed that children progressed at a greater rate than would be expected for normal developmental growth. Children made greater gains in kindergarten than in prekindergarten in more advanced math and literacy skills. The study also revealed that students who had attended a prekindergarten program in Georgia made greater gains in literacy and language skills than those students who attended a private preschool program in Georgia. Children in kindergarten who had attended a prekindergarten program demonstrated a greater growth in phonemic awareness skills than those who had no prekindergarten program at all.

Georgia State University conducted a 4-year early childhood study in 2001 to examine the development of Georgia's four-year-olds. The Georgia Early Childhood Study (GECS) measured children's skills and behaviors to assess how prepared they would be to have success in school. The study specifically examined language and communication skills, cognitive development, heath/physical well-being, social behaviors, and attitudes toward school and learning. The study was conducted from preschool until the end of their second grade year. One of the main focus questions the study examined was the effect of Georgia's prekindergarten program on children in poverty and minorities. The findings of the study indicated that children who attended preschool made significant gains from the beginning of preschool to the end of their first grade year. These gains were made in skill compared to the national norm of children their age. The findings showed that preschoolers who entered school in their first year were significantly behind peers of their age across the nation. At the end of their first grade year, they exceeded those norms in math skills, phonemic awareness, expressive language, and letter and word recognition. Children who were enrolled in Georgia's

prekindergarten program gained substantially on their peers nationally on the assessments of language and cognitive skills thought the course of the study. Children who entered prekindergarten behind the national norm finished above the national norm on 3 out of the 4 skills assessed. Participants in prekindergarten were associated with more positive outcomes than other preschool experiences on 11 of the 16 measures (Henry & Rickman, 2005).

In Texas, a study conducted by Children at Risk and The Meadows Foundation (2016) also showed a significant difference in students who have attended state-funded prekindergarten programs and students who have not. The study revealed that students in Texas who are economically disadvantaged that attended a full-day prekindergarten program in 2010 scored significantly higher on the 2015 State of Texas Assessments of Academic Readiness (STAAR) Reading Assessment than those that were economically disadvantaged who either did not attend a prekindergarten program or attended a lower quality prekindergarten program. Students who were academically disadvantaged that attended prekindergarten were 40% more likely to read at a college level pace than those who did not attend a prekindergarten and were economically disadvantaged. The average 3rd grade STAAR reading scale score for an economically disadvantaged prekindergarten student was 1,381 as compared to an economically disadvantaged student who had no prekindergarten whose score averaged 1,353, a 28 point difference. The study also showed that districts that spent more per student in prekindergarten than the 2014-2015 state average of $3,327 were more like to witness a stronger positive relationship between prekindergarten enrollment and 3rd grade STAAR reading scores (Sanborn et al., 2016). The study indicated that economically disadvantaged students who had full day, high

quality prekindergarten and high quality K-3 educational experiences had an average reading scale score of 1,431 on the 3rd grade STAAR test. This was in comparison to students who were economically disadvantaged and had only a half-day of quality prekindergarten and average quality K-3 who showed an average score of 1,404. The lowest group, which were economically disadvantaged and had no prekindergarten scored 1,353 on the STAAR reading test.

The Vanderbilt Peabody Research Institute (2015) conducted a statewide study on Tennessee's voluntary prekindergarten program. Results revealed that at the end of prekindergarten, those students enrolled in state-funded prekindergarten had significantly higher achievement test scores on all six of the achievement tests administered, with the largest effects coming from the literacy measures. No differences were found for gender, ethnicity, or age of enrollment, only significant measures found in the children who were learning English who had mothers with less than a high school degree. The study indicated that by the end of the kindergarten year, the control group who had no prekindergarten program had caught up with the group who had been enrolled in a prekindergarten program. By the end of the 1st grade year, there was no difference in achievement between the two groups showing that the group had not only caught up with the prekindergarten group, but sustained growth. By the end of the 2nd and 3rd grade years, the group with no prekindergarten scored higher in achievement measures than the group with prekindergarten. Also, behaviorally, during the spring semester of the student's 1st grade year, teachers rated students who had been through prekindergarten less prepared for school, having poorer work skills, and feeling more negative about school (Lipsey, Farran, & Hofer, 2015). The Peabody Research Institute is conducting

follow-up research to follow a portion of the same children in the original study through their 7th grade year, scheduled for the 2018-2019 school year.

Based on the Vanderbilt's Peabody Research Institute's Tennessee Voluntary Prekindergarten study, the Tennessee General Assembly passed legislation in 2016 that revised the Voluntary Pre-K for Tennessee Act of 2005. Under the law, LEAs must: (a) include as a part of their prekindergarten plans a plan for ensuring coordination between voluntary prekindergarten classroom programs and elementary schools with the goal that elementary grade instruction builds upon prekindergarten classroom experiences, (b) have a plan for engaging parents and families of prekindergarten programs throughout the school year, and (c) have a plan for delivering relevant and meaningful professional development to prekindergarten teachers specific to ensuring a high quality prekindergarten experience. This bill also requires prekindergarten programs to meet the criteria for a "highly qualified prekindergarten program" as identified by the Tennessee State Department of Education (Tennessee Code Annotated 49-6-104, 2016).

The Urban Child Institute (2008) reported that 67 percent of students who attended prekindergarten were ready for school by age 5 as opposed to the 28 percent that were not. Only 15 percent of students who attended prekindergarten needed special educational services as opposed to 34 percent of students who did not attend prekindergarten who needed special educational services. Thirty-one percent of students who attended prekindergarten repeated a grade as opposed to the 55% of students who did not attend prekindergarten repeating a grade. Thirty-six percent of students who attended prekindergarten attended a four-year college and only 13 percent of students who did not attend prekindergarten attended a four-year college. White students who

have attended prekindergarten have a 52 percent improvement in letter/word recognition, a 26 percent spelling improvement, and a 6 percent improvement in applied problems over students with no prekindergarten (Barnett, 2005). The long-term benefits state that 36 percent of students who have attended a prekindergarten program own a home as opposed to the 13% of students who own a home who have not attended a prekindergarten program. Also 41 percent of students who attended a prekindergarten program have never accepted welfare as opposed to the 20 percent of students who have accepted welfare that did not attend prekindergarten. Students who have not attended a prekindergarten program are 1.2 times more likely to be arrested as juveniles, 2.08 times more likely to be arrested for a misdemeanor, and 2.14 more likely to be arrested for a felony (O'Brien & Dervarics, 2007).

State-Funded Prekindergarten

The National Institute for Early Education Research (NIEER) expresses that for a state to qualify as having a preschool program the program has to meet certain qualifications. First, the program has to be state funded, controlled, and directed by the state. Second, the program must reach at least one percent of the 3 to 4-year-old population in that given state. Third, early childhood education must be the primary focus of the initiative. Fourth, the program must offer group learning experiences at least two days per week. Fifth, state-funded initiatives must be distinct from the state's system for subsidized child care. Lastly, the initiative cannot be primarily designed to serve children with disabilities, but those services may be offered (NIEER, 2015).

As an initial program, state-funded prekindergarten education was a slow process from the beginning. Many states did not recognize the need for a prekindergarten program much less a state-funded prekindergarten program. States mimicked the federal government and Head Start and targeted children who were born and being raised in low socioeconomic homes. States also followed the federal government's lead and targeted students with disabilities. In the 1970s, three states, Illinois, Michigan, and Wisconsin, began creating prekindergarten entitlement programs for 3-5-year-olds targeted based on socioeconomic status or students with disabilities. With this focus on students with disabilities, the United States Congress passed the Education for All Handicapped Children Act (1975). This act provided students with disabilities the right to a free and appropriate education along with parental and student protection of those rights. The act also supported all state and local educational agencies in educating those students with disabilities and held educators accountable for providing the education to these students. This was one of the first laws that examined the right of the federal government's role in public education from a child's birth (Crumm 2011). In 1986, the United States' government passed federal legislation that provided states with federal funds to incentivize them to specifically target students with disabilities. The law was effective with 25 additional states joining the 24 states that had already been providing services. In 2002, the enrollment in state-funded prekindergarten programs was at 382,290 in 50 states. That was 5% of the total population of 3 and 4-year-olds (Barnett et al., 2005).

The 2015 NIEER report published by Rutgers University (2015) examined the state of prekindergarten for the 2014-2015 school year. The findings declared that prekindergarten enrollment grew modestly to increase by 7,091 children in 2015. The

overall percentage of 4-year-olds stayed the same at 29% nationally enrolled from the 2014 school year to the 2015 school year. Nationally, the 3-year-old population grew by one percentage point or 31,863 children. The average state spending of prekindergarten per child expenditure was $4,521, which was a $319 increase from the 2014 per pupil expenditure of $4,202. According to the Education Commission of the United States (2015) nine states including Alaska, Iowa, Kansas, Missouri, West Virginia, North and South Carolina, Hawaii, and Florida all decreased funding after the 2014-2015 school year. Three states stayed constant, neither decreasing nor increasing spending. Those states were Indiana, Delaware, and Mississippi. Thirty-two states and the District of Columbia all increased funding towards state prekindergarten, and five states including Idaho, Wyoming, Montana, South Dakota, and New Hampshire did not invest in state-funded prekindergarten programs.

Prekindergarten in Tennessee and Putnam County

In 1998, Tennessee started the Early Childhood Education (ECE) Pilot Program that specifically targeted students who were 4 years old and at risk for not completing high school due to their income or their disability. Tennessee required a licensed teacher with a valid teaching certificate and trained teaching assistant. The ratio of classes was 10:1, with a maximum of 20 students. In 2004, Tennessee established a state lottery with the excess funding going towards college scholarships. The excess lottery funding was also used for early childhood programs. In 2005, the Voluntary Pre-Kindergarten (VPK) for Tennessee Act was passed by the Tennessee legislature and significantly expanded prekindergarten across the state (Tennessee Department of Education, 2016). This

legislation required the state to use 25 million dollars in excess lottery funds to establish 300 new prekindergarten classrooms. This resulted in 8,900 additional 4-year-olds receiving prekindergarten services in Tennessee. During the 2005-2007 school years, an additional 20,000 students were served with 230 classrooms added through the excess lottery funds. According to the National Institute for Early Education Research (NIEER), Tennessee spent $3,333 per child enrolled in the 2005-2006 school year. In the 2015-2016 school year, Tennessee spent $5,219 per child enrolled in state-funded prekindergarten, which is a $539 increase from the previous year. As for comparison, the state of Tennessee spends an average of $9,561 on a K-12 student. As of the 2015-2016 school year, the total state enrollment for prekindergarten was 16,274 with 96% of school districts offering a state-funded program. Tennessee ranks 17th nationally on state spending per child in prekindergarten classes. The District of Columbia ranks 1st for per child expenditure with a total amount of $16,431.

The quality standards checklist as measured by NIEER (2015) outlined a comprehensive approach in measuring the quality of care in a state-funded prekindergarten program across the United States. NIEER has defined quality as outlined by ten specific benchmarks that include:

1. Early learning standards are comprehensive as measured by NIEER.
2. The teacher in the classroom is qualified as defined by the appropriate teaching degree, which is a bachelor's degree.
3. The teacher(s) in the classroom have specialized training that include Early Childhood Education, Early Development and Learning, and/or Special Education Early Childhood.

4. The assistant teacher in the classroom has a specialized teaching degree or certificate, in which Tennessee teaching assistants have a Child Development Associate or equivalent.

5. The teacher must attend at least 18 hours a year of specialized in-service training.

6. The maximum class size is 20.

7. Teacher student ratio is 1:10 for 4-year-olds and 1:8 for 3-year-olds.

8. Screening referrals have to be completed that encompass vision, hearing, height, weight, body mass index (BMI), blood pressure, immunizations, developmental, psychological/behavioral, full physical exams and support services.

9. At least one meal is provided daily.

10. Site and monitor visits are required.

Tennessee completed nine out of ten of these benchmarks in the 2015 school year with the assistant teaching degree benchmark being incomplete.

