IMPACT ASSESSMENT OF THE DR. JERRY HAMM EARLY LEARNING CENTER: A FORMAL PROGRAM EVALUATION STUDY OF THE PROGRAM’S IMPACT ON CHILD OUTCOMES

A Dissertation by

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Submitted to the Department of Psychology
and the faculty of the Graduate School of
Wichita State University
in partial fulfillment of
the requirements for the degree of
Doctor of Philosophy

May 2020
IMPACT ASSESSMENT OF THE DR. JERRY HAMM EARLY LEARNING CENTER: A FORMAL PROGRAM EVALUATION STUDY OF THE PROGRAM’S IMPACT ON CHILD OUTCOMES

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DEDICATION

This dissertation is dedicated to first and foremost my God, who led me to pursue this doctoral degree; to my most supportive and loving mother, Marsha, who called me and listened to my frustrations and encouraged me during some tough times during this journey; to my late paternal and maternal grandparents, whose legacy still lives on in me and who laid the foundation for me to achieve my dreams; to my family, friends, and church family who provided words of encouragement, love, and emotional support when it was need most; and finally, to the students of the Dr. Jerry Hamm Early Learning Center who taught me the power of a genuine and sincere hug and smile, and to their teachers who are committed to helping them reach their fullest potential.
“Education is our passport to the future, for tomorrow belongs to the people who prepare for it today.”
-Malcolm X
ACKNOWLEDGMENTS

I would like to thank my adviser, Dr. Charles Burdsal, for having faith in me from the very beginning of my doctoral journey and for the many years of thoughtful advice, support, and mentorship. I would also like to thank the members of my committee, Dr. C. Brendan Clark, Dr. Jennifer Demers, Dr. Samantha Gregus, and Dr. Chase Billingham for supporting me through the dissertation process, including the proposal, dissertation defense, and dissertation edits. A special thank you to the Community Engagement Institute (Center for Applied Research & Evaluation), including Dr. Lynn Schrepferman and Dr. Nicole Freund for their support, helpful comments and suggestions on all stages of this project. I would also like to thank Dr. Craig Correll (USD 445 Superintendent) and all of the Dr. Jerry Hamm Early Learning Center staff members who welcomed me into their beautiful school, allowed me to engage with their students, and provided me with the data which was essential to the success of the evaluation.
ABSTRACT

This evaluation study investigated the impact of the Dr. Jerry Hamm Early Learning Center (JHELC), a district prekindergarten program located in southeast Kansas. A quasi-experimental comparative design was used to examine 2017-2018 spring end-of-the-year benchmark assessments (i.e., early literacy, reading, and math) and other school performance outcome measures (i.e., disabilities, grade retention, attendance, and behavior referrals) for students from kindergarten to third grade. Students in the treatment group participated in the JHELC, which provided wraparound services to students including literacy, math, socioemotional instruction, and mental and health care services. The comparison group either received no early childhood education instruction or some other childcare arrangement.

The current study had mixed findings showing that the JHELC had a moderate impact on the students who participated in the program. There were very few statistically significant differences between JHELC students and their comparison group peers in early literacy, reading, math, repeat discipline referrals, and grade retention. Additionally, the JHELC group had a significantly greater number of identified learning disabilities. However, JHELC students had significantly greater attendance than the comparison group. Subgroup analyses determined that gender, race, and socioeconomic status did affect the amount of benefit students received from the program. Future studies should investigate the contextual differences in the subgroups and the mechanisms that lead to the differences suggested in this evaluation study.

Keywords: Early childhood education, program evaluation, kindergarten readiness, elementary school, AIMSweb assessments, wraparound intervention model, academic achievement, early literacy, reading, math, attendance, disabilities, grade retention, behavior
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CHAPTER 1

INTRODUCTION

Investing in the lives of young children serves to maximize their future well-being. Educational experiences and learning begin at birth and are continuous; in fact, learning occurs in all contexts (Donoghue, 2017). A large body of research has consistently found that students who attend public prekindergarten (pre-K) programs are more kindergarten ready than their peers who did not attend pre-K programs (Ansari et al., 2017; Ansari & Winsler, 2016; Gormley & Phillips, 2005; Weiland & Yoshikawa, 2013; Winsler et al., 2008; Yoshikawa et al., 2013). Kindergarten readiness is recognized as a child’s early math and literacy skills, and includes socioemotional and self-regulation skills (Blair & Raver, 2015; Duncan et al., 2007; McClelland & Cameron, 2012; Rabiner et al., 2016). Childhood development researchers show that during a child’s earlier years, they develop language, cognitive, social-emotional, and self-regulation skills that are associated with later cognitive functioning and educational success (Trawick-Smith, 2014; Woolfolk & Perry, 2012). Biologically, the early years of a child’s life are the years where they make many of the neuron connections in their brain and when each brain goes through the processes that will determine both the physical structure and infrastructure of the brain, and its key future capabilities (Halvorson, 2016). However, many children in America, especially those who are economically disadvantaged, fail to reach their full developmental potential because of serious disparities in health and cognitive stimulation. Research has established that the effects of disparities in cognition and health in the early years can be harmful and have a long-lasting effect on future life outcomes, often reinforcing the intergenerational cycle of poverty (Martinez et al., 2012). Studies have also shown that risk factors associated with economic hardship for children under age five years old may lead to their failure to reach their
developmental potential cognitively, socially, emotionally, and physically (Brooks-Gunn & Duncan, 1997; Duncan & Brooks-Gunn, 2000; Grantham-McGregor et al., 2007).

More than 40% of children in the U.S. are growing up in impoverished or economically disadvantaged households, which means children are overrepresented among the U.S.’s poor (Koball & Jiang, 2018). There are key risk factors associated with poverty which include low parental education, teen parents, single-parents, non-employed parent(s), higher levels of residential mobility (i.e., moving residents very frequently), and households without English speakers. These risk factors, especially when combined with poverty, can increase children’s chances of adverse outcomes and children who are affected by multiple risk factors (three or more risk factors) are the most likely to experience poor academic achievement and other negative outcomes, like poor socioemotional skills and juvenile delinquency (Schlee et al., 2008; Pungello et al., 2010). Poverty in the U.S. is systemic and often cyclical—children born into poverty often remain stuck in the cycle generational poverty (Mosley, 2019). Early childhood education programs are not expected to and cannot eliminate the power of poverty, but they have been shown to mitigate the effects of poverty through the creation of positive early learning experiences for children facing economic adversity (Brown et al., 2018).

Early childhood education is a broad term used to describe any type of educational intervention designed to serve young children, birth to eight years old, usually including children in their preschool and early elementary years (Gullo, 2005; National Research Council, 2015; Reynolds et al., 1997). Early childhood education programs in the United States vary in the emphasis they place on education and social welfare, how they are funded and deliver services to children and families. Some early childhood education programs place more emphasis on care of the children while others focus on education or some with equal emphasis on both (Kamerman &
Additionally, early childhood education programs (e.g., formal and informal) can be federally-, state-, or locally funded (Barnett et al., 2009; Barnett & Masse, 2003; Hustedt & Barnett, 2011). Formal early education programs can be designed to meet the needs of children at each age level (i.e., usually age two through eight years) and are provided in various contexts including nursery schools, daycares, preschools (pre-kindergarten), and elementary (primary) school, which often includes kindergarten through third grade (Reynolds et al., 1997). Two important objectives of early learning programs are to 1) promote kindergarten readiness skills, including pre-reading, writing, and math concepts; and 2) teach fundamental social skills necessary for building positive relationships and conflict resolution skills (Burger, 2013). Early childhood education programs have been shown to help prevent developmental delays, foster psycho-social stimulation, and provide better nutritional options that many economically disadvantaged children lack in their earlier years (Prado & Dewey, 2014; Sandstrom & Huerta, 2013). Children raised in economically disadvantaged settings are at greater risk for academic and social-emotional problems, as well as poor nutrition, which can lead to poorer educational and life outcomes (Engle & Black, 2008).

For many decades there has been increased commitment and consideration toward preventing and ameliorating the issue of poverty. To improve the quality of lives for U.S. citizens, the federal government established programs and passed legislation to improve healthcare, education, and job training for the poor. In the mid-20th century, the Elementary and Secondary Education Act (ESEA) of 1965, subsequently known as the Improving America’s Schools Act of 1994, No Child Left Behind Act of 2001, and Every Student Succeeds Act of 2015 was passed, which created an intensive effort to improve the access of quality education and equal opportunity for children in the U.S. The ESEA of 1965, a cornerstone for Lyndon B.
Johnson’s “War on Poverty” (1965), was social-welfare legislation designed to reduce poverty and improve the lives of the poor (the poverty rate was near 20 percent during the early 1960s) through increasing federal government funding in education and health care (Nelson, 2016). Federally funded programs were established to help disadvantaged children and families, physically and mentally disabled children, and children who needed to learn English (i.e., students who are learning the English language in addition to their native language or other languages they may speak), representing a commitment to equal access to quality education and raising the academic achievement of struggling students.

Lyndon B. Johnson and his administration had concern about the problems experienced by economically disadvantaged children, and they thought that school, specifically academic achievement, was an effective agent of upward social mobility and associated with later socioeconomic status—ending the cycle of poverty (Jeffrey, 1978; Paul, 2016; Zarefsky, 1986). During this period, The Head Start Project, the first publicly funded preschool program and now the largest federally funded early education program in the U.S. was launched as a Community Action Program (CAP) initiative. It was created to serve economically disadvantaged children, children with disabilities, and children who were English learners, with an objective to increase access to early education to low-income children, and subsequently to improve school readiness. The Head Start Program was designed to offer disadvantaged children with opportunities to receive high-quality early childhood education, with emphasis in cognitive and social-emotional skills (Office of Head Start, n.d.). These programs also placed and continue to place special emphasis on the family and community, which are a part of the child’s more macro-level learning environment.
Early education and development continues to receive attention from federal, state, and local governments, parents, employers, and the local community as researchers continue to generate evidence that early education may prevent or minimize gaps in school readiness and improve future educational, health and life outcomes, especially among more economically disadvantaged children (Office of the Associate Director for Policy and Strategy, 2016). In 2017, 65% of 4th graders in the U.S. were not proficient in reading and 67% of 8th graders were not proficient in math, with a greater proportion of these students coming from low-income environments (Annie E. Casey Foundation, 2019). Additionally, researchers have shown that early education and child development is an important determinant of health over the life course (Halfon & Hochstein, 2002). Economists, like Nobel Prize winner Dr. James Heckman have referenced early childhood development and education as a method to create human capital (i.e., skills, creativity, and enterprise) and as an investment in young people. Dr. Heckman said:

“The highest rate of return in early childhood development comes from investing as early as possible, from birth through age five, in disadvantaged families. Starting at age three or four is too little too late, as it fails to recognize that skills beget skills in a complementary and dynamic way. Efforts should focus on the first years for the greatest efficiency and effectiveness. The best investment is in quality early childhood development from birth to five for disadvantaged children and their families” (Heckman, 2012, p. 1).

Moreover, advances in neuroscience and research related to developmental psychology have helped to demonstrate the benefits of early learning for young children. This research further confirms that early years are critical for learning, development and growth of children (Yoshikawa et al., 2013). Early learning provides the necessary foundation for skill development in language, literacy, numeracy, motor development and socioemotional areas. Studies reveal that participating in early learning programs can 1) boost educational attainment, 2) reduce the utilization of special education services, 3) reduce likelihood of being retained in their grade, 4)
reduce likelihood of juvenile delinquency, 5) increase likelihood of graduating high school and going on to college, and 6) boost income earnings later in life (Center for Public Education, 2008). The evolution of early childhood education has continued to transform the idea of early learning, and the importance of providing children with a stimulating and nurturing environment. Research has shown that early childhood education offers children unique experiences that can add value to their lives and may benefit them throughout their school years and beyond.

Conversely, other research has shown that often, outcomes targeted by early childhood education interventions (e.g., literacy and numeracy skills, motor skills, and social-emotional skills) soon diminish and/or disappear, with children not receiving the intervention catching up to children who did (Bailey et al., 2017; Leak et al., 2010; Puma et al., 2012). The Perry Preschool project, a famous early learning intervention, boasted a large end-of-intervention impact on IQ by age 5 when compared 5-year old students who had not received the treatment. Three years later, the large effect in IQ had diminished to statistically insignificant (Schweinhart et al., 2005). Additionally, Puma and colleagues (2012) found that the noteworthy impacts in math, literacy, and social-emotional skills at the end of the Head Start year greatly diminished over the next several years of early elementary school. Unfortunately, most early childhood education interventions which place emphasis on cognitive, social, emotional and physical development fail to follow their students beyond the end of the program (e.g., Durlak et al., 2011), which provides opportunities for future research.

However, promising findings show that though the initial impact directly following the early childhood intervention may diminish, there are patterns of reemergence and sustained positive impacts in educational attainment (e.g., high school graduation and college attendance) and behavioral domains (e.g., better health outcomes) detected in adolescence and early
adulthood (Chetty et al., 2014; Deming, 2009). So, despite these conflicting results showing that preschool may not have lasting effects on children (e.g., Weiland & Yoshikawa, 2013; U.S. Department of Health and Human Services [DHHS], 2010), early childhood education is still important. The early childhood education community must continue to explore new and innovative ways to promote positive academic and life outcomes for children who are economically disadvantaged (Brown et al., 2018).

Further research and evaluation are necessary to improve the quality of prekindergarten programs (i.e. refine practices and programs); to show the impact early childhood education has on children, their families and the entire community; to influence early childhood education policy; and to affirm the need for continued and additional early childhood education funding. It is imperative that researchers and evaluators understand what is most reasonable to expect from prekindergarten programs and which best practices should be employed to achieve the best results for American children. Moreover, it has become more of a responsibility for early childhood education programs that receive federal, state, local, and private funding to show their effectiveness, often through program evaluation studies and impact assessments, to sustain funding and secure potential future funding. Additionally, policy being based on evidence is becoming more prevalent at the state and federal levels of government, with more legislatures writing legislation that requires program evaluations and specifying outcome measures that should be studied (Phillips et al., 2017). The government wants to make its planning more rational, effective and accountable, so program evaluation has been used to provide information (e.g., a program’s value and worth) to decision makers who make funding decisions for social service programs (Levitan, 1992; Posavac, 2016). This current evaluation study attempts to
explore the impact the early learning center in Coffeyville, Kansas is having on its participants and their families.

1.1. Evaluation of Early Childhood Education Initiatives and Findings

Evaluation of early learning interventions is integral to the operation of these programs, often requiring skilled researchers to perform the evaluation (e.g., Puma et al., 2012; Schweinhart et al., 2005; Weiland & Yoshikawa, 2013). As mentioned above, early learning programs were designed to develop cognitive, social, and emotional skills in young children, and evaluating the extent to which these skills have been developed in children is necessary to show the effectiveness of the program (Ashdown & Bernard, 2012; Currie, 2001; Ramey et al., 2000). Resources (i.e., financial and human) are also devoted to ensure programs are providing high-quality instruction and services, so evaluation also provides information about the return on investment for early childhood education programs (Heckman et al., 2010; Karoly, 2012; Karoly et al., 2006). Program evaluators describe the considerable effectiveness and impacts realized by many children and families who participate in high quality early learning opportunities and considerable societal gains from an expansion of early childhood education and development interventions (Rolnick & Grunewald, 2003).

During the last several decades, evaluation on the association between participation in early childhood learning opportunities and child development has grown considerably. The primary purpose of program evaluations of early childhood education initiatives is to assess whether a program is achieving its stated objectives and goals regarding child outcomes (Janus & Brinkman, 2010; National Association for Education of Young Children [NAEYC] & National Association of Early Childhood Specialists in State Departments of Education [NAECS/SDE], 2003; Washington State Office of Superintendent of Public Instruction, 2008). The secondary
The purpose of evaluation is that of accountability or ensuring that the program is performing the activities and operating like it stated in its logic model (Janus & Brinkman, 2010; NAEYC & NAECS/SDE, 2003). These evaluations and the processes that accompany them can be helpful in strengthening the early childhood programs and their future effectiveness and impact (NAEYC & NAECS/SDE, 2003).

“Collecting and analyzing the data necessary to determine whether a given early care and education (ECE) program is accomplishing its objectives is a necessary complex enterprise” (Horton, 2006, p. 2). Program evaluation has several components and includes analysis of the specific program/initiative (e.g., problem statement, activities, target population, desired outcomes), assessment of child’s cognitive and social-emotional development, and assessment of program quality. There is no uniform program evaluation template because each program has different primary goals and commitments, different sets of resources, and external factors that influence the delivery of the program’s services. Some programs focus solely on school readiness, while other programs (e.g., Head Start) focus more intently on wraparound or comprehensive services, including education and physical and mental health.

1.1.1. **Short- and Long-Term Effects of Early Childhood Interventions**

The most prominent and influential program evaluation longitudinal studies include the Abecedarian Project (Campbell, et al., 2002), the High/Scope Perry Preschool Program (Schweinhart, 1993), the Early Training Project (Gray & Klaus, 1970), and Chicago Child-Parent Centers (Reynolds, 2000). These longitudinal studies assessed short- and long-term outcomes for children who participated in early learning programs and children who did not. These studies followed children through grade school into high school and even into adulthood. The common outcome measures assessed for these programs included IQ scores, grade retention, special
education placement, high school graduation, college attendance, employment, earnings, government transfers, arrests, convictions or incarcerations, drug use, teen pregnancy, and marriage. Studies also collect other child level information such as demographic information, including gender, race/ethnicity and socioeconomic status.

Evaluation studies assessing the effectiveness of the Abecedarian Project, Perry Preschool program and other seminal programs were small-scale, longitudinal studies and were considered high-quality and scientifically rigorous, often randomly assigning program participants to treatment and control conditions. The Perry Preschool, Abecedarian Project, and Early Training Project studies have dominated the early childhood education program evaluation field and have influenced early childhood and development policy in the United States (Horton, 2006). Although these programs are impressive in that they utilize experimental design to assess the effect participating in early childhood education programs has on low-income children, many of these programs and studies were again, small-scale, only involving approximately 90 to 125 children (including treatment and control groups) and usually only focused on a limited number of cognitive outcome measures, for example IQ. Both the Perry Preschool and Abecedarian Project showed large end-of-treatment impact on IQ, and the Abecedarian Project generated impacts in IQ that persisted beyond early elementary school (Campbell et al., 2001; Scweinhart et al., 2005). Additionally, the programs showed relatively large impacts on language and numeracy skills, indicating that early learning programs can have long lasting effects on cognitive and academic development (Campbell et al., 2001; Radin & Wiekart, 1966).

A large body of research studies also indicates that prekindergarten programs can have significant effects on children’s academic, cognitive, and socio-emotional development (Camilli et al., 2010; Gorey, 2001). The major concern for early childhood education research is the
divergence between past findings seen in the seminal demonstration programs described above and the estimated effects of the more contemporary and larger-scale public programs (Barnett et al., 2018). However, not all programs are equally effective and recent studies of larger-scale, often public pre-k programs, tend to find smaller effect sizes on similar outcome measures (Bailey et al., 2017; Magnuson et al., 2007; DHHS, 2010). Another issue is that these effects that are detected for larger-scale programs vary substantially, where some programs may show larger positive effects by kindergarten for literacy and early reading (effect size range from .45 - .62) and numeracy and geometry (effect size range from .49 - .58) and other programs show smaller effects, with significant increases in math and reading performance at primary school entry—effect size range from .10 - .13 (DHHS, 2010; Magnuson et al., 2007; Weiland & Yoshikawa, 2013). Other studies show considerable gains in literacy and math skills for the treatment groups during the early childhood intervention and at kindergarten entry. However, the positive impact on cognitive outcome measures disappears by the end of kindergarten; and in some instances, performance of students in the control group surpasses that of the treatment group (Lipsey et al., 2018; Lipsey et al., 2015).

1.1.2. Subgroup Effects

Large-scale early childhood education interventions emerged in the United States from the desire to reduce the academic achievement gap between children who were economically disadvantaged and their more affluent peers who may have grown up in better environments (Weiland & Yoshikawa, 2013; Zigler & Styfco, 2010). Duncan and Magnuson (2011) explain that gaps between more and less advantaged children in cognitive-related skills emerge early and increase substantially by kindergarten entry. Most of the literature assessing the effectiveness of early childhood education interventions is based on low-income populations (Leak et al., 2012).
As shown above, various studies indicate that effects of early childhood education interventions on cognitive, social, and emotional outcomes are greater for lower income families (DHHS, 2010; Currie, 2001). In recent years, there has been growing interest in whether early childhood education might reduce gaps in cognitive, social, and emotional skills by race/ethnicity, gender, and English language learners (Anderson, 2008; DHHS, 2010; Gormley et al., 2005; Lipsey et al., 2018; Magnuson & Waldfogel, 2005).

Both the Head Start Impact Study and Tulsa prekindergarten studies found significantly stronger effects on cognitive skills and other developmental outcomes, compared to students of other racial and ethnic groups (DHHS, 2010; Gormley et al., 2005). Gender has also been of interest for assessing which gender benefits more from participation in early childhood education interventions. Anderson (2008) pooled data from the more famous smaller-scale, more intensive early education interventions, including the Perry Preschool, Abecedarian, and Early Training Project and found that female children received greater benefits than males. However, Kelchen and colleagues’ (2012) meta-analytic study assessing a broader range of early childhood education interventions did not find the same pattern. Lastly, children from whom English was not their native language experienced greater gains than their peers on academic achievement measures during the early childhood education intervention (Lipsey et al., 2018).

Larger-scale early childhood education programs often include Head Start programs, daycare centers, state- or district-funded prekindergarten programs, and other federally funded preschool programs like the Chicago Child-Parent Centers (CPCs) program, an early childhood education intervention which emphasizes early education and services to disadvantaged families. Evaluation studies of these varying types of early learning programs, however, do make it difficult to draw any generalizable conclusions about the impact of early childhood education.
programs overall simply because programs often differ substantially in program design, target population served, and context of the program. In fact, past literature has determined that larger-scale programs have more methodological limitations, especially those regarding internal validity issues and generalizability, as mentioned above (Barnett et al., 2018; Gilliam & Ripple, 2004; Gilliam & Zigler, 2001). The limitations associated with evaluation done on larger-scale programs may be attributed to the fact that most studies are observational in nature, meaning that study participants are observed without any forced change to their circumstances (Gilmartin-Thomas et al., 2018; Sedgwick, 2012). The intent for observational studies is to observe how participants react to the intervention and which outcomes are influenced. For early childhood education, a group of students who attend a high-quality early learning program can be compared to students who did not attend the high-quality program.

1.2. Common Outcome Measures

A larger number of studies utilize various outcome measures to assess the effectiveness of early childhood education interventions. It has been generally accepted that early childhood education interventions improve cognitive performance in children who are raised in economically disadvantaged situations in the short term (Barnett, 1998). As for the more famous studies mentioned above (e.g., Perry Preschool Project, Abecedarian Project, and Early Training Project), longer term effects are more important for researchers and policymakers (Yoshikawa, 1995). To assess longer term effects of early childhood education programs on children, outcome measures that are examined include achievement in literacy, reading, and math and academic success as measured by grade retention, special education placement, and high school graduation (Barnett, 1998). Social-emotional learning has also been an outcome that is being examined since children without age-appropriate social and emotional skills usually are at risk for long-
term behavioral and academic problems (Feil et al., 2005; O’Conner et al., 2011). The next few sections describe some of the more commonly utilized outcome measures to examine longer term effects of early childhood education programs on children from economically disadvantaged situations.

