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School entry age and school readiness.

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SCHOOL ENTRY AGE AND SCHOOL READINESS

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DEDICATION

This dissertation is dedicated to Bennett Berry, the kid who missed being a 2017-2018 kindergartener by 21 days. I completed this research because of you!

ACKNOWLEDGEMENTS

This road has been long and hard. There are many people that I would like to acknowledge for their support throughout the process. First and foremost, I need to thank my husband, Chris. For the past four years, you have been the one to always make sure I had everything I needed. When I was down, you never let me stay there. Through the tears, the laughter, the sheer joy of accomplishing each little milestone, you were the first one to cheer me on. For your love, understanding, and support, I will be forever grateful. Thanks for raising the babies (and making sure they were fed and clean) while I was writing!

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but who is counting?). Finally, Dr. Buecker, you were always there for me with encouraging words and a kind smile.

Block 18, I remember sitting at doctoral orientation with you all and thinking, what am I doing here? I have been blessed to spend the past four years with such an amazing group of educators. Your passion for the students and the work kept me going even when I felt like I could not go on. As one of our professors said, we are bonded together and you all will always be "my people."

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Completing a doctoral program with four children under the age of 10 is not an easy feat. To all of my friends and family who stepped up to help when I needed you, I could not have done it without you. Becoming Dr. Berry has been a dream of mine since I was a little girl. Thank you to everyone who helped me get here!

ABSTRACT

SCHOOL ENTRY AGE AND SCHOOL READINESS

Robin Berry

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Beginning with the 2017-2018 school year, there was a change in School Entry Age (SEA) legislation. This dissertation analyzed the relationship between SEA and school readiness after the enactment of the new legislation. Hierarchical multiple regression was used to control for student demographics to ascertain the relationship between SEA and school readiness. Findings were as follows: older students scored significantly lower than younger students on the BRIGANCE Kindergarten Screen (BKS), students who had exposure to private child care outside of the home fared much better than students who were kept at home the year prior to kindergarten, and female students outscored their male counterparts. White students and African-American students scored similarly; however, Hispanic students scored markedly lower. The highest scoring subgroup in the race category were Asian students. Students who spoke English as their native language far outscored students who spoke Spanish. The correlation between SEA and BKS scores was weak, but it was statistically significant. When controlling for demographic factors, there was a negative relationship between

SEA and school readiness on the BKS. Implications for future practice, policy, and research are discussed.

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CHAPTER I: INTRODUCTION

Statement of Problem

In 2013, the Commonwealth of Kentucky began mandatory kindergarten screening. State regulation 704 KAR 5:070 requires all kindergarten students to be assessed using a common kindergarten readiness screener. The Kentucky Department of Education (KDE) piloted the BRIGANCE Kindergarten Screen (BKS) in 2012 to assess children's developmental abilities upon school entry. Within the first 30 days of the academic year, all kindergarteners are assessed and results are reported to the state. Since the Commonwealth of Kentucky legally requires the administration of the BKS, the results serve as an important source of data that can be used by educators and educational leaders for both policy and practice decisions (Snow, 2011).

According to the KDE Open House data (2017), 48.4 percent of kindergarten students in Jefferson County Public Schools (JCPS), the context of my study, were not "kindergarten ready" in the 2016-2017 school year. The results of the BKS clearly show many students are coming to kindergarten without the requisite knowledge and skills to be considered "ready to learn", which could impede performance on future accountability tests. These data are cause for concern for both parents, educators, and researchers alike. Given nearly half of the students starting school are not ready, changes need to be made to ensure the readiness of all students. In the following section, I will explain why I chose to take a closer look at school entry age (SEA) and school readiness.

Rationale for the Study

There is increasing evidence in educational research that suggests school entry age is related to initial school readiness (Dagli & Jones, 2013; Furlong & Quirk, 2011; Herbst & Strawinski, 2016; Horstschraer & Muehler, 2014; Huang & Invernizzi, 2013; Jaekel, Strauss, Johnson, Gilmore, & Wolke, 2015; Mendez, Kim, & Ferron, 2015; Pena, 2017; Suggate, 2009; Winsler et al., 2012). Diamond, Regan, and Bandyk (2000) propose a connection between the use of academic skills in readiness decisions and increased rigor during the kindergarten year. In response to the increased academic demand of kindergarten and lack of readiness among students, Kentucky state law KRS 158.030 changed the kindergarten entry age, effective the 2017-2018 school year. Previously, students had to reach the age of five by October 1 to be eligible to attend kindergarten. The new statute requires reaching the age of five prior to August 1.

School entry age (SEA) research, for the most part, is quantitative in nature, utilizing a variety of correlational models (e.g., multiple linear regression, propensity score modeling, logistical regression, and hierarchical linear modeling). Researchers have examined both short-term and long-term effects of SEA on academic achievement. Research reveals mixed findings regarding SEA and school readiness (Easton-Brooks & Brown, 2010). Although there appears to be no shortage of quantitative research on the topic of SEA and school readiness, my research will exploit a new data set due to the SEA legislation changes in the Commonwealth of Kentucky. As Kentucky moves toward changes in SEA, my study will provide evidence as to the relationship of SEA on student outcomes.

In my research study, I utilized a non-experimental research design based on hierarchical multiple regression and correlations to examine the relationship between SEA and school readiness. According to Creswell (2014), correlational research is useful in measuring the direction and magnitude between two or more variables or set of scores, while also allowing the use of one variable to predict the outcome or score of another variable. The predicting variable, in this case, was school entry age. The outcome variable was the school readiness score as measured by the BKS. Using this correlational research allowed for measurement and understanding of the relationship between these two variables. This approach will not only reveal any relationship between these two variables, but it will also quantify the direction of the relationship (whether positive or negative).

Correlational coefficients quantify the strength of relationships between two or more values (Field, 2013). My study utilized the Pearson correlation coefficient to measure the direction and strength of the relationship between two variables (school entry age and school readiness). Determining the relationship among these variables using the comparison model will lead to a greater understanding of the interrelated components of these variables. Creswell (2014) discusses the importance of learning about the relationship between variables because it allows for relative predictions of one variable among many in terms of outcomes. This information could help determine if there is a correlation between school entry age and school readiness scores. In my study, I used descriptive statistics, correlation, and hierarchical multiple linear regression to address my research questions. Descriptive statistics were used to report information on the demographic data collected (school entry age, race, socioeconomic status, and prior

setting). I examined correlations between SEA and school readiness. Finally, I employed hierarchical multiple regression to examine the relationship between predictor variables and school readiness (Petrocelli, 2003).

Purpose of Study

Sakic, Burusic, and Babarovic (2012) suggest a closer look at SEA by using a child's actual birthdate to determine differences in readiness. In the present study, I investigated the relationship between SEA (based on the student's exact age) and school readiness in a large urban district. I examined demographic factors such as free/reduced lunch status, preschool enrollment, and parental education levels. This allowed a much more detailed picture of the relationship between SEA and school readiness. Datar and Gottfried (2015) report, "The case for blanket policies that raise school entry age for all by moving cutoff dates earlier becomes much weaker with the growing evidence that the benefits of delaying entry…are largely short-run" (p. 350). As Kentucky moves into an era of moving cutoff dates, my study will provide evidence as to whether such policy changes are associated with improved student outcomes.

In this quantitative study, I sought to determine whether there is a relationship between school entry age and kindergarten readiness scores, as measured by the BRIGANCE Kindergarten Screen (BKS). Dagli and Jones (2013) call for future research on "the relationship between relative age and children's social and emotional development" (p. 35). Since the BKS includes information on social and emotional development, I was able to address this call for future research as well as utilize the existing instrument as a measurement of overall Kindergarten readiness. This study was conducted within JCPS district, a large urban district in the Commonwealth of Kentucky.

I examined a new set of data in Jefferson County because legislation changed school entry age requirements during the 2017-2018 school year. Data was gathered through JCPS.

Research Questions

In this study, I sought to answer the following research question:

- What is the relationship between school entry age and school readiness as measured by the BRIGANCE Kindergarten Screen (BKS), controlling for student demographics?

Hypotheses

The following were my hypotheses regarding the primary question that guide this study:

- Null (H_0)—there will be no relationship between SEA and school readiness scores.
- Alternative (H_1)—there will be a positive relationship between SEA and school readiness scores.