Putnam County was awarded its first prekindergarten classrooms in the 2003-2004 school year. These were pilot classes and consisted of the current teacher-student ratio in place 20:1. Currently in Putnam County, 11 school campuses house prekindergarten programs. These are one classroom at Algood Middle School; two classrooms at Cane Creek Elementary School; one classroom at Capshaw Elementary School; two at Cookeville High School; two classrooms at Jere Whitson Elementary School; one classroom at Burks Elementary School; three classrooms at Northeast Elementary School; two classrooms at Park View Elementary School; two classrooms at

Prescott South Elementary School; one classroom at Sycamore Elementary School; and three classrooms at Baxter Primary School. Each classroom has one certified teacher with at least one assistant teacher. The maximum number of students per class is 20.

CHAPTER 3
RESEARCH METHODOLOGY

The purpose of this quantitative study was to determine if there was a significant difference in academic and behavioral performance of students who had attended Putnam County's prekindergarten program and students who qualified for, but had not attended Putnam County's prekindergarten program. The researcher examined individual student data of specific students in three grade bands (elementary, middle, and high school). The specific grade levels included 3rd grade, 7th grade, and 9th grade. Pertinent data were individual end of year GPA, ACT Explore scores, spring and fall MAP universal screener scores in the subjects of Math and Reading, absenteeism rates as defined by total number of days missed out of 180 instructional days, and end-of-year discipline referral rates of students who had attended Putnam County's prekindergarten and similar socioeconomic students who would have qualified for Putnam County's prekindergarten program, but had not attended. This chapter describes what methodology and research methods were used to determine if a difference exists. Chapter 3 is organized into research questions and null hypotheses, population, instrumentation, data collection, data analysis, and the concluding summary.

Research Questions and Null Hypotheses

This research was guided by the following five research questions:

1. Is there a significant difference in the GPAs of students who had attended Putnam County's prekindergarten program and the GPAs of students who qualified for but had not attended Putnam County's prekindergarten program?

$H_0 1_1$: There is no significant difference in the GPAs of 3rd grade students who had attended Putnam County's prekindergarten program and the GPAs of 3rd grade students who qualified for but had not attended Putnam County's prekindergarten program.

$H_0 1_2$: There is no significant difference in the GPAs of 7th grade students who had attended Putnam County's prekindergarten program and the GPAs of 7th grade students who qualified for but had not attended Putnam County's prekindergarten program.

$H_0 1_3$: There is no significant difference in the GPAs of 9th grade students who had attended Putnam County's prekindergarten program and the GPAs of 9th grade students who qualified for but had not attended Putnam County's prekindergarten program.

2. Is there a significant difference in current 9th grade ACT Explore scores of students who had attended Putnam County's prekindergarten program and the ACT Explore scores of students who qualified for but had not attended Putnam County's prekindergarten program?

$H_0 2$: There is no significant difference in current 9th grade ACT Explore scores of students who had attended Putnam County's prekindergarten program and the ACT Explore scores of students who qualified for but had not attended Putnam County's prekindergarten program.

3. Is there a significant difference in the MAP Universal Screener scores in Math and Reading of students who had attended Putnam County's prekindergarten program and the MAP Universal Screener scores of students who qualified for but had not attended Putnam County's prekindergarten program?

$H_0 3_1$: There is no significant difference in the MAP Universal Screener Math and Reading scores of 3rd grade students who had attended Putnam County's prekindergarten program and the MAP Universal Screener scores of 3rd grade students who qualified for but had not attended Putnam County's prekindergarten program.

$H_0 3_2$: There is no significant difference in the MAP Universal Screener Math and Reading scores of 7th grade students who had attended Putnam County's prekindergarten program and the MAP Universal Screener scores of 7th grade students who qualified for but had not attended Putnam County's prekindergarten program.

4. Is there a significant difference in the number of days absent of students who had attended Putnam County's prekindergarten program and the number of days absent of students who qualified for but had not attended Putnam County's prekindergarten program?

$H_0 4_1$: There is no significant difference in the number of days absent of 3rd grade students who had attended Putnam County's prekindergarten program and the number of days absent of 3rd grade students who qualified for but had not attended Putnam County's prekindergarten program.

$H_{0}4_{2}$: There is no significant difference in the number of days absent of 7th grade students who had attended Putnam County's prekindergarten program and the number of days absent of 7th grade students who qualified for but had not attended Putnam County's prekindergarten program.

$H_{0}4_{3}$: There is no significant difference in the number of days absent of 9th grade students who had attended Putnam County's prekindergarten program and the number of days absent of 9th grade students who qualified for but had not attended Putnam County's prekindergarten program.

5. Is there a significant difference in the number of discipline referrals of students who had attended Putnam County's prekindergarten program and the number of discipline referrals of students who qualified for but had not attended Putnam County's prekindergarten program?

$H_{0}5_{1}$: There is no significant difference in the number of discipline referrals of 3rd grade students who had attended Putnam County's prekindergarten program and the number of discipline referrals of 3rd grade students who qualified for but had not attended Putnam County's prekindergarten program.

$H_{0}5_{2}$: There is no significant difference in the number of discipline referrals of 7th grade students who had attended Putnam County's prekindergarten program and the number of discipline referrals of 7th grade students who qualified for but had not attended Putnam County's prekindergarten program.

$H_{0}5_{3}$: There is no significant difference in the number of discipline referrals of 9th grade students who had attended Putnam County's prekindergarten program and the

number of discipline referrals of 9th grade students who qualified for but had not attended Putnam County's prekindergarten program.

Population

The Putnam County school system serves 11,490 students in grades prekindergarten through 9th grade. There are 21 schools within Putnam County. Eleven of the schools represented in Putnam County are elementary schools (prekindergarten through 3rd grade), four of the schools represented are middle schools (prekindergarten, 5 through 7th grade), and three of the schools represented are high schools (9^{th} through 12^{th}). Three "non-traditional" schools are represented in Putnam County: an alternative school, a Virtual Instruction to Accentuate Learning (VITAL) online school, and an adult high school respectively. Eighty-two percent of the student population is White, 12% of the student population is Hispanic or Latino, 4% of the student population is African American, and 2% of the student population is Asian. Putnam County has a population of 50% (approximately 5,745 students) of students on free and reduced lunch. There are 884 certified teachers as of the 2015-2016 school year in Putnam County.

Eleven different school campuses accommodate Putnam County prekindergarten programs. The breakdown of campus facility locations are one classroom at Algood Middle School; two classrooms at Cane Creek Elementary School; one classroom at Capshaw Elementary School; two at Cookeville High School; two classrooms at Jere Whitson Elementary School; one classroom at Burks Elementary School; three classrooms at Northeast Elementary School; two classrooms at Park View Elementary School; two classrooms at Prescott South Elementary School; one classroom at Sycamore Elementary School; and three classrooms at Baxter Primary School. Each classroom has

one certified teacher with at least one assistant teacher. The maximum number of students per class is 20. The population for this study consisted of a total of 1,118 students. The breakdown of students is as follows: In 3rd grade there were a total of 441 with 172 students who had not attended Putnam County prekindergarten but qualified based on free and reduced lunch status. There were 269 students who had attended Putnam County's prekindergarten program that are currently in 3rd grade. The population of 3rd graders entered Putnam County's prekindergarten as 4-year-olds in the 2012-2013 school year. In 7th grade, there were a total of 351 students used for this study. There were 136 students who had not attended Putnam County's prekindergarten program but qualified based on free and reduced lunch status. There are 215 students who had attended Putnam County's prekindergarten program that are currently in 7th grade. The population of 7th graders entered Putnam County's prekindergarten program as 4-year-olds in the 2007-2008 school year. In 9th grade, there were a total of 326 students used for this study. There were 140 students who had not attended Putnam County's prekindergarten program but qualified based on free and reduced lunch status. There were 186 students who had attended Putnam County's prekindergarten program that are currently in 9th grade. The population of 9th graders entered Putnam County's prekindergarten program as 4-year-olds in the 2005-2006 school year. The breakdown of sex is as follows: Currently in 3rd grade, 91 females and 81 males qualified but had not attended Putnam County prekindergarten, and there were 121 females and 148 males that had attended Putnam County prekindergarten. In 7th grade, 62 females and 74 males qualified but had not attended Putnam County prekindergarten, and there were 100 females and 115 males that had attended Putnam County prekindergarten. In 9th grade, 63 females and 77 males

qualified but had not attended Putnam County prekindergarten, and there were 104 females and 82 males that had attended Putnam County prekindergarten. Students who had not attended but qualified were qualified based on socioeconomic status at that time. The reasons they had not attended could have been, but were not limited to: space, unawareness of programs available, or unwillingness to attend. The Putnam County's qualifications for prekindergarten included: children who were 4 years old on or before August 15th, 2016; children who qualified for free and reduced lunches; children with disabilities, children identified as English Language Learners, in state custody, or those at risk for failure due to circumstances of abuse or neglect; and children who meet other at-risk criteria as established by the local Community Prekindergarten Advisory Council (C-PAC), which may include children in single-parent homes or being raised by grandparents (2017).

Instrumentation

The sources of the data came from a variety of measures. The researcher used end-of-year GPA, ACT Explore scores, fall and spring MAP universal screener scores in Math and Reading, absenteeism rates as defined by total number of days missed out of 180 instructional days, and end-of-year discipline referral rates. The researcher gathered this data from various resources such as individual student reports (MAP scores) and PowerSchool, which is Putnam County's Student Information System. The researcher relied on Putnam County's education information data base system administrator to pull data. Data was pulled by using set formulas for prekindergarten years of enrollment and students who have been coded in PowerSchool database as SES from enrollment documentation. When a student is entered into PowerSchool, a state-issued identification

number is assigned to them. PowerSchool records this number and issues another identification number hidden from all others types of identification sources to protect student identities from being matched by name and state identification number. The researcher was provided with only the hidden identification number assigned in PowerSchool so that matching names and ID numbers would be difficult. Once data was pulled and provided to the researcher, the researcher was able to see absenteeism rates, discipline history, and overall GPA. Current data of students were recorded from the time they entered Putnam County Schools to present. Once Putnam County Schools input all student data into the PowerSchool database, the data are stored and untouched for a set amount of time, commonly until that student graduates high school. Data found in PowerSchool can range from current grades, absenteeism rates, GPA, and discipline reports. Discipline records were coded as "discipline log entries". Based on those referrals, the researcher could be provided with discipline records from all eligible students. A report was generated with past and current discipline issues as logged by administrators. Attendance records were also stored in PowerSchool and were accessible through administrator access. By selecting the current year and/or past years, the researcher was able to obtain past absences for each student. The days absent were out of a possible 180 instructional days for a set school year.

TVAAS also stores student data for long periods of time. The data that can be found in that system are data that measure how Tennessee students perform on state assessment tests for every year they have been in a Tennessee public school. Those specific data are measured and shared with administrators in Putnam County. According to the College Board (2017), Tennessee GPA data is measured on a 4.0 scale with an "A

"calculated at a 4.0, a "B" calculated at a 3.0, a "C" calculated at a 2.0, a "D" calculated at a 1.0, and an "F" calculated at a 0.0. For the purpose of this study, GPA was calculated by using final grades in English/Language Arts, Math Social Studies and Science. The final GPA analyses for this study was analyzed on a scale of 1-100, with an A ranging from a 92.5-100; B ranging from a 84.5-92.4; C ranging from a 74.5-84.4; D ranging from a 69.5-73.4; and an F ranging from 0-69.4 (Putnam County School Board Policy, 2014). Putnam County school administrators logged discipline referrals and coded those referrals as "discipline" in PowerSchool.

MAP is a universal screener Putnam County uses to assess skills deficits for RTI2. Three times a year (fall, winter, and spring), students take the MAP test and scores are recorded into a private database. Scores were collected from the Northwest Evaluation Association (NWEA) Reports database from two test sessions, fall and spring. By assessing MAP data, the researcher was able to see how students perform certain skills in reading and math as compared to students within Putnam County and how they compare against nationally-normed students. Data are stored annually and kept until district personnel manually write students out of the program. MAP scores are based on district and nationally-normed scores that examine student progression using the Rasch Unit Scale (RIT). The RIT score is used to measure academic progress and student growth. RIT scores range in the 150-300 level. According to the NWEA (2014), the goal of the RIT scale is to measure student growth from one year to the next as compared with nationally-normed students in a selected sample.