1.2.1. Literacy and Reading

Decades of research indicate that early literacy skills in the areas of language, print concepts (i.e. features of books and text), phonological awareness, and phonics are predictive of future literacy success and how well students will learn to read when they receive formal reading instruction in elementary school (Lonigan et al., 2000; Phillips et al., 2016). Acquiring phonological awareness skills, which include rhyming, alliteration, blending, and phoneme manipulation, contribute to increased reading performance, predicting performance on word reading and comprehension tasks in later grades (Muter et al., 2004; Wackerle-Hollman et al., 2015).

1.2.2. Numeracy and Math

Literacy skills have historically dominated the evaluation of learning and academic achievement; therefore, assessment tasks focusing on mathematics and numeracy skills have been limited. Research has shown that children understand many numeracy concepts before they start learning mathematics formally in school (Song & Ginsburg, 1987; Sophian et al., 1995). Practical activities like every day counting, learning about distances and measurements, and patterns all help early numeracy development. Also, development of numeracy skills before entering kindergarten and/or primary school influences achievement in school mathematics (Malofeeva et al., 2004; Starkey et al., 2004). Like literacy, involving numeracy instruction and activities daily helps to improve numeracy skills and confidence in the students’ ability.
1.2.3. **Special Education Placement**

The purpose of special education is to provide learning opportunities to students with exceptional needs, such as students with learning disabilities or mental challenges. Early childhood education interventions can decrease the likelihood that children will require special education services in elementary school and beyond. Research shows that there are adverse outcomes associated with students needing more special education services, including lower academic performance, sustained gap in literacy and numeracy, reduced chance of completing high school, less chance of attending a postsecondary institution, greater likelihood of involvement with the criminal justice system, and lower earnings (Aron & Loprest, 2012). Additionally, special education is expensive, costing approximately twice as much to educate students receiving special education services as those in regular education curricula.

1.2.4. **Grade Retention**

Grade retention is the practice of requiring a student who has been in a given grade level for a full school year to remain at that level for a subsequent school year (Jackson, 1975). The policy of grade retention was designed to promote children’s short- and long-term educational progress. Grade retention rates are predictive of high school dropout rates, lower levels of educational attainment, lower earnings and poorer behavioral outcomes (Hammond et al., 2007; Jimerson et al., 2002; Ou & Reynolds, 2010; Pagani et al., 2001). Some researchers, educators and policymakers argue that students who are retained can receive substantial benefits (e.g., academic growth) if the policy is implemented appropriately (Pettay, 2010; Range et al., 2012; Tomchin & Impara, 1992). However, opponents explain that the boost in achievement diminishes over time or is ineffective (Aldridge & Goldman, 2007; Huddleston, 2014).
Additionally, opponents also refer to the expense of grade retention (Foster, 1993; Texas Education Agency, 2006) and the emotional toil retention exacts on students (Anderson et al., 2005). Despite the debate, research does show how early childhood education predicts the likelihood of a student experiencing grade retention (Miller & Bassok, 2019). An evaluation done on Florida’s Voluntary Prekindergarten program (i.e., Miller & Bassok, 2019) found that participation in the voluntary prekindergarten (VPK) program did not lead to changes in the likelihood that children make it to and complete the third grade without ever being retained. However, the researchers did find that the VPK led to a difference in the timing of grade retention, which is important because research has shown that retention in the later grades (fourth through eighth grades) has more adverse effects than earlier retention—between grades first and third (Miller & Bassok, 2019; Ou & Reynolds, 2010).

According to Davoudzadeh and colleagues (2015), participation in early childhood education programs can increase in early academic, behavior and social-emotional, and motor skills, which decrease grade retention at the grade school level. Findings from the study suggest that school readiness predictors, specifically low early academic skills (i.e., reading, math and general knowledge skills), were the strongest predictors of grade retention (Davoudzadeh et al., 2015).

1.2.5. Attendance

State education agencies are prioritizing the issue of school attendance. Absenteeism in the early grades (pre-K through third grade), characterized by inconsistent or unstable school attendance, causes children to miss out on the adult support and guidance to help them acquire foundation skills that are essential for success in later grades (Attendance Works, 2014). There is strong evidence that more time spent in quality early childcare and education settings is
associated with positive outcomes for children including academic achievement, especially for disadvantaged children (Domitrovich et al., 2013; Shah et al., 2017; Zaslow et al., 2010). Research also finds that chronic absence in the early grades is associated with lowered proficiency in literacy and numeracy, and increased grade retention (Chang & Romero, 2008; Ehrlich, et al., 2014). Absenteeism in the early years of schooling often leads to chronic absences in the later grades (e.g., Ehrlich et al., 2014); however, attending an early learning program before entering kindergarten has been found to boost academic growth and reduce school absences (Ansari et al., 2017; Gottfried, 2015; Phillips et al., 2017; Weiland & Yoshikawa, 2013).

Schweinart et al. (2005) indicated that attendance is an attitude variable because attendance or poor attendance habits may carry into elementary school, negatively influencing academic achievement, discipline and attitudes about school. In the early years of schooling (e.g., elementary school), attendance may be in more control of the parents; however, as students get older their school attendance in preschool and early elementary can influence their attendance in middle and high school (Ehrlich, et al., 2014). In fact, studies show that truancy (unexcused, illegal absenteeism) is often linked to lack of parental monitoring and other social conditions, such as homelessness or poverty, that students experienced as children or may still experience (Fremont, 2003).

1.2.6. Behavior and Discipline Referrals

Studies have shown that better prosocial skills and fewer behavior problems are associated with children attending quality early childhood education programs (Broekhuizen et al., 2016). In fact, other studies indicate that the improved social skills and positive behavioral links may sometimes extend to adolescence (Vandell et al., 2010). The alarming frequency with
which young children are entering school displaying severe problem behavior has resulted in an interest in early intervention for children during their early years (Shonkoff & Phillips, 2000; Simpson et al., 2001). Children who display problem behavior at a young age are more likely to respond similarly as adolescents and as adults. In fact, when troubling behavior is not resolved during the early years, children experience delayed socioemotional development, problems with school adjustment, school success, and adaptation problems in educational and vocational settings as teens and adults (Dunlap et al., 2006; Lane et al., 2008). It is crucial that quality early learning interventions focus on self-regulation and socio-emotional skills to prevent the development of such disruptive behavior (Barbarin, 2007). The number of repeat discipline referrals is an indicator of a child who is displaying problem behaviors and is also an attitude variable because the ability to follow guidelines and exhibit appropriate behavior in school is indicative of attitude (Bakken et al., 2017). Early interventions are being produced to improve character and moral development, promote social skills, and strengthen academic competencies. Focusing on social-emotional skills and discipline can prevent the onset of later maladjustment in later grades.

1.3. **Past Program Evaluations and Research Designs**

Observational studies of programs like those mentioned above assess program impact and it is useful to control for selection bias (usually caused by self-selection or eligibility restrictions) by comparing the outcomes of those participants who participated in the intervention with an estimate of what their outcomes may have been had they not experienced the intervention (Gilmartin-Thomas et al., 2018). Often this is done by utilizing a comparison or control group that does not participate in the intervention or may experience a different intervention. The comparison group must be equivalent to the treatment group, so researchers utilize a variety of
techniques, including matching, in order to emulate the randomization process for group assignment utilizing observational data (Linden & Yarnold, 2016). For this current evaluation study, it is useful to describe a couple of research designs (e.g., experimental and quasi-experimental designs) and different research approaches to establish the control/comparison and treatment groups for evaluation studies, including random assignment, matching on observable characteristics, and age-cutoff regression discontinuity.

The Head Start Impact Study (Department of Health and Human Services [DHHS], 2010) is a six-year impact (2000-2006; data collection starting in 2002) longitudinal study initiated by a legislative mandate from Congress which employed an experimental design, randomly assigning participating children to a treatment group (children who received Head Start services) and control group (children who did not receive Head Start services but may have received other community services). The study assessed a total of 4,667 newly entering 3- and 4-year-old children (2,559 in 3-year-old group; 2,108 in the 4-year-old group) children in the areas of cognitive and social-emotional development, and physical health, as well as parenting practices (DHHS, 2010).

Findings from the study provided strong evidence that the treatment group demonstrated better performance in literacy skills and language development but found null effects for math skills. Aggregately (both 3-year-old and 4-year-old cohorts), there was a significant difference between the treatment group and control group on social and emotional development as assessed by social skills and approaches to learning, adjustment to school, parent-child relationships, child behaviors and others, all favoring the treatment group. For physical health, the intervention group had an increased receipt of health care services (e.g., dental care) significant improvement in overall health status and increases in health insurance coverage. Lastly, the impact study
provided evidence that parenting practices were influenced through the intervention group, especially in reference to disciplinary practices (e.g., using fewer timeouts and fewer spankings) and educational supports, like reading to their children (DHHS, 2010).

The Chicago Child-Parent Centers (CPCs) are federally funded (Title I) center-based early childhood interventions that provide services and educational opportunities to families in economically disadvantaged communities. The centers serve children and families from pre-kindergarten (age 3) through the third grade. These centers were originally established in four sites in Chicago in 1967 and since have expanded to 35 sites including other states like Minnesota and Wisconsin. The federally funded Chicago Longitudinal Study (CLS) of the CPCs has been ongoing since the 1980s, led by principal investigator Dr. Arthur J. Reynolds. The CLS investigates the short- and long-term outcomes for 1,539 children (989 participated in the CPC program and 550 participated in a full-day kindergarten offered by the school district) who were born in 1979-1980, grew up in economically disadvantaged neighborhoods in Chicago, and attended an early childhood intervention program in their early years (Reynolds et al., 2010). Like the current evaluation study for the Dr. Jerry Hamm Early Learning Center (JHELC), this quasi-experimental design created the comparison group by matching on observable characteristics for the participants including age, eligibility and participation in the intervention, and neighborhood and family poverty (Reynolds et al., 2011).

Research findings were favorable and showed significant economic benefit, in comparison to costs. The CPC preschool program was “associated with a return of $10.83 per dollar invested in the program” (Reynolds et al., 2011, p. 391). The additional benefits of participation in the CPC included higher educational attainment, which led to increased earnings and tax revenue and reduced incidents of crime and contact with law enforcement. In the analysis
of subgroup differences, the study revealed that males, 1-year preschool participants, and children from higher risk families received greater benefits than their counterparts (Reynolds et al., 2011). The findings suggest that there are sustained and lasting benefits associated with participating in the CPC programs. This program and programs like it especially benefit disadvantaged children, and subsequently, show substantial economic and social rates of return (Blau & Currie, 2006; Duncan & Magnuson, 2013; Elango et al., 2015).

Boston Public Schools (BPS), specifically its Department of Early Childhood, provide early childhood education programs and focus on pre-kindergarten through second grade. The Department of Early Childhood focuses to improve instructional quality through a combination of research-based curricula and instructional supports, such as professional development and teacher coaching (Boston Public Schools, n.d.). Additionally, they provide curriculum-grounded family engagement activities, summer enrichment programming, and collaborate with community-based organizations through grant funding to expand pre-kindergarten access for Boston’s young people (Boston Public Schools, n.d.).

In the 2008 – 2009 school year, the BPS served approximately 2,000 4-year-old prekindergarten students in 69 elementary schools. Children who were 4 years old by September 1 in 2008 could apply for the program and their access was not restricted by family income or any other restrictions, like many other publicly funded prekindergarten programs (Weiland & Yoshikawa, 2013; Barnett et al., 2010). The September 1 cutoff date helped to establish the logic for the study’s quasi-experimental regression-discontinuity (RD) design with an age cutoff for entry into the program. Those students who met the age cutoff by September 1 (exogenous treatment eligibility), were assigned to the treatment group and those children who did not make the age cutoff were assigned to the comparison group, which would attend prekindergarten the
following year (2009-2010). Weiland and Yoshikawa’s research study (2013) assessed the impact the prekindergarten program had on children’s early numeracy, language, literacy, executive functioning and emotional development. They were also interested in subgroup effects, specifically, if child subgroups (as defined by race, family income or child gender) benefited significantly more from prekindergarten than others.

The results showed that participation in the prekindergarten program led to significant improvement in mathematics, literacy and language skills; and significant positive impacts on executive functioning and emotional development (Weiland & Yoshikawa, 2013). For the subgroup analysis, children who were eligible for free or reduced meals benefited significantly more than students who were did not received free or reduced lunch on numeracy, inhibitory control, and attention shifting, with small-to-large range effect sizes, expressed in terms of the standard deviation of the control group (.27 - .62) (Weiland & Yoshikawa, 2013). Effects were also significantly larger for Black, Hispanic, and Asian children than for White children, with Hispanic and Asian children scoring higher than White children on approximately 70% of the assessments and only 25% for Black children (Weiland & Yoshikawa, 2013).

The studies described above (i.e. Head Start Impact Study, Cost-Benefit Analysis of the Chicago Child-Parent Centers study, and BPS Prekindergarten Impact study) utilized two research designs (experimental design and quasi-experimental design) that are most commonly used in determining program impact (DHHS, 2010; Reynolds et al, 2011; Weiland & Yoshikawa, 2013). Experimental design, the most scientifically rigorous design, may provide researchers with stronger evidence for an intervention’s impact; however, quasi-experimental designs have similar power and are often more practical and feasible for researchers (Cook & Campbell, 1979; Currie, 2001; Schweizer et al., 2016). Each of the three studies above and many
other impact assessments of early childhood initiatives provide evidence that children who participate in quality early childhood interventions experience increased academic success, improved health and mental health status, and improved post-school outcomes (e.g., increased earning, increased tax revenue, reduced incident of crime and contact with law enforcement), but there are also studies that diverge from the positive results (Lipsey et al., 2015; Puma et al., 2012). In the Head Start Impact Study, while there where positive effects in literacy and language skills for students who attended Head Start, there were null effects for mathematics skills (DHHS, 2010).

1.4. Early Learning Centers in Kansas

Kansas has taken a strong stance on the importance of early childhood and how early intervention is key to improving outcomes for children in the state (i.e., low-income children, disabled children, and children who are English learners). Its goal is to increase the cognitive, social-emotional, and physical skills of the children entering kindergarten to reduce the academic achievement gap (Slaby et al., 2005; Weiland & Yoshikawa, 2013). In 1980, Kansas became the first state to establish a special fund dedicated to prevention of child abuse and neglect, the Kansas Family and Children Trust Fund. The Children’s Trust Fund is investment funding for community-based prevention programs designed to support community organizations, families and individuals in preventing child abuse and neglect. In the following years Kansas legislatures, interested in addressing issues facing children and families, approved special committees (i.e., Special Committee on Children’s Initiatives, Corporation for Change, and Governor’s Advisory Committee on Children and Families) to develop strategic education plans and to administer the Children’s Trust Fund. Their creation of the *Blueprint for Investing in the Future of Kansas*
*Children and Families* was developed to confront systemic issues affecting children and families in Kansas.

In 1999, the Kansas Children’s Cabinet was established (the Governor’s Advisory Committee on Children and Families was abolished) to advise the Governor and legislatures on how to utilize the funding from the Master Tobacco Settlement, which was the largest civil litigation settlement in U.S. history resulting in the large tobacco companies paying states and territories billions of dollars in yearly installments. In October 2015, the Kansas State Board of Education (KSBOE) announced a new vision for education in Kansas, which emphasized kindergarten readiness and gave direction for a student-centered system and provided essential resources for individual achievement (KSDE, n.d.-b). The KSBOE identified *kindergarten readiness* as one of five outcome areas to measure progress for academic achievement. The goal of kindergarten readiness is to ensure that “each student enters kindergarten by age five socially, emotionally, and academically prepared for [school] success” (KSDE, 2018). Research has shown that the ability of young children to be successful in kindergarten is directly associated with high-quality early learning experiences in the first five years of their lives (Camilli, et al., 2010; Keys et al., 2013; National Institute of Child Health and Human Development Early Child Care Research Network, 2000).

In 2016, the fiscal agent for the Children’s Trust Fund then changed from being the responsibility of the Kansas Department of Children and Families (DCF) to the Kansas State Department of Education (KSDE). The Kansas Children’s Cabinet is guided by the *Blueprint for Early Childhood* and oversees grants for Community-Based Child Abuse Prevention (CBCAP) and the Early Childhood Block Grants. The Kansas’ Blueprint for Early Childhood (i.e. strategic
early education framework) explains that healthy development, strong families, and early learning are the building blocks for early learning success (KCCTF, 2020).

The state also commissioned a professional research firm to conduct an assessment on the effectiveness of early learning programs across the state. Through the Kansas School Readiness Project (KSDE, 2011), the Kansas State Department of Education (KSDE) collected data on more than 5,000 kindergarten children and followed them through fourth grade. The results of the study (KSDE, 2011) showed the following: 1) children who attended early learning programs such as Head Start, and other high-quality community preschools had higher literacy and numeracy skills when they entered kindergarten; 2) children who received special education in preschool had higher overall skill levels than those who began receiving special education in their kindergarten year; 3) at-risk children who participated in formal preschool experiences improved their overall skill levels before entering kindergarten; and 4) children who entered kindergarten with high literacy and numeracy skills had higher scores in both third and fourth grade reading and math assessments (p. 1). These findings provide evidence that early learning programs can make a significant difference in the lives of children.

The Kansas Children’s Cabinet and Trust Fund (KCCTF) believes that every child thrives when they have their basic needs met and have equitable access to quality early childhood education and care (Kansas Children’s Cabinet and Trust Fund [KCCTF], 2020). The solid foundation for Kansas Children and families in early childhood will prepare the children to succeed in primary school and beyond (KCCTF, 2020). The Kansas Children’s Cabinet invests in early childhood interventions like Head Start and are also responsible for evaluating programs that receive grant funding from their agency. Program evaluations are required to identify the most effective strategies in early childhood, hold programs accountable, and provide strong
evidence that early childhood programs across the state are achieving their desired outcomes (Posavac, 2016).

1.5. Evaluation Study Overview

The current evaluation study of the JHELC employs a quasi-experimental design like that used in the Chicago Child-Parent Centers study (e.g., Reynolds et al, 2011), matching groups of participants on observable characteristics to form the treatment and comparison groups. The current evaluation study of the JHELC attempts to add to the current evaluation literature for early childhood education programs and investigate the impact the JHELC is having on its participants. Since the JHELC receives funding from the state of Kansas to operate its programs, the current study helps to show its value in the overall landscape of early learning programs in the state.

This study highlights an early learning center in a Southeastern Kansas community operated by its local school district and a coalition of private and public entities that provide support for the center. These partnerships assist the Dr. Jerry Hamm Early Learning Center (JHELC) in providing affordable programs and services (i.e. education, medical, child care) to children and families, which allows the JHELC to offer learning opportunities for students in the community, with emphasis on economically disadvantaged and disabled students and students who are English learners. The purpose of this program evaluation study was to gather cross sectional information and data for students who participated in the Dr. Jerry Hamm Early Learning Center (JHELC) to measure the overall impact of the program and what effects participation in the early learning center had on key learning outcomes. The summative evaluation of this early learning center will provide the center with valuable information regarding the impact the center is having on the children it serves.
This study focuses primarily on cognitive outcomes, such as benchmark tests in literacy and numeracy and will assess the number of absences, instances of special education placement or number of disabilities, grade retention, and number of behavioral referrals. This data was collected for students who participated in the JHELC during the school years of 2013 – 2014 and 2017 - 2018. Their data was compared to a comparison group of students who did not participate in the JHELC. Information was not provided about whether those students who did not attend the JHELC attended another early childhood education program. This study attempted to determine if participating in the early learning center produces a significantly different effect in key learning outcomes for students.

1.6. Origins of the Dr. Jerry Hamm Early Learning Center

In July 2007, Coffeyville, Kansas experienced a devastating flood which swept through an oil refinery on the east side of the town spilling nearly 1,000 barrels or about 40,000 gallons of crude oil, prompting state and federal officials to declare the city a federal disaster area (Gillam, 2007). The flooding and oil-contaminated water caused the loss of more than 300 homes which impelled hundreds of residents to leave the community (Potter, 2011). This event sparked a sense of urgency in Coffeyville and a motivation to address the total loss of infrastructure in parts of the community including the loss of early childhood education and care. This sense of urgency provided the opportunity for organizations like the local school district and Head Start, who historically did not collaborate, to communicate and cooperate to address the significant social issue (Dr. J. Hamm, personal communication, October 22, 2018).

Dr. Jerry Hamm, the early learning center’s namesake, a retired Coffeyville educator and school administrator, and current member of the Coffeyville USD 445 Board of Education, was a key figure in helping establish the JHELC through his attendance at several conferences and
meetings with persons who had created pre-kindergarten programs for low-income children and families in their communities. While Dr. Hamm attended a governmental relations seminar shortly after the 2007 flood, he met with a representative from the Kansas State Department of Education. After hearing the challenges Coffeyville was facing as result of the flood, the representative believed Coffeyville was an ideal community for the early learning community demonstration (pilot projects) supported with funds Kansas received from the Tobacco Master Settlement Agreement (MSA) (Dr. J. Hamm, personal communication, October 22, 2018). The MSA, included forty six (46) states which settled Medicaid lawsuits against the tobacco industry, where tobacco companies agreed to alter or cease tobacco marketing practices, as well as to pay, in perpetuity various annual payments to the states to compensate them for some of the medical costs of caring for persons with smoking-related illnesses (Kansas Legislative Research Department, 2019). The Children’s Cabinet and Trust Fund uses the state’s share of the 1998 MSA to provide grants through the Children’s Initiatives Fund for programs for children and families (KCCTF, n.d.-e).

Coffeyville was targeted as an Early Learning Community (ELC) because it had begun to establish collaborative relationships with service organizations and businesses in the community. After the flood, an Early Childhood Action Team (ECAT) assembled key early childhood partners and served as the initial foundation for the ELC initiative (Hamm, 2017). The funding received was the final piece needed by the Coffeyville school district (USD 445) to move forward with the early learning center (Hamm, 2017). Partnerships were formed among USD 445, Head Start and the local Tri-County Special Education Cooperative to form the Dr. Jerry Hamm Early Learning Center.
The Unified School District No. 445 Coffeyville (USD 445) serves as the backbone organization for the ELC initiative in Coffeyville. As the backboard organization, USD 445 serves as the “glue” for the organizations, guiding the vision and strategy for the collaborative, managing/mobilizing financial and non-financial resources, and advancing policy (Juster et al., n.d.). The USD 445 Board of Education has included the expansion of early learning efforts and services in the school district strategic plan to include all children and families who live in the district (Coffeyville Public Schools, n.d.-b). The JHELC provides inclusive/blended classrooms through the Coffeyville Coalition for School Readiness (CCSR) partners who bring their own funding streams, staff, and expertise to the project and are integral in the planning and implementation of the JHELC. The CCSR, which replaced the Early Childhood Action Team (ECAT) which formed after the 2007 flood, operates as an advisory council to strengthen and inform the public-private partnerships within the community for the JHELC (Correll, n.d.). Table 1.1. lists community entities in the CCSR that provide services at the JHELC. Appendix B provides a brief description of each community partner.

TABLE 1.1.