Theoretical Framework

Sociocultural theory, specifically the work by Vygotsky, was the theoretical framework for this study. According to Vygotsky (1978), when looking at kindergarten readiness, the Zone of Proximal Development (ZPD) forces educators to meet students where they are academically and push them along the continuum toward a goal. If the learning is too difficult, it becomes unobtainable, and if the learning is too easy, children are not challenged to move forward (Gredler, 2012). If we are not sufficiently preparing

students for school and the tasks we are asking them to perform are outside of their ZPD, they may not be successful in school. Sociocultural theory will shape this study because the end goal is to have all children enter school ready to learn. This study illustrated the importance of meeting children where they are to move them along the continuum of learning. We must develop a better understanding of what early learning should look like to prepare students for school.

The design of this study relied on elements of Vygotsky's ZPD in that it sought to find a relationship between SEA and school readiness. If school personnel are utilizing what they know about the ZPD, my study should show a reduction in the gap of students who may enter school with readiness gaps by the time they enter state accountability grades. This is critical because ZPD gives school administrators and teachers the opportunity to create early intervention programs to close those learning gaps among students.

Significance of Study

My analysis may assist officials in JCPS and the Commonwealth of Kentucky as they work to create changes in SEA legislation that are meaningful as well as provide a rationale for the importance of early care for all children in Kentucky. Information gathered through this study may also create more opportunities for strategic planning when creating early interventions for students who may enter school classified as "ready with interventions." The designation of "not ready" is given to students who do not meet the cutoff score for being considered "ready" for kindergarten on the BKS. If there is evidence of a relationship between SEA and school readiness, school leaders and teachers can focus their efforts on closing that gap early on in a student's academic career.

Through this study, I sought to further educate stakeholders about how SEA is related to school readiness in our current education system. School personnel need to know the relationship between school entry age and school readiness in order to allocate resources in a more meaningful way. Ponzo and Scoppa (2014) suggest a variety of methods to better tailor education to the age of students. These methods include: utilizing instructional assistants in classrooms with young for grade students, narrowing the age range in classrooms to better tailor education to the age of students, and directing school funds towards students who are younger. These elements could make drastic improvements in our current education system. Results of this study will be shared with JCPS personnel, so they can make informed decisions when allocating funding and personnel for our youngest students.

Findings, in the form of an executive summary, will also be shared with policymakers at the preschool and elementary school levels about the possible relationship between kindergarten readiness and future academic achievement. Information will be disseminated to the early childhood department, the three elementary superintendents, and the school board within JCPS, as well as the KDE. This will allow all policymakers the opportunity to see the relationship between SEA and school readiness in a local school district. Specifically, I will share information about the study design as well as major takeaways from the research in a presentation format. Carlton and Winsler (1999) state, "It is essential that a comprehensive outreach program be instituted between the school systems and the area preschools that feed into those schools" (p. 347). If elementary schools are expecting all children to come to school ready to learn, there must be greater communication and collaboration between

preschools and elementary schools. As policymakers work to eliminate the achievement gap in public education, they should be informed about the relationship of SEA and school readiness.

The results of this study may also inform lawmakers on possible alternatives to fixed cutoff school entry dates. Byrd, Weitzman, and Auinger (1997) suggest obtaining readiness recommendations from a child's physician. This would allow a different perspective on a child's physical and social-emotional readiness. Horstschraer and Muehler (2014) suggest more flexible entry rules based on both age and readiness screenings; students were either recommended for school entry based on the results of an entrance screener and consultation with a physician, or selected to delay their entry. This study could determine if more information is needed when making school entry decisions, instead of simply being allowed to begin school because you have met the entry date. As students are pushed to perform at higher levels, more information, from various sources (physician, teacher, parent), is needed when making entry decisions. My study will help fill those gaps.

Definition of Terms

The following terms are used in the context of my study:

BRIGANCE Kindergarten Screen (BKS): French (2013) explains, the five main domains of readiness on the BKS are: physical development, language development, academic skills/cognitive development, adaptive behavior, and social and emotional development. The BKS utilizes performance tasks as well as parent surveys to create a more holistic picture of a child's readiness or possible exceptionalities.

Diversity Index: A measurement to categorize diversity in the district. The United States Census assigns a Category 1, Category 2, or Category 3 to each block group by combining the median household income, the percentage on non-white population, and the average level of adult educational attainment in the block group to yield a single category. In JCPS, each student is identified as a Category 1, Category 2, or Category 3 based on the block group in which they reside (Dossett, 2018).

Head Start: According to the U.S. Department of Health and Human Services (2014), Head Start is a comprehensive form of early care focusing on: preschool education, medical, dental, and mental health care, nutrition services, and parent education.

Prior Setting: The place a student received early care during the 12 months prior to entering Kindergarten (Magnuson, Myers, Ruhm, & Waldfogel, 2004).

Race: The grouping of humans into categories based on physical characteristics (Davoudzadeh, McTernan, & Grimm, 2015; Duncan et al., 2014; Gormley, Phillips, & Gayer, 2008).

School Entry Age: Age at which a student enters Kindergarten, reported in the number of days old (Dagli & Jones, 2013; Easton-Brooks & Brown, 2010; Huang & Invernizzi, 2012).

School Readiness: The KDE (2015) defines, "School readiness means each child enters school ready to engage in and benefit from early learning experiences that best promote the child's success" (para 1).

Socioeconomic Status (SES): According to Gormley et al. (2008) a student's free or reduced lunch status is a proxy for SES. Since free or reduced lunch status is information JCPS routinely collects on all students, I will use it as a measure for SES.

Data Sources

In my study, I utilized data from the BKS in JCPS. According to French (2013), the BKS was created in the 1970s by a school psychologist named Alfred Brigance. Brigance wanted to design, "a criterion-referenced instrument that would provide a positive, simplified approach to assessment, progress monitoring, and instructional planning" (French, 2013, p. 2). The BKS is currently in its third edition and encompasses a wide range of developmental domains. The five main domains of readiness are: physical development, language development, academic skills/cognitive development, adaptive behavior, and social and emotional development. The BKS utilizes performance tasks as well as parent surveys to create a more holistic picture of a child's readiness or possible exceptionalities.

Limitations

In this study, I utilized a correlational design. As such, a discussion of the limitations of correlational research designs is necessary. The first limitation is that my study will not indicate causation (Field, 2013). At the conclusion of my study, I will not know if an older SEA creates students who are ready for school. I will only be able to report on the direction and strength of the relationship between SEA and school readiness.

Another limitation of my correlational study is the multitude of variables that contribute to a student's readiness for school (Field, 2013). Children have complex lives prior to starting school. Variables (e.g. socio-economic status, early care, and parents' educational attainment) will be considered as mitigating variables on a child's school readiness.

A final limitation of my study is a lack of information regarding why a student might be older for grade. In Kentucky, the compulsory school age is 6. Many parents choose to delay a child's entry into school for a variety of reasons (e.g. immaturity, perceived advantage in sports, concern about readiness, perceived academic advantage, gender). More qualitative information would be needed to identify why a parent chose to delay school entry for their child.

Delimitations

Simon (2011) explains delimitations as the elements, chosen by the researcher, that limit the boundaries and scope of your study. The primary delimitation of my study is the sample itself. I collected data from Kindergarten students in JCPS during the 2017-2018 school year. I limited the data to one school district in the Commonwealth of Kentucky rather than students from the entire state. Field (2013) states, "We collect data from a small subset of the population known as a sample and use these data to infer things about the population as a whole" (p. 44). I would like to think that my sample is representative of the entire population of Kindergarten students in Kentucky.

Another delimitation was the study site. According to the KDE Open House data (2017), there are 173 public school districts in Kentucky. My study focused on one public school district. All districts are bound to change due to the new SEA legislation

but, I only examined data from JCPS, a large urban district within the Commonwealth of Kentucky.

These choices, made as a part of my research design, are delimitations to the study. The generalizability of my study will be limited due to these design choices. I chose to conduct my study only in JCPS because that is the school district I work in.

Organization of Remaining Chapters

The remaining chapters of this study will be organized as follows: In Chapter II, I will review the literature on school readiness, factors associated with school readiness, as well as the significance of school entry age. In Chapter III, I will discuss the research design, methodology, data analysis procedures using the Statistical Package for the Social Sciences (SPSS), and limitations related to validity (internal and external). In Chapter IV, I will present the findings and analysis of data from my study. Finally, in Chapter V, I will summarize the major findings of my study and propose recommendations for future research and practice, as well as present policy implications.