> The 2015 NWEA RIT Scale Norms Study provides status and growth norms for individual students as well as for schools on each of the four RIT scales: Reading, Language Usage, Mathematics, and General Science. The study's results are based on K – 11 grade level samples. Each sample is comprised of 72,000 to

> 153,000 student test records from approximately 1000 schools. These numbers vary by subject. These samples were drawn randomly from test record pools of up to 10.2 million students attending more than 23,500 public schools spread across 6,000 districts in 49 states. Rigorous procedures were used to ensure that the norms were representative of the U.S. school-age population. (p. 2)

According to NWEA (2014, the nationally status normed score for reading in 3rd grade is 198.6 by the end of the year. The growth measure for reading over the course of the year in 3rd grade is approximately 10.3 growth points. The nationally status normed score for math in 3rd grade is 203.4 by the end of the year. The growth measure for 3rd grade math over the course of year is approximately 13 growth points by the end of the year. The nationally status normed score for 7th grade reading is 218.2 by the end of the year. The growth measure from the beginning of the year in 7th grade reading is approximately is 3.8 growth points. The nationally normed status scores for 7th grade math is 228.6 by the end of the year. The growth measure from the beginning of the year in 7th grade math is approximately 6 growth points.

Putnam County first implemented the MAP test in the 2014-2015 school year. For the purpose of this study, data from MAP was provided and matched up by student identification number and provided to the researcher using a specially coded identification number that could not be matched up with any names. For the 3rd grade cohort, the researcher measured fall 2015-2016 beginning of the year MAP test scores and spring 2015-2016 test scores in Math and Reading. For the 7th grade cohort, the researcher measured fall 2015-2016 beginning of the year MAP test scores and spring 2015-2016 test scores in Math and Reading. No other MAP data could be provided for current 9th graders due to the cohort not being screened in the current timeline of study.

ACT Explore data is also stored in the Putnam County schools' database system, PowerSchool. According to Tennessee Code Annotated, T.C.A. § 49-6-6001,

> All public school students must participate in a postsecondary readiness assessment such as the ACT or SAT. Districts may choose to administer the ACT or the SAT. Districts can also provide both assessments and allow their students to choose the assessment that is right for them." (2010, para. b).

As a Putnam County school system graduation requirement, all students in Putnam County participate in the ACT assessment in 11th grade (Tennessee Code Annotated, 2016, para.1). Until the 2016-2017 school year, all Putnam County students participated in the ACT Explore test in their 8th grade year. The ACT Explore test was taken to determine student high school course load and to prepare students for the ACT Plan test (9th grade year) and ACT test (11th grade year). The ACT Explore test consisted of a Math, Reading, Science, and English section that were 30 minutes each. The scoring of the ACT Explore was similar to the ACT scoring in giving an overall composite score while breaking down each content section into individualized scores. The composite scores could range from 1-25 with 1 being the lowest possible score received and a 25 being the highest possible score received. For the purposes of this study, the researcher used the overall composite score from the ACT Explore test that 9th grade students took in the 2014-2015 school year. Putnam County opted to stop ACT preparation testing for 9th graders after the 2015-2016 school year. The ACT requirement before graduation is still active as of this writing.

Data Collection

Data were collected from the Tennessee Value-Added Assessment System (TVAAS) database, Northwest Evaluation Association's Measure of Academic Progress (NWEA MAP) Universal Screener database, and the PowerSchool Administration website (where the researcher was able to access grades, GPA, discipline reports, and absenteeism rates). The data collected ranged from 3 to 15 years. By gaining district approval from the director of Putnam County Schools, through an application process, the researcher was able to have Putnam County's education information data base system administrator, pull all data and directly send to researcher with no name attached and non-identifying coded numbers with the data needed. The administrator sent the file with password-protected services so that no data could be released or seized in the event of a theft or mistake. The data base administrator compiled data from Putnam County's district data information database and the Tennessee student identification database for the researcher.

Data Analysis

The researcher used a series of independent sample t-tests to compare the two independent groups and assess if there were significant differences in students who had attended Putnam County prekindergarten and students who qualified but had not attended Putnam County prekindergarten in GPA, ACT Explore test scores, MAP universal screener scores in Reading and Math, attendance rates, and discipline rates. All data were analyzed at the .05 level of significance.

Chapter Summary

The purpose of this quantitative study was to determine if there is a significant difference in the academic and behavioral performance of students who had attended Putnam County's prekindergarten program and the academic performance of students who qualified for, but had not attended Putnam County's prekindergarten program. The data measures of this study were identified as GPA, ACT Explore scores, MAP universal screener scores in Math and Reading, attendance records, and discipline log entries. The methodology focused on the research questions and null hypotheses, the population of the study, data collection and analyses of the study, and instrumentation of the study.

CHAPTER 4

FINDINGS

The purpose of this quantitative study was to determine if there is a significant difference in the academic and behavioral performance of students who had attended Putnam County's prekindergarten program and the academic performance of students who qualified for, but had not attended Putnam County's prekindergarten program. The researcher examined individual student data of specific students in three grade bands (elementary, middle, and high school). The grade levels included 3rd grade, 7th grade, and 9th grade. The data analyzed were students' individual GPAs, ACT Explore scores, MAP Universal Screener Math and Reading scores, the number of days absent, and the number of discipline referrals of students who had attended Putnam County's prekindergarten program and students who would have qualified for Putnam County's prekindergarten program, but had not attended. The researcher examined a population of 1,118 students. In 3rd grade, there was a total of 441 students with 172 students who had not attended Putnam County's prekindergarten program but qualified and 269 students who had attended Putnam County's prekindergarten program. In 7th grade, there was a total of 351 students with 136 students who had not attended Putnam County's prekindergarten but qualified and 215 students who had attended Putnam County's prekindergarten program. In 9th grade, there was a total of 326 students with 140 students who had not attended Putnam County's prekindergarten program but qualified and 186 students who had attended Putnam County's prekindergarten program.

The breakdown of gender is as follows: In 3rd grade, 91 females and 81 males qualified for but had not attended Putnam County prekindergarten, and 121 females and

148 males who had attended Putnam County prekindergarten. In 7th grade, 62 females and 74 males qualified for but had not attended Putnam County prekindergarten, and there were 100 females and 115 males who had attended Putnam County prekindergarten. In 9th grade, 63 females and 77 males qualified for but had not attended Putnam County prekindergarten, and there were 104 females and 82 males who had attended Putnam County prekindergarten

The Putnam County's Education Information System and Database Administrator collected the data and presented it to the researcher in a Microsoft Excel spreadsheet with non-identifiable numbers attached to each student. Students who had attended prekindergarten were coded "P4" and students who qualified for but had not attended were coded "NO." The data were divided by grade level- 3rd, 7th, and 9th. Under each tab, the researcher was able to transfer data to SPSS to run a series of independent sample t-tests. All data were password protected and not compromised at any point.

Research Question 1

1. Is there a significant difference in the GPAs of students who had attended Putnam County's prekindergarten program and the GPAs of students who qualified for but had not attended Putnam County's prekindergarten program?

$H_0 1_1$: There is no significant difference in the GPAs of 3rd grade students who had attended Putnam County's prekindergarten program and the GPAs of 3rd grade students who qualified for but had not attended Putnam County's prekindergarten program.

Independent samples t-tests were conducted to evaluate whether significant differences were found in GPAs of 3rd, 7th, and 9th grade students who had attended

Putnam County's prekindergarten program and students who qualified for but had not attended Putnam County's prekindergarten program.

In 3rd grade, there was a significant difference [t(415)=2.78, p=.006] in GPAs for students who had attended prekindergarten (M=88.29, SD=5.83) and students who had not (M=87.08, SD=5.62). Therefore, the null hypothesis $H_0 1_1$ was rejected. The 3rd grade students who had attended prekindergarten had significantly higher GPAs than those who qualified for prekindergarten but had not attended. Figure 1.1 shows the distribution of 3rd grade GPAs.

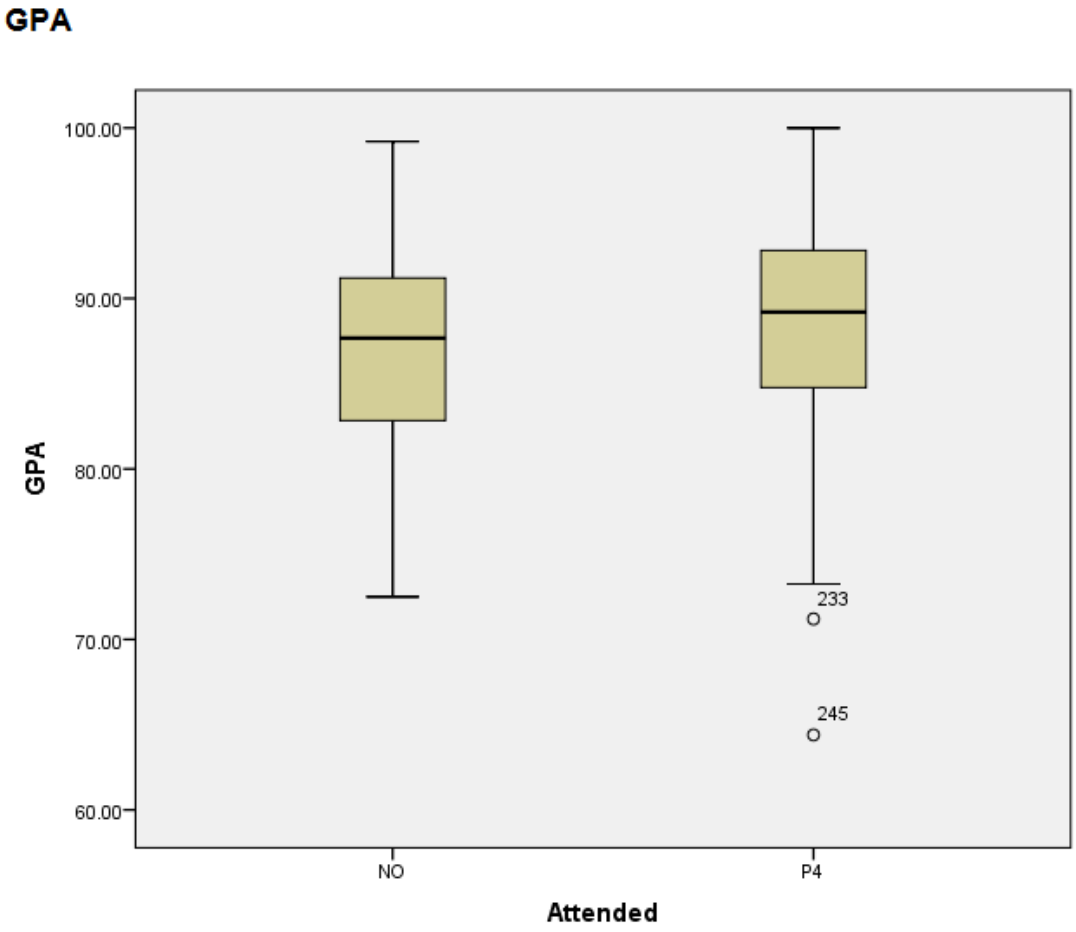

Figure 1.1-GPAs of 3rd grade students who had attended prekindergarten and students who had not attended but qualified for prekindergarten. Numbers noted by o represent extreme values.

$H_0 1_2$: There is no significant difference in the GPAs of 7th grade students who had attended Putnam County's prekindergarten program and the GPAs of 7th grade students who qualified for but had not attended Putnam County's prekindergarten program.

In 7th grade, there was a significant difference [t(316)=2.73, p=.007] in GPAs for students who had attended prekindergarten (M=90.74, SD=5.63) and students who

had not (M=88.91, SD=5.94). Therefore, null hypothesis $H_0 1_2$ was rejected. The 7th grade students who had attended prekindergarten had significantly higher GPAs than those who qualified for prekindergarten but had not attended. Figure 1.2 shows the distribution of 7th grade GPAs.