COFFEVILLE COALITION FOR SCHOOL READINESS COMMUNITY PARTNERS
THAT PROVIDE SERVICES AT THE JHELC

<table>
<thead>
<tr>
<th>Community Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Unified School District No. 445 (USD 445)</td>
</tr>
<tr>
<td>2. Southeast Kansas Community Action Program (SEK-CAP)</td>
</tr>
<tr>
<td>3. Community Health Center of Southeast Kansas (CHC-SEK)</td>
</tr>
<tr>
<td>4. Tri-County Special Education Cooperative</td>
</tr>
<tr>
<td>5. Four County Mental Health Center (FCMH)</td>
</tr>
<tr>
<td>6. Parents as Teachers (PAT)</td>
</tr>
<tr>
<td>7. Montgomery County Health Department</td>
</tr>
<tr>
<td>8. Alliance for Childhood Education (ACE)</td>
</tr>
<tr>
<td>9. Coffeyville Community College</td>
</tr>
<tr>
<td>10. Boys and Girls Club of Coffeyville</td>
</tr>
</tbody>
</table>

Note. Data for Coffeyville Coalition for School Readiness Community Partners that Provide Services at the JHELC from Dr. Jerry Hamm Early Learning Center, by Kansas State Department of Education, retrieved from https://events.ksde.org/LinkClick.aspx?fileticket=_Y057VQoII%3D&tabid=863&mid=2169/.
JHELC encourages all services to be strategically aligned and coordinated for all students in the Coffeyville area to reduce wasted effort in duplication of services. Communication, trust and accountability are essential to ensure that all students are receiving the most appropriate and effective early learning opportunities. After the center was established and operating for a few years, USD 445 and school administrators thought it necessary to expand the offering of the early learning center to serve more children in the community. Eventually, the partnerships with the business community and a large matching donation led to the raising of approximately $2.2 million locally to expand the JHELC (Dr. C. Correll, personal communication, October 22, 2018). This expansion included four additional classrooms, which allows nine preschool and two infant/toddler classrooms. The success in raising funds to expand the JHELC initially came with skepticism among some members of the local Chamber of Commerce, however, after various presentations, candid conversations, and messages from advocates helped the effort gain traction. Success stories from other communities (e.g., TOP Early Learning Center, Wichita, KS), and the potential short- and long-term benefits to employers helped convince business owners of the impact their support for early learning would have on the community (CPPR, 2014).

1.7. Dr. Jerry Hamm Early Learning Center Program Overview

The Coffeyville Unified School District 445 (USD 445), including the Dr. Jerry Hamm Early Learning Center (JHELC), is among several Early Learning Communities (ELC), formerly known as Demonstration Learning Communities, in Kansas. ELCs provide integrated prekindergarten classrooms through unique public-private community partnerships, where a diverse group of partners unite under a shared vision, develop unique and creative strategies to meet their community’s goals, and better serve children and families (Kansas Head Start Association [KHSA], n.d.). ELCs are funded by the Kansas Children’s Cabinet and Trust Fund’s
(KCCTF) Early Childhood Block Grant and managed by the Kansas Head Start Association (KHSA).

The Dr. Jerry Hamm Early Learning Center (JHELC) is in Coffeyville, Kansas, a small city in the southeastern corner of Kansas, and began serving children and families, who were mostly economically disadvantaged, in 2009. The JHELC currently serves and supports a total population of approximately 215 students, five years of age and under, with their prekindergarten program (Coffeyville Public Schools, n.d.-a; KHSA, n.d.). The vision of the JHELC is to prepare the workforce of tomorrow and break the cycle of poverty in the community. The JHELC works towards its vision by providing educational programs and services, with an emphasis on cultivating a stable, supportive, and nurturing environment for its students. JHELC’s mission statement is “Uniting staff, individuals, families, and community partners to provide quality, comprehensive services through compassionate, respectful relationships” (Coffeyville Public Schools, n.d.-c).

The initiative was designed to reduce barriers (i.e., cost and affordability, parents’ knowledge of early care and education options, limited supply of high-quality early learning programs, hours and schedules) that impede low-income families’ ability to gain early exposure to prekindergarten and interventions that prepare preschoolers for kindergarten entry (Greenberg et al., 2016). Moreover, stakeholders desire that all children ages birth to five years have an opportunity for full-day early childhood education and care and that families are met where they are. Meeting families where they are means to respect the family’s choices and circumstances related to their lifestyle and work with them according to their current situation and family dynamic including lower socioeconomic status, cultural traditions, and habits (Dr. C. Correll, personal communication, October 22, 2018).
The theory of change approach followed by the JHELC is the holistic wraparound intervention model (Burchard, Bruns, & Burchard, 2002, Burns & Goldman, 1999; Goldman, 1999; VanDenBerg & Grealish, 1996; Walker et al., 2004). This intervention model utilizes partnerships to serve the whole child (i.e. broadening the focus on more than academic achievement to include physical, social, and emotional development) by using evidenced-based practices from early childhood education, medical health and mental health. The wraparound intervention model emphasizes a community-based, family-driven collaborative team, providing a full array of supports and formal services through early learning partnerships to economically disadvantaged students and families to remove common barriers (e.g., access to quality healthcare) to student success (Bertam et al., 2011). Lastly, this model includes the process of effective value-driven teamwork, which relies on the expertise and commitment of all community partners while also placing students and families in the center of the intervention (Walker, 2008; Walker et al., 2004).

An additional element of the JHELC’s theory of change is the implementation of explicit, intentional, and uniform curriculum (i.e., common district-wide curriculum) across classrooms with instructional support, to include professional development. The uniform curricula and instructional support for teachers can improve teacher self-efficacy and job satisfaction; and subsequently enhance instructional quality and prepare students for strong academic careers (Hightower et al., 2011; National Research Council, 2002).

Prekindergarten classrooms are fully blended with three to five-year-old students and are available in full- and part-day sessions (i.e., morning or afternoon) and after school services provided by Boys and Girls Clubs—Tots started in 2016. Special education services are available daily, full-time “Early Childhood Mental Health Consultants” are onsite, and meals and snacks
are provided for children and funded by the Child and Adult Care Food Program under the United States Department of Agriculture (USDA). The JHELC’s core services include services in the domains of healthy child development, strong families, and early learning (kindergarten readiness), which form the foundation for the Blueprint for Early Childhood which was established by the Kansas Children’s Cabinet and Trust Fund (Kansas Children’s Cabinet and Trust Fund [KCCTF], n.d.-a; See Appendix C).

1.7.1. Dr. Jerry Hamm Early Learning Center Program Description

The Blueprint for Early Childhood, including the building blocks (i.e., healthy development, strong families, and early learning), influences the programs and services offered by the JHELC. The JHELC honors Head Start Performance Standards and implements evidenced-based early childhood best practices to help improve school readiness and reduce the academic achievement gap between economically disadvantaged students and their more affluent peers (Garcia & Weiss, 2017). On-going health screenings and mental health assessments allow the JHELC to monitor children as they reach developmentally appropriate milestones and make modifications to services where necessary. Interventions are administered as needed. Support services are offered to families of the JHELC students as well with hopes that the services and programs will buffer the negative effects of poverty and close the health, education and income disparity. The JHELC has been in operation for nine years, providing economically disadvantaged and special needs children equal opportunity to engage in early learning opportunities. The funds that are received through grants, private businesses, and other partners not only help JHELC’s daily operations, but also allow for increased expansion of facilities to increase access to early learning and healthcare.
Children are recruited through a community-wide, integrated intake process. Currently, there are more eligible children than the JHELC has the capacity to serve. To select those deemed most at risk, the JHELC gives priority to children who present one or more of the following factors: 1) children whose family income would qualify them for participation in the federal free or reduced lunch program, 2) children and families whose first language is not English or English is not the language primarily spoken in the home, 3) children at-risk for developmental delays or who have an established Individual Education Plan (IEP) or Individual Family Service Plan (IFSP), 4) children in Foster Care or Custodial Grandparents/Kinship, 5) families whose parent(s) has less than a high school education, and 6) teen parents (A. Cavaness, personal communication, October 22, 2018).

As part of the JHELC’s core services, Strong Families, Family Advocates make weekly home visits to meet with families to set goals and connect them with services to assist them as they work their way out of poverty. Four County Mental Health (FCMH) provides onsite services daily for children who exhibit challenging behavior and help them develop proper social-emotional and self-regulation skills. FCMH also provides parenting classes for parents with children who have challenging behaviors to equip them with strategies and interventions to better meet their needs.

The JHELC emphasizes parent and community engagement and invites all parents, guardians, grandparents, and other community members into the facilities to support the students. To enhance the educational experience and learning environments for the students, JHELC promotes positive engagement between parents, teachers, school staff, and the community through family activities. Families are encouraged to attend activities including: Parent and Child Together Nights (PACT Nights), friendship parties, literacy events, parent
meetings, Four County Mental Health classes, and site council meetings. For example, during PACT Nights, families and staff participate in various activities, including mealtime, toothbrushing, arts and crafts, story time, food experiences, games, and songs.

Additionally, to reinforce the family engagement foundation, teachers and staff have “porch visits” at the beginning of each school year, where they visit with families on porches, sidewalks, or driveways to get to know the family and children’s interests (McIntyre et al., 2001). Open houses are held before the school year starts and parent-teacher conferences are held once per semester or when necessary. Other communications with parents take place through traditional and innovative strategies, such as texting and social media including Facebook, Instagram, and Twitter.

1.7.2. **Coffeyville, Kansas and District Characteristics**

Coffeyville, Kansas. Coffeyville is a small city in southeastern Montgomery County, Kansas, just north of the Kansas-Oklahoma state line. According to 2010 census data, Coffeyville had a population of 10,295 and a 2018 population estimate of 9,366, which is the most populous city in Montgomery County (U.S Census Bureau, n.d.). Table 1.2. provides statistics for the Coffeyville area, which includes the USD 445 school district (the district the JHELC belongs to), Montgomery County, and the state of Kansas. Roughly three-fourths of the school district’s families are considered economically disadvantaged assessed by the student’s eligibility for free or reduced lunch. The data below demonstrates a significant need for early childhood education, care and services for disadvantaged children and families.
TABLE 1.2.

COFFEYVILLE, MONTGOMERY COUNTY, AND KANSAS CHARACTERISTICS ON POPULATION, POVERTY LEVEL, AND MEDIAN HOUSEHOLD INCOME

<table>
<thead>
<tr>
<th>Description</th>
<th>Coffeyville</th>
<th>Montgomery County</th>
<th>Kansas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
<td>10,295</td>
<td>32,556</td>
<td>2,913,123</td>
</tr>
<tr>
<td>Persons age 5 and below, %</td>
<td>7.6%</td>
<td>6.2%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Children under 18 living below poverty level, %</td>
<td>34.7%</td>
<td>23.6%</td>
<td>16.4%</td>
</tr>
<tr>
<td>Free and reduced lunch (2017-2018), %</td>
<td>79%</td>
<td>65.81%</td>
<td>47.95%</td>
</tr>
<tr>
<td>Persons in poverty, %</td>
<td>26.2%</td>
<td>16.8%</td>
<td>12%</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>$36,080</td>
<td>$43,977</td>
<td>$55,477</td>
</tr>
</tbody>
</table>


Montgomery County ranks near the bottom of all Kansas counties in health outcomes and educational and economic indicators. Montgomery County has some of the highest rates of poverty for children under the age 18, child food insecurity, and teen pregnancy (Kansas Action for Children & Annie E. Casey Foundation, 2018; Kansas Health Matters, n.d.-b). These indicators often cause and precipitate risk factors and are included in the Table 1.3.:
TABLE 1.3.
MONTGOMERY COUNTY AND KANSAS HEALTH AND EDUCATIONAL INDICATORS

<table>
<thead>
<tr>
<th>Description</th>
<th>Montgomery County</th>
<th>Kansas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading proficiency*</td>
<td>68.98%</td>
<td>73.81%</td>
</tr>
<tr>
<td>High school graduate rate</td>
<td>87.3%</td>
<td>86.5%</td>
</tr>
<tr>
<td>Young children living below the poverty level</td>
<td>33.7%</td>
<td>19.1%</td>
</tr>
<tr>
<td>Women failing to receive adequate prenatal care</td>
<td>19.19%</td>
<td>16.57%</td>
</tr>
<tr>
<td>Infant mortality rate (per 1,000 live births)</td>
<td>8.57</td>
<td>5.95</td>
</tr>
<tr>
<td>Children under 18 hospitalized for mental health (per 1,000 children)</td>
<td>5.58</td>
<td>5.94</td>
</tr>
<tr>
<td>Birth to mothers in 2016 without high school diplomas</td>
<td>16.10%</td>
<td>12.53%</td>
</tr>
</tbody>
</table>


*Percent of 3rd through 8th graders meeting or exceeding standards on reading assessments. Data from 2016-2017 school year.

In addition to the data presented above, the USD 445 school district is racially diverse, with approximately 50% of its student population being classified as Latino, Native American, African American, and/or other (Coffeyville Public Schools, n.d.-a). In fact, this diversity is not uncommon for the JHELC. Just over 60% of the students who receive services are children of color. Additionally, Coffeyville Public Schools has seen a significant increase in its English Language Learner (ELL) student population with approximately 200 students (10% of total population) classified as ELL (National Center for Education Statistics [NCES], n.d.). ELL students account for a little over 15% of the JHELC student population.

1.8. **Logic Model for the Dr. Jerry Hamm Early Learning Center**

A description of the Dr. Jerry Hamm Early Learning Center was put into logic model format (see Appendix A: Logic Model of Dr. Jerry Hamm Early Learning Center). Logic models are often visual representations of how the project’s activities will bring about desired outcomes—short-, intermediate, and long-term (Community Toolbox, n.d.). The following
sections address the inputs, activities, and outcomes of the JHELC. These sections follow the flow of the logic model and its primary components. A logic model presents a reasonable and sensible model of how a program will operate under specific conditions to address identified problems (Bickman, 1987).

Logic models are often visual representations to show how inputs and activities of the program are linked to desired outcomes. They usually include inputs, activities, outputs, and outcomes—e.g., short-, intermediate, and long-term outcomes; they may sometimes include assumptions, and contextual factors (Community Toolbox, n.d.). The inputs include human and financial resources and raw materials that are used to conduct the effort of the initiative.

Activities are the interventions or events that occur as a part of the intervention. These activities use the inputs to direct the course of change. Lastly, outcomes are the direct (short-term) or indirect (long-term) changes that are a result of the activities from the intervention. Usually, outputs (i.e., direct evidence of having performed the activities) are included in logic models, however, the scope of the evaluation emphasizes outcomes, so outputs were not essential for the current study.

1.8.1. Inputs

Since 2009, considerable effort, personnel, material, and financial resources have been dedicated to developing and supporting the JHELC. The resources that have been allocated to the Dr. Jerry Hamm Early Learning Center (the inputs) can be placed into four categories: financial, people, partnerships & coalitions, and material (see Appendix A). A major proportion of the financial resources received by the JHELC come from the Kansas Children’s Cabinet & Trust Fund in the form of Early Childhood Block Grants. This grant funding is used to support the salaries and benefits of personnel, including the early childhood teachers, teaching assistants and
various other administrative staff of the early learning center. This funding also supports personnel of the partnering organizations (e.g., Four County Mental Health and Southeast Kansas Community Action Program [SEK-CAP]) that provide daily and weekly services to the students at the early learning center. Additionally, it supports travel, supplies, and staff professional development.

Other financial support comes from the Kansas State Department of Education (KSDE) and the Kansas Department of Health and Environment (KDHE), which support student slots so that children have access to early education opportunities offered by the JHELC. In-kind donations from the Unified School District 445 (USD 445) and matching funds from various supporters including the Community Health Clinic of Southeast Kansas (which provide medical, dental, and health services) and the Boys & Girls Club of Coffeyville (which provide after-school child care for working parents and a summer program at the center), help to support the mission and vision of the JHELC.

JHELC’s human resources include people employed by the center who devote all or part of their time to teach or to support teacher instruction and help deliver the curriculum. Many of the teachers are licensed and hold bachelor’s degrees, and several others hold master’s degrees. Other support staff include the program coordinator, transition coordinator, assistant director, and principal. These persons, many of whom also hold bachelor’s and master’s degrees, monitor child outcomes, work with families in the transition to primary school and ensure compliance in data collection and management.

The JHELC leverages community partnerships which include the USD 445, school district, Head Start (Southeast Kansas Community Action Program—SEK-CAP, Four County Mental Health, Parents as Teachers, Coffeyville Community College, Community Health
Centers of Southeast Kansas, and the Boys and Girls Club. These partnerships and unique collaborations facilitated by the USD 445 school district create what is known as the Coffeyville Model for Early Learning.

The early learning center blends several research-based curricula and processes into the Coffeyville Model for Early Learning. As a part of the Coffeyville Model for Early Learning, teachers follow a locally developed curriculum which focuses on social-emotional growth and self-regulation, academics, and overall healthy growth and development of the whole child. These research-based curricula include Creative Curriculum® for Preschool, Second Step, Literacy First, I Am Moving, I Am Learning, My Plate Nutrition, and USD 445 Build Your Own Curriculum (BYOC) Literacy & Math Curriculum. The Creative Curriculum® for Preschool program is a comprehensive, research-based curriculum, which enables teachers to create environments for purposeful exploration and discovery where children can develop confidence, self-efficacy, creativity, and critical thinking skills (Teaching Strategies, n.d.). The Second Step program is designed to increase children’s school readiness and social skills by building social-emotional competence and self-regulation skills. The teaching curriculum is aligned Pre-K through 12th grade to ensure that children are ready for every step in their educational journey.

The Literacy First process is a district-wide initiative (i.e., pre-K through 12th grade), which utilizes concentrated and direct reading instruction according to individual students’ needs.

Lastly, the USD 445 BYOC Literacy & Math Curriculum is a district-level curriculum that ensures all students experience the same path of curriculum with smooth grade-to-grade transitions. This district-level curriculum can enhance a student’s skill-level growth and development as they matriculate through school (Soini et al., 2018).
1.8.2. Activities

A variety of activities have been designed to achieve the desired results in school readiness and healthy child development for the JHELC (See Appendix A). One of these activities has been childcare, early care and education programming, specifically the focus on social-emotional competence and self-regulation skills (i.e., Second Step curriculum). Teachers and center staff focus on four self-regulation skills that are necessary for children to master before entering elementary school. These four self-regulation skills include empathy, emotion management, friendship skills and problem solving (Frey et al., 2000). Each day, teachers help students identify and label a variety of emotions in themselves and others and emphasize how to cope with situations that provoke strong emotions. The key to helping the children develop the self-regulation skills is to model the behavior for the children (Rosanbalm, & Murray, 2017).

Additionally, each classroom has a posted picture schedule of the daily routines that establishes the structure and sense of order of the day. The daily schedules incorporate routines that provide healthy structure and stability for the children and support cognitive, physical, social, and emotional development for children birth to five. Transition activities throughout the day are also used as learning opportunities.

Another important activity has been the regular developmental screenings and health reviews, including hearing and vision. Health screenings are a key part of children’s overall health care. Within the first 30 days, no later than 45 days of school entry, per requirements of the Kansas Department of Health and Environment and Head Start, each child receives a comprehensive health screening which provides “baseline data” that helps staff plan and individualize services. These screenings include vision and hearing, dental care, cognitive and mental health assessments, and general physicals. Teachers monitor students to ensure that they
are reaching developmental milestones. Through the developmental screening and monitoring, Ages and Stages Questionnaire-3 (ASQ-3), teachers and staff observe how students grow and change over time, and if they meet developmental milestones in playing, learning, speaking, behaving, and moving (Lamsal et al., 2018; Squires et al., 1997). If teachers do observe any abnormal behavior or developmental delays, they report their observations to the Student Improvement Team (SIT). SIT along with Four County Mental Health staff assess the students to determine if an Individualized Education Program (IEP) is necessary. These early assessments, screenings and evaluations ensure that interventions and individualized services are available for students who are not meeting social-emotional, cognitive, and communication benchmarks. The center is also equipped with an on-site clinic and resource rooms to accommodate children and staff.

The final identified activity of the Dr. Jerry Hamm Early Learning Center is the assessment of students’ literacy, numeracy and social-emotional skills development across time. The program coordinator is responsible for monitoring teachers’ documentation of student outcomes and common measures, including literacy, numeracy, and social-emotional skills. The documentation of outcomes and common measures gives teachers who may get students from other classrooms an idea of where a student is developmentally, which makes the instruction consistent and jointed. Having thorough and accurate documentation serves as a means of communication from one year to the next and makes it easier to assess the impact the early learning center is having on the students.

1.8.3. Outcomes

The desired outcomes for the JHELC can be categorized into three types: short-term, which are the direct and immediate result of the center’s activities and should be realized within
one to two years of implementation, intermediate, which should be achieved within two or three years of the program, and long-term outcomes, changes in behavior or conditions that will be achieved in three or more years.

The identified short-term outcomes include improvement of language and literacy skills, improvement of numeracy (math) skills, improvement of social-emotional and self-regulation skills (not assessed in this program evaluation study), increased early detection of developmental delays, and increased school attendance. Increased early identification/detection of developmental delays helps “children who are at-risk for developmental problems, handicapping conditions, and school failure to receive ameliorative intervention services as early as possible” (Meisels, 1988, p. 527). To improve the attendance and mitigate chronic absenteeism of students, the early learning center has an absence management program which holds parents accountable for ensuring their children are attending school. Research shows chronic absenteeism is prevalent in preschool programs (Ehrlich et al., 2014).

The desired intermediate outcomes of the early learning center are those that can be expected to be achieved between two to three years after attendance of the center. Short-term outcomes that are achieved often increase the likelihood of the occurrence of the following intermediate outcomes: school readiness improves, decrease in special education placement, reduction in academic achievement gaps, reduced behavior and incident reports, reduction in grade retention, and academic proficiency scores (e.g., literacy and numeracy) will increase (Community Tool Box, n.d.; Huhman et al., 2004). For instance, an improvement of language and literacy skills and numeracy skills for students who attended the JHELC, would lead to an increase in academic proficiency scores and a reduction in the academic achievement gap for economically disadvantaged children.
The long-term anticipated outcomes include 1) improving academic and social outcomes for students, 2) increasing the high school graduation rate, 3) improving post-school outcomes (e.g., less juvenile crime, improved health outcomes, increased employment rate), 4) increasing family engagement in their child’s learning and development, 5) increasing educational attainment of families and community members, and 6) breaking the cycle of poverty in the Coffeyville community. Stakeholders explain that the most important goal of the early learning center is breaking the cycle of poverty in the Coffeyville community. In Coffeyville, approximately 26% of the population is living in poverty, and almost two thirds of the children the JHELC serves are eligible for free or reduced lunch (U. S. Census Bureau, n.d.). The early learning center desires to create an educational and social foundation for the children and offer parents an opportunity to go to college through the partnership with the local community college. If achieved, each family can increase their educational attainment, improve employment prospects, and increase potential earnings (Brand, & Halaby, 2006; Brand, & Xie, 2010; Tamborini et al., 2015).

1.8.4. Summary

The Dr. Jerry Hamm Early Learning Center is a complex set of resources, including partnerships and activities that are designed to address various needs in the community including improving student and family outcomes. The program description, which includes background information and history of the early learning center, provides information necessary for understanding the context of the early learning center, and it has described, 1) the inputs (i.e., resources), that were invested in the initiative, 2) the activities that took place as a part of the implementation of the initiative, and 3) the desired outcomes of the initiative. Appendix A presents this program description in the form of a logic model, a visual representation of the
program and its integral components. The problem statement is also a very integral component of
the logic model and provides the purpose and what motivates the need for change (Community
Toolbox, n.d.). This study’s problem statement was expressed in the form of statements of
problems that the JHELC is addressing.