CHAPTER II: LITERATURE REVIEW

Introduction

The existing literature on school readiness was reviewed to determine needed research, specifically on the relationship between school entry age (SEA) and school readiness. The present study seeks to answer the following research question: What is the relationship between school entry age and school readiness as measured by the BRIGANCE Kindergarten Screen (BKS), controlling for student demographics? The literature review is separated into five sections which discuss the relevant extant research on school readiness in the United States and frame the need for the present study.

In the first section, *School Readiness: An Overview*, I provide a brief history of school readiness. This section also includes an overview of federal and state legislation designed to increase student achievement through the early identification of students with possible learning delays or disabilities. The second section, *Defining and Assessing School Readiness,* provides characteristics of school readiness. This section contains a discussion of different instruments to assess school readiness, including the chosen instrument for the present study, the BKS. The third section, *Factors Associated with School Readiness*, reviews studies related to student characteristics and school readiness. The fourth section, *School Readiness as a Predictor of Student Achievement*, covers the importance of school readiness by identifying long-term implications of being classified as ready for school. The fifth section, *Significance of School Entry Age on School*

Performance, reviews theoretical and empirical studies on both the short- and long-term implications of SEA. The literature review will conclude with a summary of important findings surrounding SEA and school readiness.

The following section will lay the groundwork for the present study. A review of critical federal legislation related to school readiness will be covered. State legislation regarding school readiness screening will also be discussed as well as preliminary results about school readiness in the district being studied.

School Readiness: An Overview

A challenge for P-12 educators and educational leaders is to ensure all students, regardless of their race or socioeconomic status, achieve at high levels. Over the years, there have been many federal and state laws implemented to assist educators and educational leaders reach this challenge. In the following section, I will explain critical pieces of legislation that serve as the backdrop for education.

Throughout recent history, federal reforms have taken place in education to improve the educational outcomes for all students. The first such reform I will discuss occurred with the formation of the National Education Goals Panel (NEGP) in 1989. According to the NEGP Report (1999) "The need to improve the quality of American education was widely recognized during the early 1980s" (p. 1). In response to this need, the panel created six national education goals in the fall of 1989. Goal 1 stated that all children will begin school ready. The indicators in this goal were based for the most part on children's health. The NEGP collected data on children's health index, immunizations, birth weight, early prenatal care, and preschool programming for children

with disabilities. The NEGP (1999) reported increases in all indicators at the end of ten years. All goals were not as successful and the NEGP was disbanded in 2002.

The next national reform I will discuss is the No Child Left Behind (NCLB) Act. Accountability testing has become a major focus in public education since the adoption of NCLB in 2001. NCLB set up a system where students take standardized tests at set points during their academic careers (Davoudzadeh et al., 2014). The results of those assessments were released publicly and schools created plans for increasing student achievement.

According to Mathis and Trujillo (2016), this reform had several goals. One goal of this reform was to identify the lowest performing schools in each state. Once schools were identified, students could transfer to other, higher performing schools. Another goal of this reform was to provide support to improve the lower performing schools. The schools who did not meet progress goals for two years straight had to develop plans to increase student achievement. This was a largely market-based reform plan and results were mixed. NCLB created an educational system driven by assessment results with rewards and sanctions. The idea of NCLB was noble but did not come to fruition by the 2014 goal date.

NCLB created a system in which, "public schools were suddenly being held accountable for educational outcomes in consequential ways" (Moyer, 2017, p. 28). One push that came from this increased accountability was a movement to create a publicly funded prekindergarten. The rationale behind this was if low-income students were not achieving at high levels, providing early learning opportunities might help them. In this move to create students who are "ready for school", many of the traditional ideas of the

purpose of preschool were lost. Direct instruction and scripted lessons became the norm instead of learning through play. NCLB led to a high stakes accountability system that was evident from our very youngest students all the way through high school (Moyer, 2017).

In 2015, the Every Student Succeeds Act (ESSA) replaced NCLB. Darrow (2016) reports that, this federal law returns decision-making power regarding how to assess students back to the states while maintaining the requirement of reporting from schools regarding student achievement. ESSA maintained much of the testing from NCLB accountability remains within the states and districts. States are able to define progress and use more than one measure. States are given the power to utilize federal funds to create school interventions and develop their own teacher evaluation systems (Darrow, 2016). ESSA greatly contracted the federal role in education.

According to Samuels (2017), states are attempting to tie early learning goals, funding, and support for local preschool into the accountability system for schools. With greater state authority under ESSA, states are seeking ways to improve education by starting with our youngest students. The use of resources to enhance preschool education should ideally contribute to creating students who are ready to learn once they enter elementary school. This will create a situation in which early interventions yield higher test scores in the future.

One of the most promising opportunities provided by ESSA in creating more early learning programs is a $250 million allocation to assist states in expanding or starting preschool programs (Samuels, 2017). Recent federal reform legislation now allows states to have more autonomy in the accountability system as well as providing

opportunities to enhance or create meaningful early learning programs. Samuels (2016) explains, "Throughout the reauthorized law, Congress added language that makes explicit that schools can and should collaborate with preschool programs on issues such as teacher training and transitioning children into kindergarten" (p. 20). This focus on collaboration between early childhood and elementary school is a step in the right direction when trying to develop students who are ready to face the academic demands of a high stakes accountability system.

Gredler (1997) reports that screening tests have been utilized in education since the 1940s. The original intent of the kindergarten screener was to identify students with learning disabilities. Since the 1940s, kindergarten screening has become more widespread across the United States with about half of the states mandating the use of a kindergarten screener (Snow, 2011). Mandatory screenings began in Kentucky during the 2013-2014 school year. State regulation 704 KAR 5:070 requires all kindergarten students to be assessed using a common kindergarten readiness screener. The KDE selected the BRIGANCE Kindergarten Screen (BKS) in 2012 to assess children's developmental abilities upon school entry. Within the first 30 days of the academic year, all kindergarteners are assessed and results are reported to the state. Since the Commonwealth of Kentucky legally requires the administration of the BKS, the results serve as an important source of data that can be used by educators and educational leaders for both policy and practice decisions (Snow, 2011).

In JCPS, the context of my study, the results of the BKS clearly show many students are coming to kindergarten without the requisite knowledge and skills to be considered "ready to learn" which could impede performance on future accountability

tests. According to the KDE Open House data (2017), 48.4% of kindergarten students in JCPS were not "kindergarten ready" in the 2016-2017 school year. This accountability testing has now become a part of a student's kindergarten year through the administration of the BKS and subsequent reporting of those scores to the KDE. These data are cause for concern for both parents, educators, and researchers alike. However, research is needed to understand the factors associated with kindergarten readiness and student achievement.

School readiness is being mandated through federal and state legislation. The concept of school readiness is not easy to define. In the following section, I will review literature on the characteristics of school readiness as well as discuss instruments utilized to assess school readiness. The section concludes with an in-depth look at BKS with a rationale for its use in the present study.

Defining and Assessing School Readiness

Despite increased legislation to ensure every child is ready when entering school, there is still confusion on how to define school readiness. Carlton and Winsler (1999) state, "How the child will become ready, and exactly what readiness means are still a mystery" (p. 338). School readiness has been interpreted in a variety of ways. Diamond et al. (2000) detailed numerous task forces and initiatives that emphasize the importance of a child's early development and how that impacts their readiness for school. Diamond et al. (2000) set out to define kindergarten readiness based on parents' conceptions of it. The researchers used data from: the National Household Education Survey (NHES) which was conducted in 1993 and a School Readiness interview. Diamond et al. (2000) state, "Researchers and policy makers have suggested that when academic skills are

emphasized in readiness decisions, the consequence is that the expectations for performance during the kindergarten year are increased for children and for their teachers" (p. 99). Dagli and Jones (2013) report that school readiness was traditionally seen as a characteristic of the child and students should reach a certain level of maturity prior to beginning school. The standards for academic achievement in kindergarten are high. Students are being challenged academically and, according to KDE Open House data (2017), almost half of the students who enter kindergarten in JCPS are not ready.

Characteristics of School Readiness

Diamond et al. (2000) identified several key findings about kindergarten readiness. First, most parents find academic and behavioral skills to be important in kindergarten readiness. Diamond et al. (2000) categorized skills into pre-academic readiness and behavioral readiness. Factor analysis showed these two types of readiness were significantly related. Second, parents reported they provided their child with several home-based learning activities each week (reading a book, watching educational television). The researchers found no relationship between the frequencies of home-based activities and parental concern about kindergarten readiness. Third, parents who chose to delay their child starting kindergarten resulted from concern around their child's pre-academic skills rather than behavioral skills.