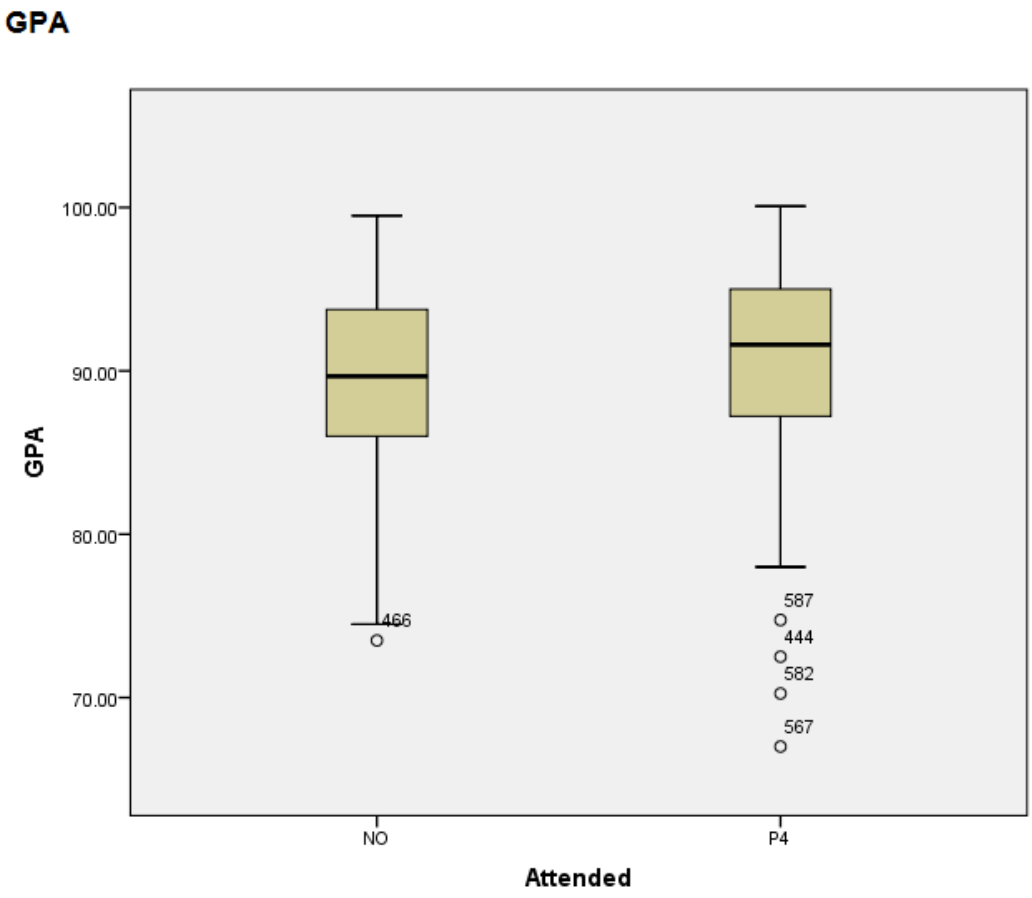

Figure 1.2-GPAs of 7th grade students who had attended prekindergarten and students who had not attended but qualified for prekindergarten. Numbers noted by o represent extreme values.

$H_0 1_3$: There is no significant difference in the GPAs of 9th grade students who had attended Putnam County's prekindergarten program and the GPAs of 9th grade

students who qualified for but had not attended Putnam County's prekindergarten program.

In 9th grade, there was a significant difference [t(300)=3.15, p=.002] in GPAs for students who had attended prekindergarten (M=88.41, SD=7.05) and students who had not (M=85.79, SD=7.25). Therefore, null hypothesis $H_0 1_3$ was rejected. The 9th grade students who had attended prekindergarten had significantly higher GPAs than those who qualified for prekindergarten but had not attended. Figure 1.3 shows the distribution of 9th grade GPAs.

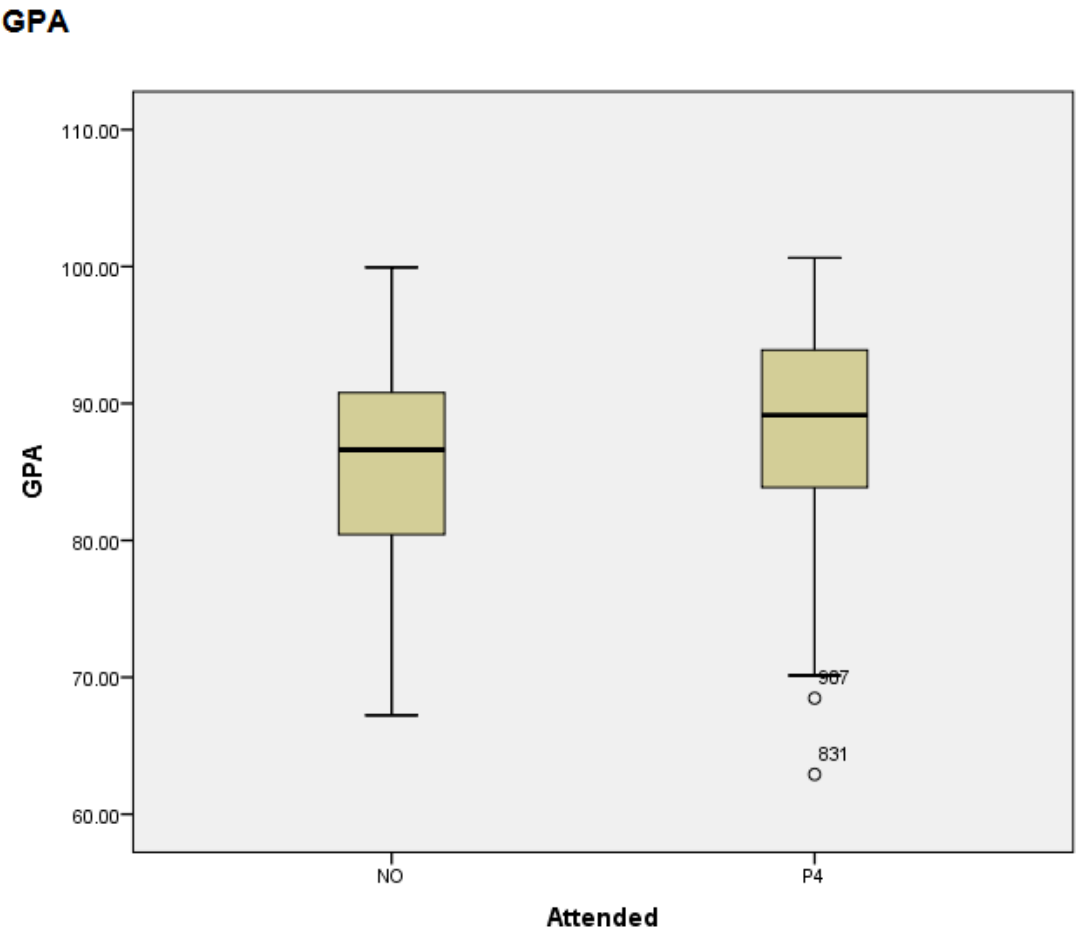

Figure 1.3-GPAs of 9th grade students who had attended prekindergarten and students who had not attended but qualified for prekindergarten. Numbers noted by o represent extreme values.

Research Question 2

2. Is there a significant difference in current 9th grade ACT Explore scores of students who had attended Putnam County's prekindergarten program and the ACT Explore scores of students who qualified for but had not attended Putnam County's prekindergarten program?

$H_0$2: There is no significant difference in current 9th grade ACT Explore scores of students who had attended Putnam County's prekindergarten program and the ACT Explore scores of students who qualified for but had not attended Putnam County's prekindergarten program.

An independent samples t-test was conducted to evaluate whether a significant difference was found in current 9th graders ACT Explore scores of students who had attended Putnam County's prekindergarten program and the ACT Explore scores of students who qualified for but had not attended Putnam County's prekindergarten program. In 9th grade, there was a significant difference [t(302)=2.95, p=.003] in ACT Explore scores for students who had attended prekindergarten (M=15.63, SD=3.11) and students who had not (M=14.59, SD=2.95). Therefore, null hypothesis $H_0$2 was rejected. The 9^{th} grade students who had attended prekindergarten had significantly higher ACT Explore scores than students who qualified for prekindergarten but had not attended. Figure 2.1 shows the distribution of 9th grade ACT Explore Scores.

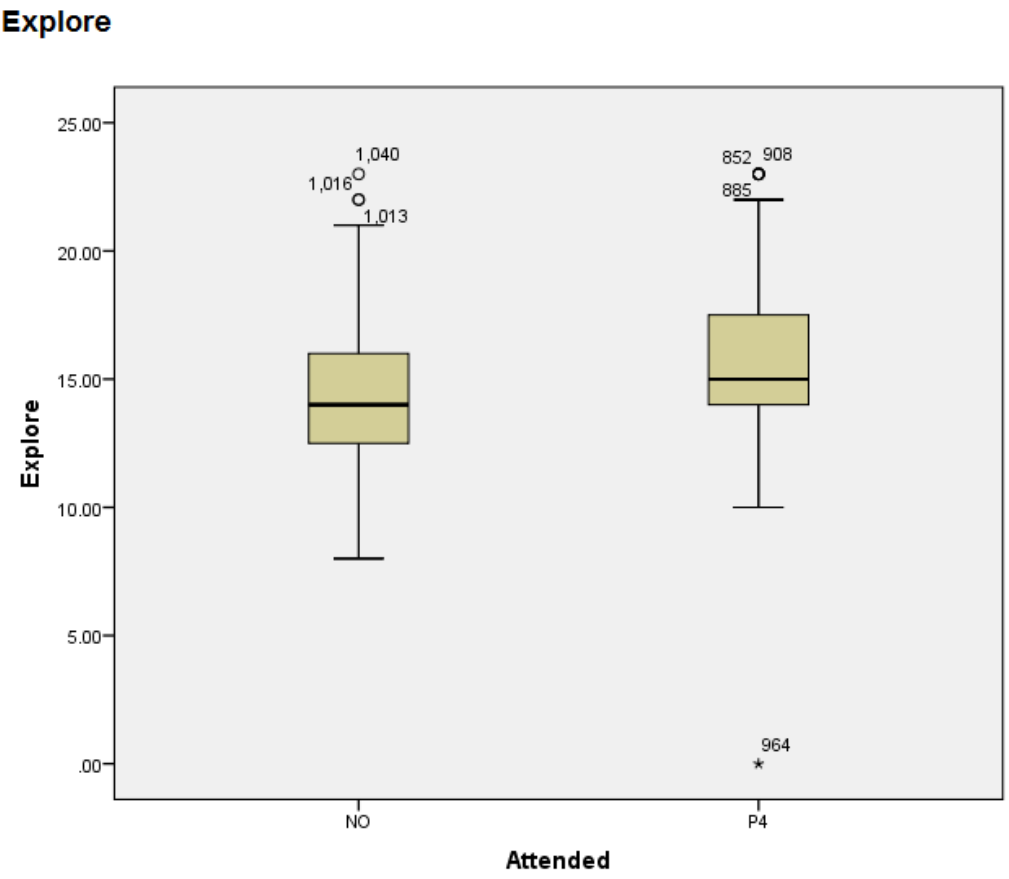

Figure 2.1-ACT Explore scores of current 9th grade students who had attended prekindergarten and students who had not attended but qualified for prekindergarten. Numbers noted by o represent extreme values.

Research Question 3

3. Is there a significant difference in the MAP Universal Screener scores in Math and Reading of students who had attended Putnam County's prekindergarten program and the MAP Universal Screener scores of students who qualified for but had not attended Putnam County's prekindergarten program?

$H_0 3_1$: There is no significant difference in the MAP Universal Screener Math scores of 3rd grade students who had attended Putnam County's prekindergarten program

and the MAP Universal Screener Math scores of 3rd grade students who qualified for but had not attended Putnam County's prekindergarten program.

Independent samples t-tests were conducted to evaluate whether significant differences were found in MAP Universal Screener Math and Reading scores in 3rd and 7th grade between students who had attended Putnam County's prekindergarten program and students who qualified for, but had not attended Putnam County's prekindergarten program. No data were available for current 9th grade students for this research question.