1.9. Problem Statement

During the initial interviews of the program evaluation stakeholders, the stakeholders
were asked, “What are the problems or issues that the early learning center was designed to
address?” All the stakeholders identified the lack of access to high-quality early learning
opportunities for students, specifically disadvantaged and at-risk students, the lack of
kindergarten readiness, and the academic achievement gap as students enter kindergarten. There
was consensus that there had been significant growth in the early learning environment,
regarding the increasing population of children birth to five. In 2016, Coffeyville had a total
child population ages birth-five years-old of approximately 750. The Dr. Jerry Hamm Early
Learning Center served 224 students, 208 three- to four-year-olds and 16 infant/toddlers.
Additionally, space is required to fill the need to enable all three- and four-year-old students to
receive the benefits of a full day early learning opportunity. The community of Coffeyville has
other pre-kindergarten programs in private and faith-based schools which serve approximately 50
total students. The remaining children of Coffeyville are unable to receive high quality early
learning experiences.

Second, the problem that the early learning center was designed to address was the lack
of kindergarten readiness in the Coffeyville community. The Kansas State Department of
Education’s mission is “to prepare Kansas students for lifelong success through rigorous, quality
academic instruction, career training, and character development according to each student’s
gifts and talents” (KSDE, 2017). The first outcome to measure progress on this mission statement is kindergarten readiness. This state-wide focus on kindergarten readiness helps to ensure all students are socially, emotionally, and academically prepared for success in school and in life. The ability of young children to be successful in kindergarten and in later years depends in large part upon their experience during their first five years, which might include the services offered by high-quality prekindergarten programs (Weiland & Yoshikawa, 20013; Yoshikawa et al., 2013). Children who do not receive early learning opportunities are less likely to successfully transition to kindergarten and less likely to perform as well as their peers who did receive early learning opportunities (Duncan et al., 2018).

Third, the other most cited problem that stakeholders identified was the need to break the cycle of poverty in the Coffeyville community. There was agreement that providing quality early learning programs to disadvantaged children produced lasting positive benefits and positive effects for the children enrolled in the program, but that those benefits would also extend to the children’s children (Heckman & Raut, 2016; McEwen & McEwen, 2017). The JHELC provides important benefits to working parents and enables them to go to work or school while also providing their children with a safe and nurturing environment and early learning opportunities necessary to improve development. Often, parents must choose between the high cost of childcare or forego the labor force to stay at home to care for their children themselves. The JHELC and other quality childcare is a critically important factor in the ability for working parents to earn a living wage for their families. “Parents with access to affordable and dependable childcare are less likely to face childcare interruptions that can result in absences or other schedule disruptions in the workplace” (Matthews & Walker, 2014, p. 2). Also, the JHELC in partnership with a local community college offers scholarships to parents who have children
who attend the JHELC. This initiative helps to potentially increase the educational attainment and achievement for the parents, which could eventually lead to increased earnings.

All these issues, 1) lack of high-quality early learning opportunities for students, 2) lack of kindergarten readiness among children, and 3) generational poverty in Coffeyville guide the efforts and activities of the early learning center and its partners.

1.10. Program Evaluation Questions

The purpose of this evaluation study is to gather information to inform the early learning center’s stakeholders of the benefits the students were receiving and if the early learning center was effective in improving desired key learning outcomes for students. Put in context of the CIPP evaluation model (Context, Input, Process, Product) for educational accountability (Stufflebeam, 1971), the current evaluation is considered a product evaluation, which will answer the following questions: 1) To what extent have student academic outcomes and attitudes toward school been impacted because of participating in the Dr. Jerry Hamm Early Learning Center?; and 2) Do these academic outcomes and attitudes toward school vary by the sociodemographic characteristics of the child? Considering the product nature of the evaluation, the following objective was used to guide the evaluation study and development of the evaluation questions: determine to what extent the short-term and intermediate outcomes of the early learning center (i.e., students’ academic outcomes) were being achieved by comparing outcome measures of students who attended the JHELC and students who did not participate in the JHELC.

The evaluation stakeholders (i.e. JHELC administration and the Coffeyville Public School superintendent), prioritized and selected the final set of evaluation questions. The process resulted in a final list of seven evaluation questions. The questions were all under the identified
objective of the evaluation study that was used to guide the current program evaluation. The evaluation questions are listed as follows:

1. Do children who participated in the early learning center show significantly higher skill in literacy and reading than children who did not participate in the JHELC?

2. Do children who participated in the early learning center show significantly higher skill in numeracy than children who did not participate in the JHELC?

3. Do children who participated in the early learning center have significantly reduced rates of identified learning disabilities as they enter the third grade when compared to children who did not participate in the JHELC?

4. Do children who participated in the early learning center have significantly reduced rates of grade retention compared to children who did not participate in the JHELC?

5. Do children who participated in the early learning center have significantly fewer repeat discipline referrals than children who did not participate in the JHELC?

6. Do children who participated in the early learning center have significantly fewer absences (better school attendance) than children who did not participate in the JHELC?

7. For children who attended the early learning center, are there demographic subgroups of students who benefit more from participation in the JHELC?

**1.11. Summary**

A large portion of this chapter was devoted to discussing elements of early childhood education, program evaluation, and prior program evaluations done on programs that served economically disadvantaged children. It also explored the gaps and deficiencies in prior research. It explored the purpose of the evaluation and provided a description of the JHELC, including background and historical information. Finally, it described the components of the logic model.
for the JHELC including the input, activities, and desired outcomes of the center, described the 
research problem and identified the program evaluation questions.

Chapter Two discusses methods for completing this evaluation study and first describes 
the research design and why it was selected. Finally, Chapter Two discusses evaluation design, 
the scope of the evaluation, the data analysis plan, as well as strategies for disseminating 
information related to outcomes of the study. Chapters Three and Four will describe the 
evaluation results and provide a discussion of the implications of those results as well as a 
discussion of the limitations and future directions for subsequent evaluations, respectively.
CHAPTER 2

METHOD

The program evaluation study was designed to address eight evaluation questions, which were identified based on input from key stakeholders for the initiative. The evaluation questions formed the foundation for the study. To provide the answers to the identified evaluation questions, the evaluation study utilized de-identified archival data collected through routine outcome measures. This data is routinely collected by teachers and care providers from the school district, the early childhood education initiative and local elementary school.

There were two broad goals for this study: 1) to assess the impact of the early learning center through assessing desired short-term and intermediate outcomes for the students and 2) to examine if those key outcomes vary by students’ sociodemographic characteristics, including race, gender, family income, and limited-English-proficient status.

2.1. Evaluation Design

The current program evaluation study was initiated for one primary reason. The primary reason was to provide information to stakeholders and decision makers about the program’s effectiveness. Before beginning the program evaluation study, determining the reason for initiating the evaluation was necessary to decide if the evaluation was being conducted for appropriate reasons. Next, it was necessary to identify the stakeholders of the program and the evaluation. Third, the evaluator (i.e., internal or external evaluator) responsible for conducting the program evaluation had to be identified. Lastly, a complete definition of the initiative to be evaluated had to be developed, including the purpose, background and historical foundation, and what the initiative does.
2.2. Scope of the Evaluation

The official inception of the JHELC was in 2009, during this time the center only offered part-day (morning and afternoon) slots to children and families. However, for the purposes of the current evaluation, the JHELC is defined as beginning during the 2013-2014 school year. This starting point was identified for several reasons. First, 2013-2014 was the year the JHELC opened its first full-day classroom, giving them one full-day classroom and four part-day classrooms. Each year since the 2013-2014 school year, the JHELC has increased the offering of full-day classrooms. To date (2018), the JHELC has seven full-day and two part-day classrooms. This is a significant development for the JHELC because this increased the amount of exposure students had to the curriculum and to the stable and nurturing environment the JHELC offers.

Research indicates that a full-day preschool intervention is associated with increased school readiness skills (e.g., literacy, language, and numeracy), attendance, and reduced chronic absences compared with a part-day program (Reynolds, et al., 2014).

The second reason the 2013-2014 school year was selected relates to the common measures initiative (CMI), which was instituted by the Children’s Cabinet in 2013 to assess Children’s Initiatives Fund (CIF) programs, including the Dr. Jerry Hamm Early Learning Center and other early childhood interventions across the state of Kansas. The goal of the CMI is to establish common outcome measures that can be used across various programs throughout the state to assess what differences the early childhood programs are making on children and families. The Children’s Cabinet is ensuring that their investments are meeting high quality standards, and the CMI does this by implementing a core set of targeted outcome measures which are all reliable and valid. The JHELC has been using a variety of common measures including the Ages and Stages Questionnaire, 3rd Edition (ASQ-3) and the Ages and Stages
Questionnaire: Socio-Emotional (ASQ-SE); the Individual Growth and Development Indicators (IGDIs); and the myIGDIs to provide both data on outcomes and targeted information regarding the quality of services to children and families.

To identify the impact of funding, the common measures align specifically with outcomes related to the three building blocks of the *Blueprint for Early Childhood*, Healthy Development, Strong Families, and Early Learning.

Finally, 2013-2014 marks a time of stability for the teachers for the JHELC. Over the last several years, the JHELC has seen consistency in the number and quality of teachers and assistants and has been able to retain a core group of teachers who have experience with the culture of the JHELC, the curriculum, and the assessment requirements. The school environment allows the teachers to maintain a consistent structure, standards, and expectations for students in their classes. Each teacher plays an active role in ensuring that their students reach their full potential in and outside the classroom.

Since the Dr. Jerry Hamm Early Learning Center is intended to improve kindergarten readiness, academic and social outcomes beyond kindergarten, the scope of the current evaluation will begin from the 2013-2014 school year and will collect data for students through the 2017-2018 school year. Students who entered the JHELC at three years old will now be in the second grade, and those students who entered the JHELC at four years old will now be in the third grade. Increasing the scope of the evaluation to assess years before the 2013-2014 school year would add another layer of complexity, since many of the common outcome measures were not being collected and the guidance from the Children’s Cabinet *Blueprint for Early Childhood* was not fully established. Limiting the evaluation to five years also increased the feasibility of the evaluation.
2.3. Participants and Setting

Data collection was conducted in one school district in a southeastern city in Kansas. To be eligible study participants, the children must have attended the Dr. Jerry Hamm Early Learning Center (JHELC) prior to entering kindergarten. A sample of 333 students included cohorts of children who began participating in the JHELC in the 2013-2014 school year. The school district also provided the evaluation study with a 267-student comparison group (students who did not participate in the JHELC, but reside in Coffeyville, KS and attended the local elementary school) to compare to the JHELC students. Each year’s group is labeled as a cohort because the students mostly go through school together, and they are labeled by the grade they were enrolled in in the 2017-2018 school year. Thus, the first study group was termed Kindergarten (Treatment group = 98 and Comparison group = 44) and were one year removed from their participation in the JHELC or some other preschool or childcare arrangement. The second, third and fourth study group were termed First Grade (Treatment group = 93 and Comparison group = 69), Second Grade (Treatment group = 78 and Comparison group = 70), and Third Grade (Treatment group = 64 and Comparison group = 84), respectively.

The current data collected shows that there are 333 JHELC children eligible for the study and 267 children who will serve as the comparison group, for a total of 600 students. There is no known information about whether students in the comparison group had participated in some other preschool program or childcare arrangement, however, there are limited offerings of preschool programs in the local area (i.e., two preschool or childcare institutions). There is an assumption that any differences between the JHELC and comparison group would be more difficult to attain if a large proportion of the students in the comparison group had participated in a preschool program.
Among the students, 20 did not have any membership days, which are instructional days for which the student is enrolled during the school calendar year; however, there were three students who did have literacy and numeracy scores. Those three students were retained and included in the analysis. The final sample thus included 583 students (JHELC/Treatment group = 333, Comparison group = 250).

The JHELC/treatment group is larger than the comparison group because there has been expansion to the JHELC. The expansion of the JHELC included four additional classrooms, allowing the school district to increase the number of full day slots, which improved access for students who would otherwise not have been able to attend the JHELC. Figure 2.1. shows the differences in the number of students by treatment and comparison group for each grade level. As indicated in the graph, treatment group students in the third grade, which would have attended the JHELC during the 2013-2014 school year, account for 44.4% (64 of 144 students) of the third-grade students. However, treatment group students in kindergarten, which attended the JHELC during the 2016-2017 school year, account for 69.5% (98 of 141 students) of the kindergarten students.
The ethnic makeup of the program evaluation study sample (White – 52%, Black or African American – 9%, Hispanic/Latino – 22%, Other (including Asian, American Indian or Alaskan Native, and Multiracial) – 18%) was similar to the Coffeyville USD 445 school district: White (51%), Black or African American (8%), Hispanic/Latino (18%), Other (24%).

Table 2.1. shows a breakdown for each of the subgroups for the treatment and comparison groups. The groups were dissimilar (i.e., as assessed by analyzing the subgroups with Chi-square tests) in ethnic makeup, free and reduced meals status, and age, but were similar in gender and Limited-English-Proficient (LEP) status. The subgroup differences were analyzed using a chi-square test, with a significance level of 5%. Ethnic makeup subgroups were reduced to minority and White, since the numbers of students in some of the ethnic and racial groups were small. In the treatment group, there were no Asian students (0%), eight were American Indian or Alaskan Native (2%), 39 were Black (12%), 149 were White (45%), 82 were
Hispanic/Latino (25%), and 55 were Multiracial (17%). In the comparison group, there were no Asian students (0%), 13 were American Indian or Alaskan Native (5%), 12 were Black (5%), 152 were White (61%), 44 were Hispanic/Latino (18%), and 29 were Multiracial (12%). The elementary school where the students attended was identified as a Title I school, which means at least 40% of the students enrolled in the school are from low-income families (U.S Department of Education, 2005). Overall, 75% of the sample was free and reduced meals status, 87% in the treatment group and 60% in the comparison group. The groups were dissimilar in age when grouped by treatment versus comparison groups. The comparison and treatment groups had an approximately 50% split for male and female students. Another subgroup in the elementary school were students who were Limited-English-Proficient (LEP), which accounted for 13% (N = 75) of the overall study sample, including the treatment and comparison groups. The differences in the subgroups, especially for ethnicity, free and reduced meal status, and age, which all were significantly different (p<.001) shows that the treatment and comparison groups were, overall, quite different from one another.

Students in the treatment sample received wraparound services and academic instruction from the JHELC. Students in the comparison sample either received no early childhood educational instruction or participated in some other childcare arrangement. The study sought to examine the mean scores of the archival spring 2018 scores for literacy and numeracy, the counts for grade retention, repeat behavioral referrals, student disability information, and absences.
# TABLE 2.1.

**GENDER, RACE, FREE OR REDUCED MEAL STATUS, LIMITED-ENGLISH-PROFICIENT AND AGE CHARACTERISTICS OF TREATMENT AND COMPARISON GROUPS AND RESULTS OF CHI-SQUARE TESTS**

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Treatment (%)</th>
<th>Comparison (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td>.53</td>
</tr>
<tr>
<td>Male</td>
<td>170 (51%)</td>
<td>121 (48%)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>163 (49%)</td>
<td>129 (52%)</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Minority</td>
<td>184 (55%)</td>
<td>98 (39%)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>149 (45%)</td>
<td>152 (61%)</td>
<td></td>
</tr>
<tr>
<td>F/R meal status</td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Eligible</td>
<td>289 (87%)</td>
<td>151 (60%)</td>
<td></td>
</tr>
<tr>
<td>Not eligible</td>
<td>44 (13%)</td>
<td>99 (40%)</td>
<td></td>
</tr>
<tr>
<td>LEP</td>
<td></td>
<td></td>
<td>.34</td>
</tr>
<tr>
<td>Yes</td>
<td>50 (15%)</td>
<td>25 (10%)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>283 (85%)</td>
<td>225 (90%)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>5</td>
<td>25 (8%)</td>
<td>7 (3%)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>91 (27%)</td>
<td>48 (19%)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>94 (28%)</td>
<td>64 (26%)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>69 (21%)</td>
<td>58 (23%)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>52 (15%)</td>
<td>69 (28%)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>2 (1%)</td>
<td>4 (1%)</td>
<td></td>
</tr>
</tbody>
</table>

*Note. F/R meal status = Free or Reduced meal status; LEP = Limited-English-Proficient*
2.4. Cognitive development and school outcome measures

The district uses Kansas State Standards, AIMSweb (i.e. a benchmark and progress monitoring system) and the USD 445 Build Your Own Curriculum (BYOC) Literacy & Math Curriculum, which is a district-level curriculum that ensures all students experience the same path of curriculum with smooth grade-to-grade transitions. De-identified archival data collected through routine outcome measures provide the foundation for the statistical analysis for this evaluation study. The data sets did not have student names; however, student identification numbers were necessary for matching students on the outcome measures. The JHELC and Coffeyville Public Schools District (USD 445) provided the researcher with data routinely collected by teachers and care providers over the last five years. The researcher assessed the effect of the JHELC on six outcome measures: literacy, numeracy, identified learning disabilities or special education placement, grade retention, number of absences, and repeat behavior referrals. Specifically, the researcher will examine whether students who participate in the JHELC displayed 1) greater literacy skills, 2) greater numeracy skills, 3) less placement in special education settings or had less identified learning disabilities as children transitioned to higher grades, 4) less incidents of grade retention, 5) greater school attendance (smaller percentage of days absent from school) and 6) fewer repeat discipline referrals and reports, when compared to the comparison group. Using these various outcome measures of the program’s effect increases the chance of identifying the program’s potential impact of the students (Meisels, 1985; Gersten et al., 2000).

2.5. Outcome Measures

In elementary school, both the JHELC and comparison group students are assessed using AIMSweb®, a product offered through the Pearson Education corporation. AIMSweb is a
benchmarking and progress monitoring tool, which uses direct, frequent and continuous student assessment to ensure continuous growth. AIMSweb assesses early literacy and math for kindergarten and first graders and reading and math for second through eighth graders. Each of the literacy and numeracy assessments are research-based and scientifically validated (e.g., Pearson, Inc., 2018) to identify children who are not at grade level and are having trouble acquiring literacy and numeracy skills necessary for academic success. The primary use of AIMSweb is to benchmark and monitor students’ development and acquisition of essential academic skills and inform instructional needs for individual children. At the heart of the AIMSweb assessment system is the Curriculum-Based Measurement (CBM) and Response to Intervention (RTI) practices. CBM provides teachers and parents with week-to-week information on the progress their children are making on the curriculum they are being taught on key academic skills (i.e. math, reading, writing and spelling) (Deno, 1985; Hosp et al., 2016). The CBM assessment probes are quick assessments, where the student is tested briefly each week from one to ten minutes, on average one to five minutes. CBM is used for universal screening and frequent monitoring of at-risk students and is also useful for drafting IEP goals and monitoring children with special needs. Response to Intervention (RTI) is a multi-tiered system that utilizes the CBM assessments to start looking at every student’s skills in reading, writing and math. Children in general education classrooms learn at different paces and struggle with materials for various reasons. Perhaps some kids have undiagnosed learning and attention issues, or some may be picking up English because it is not their first language. Other students may come from very difficult environments which might cause them to experience many absences or simply teaching instruction is inadequate. RTI provides teachers with a way to identify students earlier in the school year and give them the support they need to catch up and be successful.
Intervention is a key component of the RTI model. The goal of RTI is to identify those students who are struggling and intervene, or step in before the students fall behind even further (Brown-Chidsey & Steege, 2011). RTI is also known as a multi-tier system of supports (MTSS) and is constructed like a pyramid, with the intensity of support and the intervention increasing from one level to the next dependent on the severity of the issues students have with reading and math skills. The first tier of support may just be instructional support for most of the students because their reading and math skills are not on grade level. During the intervention, the teacher monitors the progress of the students and how they respond to the support, and the second tier is for students who are not making adequate progress in the tier one support. During tier two, perhaps students begin to receive more targeted instructional support in a smaller group setting where each student will receive extra help sessions. Finally, the third tier is typically for a small percentage of the students in the class who may need support tailored to their needs. In this tier of support, students may receive targeted and individualized one-to-one support every day. These students may include students who are receiving special education services as well. This proactive model assesses students’ skill levels in various subject areas and the data is then used to design a targeted intervention strategy for each child (Brown-Chidsey, & Steege, 2011). Students are assessed three times per school year (Fall, Winter, Spring) and trained teachers administer one-on-one or group assessments to their students. This continuous progress monitoring allows administrators, teachers, and parents to know how the interventions are working and if there are any additional changes that need to be made. Essentially, RTI is a system utilizing progress monitoring as a formative evaluation for teachers, because they can use the data to determine whether they need to change their curricula, materials, or instructional procedures (Fuchs & Fuchs, 2006).
The school district provided the evaluator with the performance indicators for reading and math for the JHELC and comparison groups for kindergarten through third grade. To assess the skill level in each of these areas, the spring scores were used because the spring scores are the final time the students were assessed and would better indicate the final skill level for each student. Additionally, since past research indicates that there is a fadeout effect when students reach the third grade (e.g., Isaacs, 2008; Schweinhart et al., 2005), the research study sought to determine if advances in academic achievement of children who participated in the JHELC dissipated by the third grade. Moreover, the school district provided data on special education placement/disability information, grade retention, absences, and behavior/incident referrals.

2.5.1. Literacy and Reading

The AIMSweb classroom assessment for early literacy is administered in kindergarten and first grade. For kindergarten, the study analyzed three measures for early literacy, including letter naming fluency (LNF), letter word sounds fluency (LWSF) and a composite early literacy score which combines the two previous measures (i.e., LNF and LWSF). LNF (Marston & Magnusson, 1988) tests a student’s ability to identify and name upper-and lower-case letters. Students are presented with a random order of both upper- and lower-case letters and are asked to name the letters for a minute. The number of correct responses is scored. LWSF measures the automaticity (i.e., or the ability to perform tasks without occupying the mind with low-order details) of phonics. LWSF “assesses a student’s ability to make letter sounds, make sounds of two-letter combinations, and read aloud consonant-vowel-consonant (CVC) words” (Pearson Inc., 2017, p. 14). Phonics involves associating letters and letter patterns and blending them with words. Research has indicated (e.g., Adams, 1990; Bond & Dykstra, 1967; Chall, 1967) that acquiring phonics skills is associated with better levels of word recognition and higher levels of
comprehension and vocabulary. Students are asked to say the sounds of the visually presented letters, syllables and words for up to 1 minute, and each sound or word said correctly is scored.

For first grade, the study analyzed two measures to assess proficiency of early literacy, a composite early literacy measure, including oral reading fluency (ORF), and word reading fluency (WRF). ORF requires that students read two fictional texts, both stories beginning with decodable words (i.e., words that can be sounded out using phonics rules). The students are asked to read as much of each story as possible in one minute. Students are scored for each correctly read word; maximum total scores for ORF vary, depending on the grade level and form type. WRF assesses a student’s familiarity with regularly and irregularly spelled words, which are words that are and are not spelled as they sound. Students are presented with a list of words and are asked to read as many words as possible in one minute, with students receiving one point for each correctly read word.

For second and third graders, the study analyzed three measures including an overall composite reading score, reading comprehension, and vocabulary. Both reading comprehension and vocabulary are important for later success in school. Reading comprehension is defined as “the process of simultaneously extracting and constructing meaning through interaction and involvement with written language” (RAND Reading Study Group, 2002, p. 11). To assess reading comprehension, students read six passages of text and answer multiple-choice questions about each question, where each correct answer is scored. Developing a child’s vocabulary (i.e., a body of words known to an individual person) starts early in the child’s life. Having a strong vocabulary helps to improve reading comprehension and writing quality (Joshi, 2005; Kame’enui & Baumann, 2012). Vocabulary is assessed by asking students to identity the meanings of target words, by selecting from multiple choice options, and the number of correct responses is scored.
Each of these reading skills is predictive of future reading performance success and provides teachers and administrators with a target for intervention and instruction (Adams, 1990; Marston, & Magnusson, 1988).