Other studies emphasize more than academic skills as critical to school readiness (Britto, 2012; Gaynor, 2015; Sahin, Sak, & Tuncer, 2013). A more in-depth definition of school readiness provided by Britto (2012) explains three dimensions of school readiness: ready children, ready schools, and ready families. Within the ready children dimension, children's learning and development is the focus. The ready schools dimension is

centered on a school environment and practices that create an efficient transition into the school and promotes the learning of all students. The ready families dimension emphasizes parental and caregiver attitudes as well as the importance of their involvement in their child's early progress and transition to school. Britto develops the idea that more than maturation or a child's readiness to learn fall into being ready for school. Gaynor (2015) defines school readiness as, "a complex concept that, relates to a child's readiness as age 5 to learn in a school environment" (p. 27). This complex concept has a variety of inputs from a child's socioeconomic status, parental educational attainment, early healthcare, and childcare outside of the home. School readiness is seen as a combination of factors.

In a qualitative study of teacher views on school readiness, preschool and first grade teachers define school readiness as a combination of physical, social/emotional readiness, cognitive readiness, language skills, and self-help skills of children (Sahin et al., 2013). Teachers in this study also stated that the family is the most important factor in ensuring children are ready for school. This definition recognizes that students' readiness for school is based on more than academic factors.

Finally, the KDE (2015) defines, "School readiness means each child enters school ready to engage in and benefit from early learning experiences that best promote the child's success" (para 1). This definition of readiness does not include any specific indicators of readiness other than ready to learn. The readiness of a child in Kentucky is assessed using the BKS. The following section will examine common readiness screens with a more in-depth discussion of the BKS.

Instruments to Assess School Readiness

As more states institute mandatory kindergarten screening, a variety of screening assessments are being utilized (Weisenfeld, 2017). There are a multitude of reasons why schools utilize readiness screeners. Maxwell and Clifford (2004) identify five reasons schools utilize readiness screeners: improve learning, identify children with special needs, evaluate programs, monitor trends over time, and use for high-stakes accountability. The variety of reasons for screening students creates a need for different screeners. Weisenfeld (2017) reports that in 2010 only seven states were collecting information on Kindergarten Entry Assessments (KEA). In 2017, 47 states report "they are using statewide, piloting, developing, or revising their KEA" (Weisenfeld, 2017, p. 1). Since the use of a KEA is left up to state discretion, many different KEAs are being administered. This section will discuss four of the more common screening tools: Qualls Early Learning Inventory, Teaching Strategies GOLD, Phonological Awareness Literacy Screening, and Desired Results Developmental Profile.

The Qualls Early Learning Inventory (QELI) is a naturalistic assessment which requires the teacher to conduct a variety of observations over time (Qualls, Hoover, Dunbar, & Frisbie, 2003). The teacher collects information on six key areas: general knowledge, oral communication, written language, math concepts, work habits, and attentive behavior. QELI can be given at any time during the kindergarten year and requires about five to ten minutes per student. Results are reported in the form of three labels: delayed, developing, and developed in each of the six areas. QELI does not collect academic performance data and the manual suggests pairing the data with results from the Iowa Tests of Basic Skills.

Teaching Strategies GOLD (TSG) is a blended KEA which requires observations and performance tasks. According to the Center for Educational Measurement and Evaluation (2013), the TSG measures nine areas of development that are most predictive of academic achievement. The nine areas are: social-emotional, physical, language, cognitive, literacy, mathematics, science and technology, and the arts. There are 36 indicators within the nine domains that teachers observe. The TSG can be used from birth through kindergarten. Results are reported as a score along a continuous scale and teachers can make instructional decisions according to the scale score.

Phonological Awareness Literacy Screening (PALS) is a KEA designed to identify students performing below expected levels in six domains of literacy development: phonological awareness, alphabet knowledge, knowledge of letter sounds, spelling, concept of word, and word recognition in isolation (Invernizzi, Juel, Swank, & Meier, 2013). The assessment does not collect information on any other readiness indicators outside of literacy. PALS is administered in a one-on-one situation and is untimed. Scores are reported as a summed score of all performance tasks. Invernizzi et al. (2013) caution the use of PALS as the only measure or determining factor of a child's readiness due to the lack of other academic and non-academic indicators in this KEA.

The Desired Results Developmental Profile (DRDP) was developed by the California Department of Education to improve the outcomes of children involved in any level of schooling from birth to twelve years old. There are six desired results on which data is collected: children are personally and socially competent, children are effective learners, children show physical and motor competence, children are safe and healthy, families support their child's learning and development, and families achieve their goals

(California Department of Education, Early Education and Support Division, 2015). Data are collected through the DRDP which is completed by the teacher and requires observations, documentation, and reflection. There is also a parent survey, environmental rating scales on the program in which a child is enrolled, and a program self-evaluation. The individual child is at the center of this system. Progress is reported through the DRDP. This list is not comprehensive as many other state developed or combinations of screeners are also being utilized across the United States (Weisenfeld, 2017).

BRIGANCE Kindergarten Screen

The research surrounding the usefulness of the BKS is sparse. In a foundational study, Mantzicopoulos (1999) set out to investigate the reliability and validity of the BKS. The BKS consists of twelve subtests that cover a wide range of skills from body awareness, language, number skills, and motor skills. The test also includes a parent questionnaire that assesses a child's development in the areas of self-help and social-emotional development. The test is designed to be a comprehensive assessment of a child's kindergarten readiness but it is a single measure, not a global assessment. Due to the brevity of the screen and the heavy reliance on the background knowledge, Mantzicopoulos (1999) sought to find answers regarding the reliability and validity of the Brigance screen. She examined five areas within the BKS:

> The test-retest, interrater, and internal consistency reliabilities of the screen; the relationship of the K and 1 screen to other measures of cognitive functioning and preacademic competence; the relationship of the K and 1 screen to the preschool form of the same test; developmental trends in the K and 1 screen test scores; and

> the K and 1 screens accuracy at predicting special education status at the end of preschool. (p. 12)

The researcher did not list any specific research questions or hypotheses in this quantitative study. Mantzicopoulos (1999) did, however, list a variety of concerns in the introduction surrounding the broad usage of the BKS. The general purpose of the introduction was to cite the lack of data on this screening tool and to urge screen administrators to exercise caution when interpreting results. Due to this gap in the research, Mantzicopoulos designed the following study.

Mantzicopoulos (1999) studied 134 children in a Head Start preschool program in a Midwestern school district. The age range of the sample was 52 to 69 months. Half of the participants were boys (67) and the other half were girls (67). The participants were mostly Caucasian (76.1%), 18.7% were African-American, and 3.7% were identified as "Other". All participants met the federal poverty guidelines required for entry into the Head Start program. All participants were given the Brigance K and 1 screen from January to March of preschool. A portion of those students (23) were also given the Brigance Preschool screen because their age was below the recommended age cutoff. These students were given the Brigance K and 1 screen in April, once they reached the recommended age. In March-April, all students were also given the Kaufman Assessment Battery for Children (K-ABC). A random sample of 37 children were also retested on the Brigance K and 1 screen in April to establish test-retest reliability. All students were then retested on the K-ABC achievement battery. Teachers did not have any information on the scores for any children throughout the study.

Mantzicopoulos found a strong interrater reliability in this study. However, the researcher noted that the range of reliability coefficients ranged from .28 for Picture Vocabulary subtest all the way to .89 for the Numeral Comprehension subtest. Mantzicopoulos suggested that the test manual adequately explains how to score the items in each subtest. The test-retest reliability data indicated overall stability is high but certain subtests had low stability coefficients. These low coefficients could be attributed to the rapid developmental changes in the students being assessed.

Mantzicopoulos (1999) states, "According to the manual, each item of the K and 1 screen was judged by a panel of experts on the degree to which it matched a particular written objective," (p. 15). In this area, validity is not a concern. One issue identified with regard to validity was construct validity because the instruments in this study are used to make decisions about regular classroom placement, specifically for special education status. The Brigance was not designed for that purpose so the validity there is of great concern. Mantzicopoulos examined five areas of concern with the Brigance K and 1 screen. Mantzicopoulos found high interrater agreement, acceptable overall internal consistency and lower test-retest reliabilities (which could possibly be attributed to rapid cognitive development of students at this age). A moderate correlation was noted between the different instruments used in this study. The preschool form and K and 1 screen within Brigance were highly correlated. Mantzicopoulos reported a moderate validity coefficient when comparing the Brigance and the K-ABC.