In 3rd grade MAP Math, there was a significant difference [$t(430)=2.50$, $p=.013$] in MAP Math scores for students who had attended prekindergarten ($M=201.99$, $SD=13.48$) and students who had not ($M=198.52$, $SD=14.80$). Therefore, null hypothesis $H_0 3_1$ was rejected. The 3rd grade students who had attended prekindergarten had significantly higher MAP Math scores than students who qualified for prekindergarten but had not attended. Figure 3.1 shows the distribution of 3rd grade MAP Math scores.

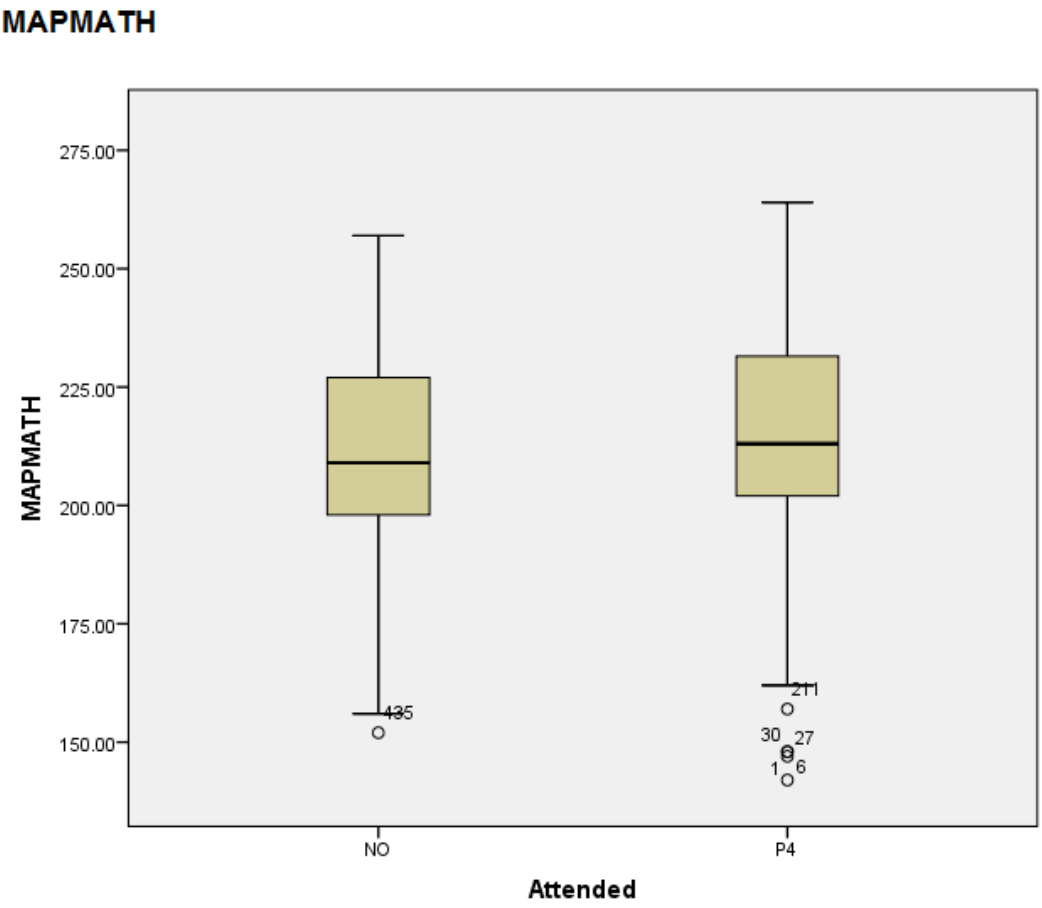

Figure 3.1-MAP Universal Screener Math scores of 3rd grade students who had attended Putnam County's prekindergarten program and students who qualified for but had not attended Putnam County's prekindergarten program. Numbers noted by o represent extreme values.

H_o3_2: There is no significant difference in the MAP Universal Screener Reading scores of 3rd grade students who had attended Putnam County's prekindergarten program and the MAP Universal Screener Reading scores of 3rd grade students who qualified for but had not attended Putnam County's prekindergarten program.

In 3rd grade MAP Reading, there was a significant difference [t(431)=2.03, p=.042] in MAP Reading scores for students who had attended prekindergarten (M=198.36, SD=15.12) and students who had not (M=195.07, SD=18.09). Therefore, null hypothesis $H_0 3_2$ was rejected. The 3rd grade students who had attended prekindergarten had significantly higher MAP Reading scores than those who qualified for prekindergarten but had not attended. Figure 3.2 shows the distribution of 3rd grade MAP Reading scores.

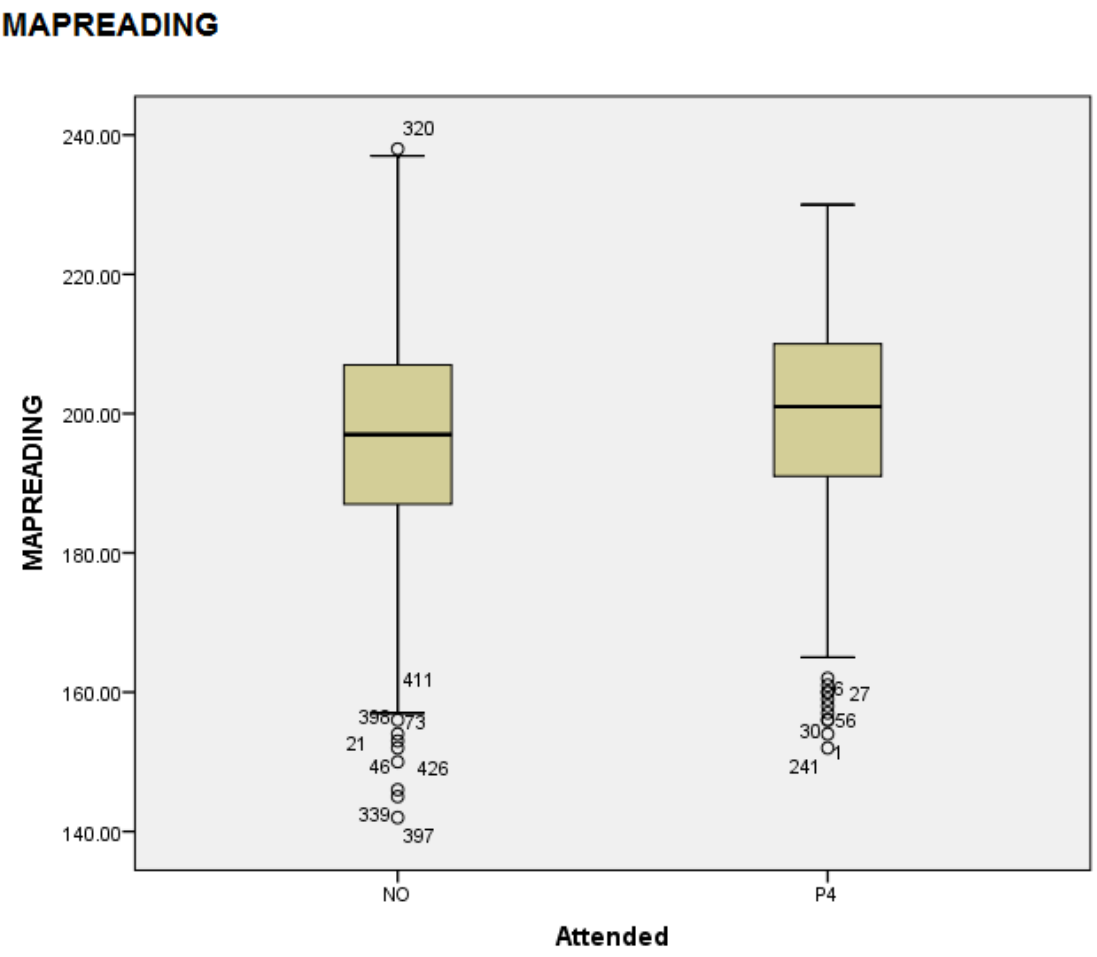

Figure 3.2- MAP Universal Screener Reading scores of 3rd grade students who had attended Putnam County's prekindergarten program and students who qualified for

but had not attended Putnam County's prekindergarten program. Numbers noted by o represent extreme values.

H_o3_3: There is no significant difference in the MAP Universal Screener Math scores of 7th grade students who had attended Putnam County's prekindergarten program and the MAP Universal Screener Math scores of 7th grade students who qualified for but had not attended Putnam County's prekindergarten program

In 7th grade MAP Math, there was a significant difference [t(331)=3.50, p=.001] in MAP Math scores for students who had attended prekindergarten (M=232.65, SD=14.41) and students who had not (M=226.55, SD=17.02). Therefore, null hypothesis H_03_3 was rejected. The 7th grade students who had attended prekindergarten had significantly higher MAP Math scores than those students who qualified for prekindergarten but had not attended. Figure 3.3 shows the distribution of 7th grade MAP Math scores.

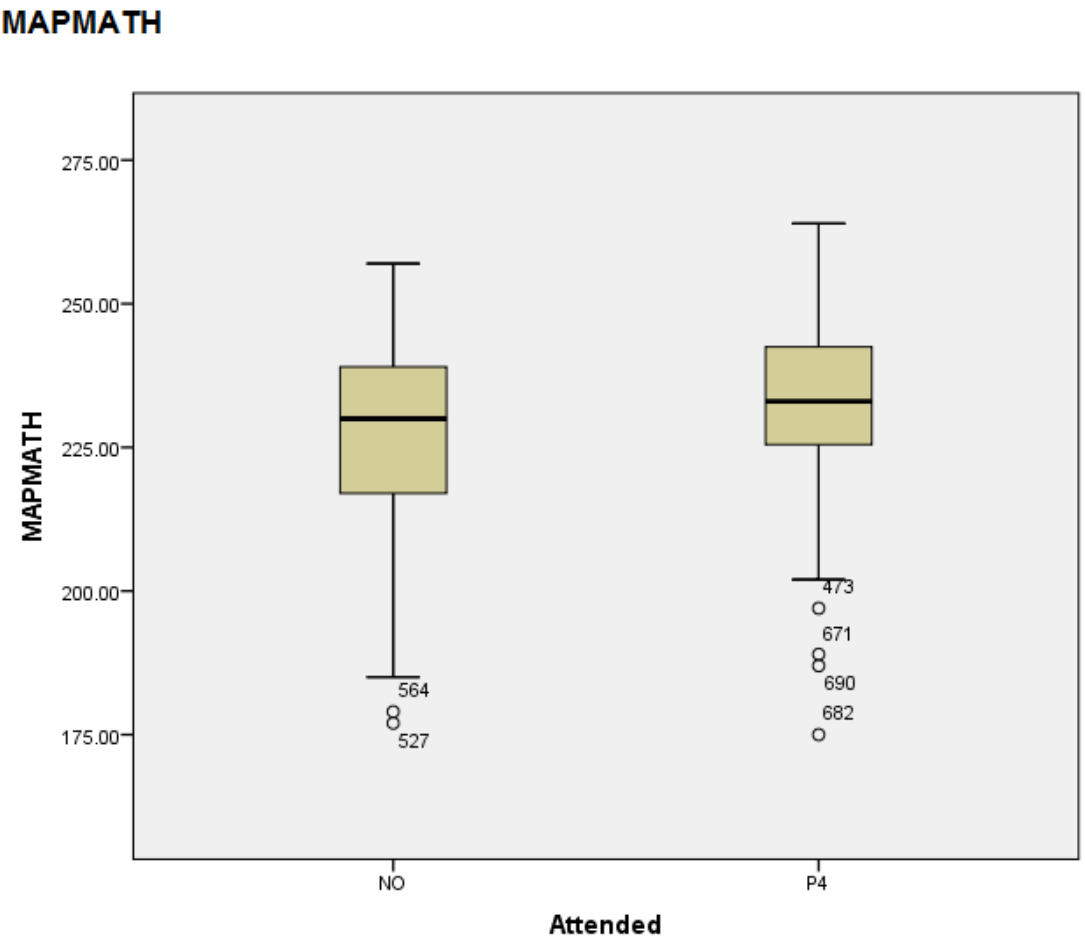

Figure 3.3-MAP Universal Screener Math scores of 7th grade students who had attended Putnam County's prekindergarten program and students who qualified for but had not attended Putnam County's prekindergarten program. Numbers noted by o represent extreme values.