2.5.2. Numeracy and Math

Kindergarten and first grade students were not assessed for numeracy skills. However, the study used five measures to assess numeracy skills in second and third grade students. These measures include: a math composite score, concepts and applications, mental computation fluency, number comparison fluency—triads, and number sense fluency. The concepts & applications (CA) measure (an untimed measure) assesses a student’s ability to solve one- and two-step word problems and requires that students have knowledge of essential math concepts in areas of algebra, measurement and data, geometry, fractions, base ten numbers and other concepts. The content for each assessment reflects the math expectations for each grade level. Students answer multiple-choice math problems like, “Matthew has 10 pieces of candy. Sarah has twice as many pieces of candy than Matthew. How many pieces of candy does Sarah have?” Answer choices: 10, 8, 20, 40. Mental computation fluency (MCF) assesses a student’s ability to mentally solve computations, which reflect math expectations appropriate for second and third graders. Students answer as many multiple-choice math problems as possible in 4 minutes. The number comparison fluency—triads (NCF-T) evaluates a student’s ability to “assess magnitude and compare numbers within and across number systems” (Pearson Inc., 2017, p. 4). Students answer multiple-choice questions which require them to compare a set of three numbers and determine if the top-middle number is closer in value to the bottom left number, the bottom right number, or exactly between the two numbers. The students have 3 minutes to answer as many problems as possible.
Finally, the number sense measure is an aggregate score of both the NCF-T and MCF, and this measure serves as the basis for progress monitoring. Number sense is defined as the ability to understand the flexibility and intuitions about numbers. Essentially, number sense allows students opportunities to be creative in solving problems, since many math problems have more than one solution.

2.5.3. Special Education Placement and Number of Identified Learning Disabilities

The evaluator assessed the number of identified learning disabilities as a proxy for special education placement for the JHELC students and for the students in the comparison group. The school district did not provide data for the number of students placed in special education classes. The school district did collect data on students with an Individualized Education Plans (IEPs), but having an IEP does not guarantee that someone will be placed in a special education class. The severity of the disability determines if a student is placed in a special education class or not. To demonstrate the amount of disabilities per treatment and comparison and by cohort, the data on disability information was dichotomized. Students were coded as having a learning disability (“Yes”) or not having a learning disability (“No”).

2.5.4. Grade Retention

The evaluator assessed whether participation in the early learning center reduced the incidents of grade retention as compared to the students who did not participate in the early learning center. Grade retention was measured by the number of grade retention incidents for each cohort. Students who were in the same grade for two consecutive years were marked as being retained.
2.5.5. Attendance

The study used the percentage of absent days to assess the differences in absences between the treatment and comparison groups. Percentage of absent days was calculated by taking the number of absent days and dividing by the total number of membership days. Total membership days are the number of instructional days for which each student is enrolled for the school calendar year.

2.5.6. Behavior/Discipline Referrals

The school district provided information about discipline, specifically if a child had documented incidents including receiving a verbal warning from the teacher and being referred to the office because of behavior issues. The evaluator assessed the number of repeat discipline referrals for both the students who participated in the early learning center and the students who did not participate in the early learning center. For the purposes of the research study, we were concerned about repeat discipline referrals for the same student. One discipline referral could be something as severe as physical altercations with peers or as minor as a verbal warning for talking in class. However, repeat discipline referrals could indicate a lack of self-regulation skills and disruptive behavior. Repeat discipline referrals was assessed on whether a child had repeat discipline referrals (two or more referrals) or not, and was coded “yes” for repeat discipline referrals or “no” for no repeat discipline referrals (one or fewer). The analysis determined if the number of repeat discipline referrals is significantly less for students who participated in the early learning center than students who did not participate in the early learning center.

2.6. Procedures

The researcher contacted the school system where the research was conducted before research approval was granted. Consent to conduct research was sought and there were several
meetings with the school system’s superintendent and JHELC principal. The school system’s superintendent was provided with a statement of work (SOW) which captured and defined all aspects of the program evaluation study. The superintendent, JHELC principal, and elementary school principal approved the SOW. After consent was granted at the system level, the researcher sought IRB approval to conduct the research and retrieve data from the school system. Once IRB approval was granted, the researcher visited the JHELC to tour the facilities and sit in and observe some of the classrooms. The researcher returned for a second visit a few months later to talk with the school system’s data specialist to discuss the data needed for the program evaluation study. In the subsequent weeks, the data specialist provided the researcher with the demographic data and data for each of the outcome measures mentioned above. This data was provided in various Excel files with verification of accuracy from the researcher, superintendent and JHELC principal. All data were saved on a protected computer belonging to the researcher who is the only person who could access the passwords for the computer. Students who were identified as kindergarten through third graders were categorized in the treatment groups (those who attended the JHELC) and those in the comparison group (those who did not attend the JHELC but may have attended some other childcare arrangement). Students were coded as 1 (JHELC/Treatment Group) and 0 (comparison group) in the Excel file. All data was provided with students’ names removed to protect identification and to secure confidentiality.

After the data was verified for accuracy, the researcher combined all the Excel files into one “master” file and then imported the Excel data into SPSS. SPSS was used to run statistical analysis for use in answering the research questions for the program evaluation study. All information regarding student data was only accessible to the researcher and was available to the dissertation committee members as deemed necessary.
2.7. **Data Collection and Analysis Plan**

Evaluation studies often are multi-method in nature, including a mix of quantitative and qualitative data collection and analysis procedures; however, for the scope of this evaluation study quantitative research methods and analysis procedures were enough. As was previously described, the primary purpose of the current program evaluation study was to assess the effectiveness of the Dr. Jerry Hamm Early Learning Center by analyzing key outcomes of learning for the children it serves. Moreover, the evaluation was considered a product evaluation, which is like outcome evaluation. The purpose of a product evaluation is “measure, interpret, and judge a project’s outcomes by assessing their merit, worth, significance, and probity” (Zhang et al., 2011, p. 66). There are a wide range of techniques applicable to product evaluation (e.g., Zhang et al., 2011), but cross-sectional cohort comparisons were most appropriate for addressing the evaluation questions. S. J. Meisels (1985) says that efficacy data from other evaluations of early intervention programs with children indicate that more than a single outcome measure must be explored to document change in early learning interventions. Finally, there will be an explanation of how the results of the program evaluation will be disseminated.

2.7.1. **Data Analysis Plan**

All analyses were conducted in SPSS version 25 for Windows to examine the differences in academic (i.e. literacy and numeracy) and other school-related outcome measures. Missing data were deleted pairwise (i.e. using cases that contain some missing data) which used all available data by discarding cases on an analysis-by-analysis basis (Peugh & Enders, 2004). This technique used available data provided for each case (i.e. student) on the outcome measures and discarded cases on an analysis-by-analysis basis. Means and standard deviations and parametric tests were used where relevant assumptions were met. Where assumptions were not met,
nonparametric tests were used. All statistical tests were two-tailed and assessed at the .05 alpha level, except where the Bonferroni correction (i.e., multiple-comparison correction used when several dependent or independent statistical tests are being performed simultaneously) technique was used.

The current study used the propensity scoring technique which was used to correct for the problem of selection bias on covariates or observable characteristics. The covariates utilized for this study include gender, age, race, free and reduced (F&R) meals status, and Limited-English-Proficient (LEP) status. The use of propensity score matching (Rosenbaum & Rubin, 1983) was used to reduce the selection bias that could be introduced through covariates. This technique allowed the researcher to create a comparison group that was like the group of students that participated in the JHELC. Propensity scoring allows one to design and analyze an observational (nonrandomized) study so that it emulates the characteristics of an experimental design (Austin, 2011). As mentioned in the previous chapter (Chapter 2: Literature Review), randomization is the best way to control for covariates or baseline characteristics, and since we are working with a population that was not selected randomly to participate in the JHELC, we try to make the covariates as balanced as possible with a propensity score.

Propensity scoring has two main uses: 1) in the design phase of the evaluation, it allows you to match subjects on a single number called the propensity score and 2) in the analysis phase of the evaluation it allows you to control or adjust for covariates in a regression analysis. Propensity score matching (PSM) matches students with similar observed characteristics and compares similar students who differ mostly in terms of the treatment effect, which in this case are students who did not participate in the JHELC (Heckman et al., 1997; Rosenbaum & Rubin, 1983; Todd, 1999). The propensity score is the probability that a student was selected and
attended the JHELC given their background characteristics (pretreatment). The comparison group was matched on the five observable characteristics: gender, age, race, socioeconomic status (as measured by free or reduced lunch eligibility), and Limited-English-Proficient status. Chi-square tests were performed on the observable characteristics of the JHELC and comparison group to determine if there was a goodness of fit or balance between the groups on the five demographic variables.

Chi-square analysis (frequency analysis) was utilized to determine whether past year prevalence of repeat discipline referrals, incidents of grade retention, and information for disabilities for students (whether a student had at least one identified disability) varied for the JHELC/treatment and the comparison groups. Chi-square analyses were used because the study wanted to test the relationship between categorical variables. The independent variable (Treatment versus Comparison group) and the dependent variables (outcome measures – repeat discipline referrals, incidents of grade retention, and information for disabilities) were discrete/categorical in nature. Difference analysis, specifically t-Tests, provide the basic foundations for describing differences between the treatment group and comparison group in literacy, numeracy, and percent absences. T-Tests were utilized because the study wants to determine if there are significant or reliable differences between the independent variable (Treatment versus Comparison group) and the continuous dependent variables, which include literacy, numeracy, and percent absences.

The archival data from the 2017-2018 spring end-of-the-year benchmarks in literacy and numeracy, and data for student absences, behavioral referrals, grade retention, and identified learning disabilities served as the foundation for the analysis. Descriptive statistics were generated to screen the data and evaluate statistical assumptions (e.g., normality, linearity,
homogeneity of variance, multicollinearity) before beginning the analysis. Outliers were examined utilizing boxplots; histograms, skewness and kurtosis measures were used to test for normality; multicollinearity for each continuous dependent variable was examined using the Pearson’s Correlation test. The assumption of homogeneity of variance was assessed by using the Levene’s test of equality of error variances. All data assumptions were met.

Chi-square tests of independence were conducted for each cohort to test for differences in the identified covariates (i.e., gender, ethnicity, free and reduced meal status, LEP, and age) for the treatment and comparison groups. Table 2.3. and Table 2.4. show that for the kindergarten and first-grade cohorts, free and reduced meal status was significantly different (p < .05) for the treatment and comparison groups. For the second- and third-grade cohorts, both ethnicity and free and reduced meal status were significantly different for the treatment and comparison groups (See Tables 2.5. and 2.6.). All the other covariates were similar across the comparison and treatment groups for the cohorts, evidenced by nonsignificant chi-square tests (i.e., p-values greater than 5 percent significance level).

The no propensity score matching (No PSM) column in Tables 2.3. – 2.6. show the frequency counts for each of the demographic subgroup characteristics and where they are similar or are significantly different across the comparison and treatment groups as indicated by their p-values. For the kindergarten cohort, meal status was significantly different across the two groups (p < .05). For first grade, meal status was again significantly different across the two groups (p < .001). For second grade, both race (p < .05) and meal status (p < .001) were significantly different across the two groups and age was approaching significance (p = .062). Lastly, for third grade, both race (p < .001) and meal status (p < .001) were significantly different across the two groups and age was approaching significance (p = .073).
Since when comparing the two groups across cohorts, there was concern that if differences between those students who attended the center (treatment) and those who did not attend the center (comparison) were found, the results could be attributed to their pretreatment conditions only. To handle the differences, propensity scores were estimated for each student in the cohorts with the five covariates and then matched treatment and comparison group participants in each cohort with the propensity score. The maximum difference in the propensity score allowed for a match was 0.01, and with this criterion 82 kindergarten students, 94 first grade students, 80 second grade students, 88 third grade students were closely matched. There were 41 kindergarten students in each group, 47 first grade students in each group, 40 second grade students in each group and 44 third grade students in each group. Performing the propensity score matching technique demonstrated that all baseline characteristics that had been significantly different (unbalanced) or were approaching significance between the groups in each cohort were balanced on the propensity score-matched pairs. The propensity score matching (PSM) column in Tables 2.2-2.5. show that all covariates are no longer significant, meaning that the characteristics are now similar across the two groups for each cohort. Thus, treatment and comparison group comparisons could be made on this subgroup of students.
TABLE 2.2.

KINDERGARTEN COHORT GENDER, RACE, MEAL STATUS, LEP CHARACTERISTICS OF TREATMENT AND COMPARISON GROUPS – NO PROPENSITY SCORE MATCHING AND WITH PROPENSITY SCORE MATCHING

<table>
<thead>
<tr>
<th>Demographics</th>
<th>No Propensity Score Matching</th>
<th>Propensity Score Matching</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment (%)</td>
<td>Comparison (%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>54 (55%)</td>
<td>21 (49%)</td>
</tr>
<tr>
<td>Female</td>
<td>44 (45%)</td>
<td>22 (51%)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minority</td>
<td>42 (43%)</td>
<td>16 (37%)</td>
</tr>
<tr>
<td>White</td>
<td>56 (57%)</td>
<td>27 (63%)</td>
</tr>
<tr>
<td>F/R meal status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eligible</td>
<td>82 (84%)</td>
<td>29 (67%)</td>
</tr>
<tr>
<td>Not eligible</td>
<td>16 (16%)</td>
<td>14 (33%)</td>
</tr>
<tr>
<td>LEP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15 (15%)</td>
<td>4 (9%)</td>
</tr>
<tr>
<td>No</td>
<td>83 (85%)</td>
<td>39 (91%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>25 (26%)</td>
<td>7 (16%)</td>
</tr>
<tr>
<td>6</td>
<td>72 (73%)</td>
<td>34 (79%)</td>
</tr>
<tr>
<td>7</td>
<td>1 (1%)</td>
<td>2 (5%)</td>
</tr>
</tbody>
</table>

Note. F/R meal status = Free or Reduced meal status; LEP = Limited-English-Proficient
TABLE 2.3.
FIRST-GRADE COHORT GENDER, RACE, MEAL STATUS, LEP CHARACTERISTICS OF TREATMENT AND COMPARISON GROUPS BY COHORTS—NO PROPENSITY SCORE MATCHING AND WITH PROPENSITY SCORE MATCHING

<table>
<thead>
<tr>
<th>Demographics</th>
<th>No Propensity Score Matching</th>
<th></th>
<th>Propensity Score Matching</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment (%)</td>
<td>Comparison (%)</td>
<td>p-value</td>
<td>Treatment (%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>41 (44%)</td>
<td>29 (45%)</td>
<td>.88</td>
<td>24 (51%)</td>
</tr>
<tr>
<td>Female</td>
<td>52 (56%)</td>
<td>35 (55%)</td>
<td></td>
<td>23 (49%)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td>Minority</td>
<td>53 (57%)</td>
<td>29 (45%)</td>
<td></td>
<td>18 (38%)</td>
</tr>
<tr>
<td>White</td>
<td>40 (43%)</td>
<td>35 (55%)</td>
<td></td>
<td>29 (62%)</td>
</tr>
<tr>
<td>F/R meal status</td>
<td></td>
<td></td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Eligible</td>
<td>79 (85%)</td>
<td>36 (56%)</td>
<td></td>
<td>36 (77%)</td>
</tr>
<tr>
<td>Not eligible</td>
<td>14 (15%)</td>
<td>28 (44%)</td>
<td></td>
<td>11 (23%)</td>
</tr>
<tr>
<td>LEP</td>
<td></td>
<td></td>
<td>.53</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15 (16%)</td>
<td>8 (12%)</td>
<td></td>
<td>4 (9%)</td>
</tr>
<tr>
<td>No</td>
<td>78 (84%)</td>
<td>56 (88%)</td>
<td></td>
<td>43 (91%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td>.94</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>19 (21%)</td>
<td>14 (22%)</td>
<td></td>
<td>7 (15%)</td>
</tr>
<tr>
<td>7</td>
<td>73 (78%)</td>
<td>49 (77%)</td>
<td></td>
<td>39 (83%)</td>
</tr>
<tr>
<td>8</td>
<td>1 (1%)</td>
<td>1 (1%)</td>
<td></td>
<td>1 (2%)</td>
</tr>
</tbody>
</table>

*Note. F/R meal status = Free or Reduced meal status; LEP = Limited-English-Proficient*
<table>
<thead>
<tr>
<th>Demographics</th>
<th>No Propensity Score Matching</th>
<th>Propensity Score Matching</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment (%)</td>
<td>Comparison (%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>38 (49%)</td>
<td>34 (54%)</td>
</tr>
<tr>
<td>Female</td>
<td>40 (51%)</td>
<td>29 (46%)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minority</td>
<td>51 (65%)</td>
<td>29 (46%)</td>
</tr>
<tr>
<td>White</td>
<td>27 (35%)</td>
<td>34 (54%)</td>
</tr>
<tr>
<td>F/R meal status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eligible</td>
<td>71 (91%)</td>
<td>37 (59%)</td>
</tr>
<tr>
<td>Not eligible</td>
<td>7 (9%)</td>
<td>26 (41%)</td>
</tr>
<tr>
<td>LEP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9 (12%)</td>
<td>7 (11%)</td>
</tr>
<tr>
<td>No</td>
<td>69 (88%)</td>
<td>56 (89%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>20 (26%)</td>
<td>13 (21%)</td>
</tr>
<tr>
<td>8</td>
<td>56 (72%)</td>
<td>42 (67%)</td>
</tr>
<tr>
<td>9</td>
<td>2 (2%)</td>
<td>8 (12%)</td>
</tr>
</tbody>
</table>

*Note.* F/R meal status = Free or Reduced meal status; LEP = Limited-English-Proficient
TABLE 2.5.

THIRD-GRADE COHORT GENDER, RACE, MEAL STATUS, LEP CHARACTERISTICS OF TREATMENT AND COMPARISON GROUPS BY COHORTS – NO PROPENSITY SCORE MATCHING AND WITH PROPENSITY SCORE MATCHING

<table>
<thead>
<tr>
<th>Demographics</th>
<th>No Propensity Score Matching</th>
<th>Propensity Score Matching</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment (%)</td>
<td>Comparison (%)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>37 (58%)</td>
<td>37 (46%)</td>
</tr>
<tr>
<td>Female</td>
<td>27 (42%)</td>
<td>43 (54%)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minority</td>
<td>38 (59%)</td>
<td>24 (30%)</td>
</tr>
<tr>
<td>White</td>
<td>26 (41%)</td>
<td>56 (70%)</td>
</tr>
<tr>
<td>F/R meal status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eligible</td>
<td>57 (89%)</td>
<td>49 (61%)</td>
</tr>
<tr>
<td>Not eligible</td>
<td>7 (11%)</td>
<td>31 (39%)</td>
</tr>
<tr>
<td>LEP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11 (17%)</td>
<td>6 (7%)</td>
</tr>
<tr>
<td>No</td>
<td>53 (83%)</td>
<td>74 (93%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>12 (19%)</td>
<td>15 (19%)</td>
</tr>
<tr>
<td>9</td>
<td>50 (78%)</td>
<td>61 (76%)</td>
</tr>
<tr>
<td>10</td>
<td>2 (3%)</td>
<td>4 (5%)</td>
</tr>
</tbody>
</table>

Note. F/R meal status = Free or Reduced meal status; LEP = Limited-English-Proficient
CHAPTER 3

RESULTS

The findings in this chapter were the result of analyzing data for two groups from the same city: children who attended an early childhood learning center in a small city in southeast Kansas (i.e., treatment group) and children who did not attend the early childhood learning center (i.e., comparison group). The findings presented in the results section address each of the seven research questions, which guided the evaluation study. This chapter discusses the results of t-Tests and chi-square tests using the matched-pair subgroups generated by propensity score matching. This results section is divided into seven sections; each will provide findings to answer the foundational research questions for this study.

3.1. Literacy and Reading Skills

Multiple analyses were conducted on the same dependent variables (i.e., early literacy, reading and math), so the chance of committing a Type 1 error (i.e., false positive) increased. The Bonferroni correction adjusted the alpha level or probability values because of the increased risk of Type I error when performing multiple statistical tests on the same dependent variables (Armstrong, 2014). To set a more stringent alpha level for each mean comparison, the original alpha level (.05) was divided by the number of comparisons that were made. For the early literacy, two comparisons were made, so the new alpha level was .025 (.05/2).

Table 3.1. shows the composite early literacy score means and standard deviations and results of t-Tests for the kindergarten and first-grade cohorts. For the Kindergarten cohort, the t-Test results indicated no significant difference between the treatment ($M = 80.08, SD = 27.52$) and comparison ($M = 80.15, SD = 33.96$) groups, with the mean scores for the two groups being approximately equal. For the first-grade cohort, there was no significant difference between the
two groups for Early Literacy, but the average early literacy score did favor the treatment group (See Figure 3.1.; NS = Not significant).

**TABLE 3.1.**

DESCRIPTIVE STATISTICS FOR AVERAGE EARLY LITERACY SCORES FOR KINDERGARTEN AND FIRST-GRADE COHORTS AND T-TEST RESULTS

<table>
<thead>
<tr>
<th></th>
<th>Treatment/Comparison</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>p-value</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>Treatment</td>
<td>36</td>
<td>80.08</td>
<td>27.52</td>
<td>.99</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>Comparison</td>
<td>33</td>
<td>80.15</td>
<td>33.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total/Average</td>
<td>69</td>
<td>80.12</td>
<td>30.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Grade</td>
<td>Treatment</td>
<td>44</td>
<td>49.34</td>
<td>29.87</td>
<td>.50</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Comparison</td>
<td>40</td>
<td>44.68</td>
<td>33.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total/Average</td>
<td>84</td>
<td>47.12</td>
<td>31.66</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 3.1. Average Early Literacy Scores for Kindergarten and First-Grade Cohorts

For reading, two comparisons were made, and the Bonferroni Correction set the new alpha level .025 (.05/2). Table 3.2. shows that for the second-grade cohort, the t-Tests results indicated no significant difference between the treatment ($M = 375.08, SD = 64.28$) and comparison ($M = 386.52, SD = 77.24$) groups, and the average early literacy score were more
favorable for the comparison group. Similarly, for the third-grade cohort, there was no significant difference between the treatment ($M = 402.88$, $SD = 61.32$) and comparison ($M = 415.14$, $SD = 57.78$) groups for Reading. The average early literacy scores favored the comparison group (See Figure 3.2.; NS = Not significant).

**TABLE 3.2.**

DESCRIPTIVE STATISTICS FOR AVERAGE READING SCORES FOR SECOND- AND THIRD-GRADE COHORTS AND T-TEST RESULTS

<table>
<thead>
<tr>
<th>Treatment/Comparison</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>p-value</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Second Grade</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>38</td>
<td>375.08</td>
<td>64.28</td>
<td>.50</td>
<td>.01</td>
</tr>
<tr>
<td>Comparison</td>
<td>31</td>
<td>386.52</td>
<td>77.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total/Average</td>
<td>69</td>
<td>380.22</td>
<td>70.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Third Grade</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>41</td>
<td>402.88</td>
<td>61.32</td>
<td>.37</td>
<td>.01</td>
</tr>
<tr>
<td>Comparison</td>
<td>36</td>
<td>415.14</td>
<td>57.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total/Average</td>
<td>77</td>
<td>408.61</td>
<td>59.62</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.2. Numeracy and Math Skills

For math, two comparisons were made, and the Bonferroni Correction set the new alpha level .025 (.05/2). The analysis for the math composite scores in the second- and third-grade cohorts was like that of reading. For the second-grade cohort, there was no significant difference between the treatment ($M = 182.68, SD = 38.22$) and comparison ($M = 194.09, SD = 37.13$) groups, but data was more favorable for the comparison group. For the third-grade cohort, there was a significant difference in average math composite scores between the treatment and comparison groups, but the effect size is extremely small (See Table 3.3. and Figure 3.3.; NS = Not significant). Table 3.3. presents the descriptive statistics for the math scores and provides p-values for the t-Tests run to assess the differences in average math scores between the treatment and comparison groups.
### TABLE 3.3.