Several concerns emerged when using Brigance results to refer students for special education. Mantzicopoulos (1999) noted that, "When the recommended score of 65 was used as the criterion cutoff, 59% of special needs children were missed" (p. 18).

The researcher points out that Brigance is not intended to be a diagnostic instrument and these results reflect that fact. She closes by stating, "With early identification being a critical issue, further cross-validation and longitudinal research are needed to inform practitioners of the accuracy and potential uses of this screen with young children from diverse backgrounds" (p. 19).

There was no mention of the generalizability in this study. The author found no significant gender effects using multivariate analysis. The sample did consist of a majority of Caucasian participants (76.1%) and all students met poverty guidelines for entry into the Head Start program. These two aspects could limit generalizability to the larger population. Future research needs to be framed around the long-term implications of the Brigance K and 1 screen.

Although the Mantzicopoulos study took place many years ago, current information supports the validity and reliability of the BKS. Hawker Brownlow Education (2014) reported that the BKS can be used to not only identify readiness, but to identify children with developmental delays, disabilities, or academic giftedness. BKS results can also assist in instructional planning. Hawker Brownlow Education (2014) reported the third edition of BKS had desired levels of reliability, accuracy, and validity.

In the following section, factors associated with school readiness will be explored. I will include factors such as student characteristics and family background. I will also discuss pre-kindergarten care and its effect on school readiness.

Factors Associated with School Readiness

As schools strive to ensure all students are ready to learn at school entry, it is important to look at factors associated with readiness. These factors can be present at birth (gender, race) or can be something that occurs during childhood (enrollment in pre-kindergarten care). All of these factors work together to produce students who are ready, or not, at school entry. This section will discuss those factors.

Student Characteristics and Family Background

Duncan et al. (2006) report the strongest predictors of later academic achievement are a child's math, reading, and attention skills when entering school. They also found that this held true regardless of the child's socioeconomic status. Britto (2012) proposed the use of school readiness as a tool to close the learning gap, and as a tool to help all students reach their full potential through the early identification of students who need extra support to be successful in school.

When looking at a child's development prior to beginning kindergarten Sheridan, Knoche, Edwards, Bovaird, and Kupzyk (2010) posit that school readiness begins at home and the first five years in a child's life are crucial to their future functioning. Protective factors present in a child's life before kindergarten that contribute to closing the achievement gap are better health care, childcare outside the home, speaking English in the home, and parental education level (Holliday, Cimetta, Cutshaw, Yaden & Marx, 2014).

Magnuson et al. (2004) inform that students from lower socioeconomic homes display less school skills than students from more affluent homes. Magnuson et al. (2004) propose this could be due to being less likely to participate in preschool as well as

being less likely to receive "stimulating" care at home. Children from low socioeconomic status backgrounds have delays in executive function skill development. Welsh, Nix, Blair, Bierman, and Nelson (2010) state, "Early executive function skills contribute to the development of emergent literacy and numeracy skills during the pre-kindergarten years" (p. 9). Examples of executive function skills are working memory and attention control. These executive function skills are critical when starting school and students from poverty are at a disadvantage.

Joe and Davis (2009), characterized parents as having key roles in developing their children academically. Sheridan et al. (2010) report that parental engagement is connected to school readiness characteristics in preschool children and that forming positive relationships between parent and child led to less teacher reported incidents of anxiety in those children. Downer and Mendez (2005) found that African-American students whose fathers are involved in home-based educational activities and care of the child are reported as having more regulation of their emotions and more positive peer interactions (indicators of school readiness) by their teachers. Joe and Davis (2009) studied African-American boys and found that when parents valued education, cognitive outcomes for their children increased, reading books to their children was significantly correlated to school readiness reading scores, and discussions of racial and ethnic heritage on a regular basis led to greater achievement in many academic areas.

Finally, Hill (2001) asserts that parental belief in the value of education, expectation for grades, and the quality of the relationship between parent and teacher increased school readiness. Hill (2001) also found that a "mother's use of hostile socialization strategies, including having a short temper and a lack of patience, was

associated with lower pre-math and pre-reading scores" (p. 693). This held true among students in poverty. Research reveals that parents and their socio-economic status play critical roles in producing children who are ready for school.

Pre-Kindergarten Care

There are many factors (e.g., gender, race, early care, availability of healthcare, parent beliefs about education) that influence a student's academic performance, and some of them occur prior to a child's entrance into school (Davoudzadeh et al., 2015; Duncan & Magnuson, 2005). Since one of the only factors that educators can influence is childcare outside the home, it deserves a closer look. Students who participate in childcare or preschool outside of the home perform at higher levels on kindergarten readiness screens (Connell & Prinz, 2002; Holliday et al., 2014; Magnuson et al., 2004). Factors that are most closely related to kindergarten readiness are: exposure to childcare/preschool outside the home, race, socioeconomic status, and parental involvement.

One of the most successful forms of pre-kindergarten care is Head Start. Schilder and Leavell (2015) report on the Early Education Plan of 2014. This plan authorized $500 million to expand "high-quality early learning" (p. 109). This allocation of funds demonstrates the importance of early learning. According to the U.S. Department of Health and Human Services (2014), Head Start began in 1965 as part of the war on poverty. Head Start is a comprehensive form of early care focusing on: preschool education, medical, dental, and mental health care, nutrition services, and parent education. This holistic approach has been very successful in creating improved preschool performance. The effects become less noticeable the older a child is, with

minimal differences noted in third grade with peers who were not involved in Head Start. This is not to say Head Start is not a worthwhile endeavor. It has had success in closing the readiness gap (U.S. Department of Health and Human Services, 2014). Since school readiness is a predictor of future student academic achievement, the relationship between Head Start enrollment and school readiness is important.

The education of the whole child is one reason for the success of Head Start programs. Ansari and Gershoff (2015) found that instructional practices did not predict academic outcomes for children but learning related social skills did. This broader view of the role of early education supports the idea of readiness meaning more than simply identifying letters and numbers.

Increased accountability legislation has created a movement to ensure all students are ready at school entry. As students enter school, they are screened for readiness and interventions or enrichments can be put into place to increase academic performance later on in their school career. The following section will review three studies surrounding the long-term implications of school readiness.

School Readiness as a Predictor of Student Achievement

With all of the information gathered surrounding a child's readiness for kindergarten, Kurdek and Sinclair (2001) set out to investigate the link between young children's readiness for kindergarten and their achievement at the fourth-grade level. They noted several interesting findings in their study. First, with regard to age, younger kindergarten students achieve at lower levels on entry exams but those differences dissipate with age. Secondly, the researchers also found that verbal skills in kindergarten are a predictor of both future math and reading achievement scores. Kurdek and Sinclair

(2001) suggest, “If future investigations confirm that verbal skills at kindergarten predict later performance in both reading and mathematics, whereas visual motor skills predict later performance in only mathematics, then additional work would be needed to develop a hierarchical assessment of readiness” (p. 454). The authors suggested that verbal skills form the basis of formal education for these young students. Finally, Kurdek and Sinclair suggest that the readiness skill most related to later achievement in math and reading is auditory memory. Kurdek and Sinclair found the verbal skills score on the kindergarten screener was a predictor for future achievement in math and reading; however, visual motor skills were a predictor for future math achievement only. In a different study, Davoudzadeh et al. (2015) examined early school readiness as a predictor of grade retention. They found the leading predictor of grade retention was low early academic skills.

In an attempt to mitigate the lack of readiness of kindergarten students, legislators are pushing back the school entry age (SEA) for kindergarten students (Dagli & Jones, 2013). Most states require a student to have reached the age of five prior to September 30 of their kindergarten year. Each state also has guidelines on early admission to kindergarten or delayed admission to kindergarten. Dagli and Jones (2013) suggest that kindergarten students are facing a much more challenging experience than their predecessors, and younger children are more at risk for falling behind academically due to a lack of readiness.

As schools increase the academic demand placed on students, districts and states are reacting by creating policies about SEA. Parents are also choosing to delay their child’s entry into school. The following section will explore the relationship between

SEA and school readiness. It concludes with a look at the long-term implications of SEA both academically and beyond formal schooling.