H_o34: There is no significant difference in the MAP Universal Screener Reading scores of 7th grade students who had attended Putnam County's prekindergarten program and the MAP Universal Screener Reading scores of 7th grade students who qualified for but had not attended Putnam County's prekindergarten program

In 7th grade MAP Reading, there was a significant difference [t(330)=3.65, p<.001] in MAP Reading scores for students who had attended prekindergarten (M=221.86, SD=12.53) and students who had not (M=216.26, SD=15.14). Therefore, null hypothesis $H_0 3_4$ was rejected. The 7th grade students who had attended prekindergarten had significantly higher MAP Reading scores than those who qualified for prekindergarten but had not attended. Figure 3.4 shows the distribution of 7th grade MAP Reading scores.

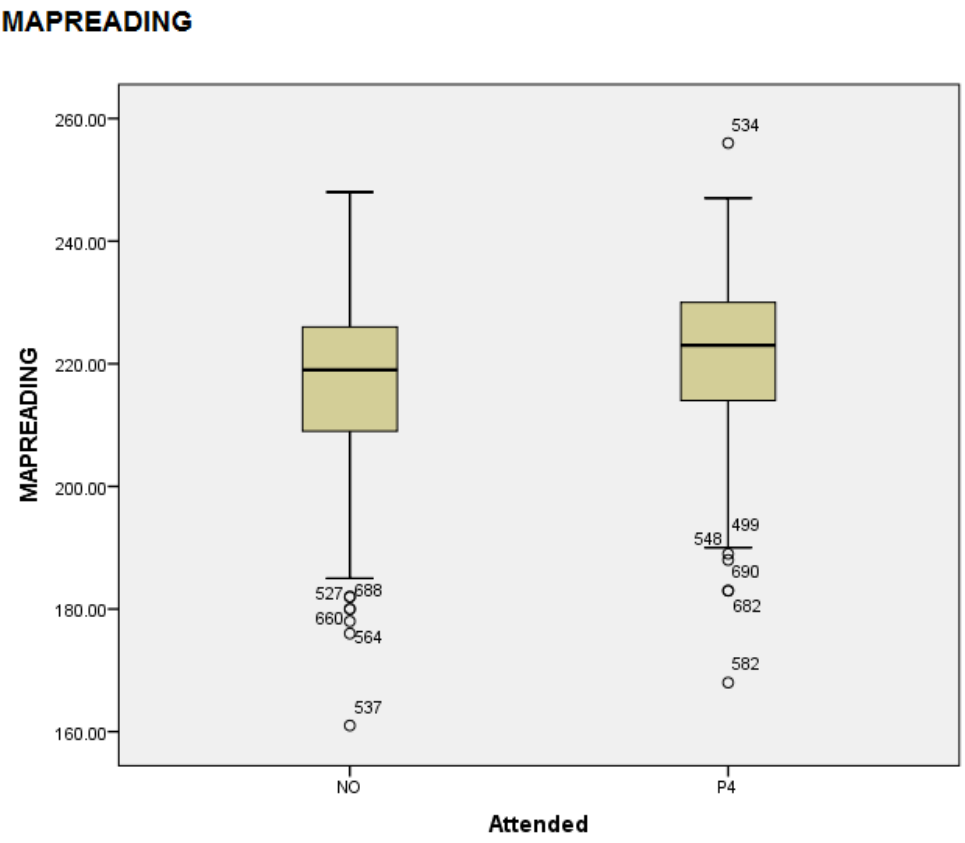

Figure 3.4-MAP Universal Screener Reading scores of 7th grade students who had attended Putnam County's prekindergarten program and students who qualified for

but had not attended Putnam County's prekindergarten program. Numbers noted by o represent extreme values.

Research Question 4

4. Is there a significant difference in the number of days absent of students who had attended Putnam County's prekindergarten program and the number of days absent of students who qualified for but had not attended Putnam County's prekindergarten program?

$H_0 4_1$: There is no significant difference in the number of days absent of 3rd grade students who had attended Putnam County's prekindergarten program and the number of days absent of 3rd grade students who qualified for but had not attended Putnam County's prekindergarten program.

Independent samples t-tests were conducted to evaluate whether significant differences were found in number of days absent in 3rd, 7th, and 9th grade between students who had attended Putnam County's prekindergarten program and students who qualified for, but had not attended Putnam County's prekindergarten program.

In 3rd grade, there was a significant difference [$t(439)=2.16$, $p=.032$] in number of days absent for students who had attended prekindergarten ($M=6.13$, $SD=6.45$) and students who had not ($M=7.62$, $SD=8.04$). Therefore, null hypothesis $H_0 4_1$ was rejected. The 3rd grade students who had attended prekindergarten had significantly fewer days of absence than those students who qualified for prekindergarten but had not attended. Figure 4.1 shows the distribution of 3rd graders number of days absent.

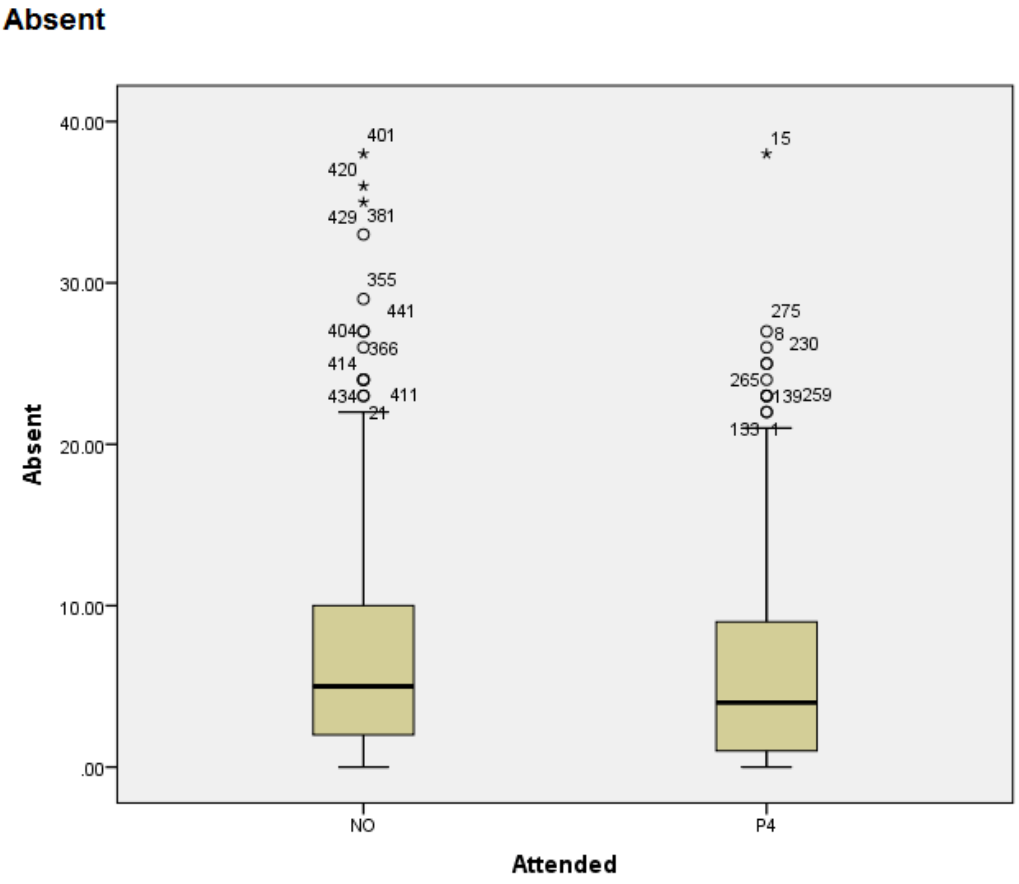

Figure 4.1-Number of days absent of 3rd grade students who had attended prekindergarten and students who had not attended but qualified for prekindergarten. Numbers noted by o represent extreme values.

$H_0 4_2$: There is no significant difference in the number of days absent of 7th grade students who had attended Putnam County's prekindergarten program and the number of days absent of 7th grade students who qualified for but had not attended Putnam County's prekindergarten program.

In 7th grade, there was no significant difference [t(341)=1.04, p=.299] in number of days absent for students who had attended prekindergarten (M=10.20, SD=10.43) and students who had not (M=9.12, SD=7.38). Therefore, null hypothesis $H_0 4_2$ was retained. The number of days absent did not differ significantly whether or not 7th graders had or had not attended kindergarten. Figure 4.2 shows the distribution of 7th graders' number of days absent.

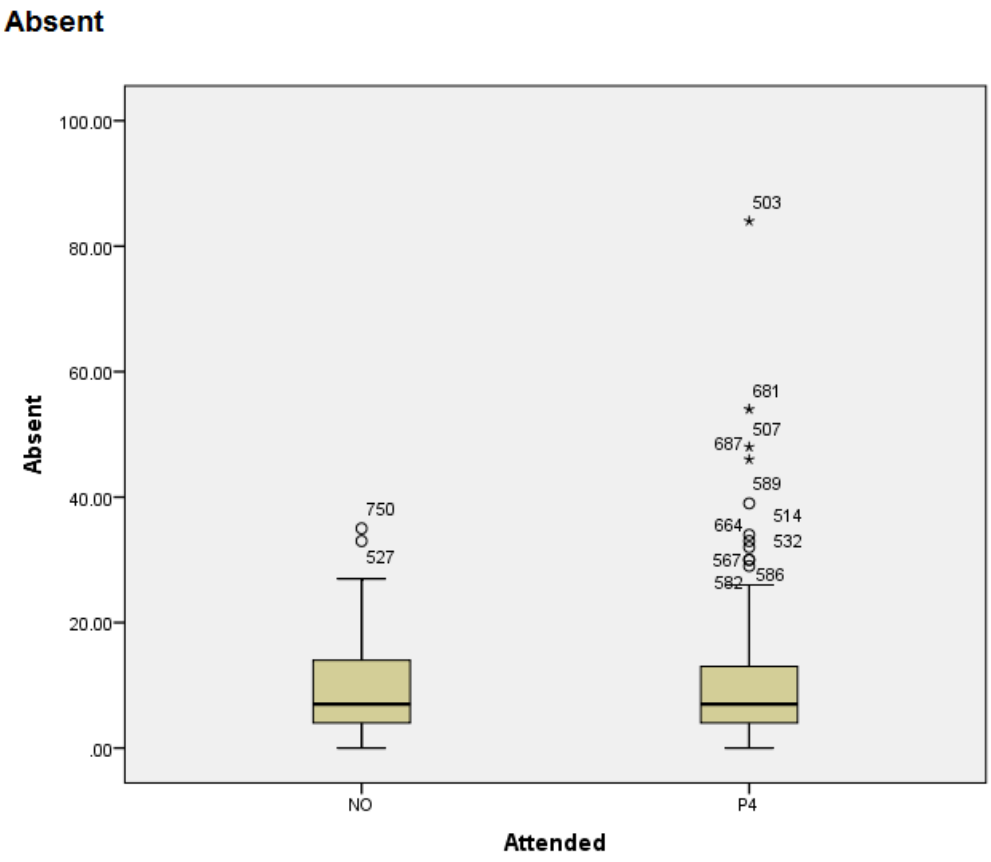

Figure 4.2-Number of days absent of 7th grade students who had attended prekindergarten and students who had not attended but qualified for prekindergarten. Numbers noted by o represent extreme values.

$H_0 4_3$: There is no significant difference in the number of days absent of 9th grade students who had attended Putnam County's prekindergarten program and the number of days absent of 9th grade students who qualified for but had not attended Putnam County's prekindergarten program.

In 9th grade, there was no significant difference [t(317)=1.44, p=.150] in number of days absent for students who had attended prekindergarten (M=7.05, SD=8.48) and students who had not (M=8.55, SD=10). Therefore, null hypothesis $H_0 4_3$ was retained. The number of days absent did not differ significantly whether or not 9th graders had or had not attended kindergarten Figure 4.3 shows the distribution of 9th graders' number of days absent.