**DESCRIPTIVE STATISTICS FOR AVERAGE MATH SCORES FOR SECOND- AND THIRD-GRADE COHORTS AND T-TEST RESULTS**

<table>
<thead>
<tr>
<th>Treatment/Comparison</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>p-value</th>
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<td>182.68</td>
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<td>.02</td>
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<td>Comparison</td>
<td>32</td>
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<tr>
<td>Total/Average</td>
<td>70</td>
<td>187.90</td>
<td>37.89</td>
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</tr>
<tr>
<td><strong>Third Grade</strong></td>
<td></td>
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<td>.07</td>
</tr>
<tr>
<td>Treatment</td>
<td>43</td>
<td>195.02</td>
<td>39.47</td>
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</tr>
<tr>
<td>Comparison</td>
<td>37</td>
<td>216.38</td>
<td>37.17</td>
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</tr>
<tr>
<td>Total/Average</td>
<td>80</td>
<td>204.90</td>
<td>39.66</td>
<td></td>
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</tr>
</tbody>
</table>

![Figure 3.3. Average Composite Math Scores for Second- and Third-Grade Cohorts](image)

**Figure 3.3.** Average Composite Math Scores for Second- and Third-Grade Cohorts

#### 3.3. Identified Learning Disabilities

For the overall matched sample (N = 344; Treatment group = 172 and Comparison group = 172), the treatment group had a greater number of students with identified learning disabilities (n =30) compared to the comparison group (n = 17). However, the chi-square test for independence (with Yate’s Continuity Correction for a 2 by 2 table or each variable has only two
categories) indicated no significant difference between the treatment and comparison groups, $\chi^2(1, N = 344) = 3.55, p = .06, \phi = .11$ (small effect size).

Figure 3.4. shows that in the kindergarten cohort, JHELC students have a greater number of identified learning disabilities than their non-JHELC peers, 11 identified learning disabilities for the JHELC students versus 1 for the non-JHELC students. In fact, the Chi-square test for independence (with Yate’s Continuity Correction) indicated a significant difference between the treatment and comparison groups, $\chi^2(1, N = 82) = 7.91, p < .01, \phi = .35$. Like the kindergarten cohort, there were a greater number of JHELC students in the first-grade cohort who had identified learning disabilities than the comparison group, 6 identified learning disabilities for treatment group versus 2 for the comparison group. The Chi-square test for independence (with Yate’s Continuity Correction) indicated that there was no significant difference between the treatment and comparison groups, $\chi^2(1, N = 94) = 1.23, p = .27, \phi = .15$. In the second-grade cohort, the number of identified learning disabilities were similar in number for the treatment and comparison groups, 4 for the JHELC students versus 5 for the comparison group. Lastly, in the third-grade cohort, both groups had the same number of identified learning disabilities, 9 for the JHELC students and 9 for comparison group. For both the second- and third-grade cohorts, the Chi-square test for independence (with Yate’s Continuity Correction) indicated no significant difference between the treatment and comparison groups.
3.4. Grade Retention

For the overall matched sample, there were no significant associations between participating in the JHELC and grade retention incidents, both the treatment and comparison groups each had five incidences of grade retention. Additionally, in looking at the grade retention rates for each cohort, there were no significant differences between the treatment and comparison groups for grade retention (See Figure 3.5.). For the entire student sample (583 students), there were only 16 incidences of grade retention (JHELC students = 8; comparison group students = 8), which means that only 3% of the overall sample of students were retained.

The kindergarten and first-grade cohorts showed no significant differences between the treatment and comparison group for grade retention incidents. In the kindergarten cohort, both groups had one grade retention incident, and for the first-grade cohort, both groups had two grade retention incidents. For the second-grade cohort, the JHELC group had two grade retention
incidents versus zero grade retention incidents for the comparison group and there was no significant difference found between the treatment and comparison groups, \( \chi^2 (1, N = 80) = .51, p = .47, \phi = .160 \). For the third-grade cohort, the comparison group had two grade retention incidents versus zero grade retention incidents for the JHELC group, and there was no significant difference found between the treatment and comparison groups, \( \chi^2 (1, N = 88) = .51, p = .47, \phi = -.152 \).

![Graph showing grade retention incidents by JHELC and comparison groups](image.png)

Figure 3.5. Number of Grade Retention Incidences for the Kindergarten, First-Grade, Second-Grade and Third-Grade Cohorts by JHELC and Comparison Student Groups

3.5. Repeat Discipline Referrals

Only 9% of the students (52 of 583 students) had repeat discipline referrals. For the overall matched sample, the number of repeat discipline referrals for the treatment and comparison groups were similar, 13 and 17 respectively. The chi-square test for independence (with Yate’s Continuity Correction) indicated no significant difference the JHELC students and the comparison group for repeat discipline referrals, \( \chi^2 (1, N = 344) = .33, p = .57, \phi = -.041 \).
As shown in Figure 3.6., the treatment groups (JHELC students) received a similar number of discipline referrals as the comparison group (non-JHELC students). In the kindergarten cohort, both groups had one student who had repeat discipline referrals and for the second- and third-grade cohorts there were similar numbers of repeat discipline referrals between the two groups. In fact, there were no significant differences between the treatment and comparison groups for repeat discipline referrals; for the kindergarten (not significant), second ($\chi^2 (1, N = 80) = .26, p = .61, \phi = .115$) and third-grade (not significant) cohorts. However, there was an association between participation in the JHELC and repeat discipline referrals for the first-grade cohort, $\chi^2 (1, N = 94) = 2.80, p < .05, \phi = -.21$.

![Figure 3.6. Number of the Treatment and Comparison Group Students with Repeat Discipline Referrals for the Kindergarten, First-Grade, Second-Grade and Third-Grade Cohorts](image)

**3.6. Attendance**

An independent samples Welch’s t-Test was conducted to compare the percentage of days absent for the treatment and comparison groups. The Levene’s test for equality of variances
revealed that the sample (N = 344) violated the assumption for homogeneity of variances. However, the Welch’s t-Test (for unequal variances) revealed that there was a significant difference in percentage of days absent for treatment (M = .057, SD = .049) and comparison (M = .072, SD = .070); Welch’s t(305.77) = 2.35, p = .02. The magnitude of the differences in the means (mean difference = .02) was small, eta squared = .02.

Figure 3.7. (Note: Significant differences are indicated by asterisks (p < .05); Error bars represent the standard deviations) presents the average percent days absent for the JHELC students (treatment) and the comparison groups for the kindergarten, first-, second-, and third-grade cohorts. For all the cohorts, except the third-grade cohort, the treatment group had fewer percent days absent than the comparison group. There was a significant difference in percent days absent between the treatment and comparison groups in the kindergarten cohort, t(63.58) = 2.33, p < .05, eta squared = .06, equal variances not assumed. There were no significant differences in percent days absent between the treatment and comparison groups for the first- (p = .48, eta squared = .01), second- (p = .12, eta squared = .03) or third- (p = .79, eta squared = .00) grade cohorts.
Figure 3.7. Average Percentage of Days Absent for Treatment (Jerry Hamm Early Learning Center Students) and Comparison Group Students for All Cohorts

3.7. Subgroup Effects

3.7.1. Literacy and Reading

Kindergarten and first grade were assessed on early literacy, so table 3.4. and 3.5. present average early literacy scores and how they vary by demographic characteristics, including gender, race, LEP, and free/reduced lunch status. Since there are four demographic characteristics, there will be four different mean comparisons. The Bonferroni correction set a more stringent alpha level for each mean comparison, the original alpha level (.05) was divided by the number of comparisons that were made. For this study, four comparisons were made, so the new alpha level was .0125 (.05/4).

For the kindergarten cohort, there were no significant differences between the demographic groups as seen in the table (Table 3.4.), however results did favor female students and minority students. Like the kindergarten cohort, for the first-grade cohort, there were no
significant differences between the subgroups of demographics, but the results did favor White students, students who were not eligible for free and reduced meal status, and students who were not Limited-English-Proficient (LEP) (See Table 3.5.).

TABLE 3.4.

MEAN LEVELS OF COMPOSITE EARLY LITERACY SCORES (AND STANDARD DEVIATIONS) FOR KINDERGARTEN COHORT BY DEMOGRAPHIC CHARACTERISTICS AND T-TEST RESULTS

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>p-value</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Male</td>
<td>47</td>
<td>78.21</td>
<td>23.74</td>
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<td>.02</td>
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<tr>
<td>Female</td>
<td>40</td>
<td>86.35</td>
<td>29.13</td>
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</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minority</td>
<td>39</td>
<td>85.82</td>
<td>25.01</td>
<td>.22</td>
<td>.02</td>
</tr>
<tr>
<td>White</td>
<td>48</td>
<td>78.81</td>
<td>27.53</td>
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<td></td>
</tr>
<tr>
<td>Free/Reduced Lunch</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Eligible</td>
<td>72</td>
<td>81.39</td>
<td>26.34</td>
<td>.67</td>
<td>.00</td>
</tr>
<tr>
<td>Not eligible</td>
<td>15</td>
<td>84.67</td>
<td>28.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEP student</td>
<td>13</td>
<td>82.62</td>
<td>23.32</td>
<td>.92</td>
<td>.00</td>
</tr>
<tr>
<td>Non-LEP student</td>
<td>74</td>
<td>81.84</td>
<td>27.18</td>
<td></td>
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</tr>
</tbody>
</table>
TABLE 3.5.

MEAN LEVELS OF COMPOSITE EARLY LITERACY SCORES (AND STANDARD DEVIATIONS) FOR FIRST-GRADE COHORT BY DEMOGRAPHIC CHARACTERISTICS AND T-TEST RESULTS

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>p-value</th>
<th>Effect Size</th>
</tr>
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<tbody>
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<td>Gender</td>
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</tr>
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<td>39</td>
<td>46.08</td>
<td>34.52</td>
<td>.99</td>
<td>.00</td>
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<tr>
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<td>49</td>
<td>46.00</td>
<td>31.54</td>
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<td>Race</td>
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<td>41.86</td>
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<td>.17</td>
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<td>White</td>
<td>38</td>
<td>51.53</td>
<td>29.30</td>
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<td>Free/Reduced Lunch</td>
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<tr>
<td>Eligible</td>
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<td>44.39</td>
<td>32.32</td>
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<td>.01</td>
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<tr>
<td>LEP student</td>
<td>15</td>
<td>32.93</td>
<td>33.46</td>
<td>.09</td>
<td>.03</td>
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<tr>
<td>Non-LEP student</td>
<td>73</td>
<td>48.73</td>
<td>25.83</td>
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</tbody>
</table>

Second- and third-grade cohorts were assessed on reading, which includes measures of vocabulary and reading comprehension. Tables 3.6. and 3.7. present average composite reading scores and how they vary based on subgroup demographic characteristics. For the second-grade cohort, there was no significant difference between the reading scores for JHELC male and female students, but results did favor female students for composite reading scores. There were significant differences between JHELC minority and white students; JHELC students who were eligible for free and reduced meal status and students who were not eligible free and reduced meal status; and JHELC Limited-English-Proficient (LEP) students and students who were not LEP students. White students scored on higher on average for reading, than their minority peers. Students who were not eligible for free and reduced lunch scored higher on average, than students who were eligible. Students who were not LEP scored higher on average in reading than students who were LEP. The effect sizes ranged from moderate to large effect size (eta squared: .10 - .49) (See Table 3.6.).
TABLE 3.6.
MEAN LEVELS OF COMPOSITE READING SCORES (AND STANDARD DEVIATIONS) FOR SECOND-GRADE COHORT BY DEMOGRAPHIC CHARACTERISTICS AND T-TEST RESULTS

<table>
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<tr>
<th>Demographics</th>
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<th>Effect size</th>
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<td>358.51</td>
<td>65.67</td>
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<td>61.08</td>
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<td>Race</td>
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<td>56.11</td>
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<td>.10</td>
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<td>68.80</td>
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<td>357.14</td>
<td>57.67</td>
<td>.01</td>
<td>.10</td>
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<td>LEP Status</td>
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<tr>
<td>LEP student</td>
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<td>288.89</td>
<td>21.56</td>
<td>&lt;.001</td>
<td>.49</td>
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<tr>
<td>Non-LEP student</td>
<td>64</td>
<td>374.02</td>
<td>60.00</td>
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</tbody>
</table>

As shown in Table 3.7., there were no significant differences for the four demographics. The new alpha level \( p = .0125 \) was much lower than even the \( p \)-value (.03) obtained by the t-Test to assess the JHELC gender differences in composite reading scores. Though there are no significant differences, the results did favor female students, White students, students who were not eligible for free and reduced meal status, and students who were not Limited-English-Proficient (LEP).

TABLE 3.7.
MEAN LEVELS OF COMPOSITE READING SCORES (AND STANDARD DEVIATIONS) FOR THIRD-GRADE COHORT BY DEMOGRAPHIC CHARACTERISTICS AND T-TEST RESULTS

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>p-value</th>
<th>Effect size</th>
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<tr>
<td>Male</td>
<td>34</td>
<td>388.59</td>
<td>63.00</td>
<td>.03</td>
<td>.08</td>
</tr>
<tr>
<td>Female</td>
<td>26</td>
<td>422.42</td>
<td>53.12</td>
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<tr>
<td>Race</td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Minority</td>
<td>35</td>
<td>391.89</td>
<td>61.15</td>
<td>.09</td>
<td>.05</td>
</tr>
<tr>
<td>White</td>
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<td>419.16</td>
<td>59.36</td>
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<td>400.41</td>
<td>62.93</td>
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<td>.02</td>
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<tr>
<td>Not eligible</td>
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<td>LEP</td>
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</tr>
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<td>LEP student</td>
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<td>60.20</td>
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<tr>
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<td>49</td>
<td>405.00</td>
<td>62.17</td>
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<td></td>
</tr>
</tbody>
</table>

89
3.7.2. Numeracy and Mathematics

The kindergarten and first-grade cohorts were not assessed for math proficiency, so the two tables presented below (Table 3.8. and 3.9.) show the average composite math scores for the second- and third-grade cohorts. For the second-grade cohort, there were no significant differences among the subgroups for the demographic characteristics. However, for math, the results did favor male students (mean difference = 13.19), White students (mean difference = 18.35), students who were not eligible for free and reduced meal status (mean difference = 24.14), and students who were not LEP (mean difference = 23.37).

**TABLE 3.8.**

MEAN LEVELS OF COMPOSITE MATH SCORES (AND STANDARD DEVIATIONS) FOR SECOND-GRADE COHORT BY DEMOGRAPHIC CHARACTERISTICS AND T-TEST RESULTS

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>p-value</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>37</td>
<td>187.11</td>
<td>42.34</td>
<td>.12</td>
<td>.03</td>
</tr>
<tr>
<td>Female</td>
<td>36</td>
<td>173.92</td>
<td>27.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Minority</td>
<td>49</td>
<td>174.57</td>
<td>33.62</td>
<td>.04</td>
<td>.06</td>
</tr>
<tr>
<td>White</td>
<td>24</td>
<td>192.92</td>
<td>38.69</td>
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<td></td>
</tr>
<tr>
<td>Free/Reduced Lunch</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Eligible</td>
<td>66</td>
<td>178.29</td>
<td>34.33</td>
<td>.09</td>
<td>.04</td>
</tr>
<tr>
<td>Not eligible</td>
<td>7</td>
<td>202.43</td>
<td>47.99</td>
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</tr>
<tr>
<td>LEP</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>LEP student</td>
<td>9</td>
<td>160.11</td>
<td>23.22</td>
<td>.07</td>
<td>.05</td>
</tr>
<tr>
<td>Non-LEP student</td>
<td>64</td>
<td>183.48</td>
<td>36.84</td>
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</tr>
</tbody>
</table>

For the third-grade cohort, there were significant differences between males and females and minority and white students (See Table 3.9.). There were no significant differences between subgroups for free/reduced lunch status and LEP status; however, results favored students who are not eligible for free or reduced meals status (mean difference = 18.23).
### TABLE 3.9.

MEAN LEVELS OF COMPOSITE MATH SCORES (AND STANDARD DEVIATIONS) FOR THIRD-GRADE COHORT BY DEMOGRAPHIC CHARACTERISTICS AND T-TEST RESULTS

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>p-value</th>
<th>Effect size</th>
</tr>
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<tbody>
<tr>
<td>Gender</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>36</td>
<td>184.42</td>
<td>37.49</td>
<td>&lt; .01</td>
<td>.15</td>
</tr>
<tr>
<td>Female</td>
<td>26</td>
<td>212.92</td>
<td>29.39</td>
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<tr>
<td>Race</td>
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<td>Minority</td>
<td>36</td>
<td>185.67</td>
<td>32.18</td>
<td>&lt; .01</td>
<td>.12</td>
</tr>
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<td>White</td>
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<td>211.19</td>
<td>38.46</td>
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</tr>
<tr>
<td>Free/Reduced Lunch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eligible</td>
<td>56</td>
<td>194.61</td>
<td>34.66</td>
<td>.25</td>
<td>.02</td>
</tr>
<tr>
<td>Not eligible</td>
<td>6</td>
<td>212.83</td>
<td>55.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEP student</td>
<td>11</td>
<td>196.82</td>
<td>20.26</td>
<td>.95</td>
<td>.00</td>
</tr>
<tr>
<td>Non-LEP student</td>
<td>51</td>
<td>196.27</td>
<td>39.74</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3.7.3. Identified Learning Disabilities

Chi-square tests were run to determine if the number of identified learning disabilities were associated with any of the four demographic characteristics (e.g., gender, race, LEP, and free/reduced lunch status) mentioned above. A chi-square test for independence (with Yates Continuity Correction) indicated a significant difference between males and females for the number of identified learning disabilities, \( \chi^2 (1, N = 333) = 11.34, p < .01, \phi = -.19 \). Male students had significantly more identified learning disabilities than their female peers (See Table 3.10.). There were no other significant differences between any of the other subgroup demographic characteristics.
TABLE 3.10.

NUMBER OF IDENTIFIED LEARNING DISABILITIES AS A FUNCTION OF DEMOGRAPHIC CHARACTERISTICS AND CHI-SQUARE TEST RESULTS

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Identified Learning Disabilities</th>
<th>$\chi^2$</th>
<th>p-value</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male 37</td>
<td>11.34</td>
<td>&lt; .01</td>
<td>-.19</td>
</tr>
<tr>
<td></td>
<td>Female 13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>Minority 25</td>
<td>.43</td>
<td>.51</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td>White 25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free/Reduced Lunch</td>
<td>Eligible 40</td>
<td>1.72</td>
<td>.19</td>
<td>.06</td>
</tr>
<tr>
<td></td>
<td>Not eligible 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEP</td>
<td>LEP student 5</td>
<td>.74</td>
<td>.39</td>
<td>-.08</td>
</tr>
<tr>
<td></td>
<td>Non-LEP student 45</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.7.4. Grade Retention

The incidences of grade retention were low for the overall sample (n = 16), and of those 16 cases of grade retention eight were students who attended the JHELC for preschool. There were no significant differences between any of the subgroup demographic characteristics for grade retention. As shown in Table 3.11., none of the chi-square tests provided any p-values that were close to the $p < .05$.

TABLE 3.11.

NUMBER OF GRADE RETENTION INCIDENCES AS A FUNCTION OF DEMOGRAPHIC CHARACTERISTICS AND CHI-SQUARE TEST RESULTS

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Grade Retention</th>
<th>$\chi^2$</th>
<th>p-value</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male 6</td>
<td>1.03</td>
<td>.31</td>
<td>-.08</td>
</tr>
<tr>
<td></td>
<td>Female 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>Minority 6</td>
<td>.60</td>
<td>.44</td>
<td>-.06</td>
</tr>
<tr>
<td></td>
<td>White 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free/Reduced Lunch</td>
<td>Eligible 8</td>
<td>.35</td>
<td>.56</td>
<td>.06</td>
</tr>
<tr>
<td></td>
<td>Not eligible 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEP</td>
<td>LEP student 0</td>
<td>.49</td>
<td>.48</td>
<td>-.07</td>
</tr>
<tr>
<td></td>
<td>Non-LEP student 8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.7.5. Repeat Discipline Referrals

The Chi-square tests for independence (with Yates Continuity Correction) indicated significant differences for gender and race for repeat discipline referrals. Males had significantly more repeat discipline referrals than females and minority students had significantly more repeat discipline referrals than White students (See Table 3.12.). There were no significant differences for free and reduced meals status ($p = .20$) and LEP status ($p = .35$). Table 3.12. summarizes the results of the chi-square tests.

Table 3.12. summarizes the results of the chi-square tests.

### Table 3.12.
NUMBER OF REPEAT DISCIPLINE REFERRALS AS A FUNCTION OF DEMOGRAPHIC CHARACTERISTICS AND CHI-SQUARE TEST RESULTS

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Repeat Discipline Referrals</th>
<th>$\chi^2$</th>
<th>p-value</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>26</td>
<td>19.59</td>
<td>&lt; .001</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>Minority</td>
<td>22</td>
<td>5.73</td>
<td>.02</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free/Reduced Lunch</td>
<td>Eligible</td>
<td>27</td>
<td>1.65</td>
<td>.20</td>
</tr>
<tr>
<td></td>
<td>Not eligible</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEP</td>
<td>LEP student</td>
<td>2</td>
<td>.89</td>
<td>.35</td>
</tr>
<tr>
<td></td>
<td>Non-LEP student</td>
<td>26</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.7.6. Attendance

As for literacy and mathematics composite scores, the Bonferroni adjustment was necessary for the percent days absent outcome measure as well. For percent days absent, four comparisons were made (for each demographic characteristic), so the new alpha level was .0125 ($.05/4$). Each p-value was compared to the new alpha level. Of the subgroup demographic characteristics, free and reduced meals status and LEP status showed significant differences between the subgroups. Students who were not eligible for free and reduced meals status had significantly fewer absences than students who were eligible for free and reduced meals status.
Students who were LEP had significantly fewer absences than students who were not LEP (See Table 3.13.). Gender and race did not show significant differences among the subgroups for male and female or minority and White students. Table 3.13. summarizes the results of the t-Tests.

TABLE 3.13.

PERCENT DAYS ABSENT BY DEMOGRAPHIC CHARACTERISTICS AND T-TEST RESULTS

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>p-value</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>169</td>
<td>.06</td>
<td>.05</td>
<td>.89</td>
<td>.00</td>
</tr>
<tr>
<td>Female</td>
<td>163</td>
<td>.06</td>
<td>.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minority</td>
<td>183</td>
<td>.05</td>
<td>.04</td>
<td>.03</td>
<td>.01</td>
</tr>
<tr>
<td>White</td>
<td>149</td>
<td>.06</td>
<td>.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free/Reduced Meals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eligible</td>
<td>288</td>
<td>.06</td>
<td>.05</td>
<td>&lt; .001</td>
<td>.06</td>
</tr>
<tr>
<td>Not eligible</td>
<td>44</td>
<td>.04</td>
<td>.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEP student</td>
<td>49</td>
<td>.04</td>
<td>.03</td>
<td>&lt; .001</td>
<td>.07</td>
</tr>
<tr>
<td>Non-LEP student</td>
<td>283</td>
<td>.06</td>
<td>.05</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 4

DISCUSSION

4.1. Overview

Chapter Four examines the results of the study by refocusing the program evaluation questions. Findings from Chapter Three are examined in relation to past studies and literature. This chapter will also consider theoretical, research, and applied implications of the study as a result of the findings. Limitations of the study in terms of internal and external validity; reliability, validity, and scope of measures; and statistical analyses are identified in order to strengthen future studies in evaluation of early childhood education programs. Lastly, recommendations are made for future directions for the research topic.