Significance of School Entry Age on School Performance

In response to the increased academic demand of kindergarten and lack of readiness among students, Kentucky state law KRS 158.030 has changed the kindergarten entry age, effective the 2017-2018 school year. Previously, students had to reach the age of five by October 1 to be eligible to attend kindergarten; the new statute requires reaching the age of five prior to August 1. There is also a stipulation in the law that all local school districts must adopt a policy to allow for early entry of students into kindergarten. The policy must include an assessment process to determine if a student is ready for early entry. In Jefferson County Public Schools (JCPS), this petition process includes required dates for documentation, assessment protocols, recommendations by staff, and approval by the superintendent. Originally, parents requesting early admission were required to pay tuition but that has since been eliminated.

Delayed School Entry

Many parents choose to delay school entry due to concerns about their child's readiness for school. Students who are delayed are more likely to be male (Dagli & Jones, 2013; Mendez et al., 2015; Winsler et al., 2012). Dagli and Jones (2013) also found that white children were more likely to be delayed entering school than their African-American, Hispanic, and Asian counterparts. Winsler et al. (2012), however, found no connection between ethnicity and decisions to delay school entry but rather a connection between socioeconomic status, as measured by eligibility for free or reduced lunch, and decisions to delay entry. Students who were not eligible for free or reduced

lunch were more likely to be delayed. Pre-kindergarten care is also a critical factor to decisions to delay or not (Dagli & Jones, 2013; Winsler et al., 2012). Children who attended childcare outside of the home are more likely to be delayed (Winsler et al., 2012); however, childcare with higher cost increased the likelihood of being enrolled in kindergarten early (Dagli & Jones, 2013). My study seeks to determine the relationship between SEA and school readiness.

School Entry Age and School Readiness

Research shows mixed findings regarding SEA and school readiness (Easton-Brooks & Brown, 2010). Huang and Invernizzi (2012) found an association between kindergarten entry age, literacy skills, and risk for retention. The youngest students who had no preschool exposure were at the greatest risk for retention and also exhibited lower emergent literacy scores. Students who were older and had attended preschool had the lowest risk for grade retention and higher emergent literacy scores. An interesting point to note was that regardless of age, students with preschool exposure outscored their same age peers. Huang and Invernizzi (2012) report that the benefits of attending preschool are the same, regardless of age. Younger students in kindergarten gain literacy skills at a faster rate than their older peers, but a gap in their skills is still evident in second grade (Huang & Invernizzi, 2012).

In a study on delayed entry, Dagli and Jones (2015) also found differences in school readiness based on age. Students who delayed entry and were older for grade had the highest scores in reading and mathematics. Young for grade students had the lowest scores but that gap was closed by the end of third grade, suggesting a maturation effect instead of ability. Huang and Invernizzi (2013) state young for grade students are also at

the highest risk for retention in kindergarten. These studies suggest a difference in school performance at entry based on age.

In contrast, other studies show no difference in school readiness based on school entry age (Easton-Brooks & Brown, 2010; Furlong & Quirk, 2011; Mendez et al., 2015). Easton-Brooks and Brown (2010) posit that the reading proficiency of students who had delayed entrance into school were not any higher than students who entered school when eligible. Furlong and Quirk (2011) also report similar findings and state that the effects of age on future achievement were minimal. They recommend the idea that kindergarten is a critical transition time where students are developing skills at a rapid rate. The most important influences on readiness were preschool experience and age.

Mendez et al. (2015) found that students who started kindergarten later, regardless of lunch status, scored on par with their average age peers. The one area where students differed were assignments to special education. Students with delayed entry were referred for special education more than their average age peers. Mendez et al. (2015) propose, "It is likely the overrepresentation of delayed entry students in special education is due to the fact that there were developmental concerns that resulted in both the choice to delay entry and later identification for special education" (p. 201). The suggestion that parents held their students back because of academic concerns could not be verified due to the use of a data set that did not include said information.

In an attempt to further examine the effects of age on school readiness, Pena (2017) explored the concepts of relative age and absolute age. Relative age (the difference between age in days and average age of kindergarten students in the state, divided by 365.25) students, who were older, had higher test scores than their classmates

who were younger than the average age. When looking at absolute age (testing students at an exact age), younger students would outperform the older students. This could be due to spending a greater number of days in an educational setting than their older peers. This study supports the value of early education when looking at school readiness. Pena (2017) suggests that the aptitude of certain students could be overlooked due to their younger age. Herbst and Strawinski (2016) also reported benefits to early enrollment when students are assessed based on their absolute age instead of during predetermined points in their academic careers. These two studies draw attention to the vast variance of age in children when assessing at school entry.

Other studies (Byrd et al., 1997; Carlton & Winsler, 1999; Martin, 2009) found a negative relationship between delayed school entry and school progress. Byrd et al. (1997) report that students who delayed school entry have higher rates of behavior problems. Martin (2009) found that older for grade students experienced academic disadvantage, while younger for grade students experienced higher levels of motivation, engagement, and performance. Taken together, Martin (2009) states that there is little to no academic advantage to delayed school entry.

Carlton and Winsler (1999) recommend that delaying school entry not be supported but instead create a partnership between preschools and primary schools to ensure all students are ready without having to delay starting school. With the mixed results of the relationship between SEA and school readiness, it is important to also look to lasting effects of SEA. This following section will investigate long-term effects of SEA. Horstschraer and Muehler (2014) propose a shift from utilizing fixed birthdate cutoff rules to using a readiness checklist to make decisions about school entry.

Long-Term Implications of School Entry Age

Several studies move beyond the effect of SEA and school readiness by looking at later academic achievement. Students with an older SEA were rated higher in a variety of areas upon school entry than their younger counterparts (Datar & Gottfried, 2009; Huang & Invernizzi, 2012; Jaekel et al., 2015; Ponzo & Scoppa, 2014; Sakic et al., 2013). Datar and Gottfried (2009) report an older SEA has positive effects on social-behavioral skills and cognitive skills but those differences diminish during middle school. Sakic et al. (2013) conducted a similar study in Croatia which examined SEA and school achievement in fourth and eighth grades. The results in this study were mixed, as older students outperformed younger students in fourth grade. Once in eighth grade, however, there were benefits attributed to younger students. Younger students outscored their older classmates in the areas of English, Chemistry, and Biology. One possible reason given for the higher English scores is that foreign language learning is less difficult for younger students.

A study by Ponzo and Scoppa (2014) found that younger children in Italy score substantially lower in both fourth and eighth grades. Their research did not support the idea that the readiness gap closes over time. Furthermore, the advantage of older children was still apparent at 15 years of age. Young for grade students are more likely to be tracked into vocational studies rather than college bound tracks at the high school level. This study did not follow the trend of students growing out of age differences at school entry. The long-term effects of being young for grade are significant through primary and secondary school and beyond. Huang and Invernizzi (2012) also described lasting effects of SEA on literacy measures. Young for grade students learned at a faster rate

than their older counterparts but scored lower on all dependent variables. The achievement gap was still present among young for grade students at the close of second grade. Jaekel et al. (2015) also found lasting effects of delayed school entry on academic achievement. Delayed school entry did not lead to higher achievement scores. In fact, even when looking at length of schooling instead of age, students with delayed school entry still score lower than average school age students. Jaekal et al. (2015) propose, "Teachers are essential resources in learning and providing formal instruction" (p. 658). This study suggested students who enroll in school later miss out on critical learning experiences in their formative years that can never be made up.

In conclusion, there are definite differences in students when starting school. Young for grade students tend to score lower but learn at a faster rate than their older classmates. There is disagreement as to whether this achievement gap ever closes with some studies showing closure in elementary school, others in middle, and, yet, others who suggest it never closes. The vast majority of studies on SEA are quantitative in nature. The present study seeks to inform about the relationship between SEA and school readiness to create meaningful policy change to better meet the needs of students and their families. My study will also use a quantitative methodology. This will continue to build the existing knowledge on how SEA is related to school readiness. This information is important as states are adjusting their starting age requirements in order to assure later academic success.

Summary

Screening for school readiness has taken place since the 1940s. Over the decades, there has been increased legislation designed to ensure a child's readiness to learn prior to

beginning school. The legislation has been both federal and state level. This added pressure is a result of increased accountability testing. In the five years of mandated reporting in Kentucky, JCPS students have not fared well with only about half of them being ready for school. Recent legislation has moved the starting cutoff date to August 1. This means that a student wishing to enroll in kindergarten must have turned five by that date or go through an appeals process to be granted entry.