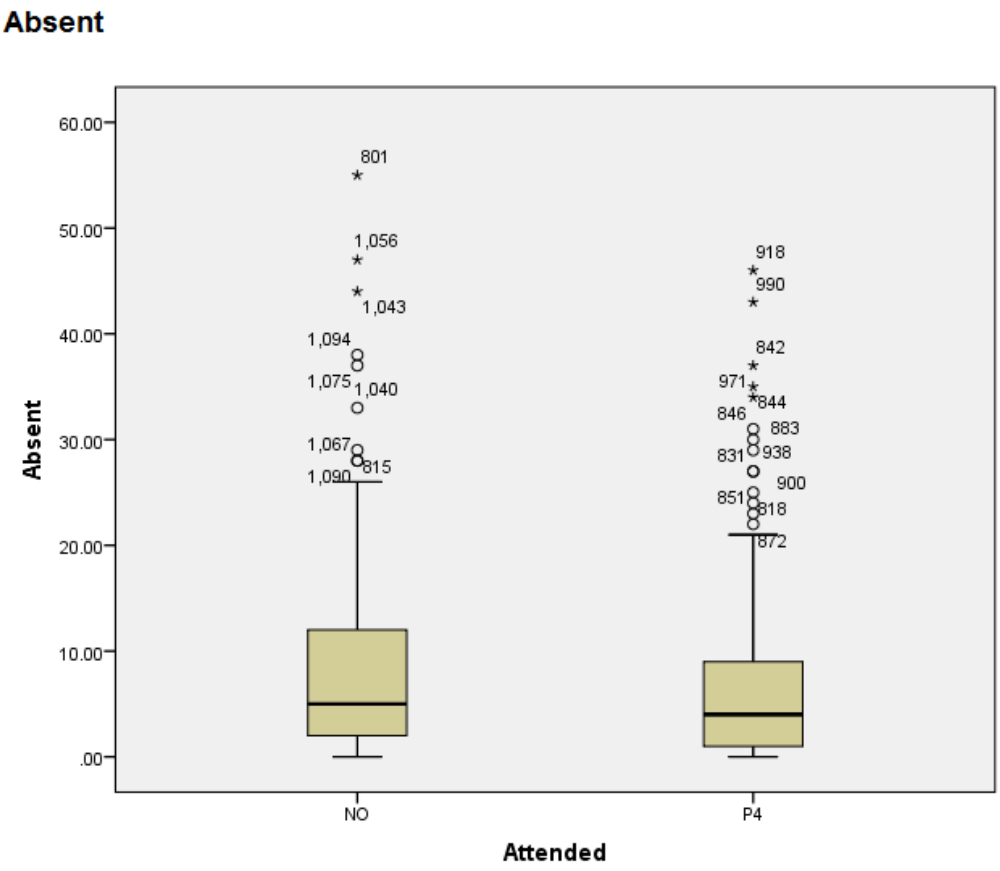

Figure 4.3-Number of days absent of 9th grade students who had attended prekindergarten and students who had not attended but qualified for prekindergarten. Numbers noted by o represent extreme values.

Research Question 5

5. Is there a significant difference in the number of discipline referrals of students who had attended Putnam County's prekindergarten program and the number of discipline referrals of students who qualified for but had not attended Putnam County's prekindergarten program?

$H_0 5_1$: There is no significant difference in the number of discipline referrals of 3rd grade students who had attended Putnam County's prekindergarten program and the number of discipline referrals of 3rd grade students who qualified for but had not attended Putnam County's prekindergarten program.

Independent samples t-tests were conducted to evaluate whether significant differences were found in number of discipline referrals in 3rd, 7th, and 9th grade between students who had attended Putnam County's prekindergarten program and students who qualified for, but had not attended Putnam County's prekindergarten program.

In 3rd grade, there was no significant difference [t(439)=.823, p=.411] in number of discipline referrals for students who had attended prekindergarten (M=.18, SD=.619) and students who had not (M=.23, SD=.85). Therefore, null hypothesis $H_0 5_1$ was retained. The number of discipline referrals did not differ significantly whether or not 3rd graders had or had not attended kindergarten. Figure 5.1 shows the distribution of the number of 3rd grade discipline referrals.

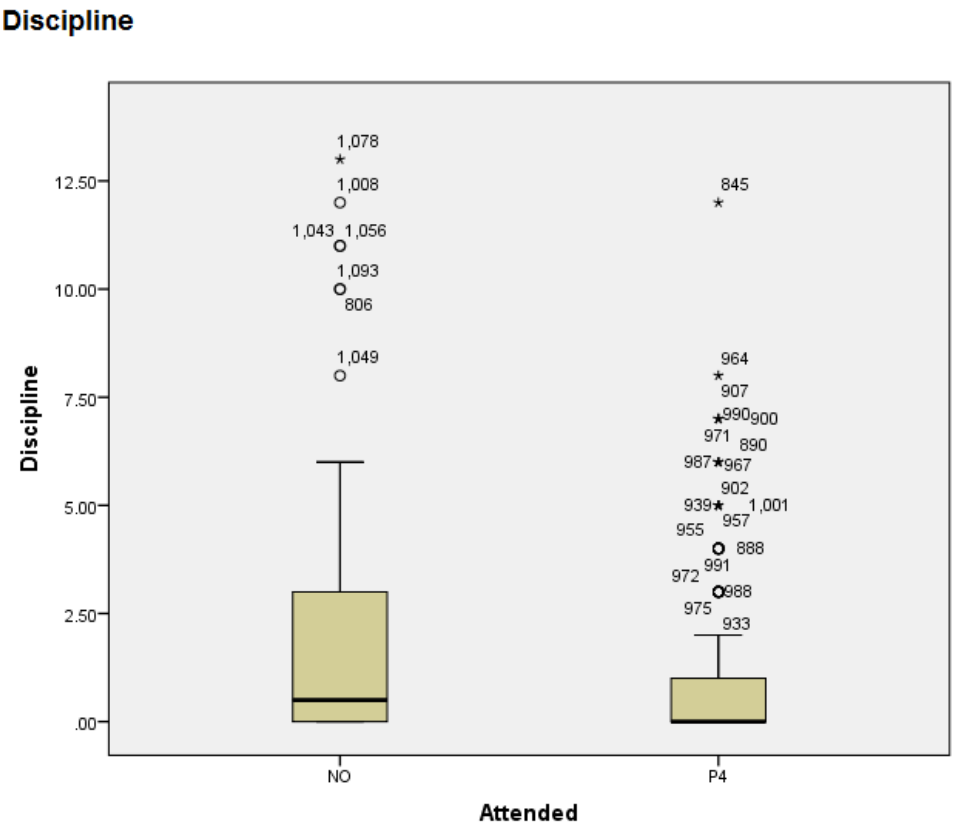

Figure 5.1- Number of discipline referrals of 3rd grade students who had attended prekindergarten and students who had not attended but qualified for prekindergarten. Numbers noted by o represent extreme values.

$H_0 5_2$: There is no significant difference in the number of discipline referrals of 7th grade students who had attended Putnam County's prekindergarten program and the number of discipline referrals of 7th grade students who qualified for but had not attended Putnam County's prekindergarten program.

In 7th grade, there was no significant difference [t(349)=.443, p=.658] in number of discipline referrals for students who had attended prekindergarten (M=.75, SD=1.80.) and students who had not (M=.83, SD=1.49). Therefore, the null

hypothesis $H_0 5_2$ was retained. The number of discipline referrals did not differ significantly whether or not 7th graders had or had not attended kindergarten. Figure 5.2 shows the distribution of the number of 7th grade discipline referrals.

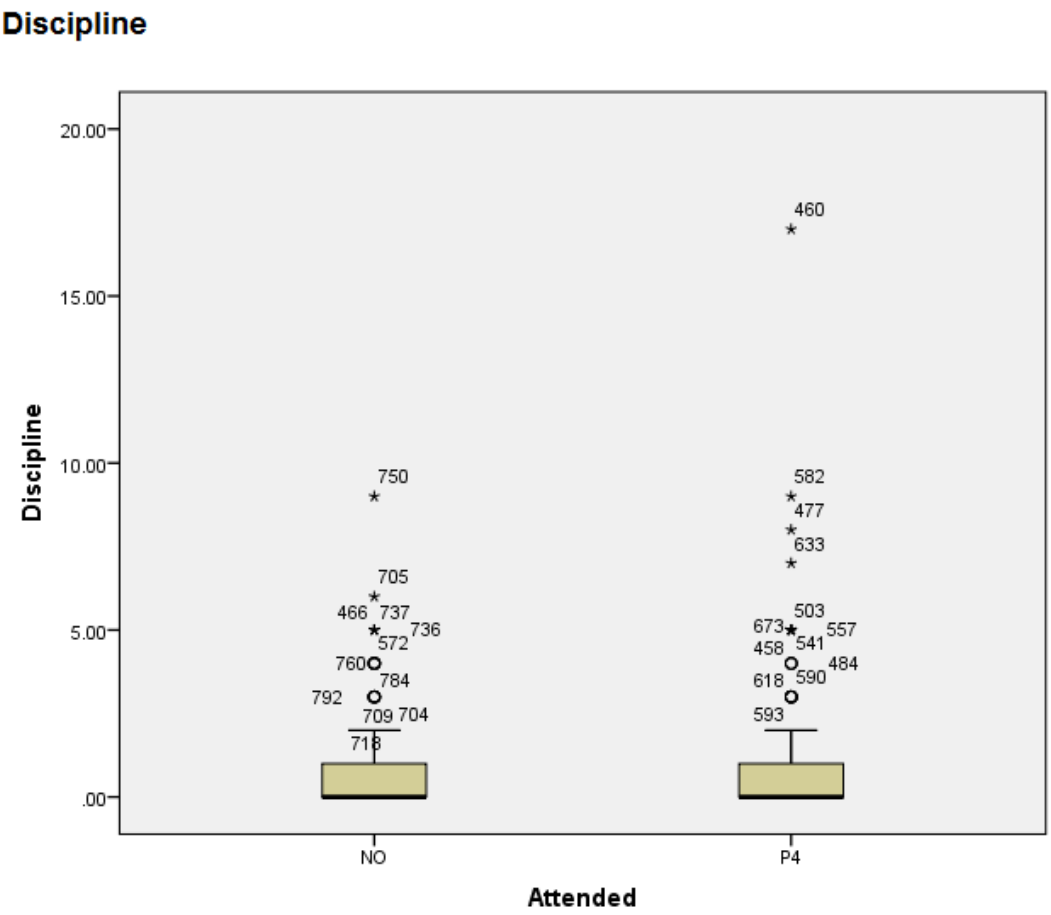

Figure 5.2- Number of discipline referrals of 7th grade students who had attended prekindergarten and students who had not attended but qualified for prekindergarten. Numbers noted by o represent extreme values.

$H_0 5_3$: There is no significant difference in the number of discipline referrals of 9th grade students who had attended Putnam County's prekindergarten program and the

number of discipline referrals of 9th grade students who qualified for but had not attended Putnam County's prekindergarten program.

In 9th grade, there was a significant difference [t(324)=2.2, p=.028] in number of discipline referrals for students who had attended prekindergarten (M=1.14, SD=1.9) and students who had not (M=1.71, SD=2.69). Therefore, the null hypothesis $H_0 5_3$ was rejected. The 9th grade students who had attended prekindergarten had significantly fewer discipline referrals than those who qualified for prekindergarten but did not attend. Figure 5.3 shows the distribution of the number of 9th grade discipline referrals.