4.2. Discussion

Since the War on Poverty was declared in 1965, the goal for many prekindergarten programs has been to provide high-quality instruction to boost school readiness for economically disadvantaged children. Past research indicates that high-quality early childhood education can equip children with the cognitive, social, and emotional skills required to be successful in school and often have a lasting effect well into adulthood (Campbell et al., 2002; Heckman et al., 2010; Reynolds et al., 2011). Currently, the cited goal for prekindergarten programs is school readiness which includes proficiency in language, literacy, and numeracy; willingness to exhibit the proper behavior in school and the classroom; and developing social and emotional skills which enable children to focus in the classroom and get along with their peers. For this study, there were few substantial and statistically significant effects of the prekindergarten program on the educational outcomes examined. However, the findings for each of the cohorts does suggest that prekindergarten can close the academic achievement gap by kindergarten entry for students who
attended the JHELC versus those students who did not. The findings also suggest that the academic achievement gap may widen again, as evidenced by the reading and math scores for the second- and third-grade cohorts. Findings for the non-cognitive outcome measures (i.e., identified learning disabilities, grade retention, repeat discipline referrals, and absences) indicate that cohort effects (i.e., results that occur because of the characteristics of the cohort) may have occurred. The findings do not uncover any trends for the outcome measures for the cohorts, and this may have occurred because different cohorts’ characteristics vary over time due to their shared experiences.

In terms of subgroups, the study found that impacts on most outcome measures were not statistically significantly different when comparing students who were lower income versus those who were higher income. Likewise, effects for minority students were not statistically higher than those of White children for most of the outcomes. The findings run counter to some studies that suggest that the positive benefits of prekindergarten amass mostly for lower income and minority children (see Currie, 2001). Table 4.1. summarizes the results section by presenting the research questions and how those questions were answered for each cohort based on the data and data analysis.
<table>
<thead>
<tr>
<th>Research Question</th>
<th>Cohort</th>
<th>Yes/No/NA*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do children who participated in the early learning center show significantly higher skill in literacy and reading than children who did not participate in the early learning center?</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Kindergarten</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>First</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Third</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>NA</td>
</tr>
<tr>
<td>Do children who participated in the early learning center show significantly higher skill in numeracy than children who did not participate in the early learning center?</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Kindergarten</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>First</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Third</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>NA</td>
</tr>
<tr>
<td>Do children who participated in the early learning center have significantly reduced rates of identified learning disabilities as they enter the third grade when compared to children who did not participate in the early learning center?</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Kindergarten</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>First</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Third</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>No</td>
</tr>
<tr>
<td>Do children who participated in the early learning center have significantly reduced rates of grade retention compared to children who did not participate in the early learning center?</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Kindergarten</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>First</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Third</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>No</td>
</tr>
<tr>
<td>Do children who participated in the early learning center have significantly fewer discipline referrals than children who did not participate in the early learning center?</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Kindergarten</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>First</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Third</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>No</td>
</tr>
<tr>
<td>Do children who participated in the early learning center have significantly fewer absences (better school attendance) than children who did not participate in the early learning center?</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Kindergarten</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>First</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Third</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Note. *NA = Not applicable*
Each research question uses the term *significantly* because the study wanted to assess if there were statistically significant differences between the treatment and comparison groups for each cohort. Past research indicates that, often those students who receive high-quality prekindergarten instruction score significantly higher on cognitive and social-emotional measures (evidence for social-emotional effects are based on a smaller number of studies). The results from the past smaller-scale, researcher led, demonstration interventions render larger effects, but for state- and district-run prekindergarten programs, the effects are often smaller and vary a great deal. Not all prekindergarten programs are created equal, and not all are equally effective simply because there are varying factors that can influence the effectiveness of prekindergarten programs including children’s experiences in the home, child-care opportunities that children have before entering prekindergarten, childrens’ experiences during prekindergarten, and the experiences they have after leaving the prekindergarten programs (Phillips et al., 2017).

### 4.2.1. Literacy and Numeracy

Much of the past research shows that students who attend high-quality prekindergarten programs have significantly greater cognitive outcomes (e.g., language, literacy, and numeracy) than students who do not (Reynolds et al., 2010; Schweinhart et al., 2005; Weiland & Yoshikawa, 2013). However, other studies, like the Head Start Impact Study, have shown noteworthy impacts at the end of prekindergarten, but no statistically significant impacts on cognitive skills over the next several elementary school years (Puma et al., 2012). Another study of the Tennessee Voluntary Prekindergarten (TN-VPK) program evaluation project (i.e., Lipsey et al., 2015) found that at the end of the prekindergarten program, the TN-VPK children had significantly higher achievement scores on all of the subtests of the Woodcock Johnson III
Achievement Battery standardized to include literacy, language and math. At kindergarten entry, TN-VPK children were rated as being better prepared and as having better behavior than their peers by the teachers (Lipsey et al., 2015). However, by the second grade the treatment and control groups diverged with the TN-VPK children scoring lower than the control group on most of the cognitive outcome measures. The current data offer some support for those findings in the TN-VPK Evaluation Project. The kindergarten and first-grade cohorts were tested for early literacy proficiency. For the kindergarten cohort, JHELC students’ composite early literacy scores were approximately equal to the comparison group, indicating no statistically significant difference between the treatment and comparison group. Similar findings held true for the first-grade cohort, and though there were no statistically significant differences between the treatment and the comparison group, the results favored the JHELC students who scored approximately 4.5 points greater than the comparison group on average. The second- and third-grade cohorts were tested for reading, which included reading comprehension and vocabulary. For both the second- and third-grade cohorts, there were no statistically significantly differences, but the results favored the comparison groups.

For math, findings show a similar trend as the second- and third-grade cohorts showed in reading. Since the kindergarten and first-grade cohorts were not assessed in numeracy and no data was provided by the school district, determining impact on numeracy skills was not possible. For the second-grade cohort, there was no statistically significant difference between the treatment and comparison groups, but the results favored the comparison group for math skills. The JHELC students’, in the third-grade cohort, scores were on average significantly less than scores of the comparison group. These findings do support the findings shown in the Head Start Impact Study (see DHHS, 2010; Puma et al., 2012). Students who attended the Head Start
centers showed statistically significant positive impacts when assessed while they were still attending the Head Start centers as 3- and 4-year-olds and at kindergarten entry, but at the third grade follow up, the results for cognitive and noncognitive measures favored the control group.

4.2.2. Identified Learning Disabilities

As mentioned above, as a part of its program model, the JHELC administers early identification techniques to assess children’s developmentally appropriate communication, general cognitive, social, and emotional skills. The JHELC identifies learning issues and other disabilities as early as possible so that interventions are in place to help children, resulting in a reduction in special education placement. Past research has indicated that there is lower special education placement for children who experience high-quality prekindergarten programs, especially as the children progress through later years in school (Barnett, 1995; Schweinhart et al., 2005). The current data offers some support for those findings. While we were not able to collect data on special education placement directly, the study used identified learning disabilities to assess differences between the treatment and comparison groups.

The researcher expected that in the kindergarten cohort that the JHELC group may have a greater number of identified learning disabilities than the comparison group. In the kindergarten cohort, there were a significantly greater number of identified learning disabilities in the JHELC group than in the comparison group. This finding supported the researcher’s hypothesis. In fact, approximately 27% of the students in the JHELC group had an identified learning disability, while only 2% of the students of the comparison group had one. Since the study is cross-sectional, it is difficult to determine if the number of identified learning disabilities decreased over time as the students progressed through school. However, findings do suggest that the difference between the number of identified learning disabilities decreases for each cohort from
kindergarten to third grade. The kindergarten cohort did show a significant difference between the treatment and control group, however for the first-, second-, and third-grade cohorts there were no statistically significant differences detected.

The findings for the High/Scope Perry Preschool Study (Schweinhart et al., 2005) indicated that the treatment group had a larger number of students whose identified disability was a speech/language disability as their primary disability than the comparison group, but had fewer identified learning disabilities in the more serious disability categories. The current data seem to follow their findings. The treatment and comparison groups in the third-grade cohort have the same number of identified learning disabilities, however, 6 of the 9 identified learning disabilities (67%) were classified as developmental delays and the other 3 were classified as a speech/language disability. On the other hand, for the comparison group, there were a greater variety of identified learning disabilities including: speech/language disability, specific learning disability, developmental delay, autism, hearing impairment, orthopedic impairment, and other health impairment. Thus, students in the treatment group for the third-grade cohort were grouped into fewer disability categories than students in the comparison group.

4.2.3. Grade Retention

The current study does not show any significant differences between the treatment and comparison groups for grade retention, which follows the findings of the Florida VPK evaluation (Miller & Bassok, 2019). This cross-sectional study provides limited information on how grade retention rates may change over time, and with very few grade retention incidents, it is difficult to draw many conclusions. Research has shown that the timing of grade retention makes a difference in academic achievement, where retention in early grades have less of an adverse effect on educational outcomes than retention in later grades (i.e., fourth through eighth grades)
(Miller & Bassok, 2019). It would be necessary to follow students who have been retained in later grades to see if participating in the JHELC makes a difference in grade retention or not. Especially since grade retention is predictive of high school dropout rates, lower levels of academic achievement, and poorer behavioral outcomes (Hammond et al., 2007; Ou & Reynolds, 2010).

### 4.2.4. Repeat Discipline Referrals

Disruptive behavior and disciplinary issues appear to be developmental traits that begin in childhood and often persist into adolescence and adulthood (Patterson et al., 1989; Patterson et al., 2017). These disruptive behaviors and discipline problems during the earlier years often result in juvenile delinquency and higher high school dropout rates (Schweinhart et al., 2005). The data for this study does not show a reduction in repeat discipline referrals as the students progress through the higher grades. However, in the first-grade cohort, the JHELC group had significantly fewer repeat discipline referrals than the comparison group. For all other cohorts, there were no statistically significant differences between the treatment and comparison groups. For the third-grade cohort, the two groups had similar numbers of repeat discipline referrals. Although the trend does not follow a decrease in repeat discipline referrals as the children get older, overall the results did favor the JHELC. Though there were not significant differences between the treatment and comparison groups, except for the first-grade cohort, past research shows that the social and emotional skills that the students may have learned in the JHELC program may prove beneficial as the students transition to adolescence and even into adulthood (Schweinhart et al., 2005).
4.2.5. Attendance

Findings from prior research (Reynolds, et al., 2014, Schweinhart et al., 2005) indicate that attendance improves for students who attend high-quality prekindergarten programs. Schweinhart and colleagues (2005) found that Perry Preschool participants’ attendance continued to increase as the students progressed through their school years. This current study shows a statistically significant difference between the JHELC students and the comparison group, with the JHELC group having better attendance rates. The JHELC group in the kindergarten cohort had significantly fewer absences (greater attendance) than the comparison group. However, for the first-, second-, and third-grade cohorts there were no statistically significant differences between the treatment and comparison groups. The JHELC group for the first- and second-grade cohorts had more favorable attendance rates than the comparison group, but for the third-grade cohort attendance was approximately the same for the treatment and comparison groups.

4.3. Sociodemographic Subgroup Effects

Previous literature and research have suggested that effects of prekindergarten may differ across various sociodemographic groups. Past studies tested for statistically significant differences in impacts by gender, free or reduced lunch status, race, and native English speaker status (irrespective of race) (Weiland & Yoshikawa, 2013; Lipsey et al., 2015). To build upon the prior research done on subgroup differences, the current study chose the following sociodemographic variables: gender, race, free and reduced meals status, and limited-English-proficient status. In the study of race, past research has shown that Latino children show significantly stronger cognitive impacts from prekindergarten programs than other racial or ethnic groups (Gormley et al., 2005; U.S. Department of Health & Human Services, 2010). Gender has also been of interest to researchers for differentiation of prekindergarten impacts. An
aggregation of the results for pioneering, model prekindergarten programs (i.e. Abecedarian Project, Early Training Project, and Perry Preschool Project) revealed that female children received greater benefits than males (Anderson, 2008).

In terms of subgroups, the study found that impacts on most of the cognitive outcome measures were not significantly different when comparing the subgroups in early literacy, reading, and math. However, in the second-grade cohort the study did find subgroup differences, and the magnitude of the differences were moderate to considerably large. The findings were counter to what has been evidenced in prior research studies. In the second-grade cohort, white students scored significantly higher in reading than minority students; those who were not eligible for free and reduced lunch scored significantly higher in reading than students who were eligible; and native English speakers scored higher in reading than children where English is their second language. You would expect native English speakers to score higher than limited-English-proficient because they are still being introduced to the English language. In math, the third-grade cohort saw some additional differences in subgroups. Female students scored significantly higher in math than their male peers and white students scored significantly higher in math than their minority peers. These results were like the Tulsa prekindergarten program and the Boston Public Schools prekindergarten evaluation where the White and more affluent children also benefitted more than their peers from the prekindergarten programs (Gormley et al., 2005; Weiland & Yoshikawa, 2013). These outcomes were found perhaps behavior plays a major role in academic achievement. The study shows that male and minority students exhibited more disruptive behavior as evidenced by the number of repeat discipline referrals for each subgroup.
Culturally and linguistically diverse children receive special education services at significantly higher rates than the total amount of students who receive special education services in K-12 schools (U.S. Department of Education, 2006). Gender was the only subgroup that showed a significant difference in the number of identified learning disabilities. Male students had a significantly higher number of identified learning disabilities than their female peers, which means they are more likely to receive special education services. Male students represented 87% of the students who were identified as having developmentally delays. Male students also had a greater variety of identified learning disabilities than their female peers.

Past research provides evidence that prekindergarten participation lowers grade retention rates. Evidence from two seminal, high-quality, intensive prekindergarten program evaluations (i.e. Abecedarian preschool program and Perry Preschool program) showed lower rates of retention and decreases in the likelihood of being retained (Anderson, 2008; Campbell & Ramey, 1995). Even for larger-scale programs, results were similar. The Chicago Parent Centers prekindergarten intervention showed retention rates that were approximately 15% lower than the comparison group (Reynolds et al., 2002). As mentioned above, grade retention can have adverse effects for children as they progress through school and even into adulthood. Also, since grade retention offers another early performance indicator for students in school, it is important to collect data on the measure. Fortunately, the incidences of grade retention for the JHELC group are very low. In fact, for the entire JHELC group sample there were a total of only eight incidences of grade retention. There were no significant differences in the subgroups, but it is interesting to note that of the eight incidences of grade retention, six of the incidences were students who were male, minority, and were eligible for free or reduced lunch. The data from this study is counter to that of those earlier studies, and may fall more in line with the Head Start
Impact Study, which found that there was no evidence that participation in prekindergarten had any effect on grade retention at any point between kindergarten and third grade (DHHS, 2010).

Carlson and Corcoran (2001) posit that inputs that children receive from their environments directly influence and shape their behavioral patterns, learning and skills. This is very important since high-quality prekindergarten programs create supportive and nurturing environments, while reinforcing the positive prosocial behaviors that will help children succeed in school. The early learning environments that children experience in their prekindergarten programs set their behavioral expectations they perceive from others (Owens, 2016). It is important to teach proper behavior in the earlier years since behavior problems are associated with educational attainment. Studies show that boys are more likely than girls to have persistent behavioral issues in early childhood and adolescence (Duncan & Magnuson, 2011). The current data offer some support for that statement. Male JHELC students had significantly more repeat discipline referrals than females. Additionally, minority students had significantly more repeat discipline referrals than white students. Bi-racial male students accounted for 39% of the students who had repeat discipline referrals. These findings provide insight on which groups of children may require more intensive socioemotional interventions, which focus on prosocial behaviors and emotional maturity. More supportive contexts could in fact help boys with early behavior problems (Owens, 2016).

4.4. Implications

The findings from the current study of the JHELC program were counter to what the more popular evaluation studies of prekindergarten programs (e.g., Perry Preschool, Abecedarian Project, and Early Training Project) of the past found. This study is not a one and done study,
there must be multiple studies, replication and cross validation before any result can be interpreted with confidence (Campbell et al., 1963).

This research implies that researchers should more closely consider results of larger-scale, district-run prekindergarten programs and continue to evaluate those programs to determine impact. The expectation for sustained and long-term positive effects comes from small-scale experimental studies of model programs conducted four to five decades ago. Their results show not only sustained impacts in elementary school, but even well into adulthood. Persons must remember, however, that these interventions were implemented by researchers, were very intensive, and worked with very specific target populations. Today’s prekindergarten programs vary widely in the types of students served, performance standards, teacher requirements, and delivery settings (i.e., schools, Head Start centers, early learning centers). Researchers and early childhood education practitioners expect that benefits from prekindergarten programs should be evident at the end of the prekindergarten, and that those benefits should sustain into early elementary and middle school to some degree.

As the data suggests, there actually may be a “fade out” effect of the initial benefits as the students progress through school. Similar matching studies show this “fade out” effect, where there are initial effects post prekindergarten programs. At kindergarten entry, the differences that favor the prekindergarten group are often nonsignificant and then eventually reverse in favor of the comparison or control group. However, there have been nonexperimental matching studies (Deming, 2009; Reynolds et al., 2011) where benefits favored the prekindergarten group and were sustained in early elementary school and into adulthood. On the contrary, there have been studies like the Tennessee Voluntary Prekindergarten (TN-VPK) Program evaluation study (Lipsey et al., 2015) and the Head Start Impact study (DHHS, 2010) which produced similar
results to the current study. These two studies used random assignment to create their treatment and control groups, which is considered the gold standard for assessing causal relationships. The Head Start impact study, like the TN-VPK study, found positive effects at the end of prekindergarten. The largest effects they found were in literacy and language, and very modest effects for math. By the first grade, the control group had caught up to the treatment group, and by the third grade the two groups diverged, and the control group was experiencing more academic success than the treatment group, indicating that the prekindergarten effects were not sustained.

Considering the results of this current study and how they reveal a widening of the academic achievement gap, the following question is generated: “How do we better bridge the gap between early and elementary education?” The Dr. Jerry Hamm Early Learning Center (JHELC) attempts to create a supportive and nurturing environment for their students designed to develop the whole child and includes individualization and differentiation in the instructional content and teaching strategies. The JHELC also provides kindergarten transitioning guides, works with the elementary school and assists families in making the transition from the JHELC to the local elementary school. However, even with these structures and resources in place how do we account for the “fade out” effect? The current data reinforce the need for sustaining learning environments for our young people, especially those who are more economically disadvantaged. These children and their families receive a very intensive and supportive environment during the prekindergarten program, and the next grades must ensure that the energy and learning gains these children received in prekindergarten are carried into the early elementary school years and beyond.
The fade out effect could be caused in part because the kindergarten teachers may not be reinforcing or building on the skills that the children learned in prekindergarten. Or perhaps because the material being covered is too difficult or too easy, which could both stagnate the learning process and motivation of young people (Claessens et al., 2014). The JHELC serves some of the most economically disadvantaged children in the community, and research shows that poverty directly affects academic achievement due to lack of resources, tangible and intangible, available for student success (Lacour & Tissington, 2011). Children who attend the JHELC program usually attend the local elementary school, which is Title I with over 75% of their students eligible for free or reduced lunch. It is important that, despite the label of the school, strategies are implemented to assist teachers in closing the academic achievement gap. The data suggests that the achievement gap may start earlier in children’s lives, so that provides opportunities to create a bridge between the early and elementary school years sustaining the momentum gained in prekindergarten and closing the academic achievement gap between the economically disadvantaged and their more affluent peers. Phillips and her colleagues (2017) noted:

“Pre-k can thus be viewed as powering up early learning, for which the elementary grades need to provide essential charging stations that sustain and amplify the learning gains made by children in pre-kindergarten. Absent re-charging, progress will likely be stalled, and the benefits from any boost provided by pre-kindergarten education may be lost” (p. 8).

The result of the current study suggest that more emphasis should be placed on examining the effectiveness of more current, larger-scale prekindergarten programs that serve a variety of children and are delivered in a variety of settings. Continuing to expect that every
program will perform like the seminal model programs of the past is unproductive. These results should motivate researchers to determine which pieces of prekindergarten programs work most effectively and create ways to successfully scale them up for larger prekindergarten programs.

The JHELC preschool program uses specified criteria to select the students who are eligible to attend the program, often selecting the students who come from the most economically disadvantaged families. A simple comparison to children who attended other preschools or no preschools on cognitive and behavioral outcomes would produce biased results. Where experimental design is not practical in this case, the challenge is to counteract the selection bias by matching students on observed characteristics. This study implies that investigating the effects of prekindergarten programs using quasi-experimental designs, such as matching, can be effective. Though this is a nonexperimental method, it provides researchers with the best available way to create a comparison groups to show treatment effects for the early childhood education intervention.

The current study used observable characteristics to match children and form the comparison group. The pretreatment observable characteristics were selected because they were associated with being selected to the treatment condition or not. This study implies that there should be a consideration of factors or observable characteristics that will allow for the most effective match possible. The current study used age, gender, race, free or reduced lunch status, and limited-English-proficient status. Other studies have matched groups on neighborhood and family poverty levels, eligibility criteria, birth order, maternal work history, childcare arrangements before prekindergarten, family structure, and infant health (Deming, 2009; Reynolds et al., 2011). These additional covariates and observable characteristics would likely produce more effective and robust matching results which would more closely resemble random
assignment. Of course, there is no optimal number of characteristics to include for matching, but it is necessary to have many more studies which provide replication and cross validation. When randomized experimental designs are not plausible, other nonexperimental designs can produce very similar and robust results. Some studies (e.g., Lipsey et al., 2015) utilize the age cutoff regression-discontinuity design (RDD), which creates a control group by setting an age cutoff to enter a program. Those students who meet the age cutoff by a certain date become the treatment group, and those who do not meet the age cutoff become the control group. This method is another quasi-experimental design which allows researchers to detect causal effects of pre-kindergarten programs; however, it does not allow you to assess groups long-term. The treatment group participates in the prekindergarten program and at the completion of the program the treatment and control groups are assessed to determine impact. The following year, the control group then receives the prekindergarten intervention, so both will eventually have received prekindergarten instruction. Each design has its advantages and disadvantages, and the current study implies that when unable to create completely random assignment, other quasi-experimental designs can work to accomplish the goal of detecting causal effects of prekindergarten programs on school readiness as well.

4.5. Limitations and Suggestions for Future Research

4.5.1. Limitations

As with all studies, there are limitations to this current study. While there are many limitations, the following were deemed the most relevant. The first limitation is a design limitation since we cannot determine or control who enrolls or who is accepted or left out of the prekindergarten intervention. Since the researcher was not able to control who is accepted or not and archival data was reported, the experimental design and random assignment is impossible
making it more difficult to determine causal relationships or conclude that the JHELC program made a significant impact on students. Since the study was a quasi-experimental, causal comparative study, the study may have weak internal validity. The researcher was not completely aware of what experiences and childcare the children had before entering the program, and cannot be sure what happens outside of school during the prekindergarten intervention. Merely observing the differences between two groups or finding strong correlations between two variables is not enough for causal inferences (Warner, 2012). Though the researcher did use propensity score matching which attempts to predict covariates that predict receiving the treatment, there is still room for error so there could be other explanations that explain the variability in the results of this study. Success for propensity score matching is based on the proper identification and availability of covariates. Selecting the improper covariates or omission of relevant covariates could lead to bias in the estimation for statistical comparisons and of the effects for the prekindergarten program (Baser, 2006).