School readiness is not an easy concept to define. There are typically several categories that are included when assessing school readiness. Those categories are cognitive skills, social-emotional readiness, self-help, language, and physical. There are also a variety of instruments used throughout the United States to assess school readiness. The screener I will use in the present study is the BKS. This screener includes both teacher observation and parent surveys to measure a child's readiness in six domains: physical development, language development, academic skills/cognitive development, adaptive behavior, and social-emotional development. I am using this instrument due to its holistic approach to school readiness.

Many factors are related to a child's readiness for school. Researchers found that the first five years of a child's life are critical. Students who have exposure to preschool are more ready for school at entry. Also, students who are from affluent homes exhibit more school skills than their peers from lower socioeconomic homes. Positive parent relationships, parental engagement, and parental value of education all contribute to school readiness. School readiness is a predictor to a child's future academic success.

In reaction to increased academic pressure placed on schools, districts and states have made changes to their school entry age requirements. Parents also have made

decisions to delay school entry due to various concerns about school readiness. The research shows mixed findings about SEA and school readiness. All studies indicate a difference at school entry but those differences seem to dissipate over time. Sakic et al. (2012) suggest a closer look at SEA by using the actual birthdates to determine differences in readiness. In the present study, I will investigate the relationship between SEA (based on the student's exact age) and school readiness in a large urban district. I will examine demographic factors such as free/reduced lunch status, race, preschool enrollment, and parental education levels. This will allow a much more detailed picture of the relationship between SEA and school readiness. Datar and Gottfried (2015) report, "The case for blanket policies that raise school entry age for all by moving cutoff dates earlier becomes much weaker with the growing evidence that the benefits of delaying entry…are largely short-run" (p. 350). As Kentucky moves into an era of moving cutoff dates, the present study will inform on the advantages and/or disadvantages of school entry age.

CHAPTER III: METHODOLOGY

Introduction

The purpose of this study was to examine the relationship between school entry age and kindergarten readiness scores, as measured by the BKS. In particular, this study sought to address the call for research in this area, as indicated by Dagli and Jones' (2013) call for future research on "the relationship between relative age and children's social and emotional development" (p. 35). Since the BKS includes information on social and emotional development, I will be able to address this call for future research as well as utilize the existing instrument as a measurement of overall Kindergarten readiness. The context of my study was JCPS, a large urban district in the Commonwealth of Kentucky. I examined a new set of data in Jefferson County because legislation changed school entry age requirements effective the 2017-2018 school year. Data was gathered through the research and evaluation office within JCPS.

Sakic et al. (2012) suggest a closer look at school entry age (SEA) by using a child's actual birthdate to determine differences in readiness. In the present study, I investigated the relationship between SEA (based on the student's exact age when entering school) and school readiness, as measured by the BKS, in a large urban district. I examined demographic factors such as free/reduced lunch status, race, preschool enrollment, and parental education levels. This allowed a much more detailed picture of the relationship between SEA and school readiness. Datar and Gottfried (2015) report, "The case for blanket policies that raise school entry age for all by moving cutoff dates

earlier becomes much weaker with the growing evidence that the benefits of delaying entry…are largely short-run" (p. 350). Kentucky state law KRS 158.030 changed the kindergarten entry age, effective the 2017-2018 school year. Previously, students had to reach the age of five by October 1 to be eligible to attend kindergarten; the new statute requires reaching the age of five prior to August 1. As Kentucky moves into an era of moving cutoff dates earlier, my study examined whether such legislation changes are associated with improved student outcomes.

The remainder of this chapter is organized into the following five sections: *Research Design, Measurement of Variables, Participants, Procedures,* and *Data Analysis*. In *Research Design,* the purpose of my study and why a correlational design was selected will be discussed. In the section entitled *Measurement of Variables*, there will be a review the independent and dependent variables and discussion of how each will be operationalized. I will also include a discussion of the BKS instrument and report findings on the reliability and validity of the instrument. In the next section, *Participants*, I describe the students who were included in my study. In the *Procedures* section, I will explain the method of obtaining the data included in my study. Finally, in the *Data Analysis* section, the statistical procedures to be employed to answer the research question will be discussed. My research in this study produced data-based outcomes related to SEA and school readiness in JCPS.

Research Design

In this study, I utilized a nonexperimental research design based on multiple linear regression to examine the relationship between SEA and school readiness. The purpose of my study was to examine relationships among SEA and demographic

information to determine possible contributing factors to school readiness. I utilized data from JCPS on each kindergarten student's SEA and school readiness scores on the BKS. Although Field (2013) mentioned limitations of correlational research, such as an inability to determine cause and effect, a correlational design is appropriate in educational settings when an experimental design is not feasible. Creswell (2014) explains, "A…nonexperimental form of research is the correlational design in which investigators use the correlational statistic to describe and measure the degree or association (or relationship) between two or more variables" (p. 12). Since there is no way to control for a student's age when entering school or randomly assigning students to a control group or test group, a correlational design was selected for my study. I examined data that are naturally occurring and do not require any outside manipulation of human subjects.

Measurement of Variables

The purpose of this section is to identify and describe study variables, beginning with the independent variables, followed by the outcome of interest (student performance on the BKS). The independent variables included in my study were: gender, native language, race, prior setting, diversity index, and SEA. The dependent variable was the composite score on the BKS.

School Entry Age

School entry age was the primary independent variable of interest in this study to predict BKS performance. Age was reported as the number of days old a student is on the day they were assessed using the BKS. As such, age is a continuous variable, where the number of days old for each student will fall somewhere on the age continuum (Field,

2013). Furthermore, since each day is an equal measure, age can be further classified as an interval variable. For the purposes of my study, age was operationalized as a number of days. It was calculated by determining the number of days from a student's birthdate until the date they were assessed using the BKS during their kindergarten year. Other studies have categorized students as old for grade, young for grade, and average. My study took a much closer look at the relationship of age and school readiness by using an exact number of days to report age rather than the categories of old for grade, young for grade, and average as seen in other studies (Datar & Gottfried, 2009; Huang & Invernizzi, 2012; Jaekel et al., 2015; Ponzo & Scoppa, 2014; Sakic et al., 2013). The number of days old when assessed using the BKS was provided by the JCPS Data Management department.

Demographic Information

In addition to age, additional demographic variables were included in the statistical analysis. The student-level demographic data included: gender, race, native language, prior setting, diversity index- included information on median household income, percentage of non-white population, and parental educational attainment for the census block in which the student resides. These demographic variables were included because there are many factors (e.g., gender, race, early care, availability of healthcare, parent beliefs about education) that may shape a student's academic performance, and some of them occur prior to a child's entrance into school (Davoudzadeh, et al., 2015; Duncan & Magnuson, 2005). Taken together, there are clear implications of a child's demographic factors and their performance on the BKS at school entry. Due to these implications, demographic factors will be included in my study.

Table 1 provides a summary of all independent variables in my study. A definition of the variable, its operationalization, and relevant literature are noted as evidence of grounding in the extant research literature. Within Native Language, there were three levels: English, Spanish, and other language speakers. The category of other language included 48 distinct languages spoken by JCPS kindergarteners. Each category within the independent variable was dummy coded in the following manner: 1 = member of subgroup, 0 = not a member of subgroup. For example, English = 1, all other language and Spanish speakers = 0. In a new variable column, Spanish = 1, all other language and English speakers = 0. Finally, within language, Other = 1, all English and Spanish speakers = 0. This coding scheme was carried across the categorical independent variables of gender (male = 1, female = 0), race, diversity index, and prior setting.

Instrumentation - BRIGANCE Kindergarten Screen (BKS)

Within this study, I utilized data from the BKS as the measure of a student's school readiness (dependent variable). According to French (2013), the BKS was created in the 1970s by a school psychologist named Alfred Brigance. Brigance wanted to design, "a criterion-referenced instrument that would provide a positive, simplified approach to assessment, progress monitoring, and instructional planning" (French, 2013, p. 2). The BKS is currently in its third edition and encompasses a wide range of developmental domains. The five main domains of readiness are: Physical development, language development, academic skills/cognitive development, adaptive behavior, and social and emotional development. The BKS utilizes performance tasks as well as parent surveys to create a more holistic picture of a child's readiness or possible exceptionalities.