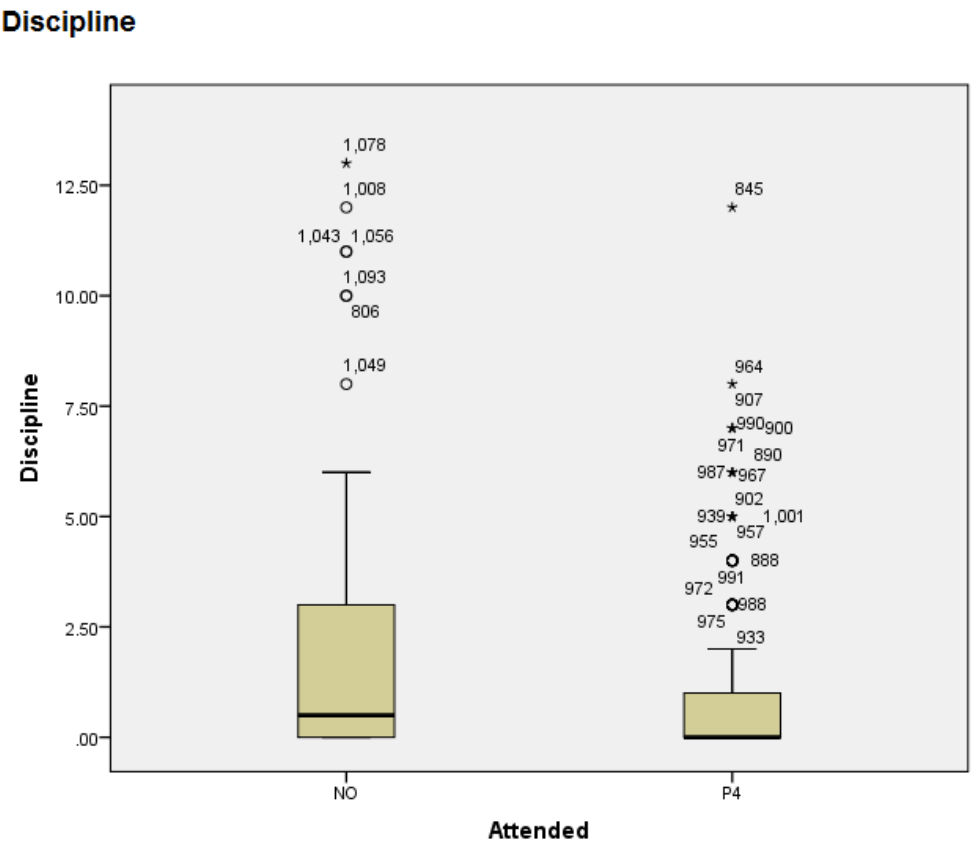

Figure 5.3- Number of discipline referrals of 9th grade students who had attended prekindergarten and students who had not attended but qualified for prekindergarten. Numbers noted by o represent extreme values.

Chapter Summary

In this chapter, data from 1,118 Putnam County students across three band levels (elementary, middle, and high) were analyzed. The specific grade levels included 3rd grade, 7th grade, and 9th grade. There were five research questions and eleven null hypotheses. The sources from the data came from a variety of measures including GPA, ACT Explore scores, MAP Universal screener scores in Math and Reading, absenteeism rates, and end of year discipline referral rates.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter contains a summary of the findings, conclusions, implications for practice, and recommendations for future research. The purpose of this quantitative study was to determine if there is a significant difference in the academic and behavioral performance of students who had attended Putnam County's prekindergarten program and the academic performance of students who qualified for, but had not attended Putnam County's prekindergarten program. The researcher examined individual student data of specific students in three grade bands (elementary, middle, and high school). The grade levels included 3rd grade, 7th grade, and 9th grade. The data analyzed were students' individual GPA, ACT Explore scores, MAP Universal Screener Math and Reading scores, number of days absent, and number of discipline referrals of students who had attended Putnam County's prekindergarten program and students who would have qualified for Putnam County's prekindergarten program, but had not attended.

Conclusions

Research Question 1 addressed the GPAs of students in 3rd, 7th, and 9th grades. The findings showed that there were significant differences in the GPAs of students who had attended Putnam County's prekindergarten program and students who qualified for but had not attended. In every grade level, students who had attended Putnam County prekindergarten had higher GPAs than those who qualified for but had not attended prekindergarten. Bauer and Schanzencach's (2016) found that students who have participated in early childhood programs have higher GPAs than their counterparts.

Research Question 2 addressed the ACT Explore scores of current 9th graders who took the ACT Explore test in the 8th grade. Students who had attended Putnam County's prekindergarten program scored higher on the ACT Explore test than the students who qualified for but had not attended prekindergarten. Reynolds et al. (1997) revealed that students who attend preschool programs score higher in Math and Reading concepts than those who do not attend a preschool program. In the Chicago Longitudinal study, students who attended preschool scored in the 63rd percentile in Math achievement and 50th percentile in word analysis as compared to their counterparts who had not attended preschool. Those students scored in the 35th percentile in Math and 47th percentile in word analysis. Research Question 3 addressed the MAP Reading and Math scores of students in 3rd and 7th grade. The findings showed that there were significant differences in MAP Reading scores of students who attended Putnam County's prekindergarten program and students who qualified for but did not attend. The national norm for MAP reading scores by the end of the year in 7th grade is 218, which means that students who had attended prekindergarten in Putnam County scored above grade level. The students who qualified for prekindergarten in Putnam County but had not attended scored below grade level (NWEA, 2015).

The findings showed that there were significant differences in MAP Math scores of students who had attended Putnam County's prekindergarten program and students who qualified for but had not attended. The national norm for MAP Math scores by the end of the year in 7th grade is 228.6, which means that students who had attended prekindergarten in Putnam County scored above grade level. The students who qualified for prekindergarten in Putnam County but had not attended scored below grade level

(NWEA, 2015). Students who had attended Putnam County's prekindergarten program scored higher in the MAP Reading and Math universal screener than those students who qualified for, but had not attended prekindergarten in Putnam County. The Children at Risk and Meadows Foundation (2016) study showed that students in the 3rd grade who attended a state funded prekindergarten program scored 28 points higher in Reading on the State of Texas Assessments of Academic Readiness (STAAR) Reading Assessment than students who did not attend prekindergarten. Aikens et al. (2013) indicated that successes are found in language, literacy, and math in students who have had early childhood intervention programs such as Head Start. Phillips, Gormley, and Lowenstien (2016) explained that early childhood interventions can lead to higher math scores in the 7th grade of students who attended an early childhood program than those who did not attend.

Research Question 4 addressed the number of days absent of students in 3rd, 7th, and 9th grades. The findings showed that there were significant differences in days absent of students who had attended Putnam County's prekindergarten program and students who qualified for but had not attended in the 3rd grade only. Students who had attended Putnam County's prekindergarten program missed fewer days of school than those who had not attended. Phillips et al. (2016) revealed that early childhood educational programs have a significant impact on chronically absent students with students who attended preschool programs having lower absentee rates than those students have not attended.

Research Question 5 addressed the number of discipline referrals of students in 3rd, 7th, and 9th grades. There was a significant difference found only in 9th grade

students who had attended prekindergarten and those who qualified for prekindergarten but had not attended. Ninth grade students who had attended prekindergarten had fewer discipline referrals than those students who had not attended. Anderson et al. (2016) reported differences in an academic setting with students who attended Head Start scoring higher in achievement measures in Math and Language, but no significant differences were found in in-school and out-of-school suspensions. Additionally, Feinberg and Schaaf (2010) revealed that no significant differences were found in the behavior problems of students who attended prekindergarten and students who had not attended prekindergarten in North Carolina over a measured period of time.

Recommendations for Future Practice

The researcher made the following recommendations for prekindergarten educator practices:

- Federal and state funding agencies and federal and state departments of education should implement a stronger and more focused approach in terms of funding early childhood education which includes further research on how to effectively fund prekindergarten programs. This should include examining recent and older data to measure success of the programs
- State and local evaluation expectations should call for stronger accountability standards for quality state-funded prekindergarten programs that address specific academic and whole-child needs
- State level administration and local level school districts should provide effective and quality professional development for teachers and teaching assistants to

implement better quality, lasting practices that continuously demand high expectations of prekindergarten students as well as high expectations for teachers and teaching assistants.

- School districts should provide structure and expectations regarding vertical teaming practices that connect prekindergarten teachers to early elementary and middle school teachers to help sustain early childhood educational practices throughout elementary, middle, and high school

Recommendations for Future Research

The researcher recommended the following suggestions for future prekindergarten research:

- Consider a longitudinal comparison study that measures the different grade bands across the years to see how students performed in specific grade levels.
- Consider researching gender as an independent variable between the different grade bands and within the grade bands.
- Consider researching students post-secondary and analyzing which students attended college and which students did not attend. Future research could also measure how those students perform in college by other independent variables.
- Consider measuring the quality of prekindergarten programs by breaking each program down by specific school. Future research could analyze students coming out of school-specific prekindergarten programs and how they perform based on a set independent variables.

- Consider using other independent variables as success measures such as surveys or questionnaires to see whether students' and teachers' perceptions of prekindergarten are accurate.

Chapter Summary

This chapter included the findings, conclusions, and discussions of findings. Recommendations for practice and recommendations for future research were also included in this chapter. The quantitative findings in this study showed significant differences in individual and multiple grade levels for students GPA, MAP Reading and Math scores, ACT Explore scores, discipline rates, and absentee rates. The overall differences are shown as positive in the students who had attended the Putnam County prekindergarten program. The differences shown make it evident that the students who had attended Putnam County prekindergarten perform better than those that had not attended Putnam County prekindergarten, but qualified for the program. Some grade bands showed no differences in the areas of discipline and absenteeism. All other research conducted in the academic setting showed greater student success as defined by higher numerical data in achievement of those students who had attended prekindergarten in Putnam County.

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APPENDIX A: PERMISSION TO CONDUCT RESEARCH LETTER

PUTNAM COUNTY SCHOOL SYSTEM

ENGAGE INSPIRE ACHIEVE

February 14, 2017

Dr. Virginia Foley
Educational Leadership and Policy Analysis (ELPA)
East Tennessee State University
P.O. Box 70550
Johnson City, TN 37614

Dear Dr. Foley:

It is my understanding that Mr. Chris Winningham, graduate student at East Tennessee State University, would like to conduct a quantitative study in conjunction with Putnam County School System. I hereby grant permission to have access to 3rd grade, 7th grade, and 9th grade data in several areas with regards to their in the Voluntary Pre-K program for the study. All data will be given in a confidential manner to protect anonymity. Mr. Winningham's agreement with PCSS includes the following commitment to PCSS:

1. A copy of the results of her study to be shared at the conclusion of the study with PCSS;
2. Compliance with FERPA, TN Public Records Act, and PCSS Board Policies;
3. Agree to destroy all PCSS student data, electronically and/or paper;
4. A formal submission of PCSS External Researcher "Statement of Assurances";
5. Involvement of students in the study including, but not limited surveys and/or interviews would require Board Approval; and
6. If any changes occur from the original submitted proposal, PCSS will immediately be notified in writing of the changes and seek permission once again for the study.

If you have any questions, please feel free to contact me at the District Office.

Sincerely,

Denette E. Kolbe
Assistant Director of Schools - Teaching & Learning

1400 East Spring Street • Cookeville, Tennessee 38506 • Office (931) 526-9777 • Director / Board Fax (931) 528-6942 • www.pcsstn.com

VITA

CHRISTOPHER J. WINNINGHAM

Personal Data:	Date of Birth: Novermber 9th, 1982 Place of Birth: Cookeville, Tennessee
Education:	
	B.S. Secondary Education-Government and History, Tennessee Technological University, Cookeville, Tennessee 2007
	M.Ed., Instructional Leadership, Tennessee Technological University, Cookeville, Tennessee, 2009
	Ed.S., Curriculum and Instruction, Tennessee Technological University, Cookeville, Tennessee, 2013
	Ed.D., Educational Leadership, East Tennessee State University, Johnson City, Tennessee, 2017
Professional Experience:	2007-2008 History and Government Teacher- White County High School, Sparta, Tennessee
	2008-2015 Social Studies Teacher- White Plains Academy, Cookeville, Tennessee
	2014-Present VITAL On-Line Teacher- Personal Finance, VITAL School, Cookeville, Tennessee
	2015-Present Assistant Principal, Algood Middle School, Algood, Tennessee
Honors and Awards:	2014-2015 Teacher of the Year Recipient-White Plains Academy
	2015-2016 Rotarian Teacher of the Year- VITAL On-Line School
Memberships-	Golden Key International Honour Society