The second limitation is poor external validity or whether the results of this study can be generalized to other settings, people and at other times. The seminal prekindergarten programs (Perry Preschool, Abecedarian Project, and Early Training Project) discussed above are often listed as the gold standard and model for pre-kindergarten programs. However, these programs were implemented several decades ago and would likely not have the same impact in today’s current educational climate. State-funded and district prekindergarten programs vary a great deal in their characteristics (Phillips, et al., 2017). Therefore, researchers should expect varied effects on the children that are served by these programs. Results from this study are specific to a sample of students from one school district in a southeastern city in Kansas, and demographics in the area researched may not be generalizable to other school districts. This research serves as
another attempt to assess the effectiveness of a unique prekindergarten intervention and adds to an existing body of differentiated evaluation research on early childhood education that is still being constructed. Though the results are not generalizable to other programs, this study’s goal was to produce evidence that shows potential impact that high quality early childhood education and care programs may have on disadvantaged children’s outcomes. The current study provides feedback for the JHELC, and it would be unwise to generalize the findings from this study for the JHELC to others, since many other district prekindergarten programs have produced more favorable results within the same state as the JHELC, including TOP Early Learning Centers in Wichita, Kansas (Bakken et al., 2017). The results of the study may still have a significant effect on whether the JHELC can secure additional funding from the state and potential funders in their local community.

An additional limitation was a small sample size located in one school district in the southeast corner of Kansas. As a result of propensity score matching, the study saw a 41% decrease in total sample size including all cohorts, which in turn made the individual cohort samples smaller. Having a small sample size influences the amount of statistical power for the study. The propensity scores matching technique helped to eliminate the selection bias in order to show true effects of the prekindergarten intervention, but sample size could undermine the opportunity to see statistically significant effects. Studies with lower statistical power reduce the chances of detecting a true effect and the likelihood that the statistically significant effects that are found are true effects (Button, et al., 2013).

One final limitation to mention is the inability to assess the students at the end of prekindergarten or the beginning of their kindergarten year. Having the ability to assess students at the end of prekindergarten on language, literacy, numeracy, and other socioemotional skills
could show the immediate effects of prekindergarten. The current study utilized outcome measures that were assessed in the spring on the students’ kindergarten year or at the end of kindergarten, which would not provide an accurate assessment of immediate impact. One other limitation is the lack of information on what experiences children had before they attended prekindergarten. Even children entering prekindergarten come having a variety of skill levels, so it is essential to know that information and how it might influence academic achievement in prekindergarten and into early elementary school. Lastly, the researcher was unable to determine the types of childcare experiences those students who did not attend the JHELC received prior to entering kindergarten. There is a limited number of childcare offerings located in the area being researched but knowing the types of childcare settings the comparison group had would have been beneficial for propensity score matching.

4.5.2. Future Research

Cognitive measures like language, literacy, and numeracy are more commonly studied when assessing the effectiveness of prekindergarten programs. Socioemotional and self-regulatory skills are assessed by a smaller number of studies and show that prekindergarten programs modestly influence those skills in the children they serve. Children’s socioemotional, self-regulatory, and interpersonal skills positively or negatively affect not only their potential to learn and master new material in the classroom, but also affect their relationships with teachers and peers. If these skills are developed and refined earlier, children are more likely to engage in prosocial behavior which, will improve academic achievement in the early elementary years (Rabiner et al., 2016; Duncan et al., 2007). Additionally, research has shown that it is possible to improve social and emotional skills through explicit instruction, which subsequently improves their socioemotional well-being and academic achievement (Ashdown & Bernard, 2012; Nelson
et al., 2003; Payton et al., 2008). The next step would be to determine which social and emotional outcomes (e.g., achievement motivation, persistence, delayed gratification, academic self-efficacy) are important for later academic and life success. Future research studies should incorporate an identification of the socioemotional skills which directly influence academic success in later grades and ways in which to assess those skills, through ratings from teachers and parents and even surveys administered to the students to directly measure the levels of socioemotional skills.

Second, creating opportunities to evaluate parents’ perceptions and experiences of and with the prekindergarten program is very important. Early parent involvement and their perceptions about education and what is required to academically achieve are essential for both the children and parent. Castro and her colleagues (2015) consider parental involvement to be active participation of the parent in all domains of a child’s life including social, emotional, and academic development. Their active engagement in their child’s academic life is imperative for sustained gains after children leave prekindergarten. Meta-analyses of the relationship between parent involvement and academic achievement show that there is a positive relationship between the level of parent engagement and academic achievement (Jeynes, 2007). It is important to know how prekindergarten programs are influencing the parents and their parental practices. Very few studies (e.g., DHHS, 2010) have assessed parents and the impact early childhood education early childhood education has had on them, specifically changes in their perspectives about school and experiences they had while their children attended the prekindergarten program.

Third, determining the length of time spent in the JHELC program may provide differences in the findings of JHELC students in the early elementary grades. Past studies
(Domitrovich et al., 2013; Shah et al., 2017; Zaslow et al., 2010) have found that children who were exposed to prekindergarten programs for longer periods of time outperformed those students who had shorter exposure times. In fact, Domitrovich and colleagues (2013) found that length of exposure time was positively associated with school readiness and academic achievement in literacy and numeracy. Having information on the amount of time spent in the prekindergarten program would provide an additional research opportunity to assess how the amount of dosage of prekindergarten programs may influence subsequent academic achievement.

Lastly, longitudinal studies are necessary to assess effectiveness beyond elementary school. Current research and evidence of longer-term effects has been sparse. The seminal, more famous projects of the 1960s and 70s were able to follow their students well into adulthood, including the Abecedarian Project (Campbell et al., 2002), the High/Scope Perry Preschool Program (Schweinhart, 1993), the Early Training Project (Gray & Klaus, 1970), and Chicago Child-Parent Centers (Reynolds, 2000). Not only did these programs show immediate impacts on cognitive, social, and emotional skills, they showed better life outcomes including higher graduation rates, college attendance, greater earnings, fewer arrests, and more stable relationships (Campbell et al., 2002; Reynolds, 2000). The fadeout effect may occur in elementary school. However, findings from other studies suggest that though the initial impact may diminish following prekindergarten, the positive impacts can reemerge as students reach adolescence and early adulthood. This reemergence and sustained impact can be seen in educational attainment and behavioral outcomes (Chetty et al., 2014; Deming, 2009).
4.6. Conclusions

The results of this study, while not all favorable, do provide useful information for the JHELC and school district. In the kindergarten cohort, the JHELC and comparison group had similar scores in early literacy, but did show significant differences between the JHELC and comparison group in percent days absent and identified learning disabilities. The JHELC group had significantly fewer days absent and more identified learning disabilities than the comparison group, which may be caused to the early and continuous developmental screening done by the JHELC. As we view the same results in the third-grade cohort, we see that the comparison group surpassed the JHELC group in reading and numeracy and had fewer percent days absent as well. Since each cohort is separate, there just may be cohort characteristics (e.g. age and social events) that cause these differences.

What other factors may be causing this outcome? The JHELC’s vision is to disrupt the cycle of poverty in families, and that is most certainly still possible. There are increasing numbers of children who are growing up in economically disadvantaged situations, and these circumstances have short- and long-term impacts on their lives. Prekindergarten programs like the Dr. Jerry Hamm Early Learning Center have an opportunity to support and nurture children and families they serve but make positive impacts on society as well. The additional opportunity is to increase general knowledge about what program characteristics are essential for producing short- and long-term learning and success. Just scaling up programs quickly to say a need for early childhood education was met is unwise. Careful attention should be placed on what inputs go into prekindergarten programs so that we get the desired outputs and most importantly those outcomes we see in the program’s logic model. Kansas has made a commitment to early
childhood education and is using prekindergarten as a means for preparing our youngest children for school success.

For the district and the JHELC, which types of innovations and further evaluations are necessary during the prekindergarten program and after to ensure that there is continuous improvement and sustained learning gains? What types of research-practice partnership can be developed for early childhood education that will help create the most effective prekindergarten program and help bridge the gap into elementary school? Phillips and her colleagues (2017) say that the potential academic achievement of children is dependent upon a child’s experiences before prekindergarten, during prekindergarten, and even after they leave prekindergarten. It is important for the earlier elementary grades to create classroom experiences for students that reinforce the skills they learned and enhance their learning experiences moving forward.

The term “high-quality” is subjective, and when placed in front of “prekindergarten program” it does not automatically show which characteristics of the program cause it to be high quality. We must work diligently to elucidate which activities, curricula, and standards are most effective and generate long-run impacts. Back in 1965, when Lyndon B. Johnson declared a War on Poverty, he and his administration thought early childhood education would be the way to lift families out of poverty. Today, we are still fighting the same war, and early childhood education is one weapon that will assist in achieving the victory. We must pay careful attention to the challenge of developing the most robust programs which are sensitive to the needs of our nation’s most economically disadvantaged children and families. These early learning programs will probably not eliminate the effects poverty has on children and families; however, they do have the potential to positively affect the lives of the next generation.
REFERENCES


REFERENCES (continued)


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REFERENCES (continued)


Center for Public Partnerships and Research [CPPR]. (2014). *Case studies in expanding early childhood public-private partnerships in Kansas: Experiences from the field*. Lawrence, KS: University of Kansas-Center for Public Partnerships and Research.


REFERENCES (continued)


Correll, C. (n.d.) *The Dr. Jerry Hamm Early Learning Center* [PowerPoint slides]. Retrieved from https://events.ksde.org/LinkClick.aspx?fileticket=_Y057VQoII%3D&tabid=863&mid=2169


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REFERENCES (continued)


REFERENCES (continued)


REFERENCES (continued)


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APPENDICES
APPENDIX A

PROGRAM LOGIC MODEL FOR THE DR. JERRY HAMM EARLY LEARNING CENTER

**Inputs**
- Coffeyville Model for Early Learning
- CCE
- CCSR
- JHELC Principal
- JHELC Assistant
- JHELC Teachers & Staff
- Evidence-based teaching curriculum
- Evidence-based parenting curriculum
- Data collection and management by state and university institutions
- Community Sponsors
  - Donations
  - Sustainable funding (ECBG and others)
- Students
  - Parents & Guardians
  - Volunteers

**Activities**
- Childcare, early care and educational programming
- Health screenings (hearing, vision, dental)
- Developmental screening (mental health included)
- Parent engagement (parent-teacher conferences, home visits)
- Professional development for teachers

**Outputs**
- # of childcare slots
- # of children participating in high quality learning activities
- Amount of dollars invested
- # of low-income households with access to childcare
- # of families utilizing health care services
  - Volunteer logs
  - # of behavior incident reports

**Short-term**
- Reduction in absences
- Improvement in language and literacy skills
- Improvement in numeracy skills
- Improvement in social-emotional skills
- Increased early detection of developmental delays
- Improved Peer Relationships

**Intermediate**
- School readiness improves
- Scholaristic - Enthusiasm
- Reduction in achievement gap
- Reduced incident reports
- Reduced grade retention
- Increase in academic proficiency scores
- Reduction in special education placement
- Improved Self-Esteem
- Improved Self-Efficacy
- Positive Attitudes - Optimism

**Long-term**
- Improve academic and social outcomes
- College Attendance
- Narrow Achievement Gap
- Improve post-school outcomes
- Families are more engaged in child’s learning and development
- Positive self-Perception
- Increase education attainment of families and community members
- Overall
- Break the cycle of poverty in Coffeyville community

**Timeline of Outcomes**
- Program Entrance to one year
- One to Two years after attendance
- Three or more years after attendance

- Reduce the cycle of
- Poverty in
- Coffeyville
- Community

- # of low-income
  - households
  - with access to
  - childcare
- # of families
  - utilizing health
  - care services
- # of behavior
  - incident reports
- # of children
  - participating in
  - high quality
  - learning activities
- Amount of dollars
  - invested
APPENDIX B

DESCRIPTION OF DR. JERRY HAMM EARLY LEARNING CENTER PARTNERS

Unified School District No. 445 (USD 445): The public-school district provides free education for all students living within the school district boundaries. It is committed to equity and excellence. The Kansas State Department of Education verified in 2017 that the district had attained the highest level of achievement in providing services to children and youth with disabilities. USD 445 serves as the lead or backbone agency for the ELC, assumes most of the responsibility for implementation, monitors data collection and evaluation of the JHELC, and employs most staff of the JHELC.

Southeast Kansas Community Action Program (SEK-CAP): SEK-CAP provides both Head Start and Early Head Start services in home- and center-based program options. The agency has been in operation for over fifty years. Their Early Childhood Services department offers approximately 780 funded enrollment opportunities throughout their twelve county service areas in Southeast Kansas, including Coffeyville (SEK-CAP Annual Report). SEK-CAP’s Head Start program has been a part of the USD 445 system for more than a decade and the JHELC observes all Head Start performance standards. It currently provides all the staff for infant/toddler rooms.

Community Health Center of Southeast Kansas (CHC-SEK): CHC-SEK is a 501 © 3 that offers a variety of medical, dental, and behavioral health services in twelve sites throughout five counties. CHC-SEK is the region’s only Federally Qualified Health Center and operates Kansas’ only school-based health centers at the JHELC, elementary and high school campuses in Coffeyville. Medical, dental, and mental health practitioners provide services to students and families in the Coffeyville community. It continues to expand its operational capacity through partnerships with the University of Kansas.

Tri-County Special Education Cooperative: Tri-County Special Education provides Part B Medicare services through the Individuals with Disabilities Education Act (IDEA) for all eligible students within the USD 445 school district. They provide a screening process for children from birth to age five, which includes looking at a child’s hearing, vision, communication, motor, general health, self-help and learning skills by trained professionals. These services are available to families residing in the Coffeyville school district. They provide early intervention services to children with special needs at the JHELC.

Four County Mental Health Center (FCMH): FCMH serves five Kansas counties and has been an area provider of public mental health services since 1964. FCMH has three full-time mental health clinics in Independence, Coffeyville, and Winfield, Kansas (https://www.fourcounty.com/). FCMH has extensive experience working with families exhibiting high-risk behaviors and continues to successfully provide their services in a community-based setting. They offer specialized services addressing early childhood mental health, family case management, social-emotional classroom consultation and parent education. FCMH provides a mental health consultant for the JHELC.
Parents as Teachers (PAT): PAT, founded in Missouri in 1984 serves more than 195,000 children in all 50 U.S states, more than 100 Tribal organizations, schools and communities, and five other countries and one U.S. territory (https://parentsasteachers.org/about/). In Coffeyville USD 445, PAT is a free voluntary early learning program designed to provide practical and timely information to all families that are served. PAT serves children age zero to five (0-5) and their families in a program grounded in research, supporting the parent’s role as the child’s first teacher and promoting health cognitive and physical development.

Montgomery County Health Department (MCHD): The MCHD offers a variety of services to prevent disease, promote health lifestyle behaviors, and protect the community at large from communicable diseases (http://mgcountyks.org/county-depts/health-department). The MCHD offers prenatal/postpartum case management services and home visiting services for at-risk mothers and families, as well as preventative and wellness health care to JHELC students and their families.

Alliance for Childhood Education (ACE): ACE is a local business advocacy group and engages local business leaders to support the growth and expansion of the JHELC.

Coffeyville Community College (CCC): CCC is a comprehensive two-year institution of post-secondary learning and consists of three campuses. Beginning in 2015, CCC now offers tuition scholarships to parents of JHELC students to educate multiple generations, close the achievement gap, and break the cycle of poverty.

Boys and Girls Club of Coffeyville: The Boys and Girls Club of Coffeyville provides low-cost after-school childcare, Boys and Girls Clubs—Tots, for working parents from 3:00 – 5:30 PM. It also offers a summer program for the months of June and July at the JHELC so that children ages three and four have age and developmentally appropriate equipment and manipulatives.
APPENDIX C

KANSAS CHILDREN’S CABINET AND TRUST FUND BLUEPRINT FOR EARLY CHILDHOOD

**Investing in the Future of Kansas**

*Healthy Development, Strong Families, Early Learning*

- **700 New neural connections** made every second in the first few years of life
- **Vital period of brain growth** Maximized by supporting cognitive, social, and emotional development through quality early learning
- **Reduced social costs** Through investments in early childhood education for at-risk children
- **10% Return** For every dollar invested in early childhood education annually for the life of the child

**Strong Family environments** Major predictor of children’s cognitive and social abilities and life outcomes such as crime and health

**Children** who participate in early childhood programs are more likely to...

- **Graduate** High school
- **Commit** fewer crimes
- **Earn** a higher lifetime salary and have savings accounts
- **Own** a home and pay more in taxes

With a primary focus on Kansas Children’s Cabinet supported programs, the cabinet developed the Blueprint for Early Childhood as a strategic framework to guide investments and maximize positive outcomes for children and families.

*Sources: Center on the Developing Child (Harvard University), Partnership for America’s Economic Success, Peo Center on the States, The Heckman Equation, ReadyNation*
What is the Blueprint for Early Childhood?

Building a Strong Foundation for Children and Families

An expression of the Kansas Children’s Cabinet and Trust Fund’s vision for early childhood in Kansas, the Blueprint for Early Childhood (“Blueprint”) is a strategic framework to optimize child and family well-being. The Blueprint will be used to align the Cabinet’s investment portfolio and monitor progress toward goals.

“Often the most powerful change comes from the community level and develops from the alignment of stakeholders working together in a coordinated way.”

- Amanda Atkins, Kansas Children’s Cabinet and Trust Fund Chair

Overview

Implementation
Built on past systems’ work, the Blueprint is a forward-looking guide for expanding an effective early childhood system of services and supports for young children and their families.

Areas of Impact
The Cabinet identified Areas of Impact within each of the Building Blocks – Healthy Development, Strong Families, and Early Learning that aim to unite past and current collaborative work products.

Current Measures
The Cabinet is committed to a system of shared measurement and strong accountability to tell the story of early childhood investments in Kansas. Common measures are the tools currently being used to measure short-term and intermediate outcomes in Early Childhood Block Grant (ECBG) and Community-based Child Abuse and Neglect Prevention (CRCAP) programs.

Community Collaboration
Moving the needle on Healthy Development, Strong Families, and Early Learning will require creative community collaboration across sectors, involving multiple partners working toward a shared vision of high quality, accessible, affordable programs for young children and families.

What Do Healthy Development, Strong Families, and Early Learning Look Like?
While the path to achieve success may vary, the Cabinet’s vision of success is intended to serve as a guide for innovative program design, partnership development, implementation and tracking toward long-term outcomes for children and families.
Blueprint for Early Childhood
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The Kansas Children's Cabinet and Trust Fund recognizes early childhood as a critical period of intervention that establishes a child's foundation for school and life success. We are therefore committed to nurturing a culture of public-private partnerships in early childhood programming where diversity of thought is an asset and past works is valued.

Healthy Development

- Primary Care
- Social-Emotional Development
- Early Identification

Areas of Impact
- Ensure outreach, education, and ongoing support for pregnant women (particularly underserved populations)
- Promote early and comprehensive prenatal care
- Increase identification, accessibility, and quality of services
- Increase insurance coverage for pregnant women and children
- Support all children in having a medical home
- Promote access to oral health and vision care
- Integrate and screen annually for healthy development
- Improve access to mental health services through partnerships
- Promote inclusion of children with disabilities into natural environments
- Promote public-private partnerships

Strong Families

- Parent Support
- Safe, Stable, and Nurturing Relationships (SSNR)
- Community Engagement

Areas of Impact
- Support parent involvement and leadership
- Promote self, stability, and nurturing relationships
- Support cross-sector partnerships to support comprehensive needs of families
- Engage non-traditional stakeholders
- Promote, sustain, and enhance evidence-based family support programs
- Promote the facilitation of peer-to-peer support opportunities
- Promote opportunities for families to form a living wage
- Promote public-private partnerships

Early Learning

- Child Care
- Pre-K
- Early Literacy

Areas of Impact
- Promote community-based, school-based, and faith-based early learning experiences
- Support economic development and child care facilities
- Ensure high-quality care for all children by promoting adequate funding for care services
- Ensure high-quality care for all children by supporting the implementation of a statewide quality rating and improvement system
- Promote effective transitions into school for all-age populations, including voluntary, half-day kindergarten
- Support attractive and culturally sensitive托儿所，为早期儿童开发适合各年龄段的儿童
- Support the use of early learning standards to increase consistency and quality of services
- Promote public-private partnerships

As a baseline for this Blueprint, collaborative work products in which the Cabinet has participated, such as the Kansas Early Childhood Comprehensive Systems Plan, the Kansas School Readiness Framework, and the Kansas Strengthening Families Plan, have been used. Existing plans such as the Governor's Roadmap for Kansas, the Medicaid and Child Health Strategic Plan (2011), the Children's Development and Investment Plan (2017), and the Kansas Early Childhood Collaborative Other Priority Areas (2017) outlined community before the Blueprint to support collective impact.
APPENDIX C (continued)
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Why Does Kansas Need Investments in Early Childhood?
Building a Strong Foundation for Children and Families

- **17,684**
  - Average monthly enrollment of Kansas children in the child care subsidy program

- **152,120**
  - Number of Kansas children under age 6 who need child care because parents work

- **6**
  - Number of available slots in Early Head Start programs throughout Kansas for every 100 eligible children

- **43**
  - Number of available slots in Head Start programs throughout Kansas for every 100 eligible children

- **70,615**
  - Number of women and children in Kansas receiving WIC (Women, Infants, and Children) supplemental nutrition support

- **48**
  - Percent of Kansas children under age 6 living in low-income families

- **50**
  - Percent of public school students in Kansas approved for the Free and Reduced Price Lunch Program

- **60**
  - Percent of Kansas children ages 3-4 from low-income homes not enrolled in preschool

- **13**
  - Percent of Kansas children ages 1 to 5 read to fewer than 3 days per week

- **36**
  - Percent of children under age 6 developmentally screened in a health care setting

- **50**
  - Percent of elementary schools in Kansas that offer public preschool

Sources: Child Care Aware of Kansas, Kids Count Data Center, The Heckman Equation, U.S. Department of Labor, U.S. Department of Agriculture
APPENDIX C (continued)

Blueprint for Early Childhood
Building a Strong Foundation for Children and Families

Why Early Childhood?
- A child's brain grows the fastest in early childhood
- Investments in early childhood yield significant dividends
- Supportive relationships and healthy environments are critical in the early years

Where must we focus?
The Building Blocks
- Early Learning
- Healthy Development
- Strong Families

How will we get there?

SUMMARY 3.25.14
Date: February 6, 2019

Principal Investigator: Charles Burdsal

Co-Investigators: Randy Barbour, Jr.

Department: Psychology

IRB Number: 4372

Title: IMPACT ASSESSMENT OF THE DR. JERRY HAMM EARLY LEARNING CENTER: A FORMAL PROGRAM EVALUATION STUDY OF THE PROGRAM’S IMPACT ON CHILD OUTCOMES

This letter is to certify that based on the exemption categories and conditions pursuant to Title 45, Code of Federal Regulations Part 46 (45 CFR 46.104) the Wichita State University Institutional Review Board (IRB) has determined that your research qualifies for a Category 4 exemption. This exemption applies only to the proposal as written and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

A determination that research is exempt from the requirements of HHS/DEHP regulations does not imply that investigators have no ethical responsibilities to subjects in such research. Depending on the nature of the study, investigators performing exempt studies may need to make provisions to obtain informed consent, protect confidentiality, minimize risks, and address problems or complaints.

Please keep this letter with your protocol files as documentation of IRB exemption approval. If you have any questions, you may contact me at IRB@wichita.edu.

Sincerely,

Linda Steinmacher
IRB Administrator