Table 1. *Student Demographics Independent Variables*

Independent Variable	Measurement Of Variable	Definition	Level of Measurement	Grounding in the Research Literature
School Entry Age	Birthdate on file with district	Age at which a student enters Kindergarten, reported in the number of days old	Interval	Dagli & Jones (2013): Easton-Brooks Brown (2010); Huang & Invernizzi (2012)
Gender	Educational guardian identified	Either of the two sexes	Categorical Male Female	Mendez et al. (2015)
Native Language	Educational guardian identified	Language spoken most frequently in the home	Categorical English Other Spanish (Dummy-coded, with English as referent)	Mendez et al. (2015)
Race	Educational guardian identified	The grouping of humans into categories based on physical characteristics	Categorical White Asian Hispanic Other Two or More (Dummy-coded, with White as referent)	Gormley, Phillips, & Gayer (2008); Davoudzadeh, McTernan, & Grimm (2015); Duncan et al.(2014)
Diversity Index	Determined by US Census based on the neighborhood in which student resides	A measurement to categorize diversity in the district combining the median household income, the percentage on non-white population, and the average level of adult educational attainment in the block group to yield a single category.	Categorical Category Category 2 Category 3 (Dummy-coded, with Category 2 as referent)	Dossett (2018)
Prior Setting	Educational guardian identified on parent portion of BKS	The place a student received early care during the 12 months prior to entering Kindergarten	Categorical State-funded Head Start Private Home Other Outside home Two or more prior settings (Dummy-coded, with Private Childcare as referent)	Magnuson et al. (2004)

French (2013) reported three purposes of the BKS: identify developmental delays, disabilities, or giftedness; determine school readiness; and monitor progress over time. State regulation 704 KAR 5:070 requires all kindergarten students to be assessed using a common kindergarten readiness screener. The KDE piloted the BKS in 2012 to assess children's developmental abilities upon school entry. Within the first 30 days of the academic year, all kindergarteners are assessed and results are reported to the state. The legislation aligns with the definition of school readiness from the KDE. The KDE (2015) defines school readiness as when a child, "enters school ready to engage in and benefit from early learning experiences that best promote the child's success" (para 1). In JCPS, the context of my study, the results of the BKS clearly show many students are coming to kindergarten without the requisite knowledge and skills to be considered "ready to learn" which could impede performance on future accountability tests. According to the KDE Open House data (2017), 48.4% of kindergarten students in JCPS were not "kindergarten ready" in the 2016-2017 school year. This accountability testing has now become a part of a student's kindergarten year through the administration of the BKS and subsequent reporting of those scores to the KDE.

Since the Commonwealth of Kentucky has mandated the use of the BKS with all of its kindergarten students, I utilized that assessment in my study. The BKS includes information on five domains. However, data analysis will rely on each student's composite score on the BKS as well as the categorical designations of: not ready, ready, and ready with enrichment. Table 2 identifies the definition and level of measurement for the composite score as well as categorical designation on the BKS.

Table 2. *Dependent Variables to Determine School Readiness*

Variable	Measurement	Definition	Level of Measurement	Grounding in the Literature
BRIGANCE Kindergarten Screen	Composite Score	From the raw score in each domain, a normative score can be obtained to compare students to their peers. An overall composite score can also be calculated based on raw scores from each domain. French (2013) reports, "A composite score reflects a child's performance along a normative scale" (p. 107). The mean composite score is 100 with a standard deviation of 15.	Interval	French (2013)
BRIGANCE Kindergarten Screen	Readiness Designation	<81 Not Ready 82-87 Not Ready/Ready 88-105 Ready 106-108 Ready/Ready with Enrichments 109-130 Ready with Enrichments	Categorical Not Ready Ready Ready with Enrichment	JCPS Data Management, Planning, and Program Evaluation (2018)

Reliability, Validity, and Accuracy

Prior research suggests that the BKS is a reliable, valid, and accurate assessment. French (2013) explains that an emphasis on researching the reliability, validity, and accuracy of the BKS began in 2010. Research has shown that there is a high degree of accuracy, internal consistency, test-retest reliability, inter-rater reliability, strong correlation with other measures of academic ability, and item fairness within the BKS

(French, 2013). In the remainder of this section, I will discuss the research behind the use of the BKS as far as reliability, validity, and accuracy are concerned. This information also supports the earlier findings of Mantzicopoulos (1999) discussed previously in the literature review.

Reliability is a measure of whether an instrument yields the same results across different settings (Field, 2013). French (2013) explains that a child may not always obtain the same score on the same assessment because all assessments contain some degree of error. The BKS has been found to be reliable in that it consistently approximates a child's true score. In 2012, a study was conducted to assess the internal consistency score reliability of the BKS. Items that were supposed to measure the same skill were compared amongst children from infancy to first grade using a correlation. There were a few estimates that fell below the desired correlation of .80 which the researchers attributed to lack of variability at certain age ranges. However, the internal consistency coefficients across each age fell between .94 and .98, which means there is a very strong correlation (French, 2013). Other measures of reliability examined were the test-retest reliability and the inter-rater reliability. Test-retest reliability refers to administering the same assessment to the same child on two separate occasions. The assessment should produce two similar scores. The test-retest reliability correlation coefficient was .99 in the infant-toddler subgroup and .92 in the two-year-old to first grade subgroup (French, 2013). These correlations mean that the test-retest reliability has a very strong correlation. Finally, the inter-rater reliability checked to see if a child could obtain the same score when assessed by two different people. The BKS once again had a highly correlated result on inter-rater reliability with correlations of .96 in the infant-

toddler subgroup and .93 in the two-year-old to first grade subgroup. In conclusion, the BKS is a highly reliable instrument for measuring a child's abilities at various ages.

The BKS was also checked for validity. Validity is checking to see if an instrument actually measures what it is said to measure (Stevens, 2007). There have been numerous studies which determined the validity of the BKS (Brennan, 1985; Helfeldt, 1984; & Mantzicopoulos, 1999). Brennan (1985) compared the BKS to other similar assessments to determine criterion validity, and found that the BKS produced comparable scores as the other assessments. Helfeldt (1984) found that the BKS was a methodical and organized method of early identification of students for further testing, which indicated construct validity. Mantzicopoulos (1999) found high interrater agreement, acceptable overall internal consistency, and lower test-retest reliabilities (which could possibly be attributed to rapid cognitive development of students at this age). A moderate correlation was noted between the different instruments used in this study. The preschool form and K and 1 screen within BKS were highly correlated. Mantzicopoulos reported a moderate validity coefficient when comparing the Brigance and the Kaufman Assessment Battery for Children (K-ABC), another kindergarten screen. Finally, French (2013) reported the BKS was found to have validity within test content, internal structure, fairness, and associations with other similar assessments (French, 2013).

Another area in which the BKS was evaluated was its accuracy. Accuracy refers to the ability of the BKS composite score to correctly identify students as developing normally or possessing some sort of delay (French, 2013). Accuracy allows educators to identify students who may need special education services, additional support due to academic difficulties, additional evaluations to determine giftedness, or students who are

performing satisfactorily for their age (French 2013). The findings showed the BKS was sensitive in identifying students with potential developmental delays, sensitive in identifying students demonstrating giftedness/advanced development, and specific in identifying students who are developing satisfactorily (French, 2013). These data, taken together, support the claims that the BKS may serve useful for measuring a Kindergarten student's readiness for school.

Administration Requirements

There are no special requirements to administer the BKS. However, French (2013) recommends that all administrators familiarize themselves with the directions and scoring procedures, practice administration prior to assessing a child, and strictly follow the assessment directions. In the Commonwealth of Kentucky, test administrators are required to complete an initial three-hour training prior to administering the BKS. Experienced administrators must complete a one- to two-hour annual training. Each school district is responsible for providing the training and maintaining records for each test administrator. The BKS can be administered 15 days prior to the start of Kindergarten through the thirtieth instructional day of Kindergarten (KDE, 2018).

Domains and Score Types

The five domains of the BKS to obtain the composite score utilized in this dissertation are: physical development, language development, academic/cognitive, social emotional, and self-help. Each domain has a possible score of 100. From the raw score in each domain, a normative score can be obtained to compare students to their peers. An overall composite score can also be calculated based on raw scores from each domain. French (2013) reports, "A composite score reflects a child's performance along a

normative scale" (p. 107). The mean composite score is 100 with a standard deviation of 15. Composite scores can be interpreted from Table 3 which can be found in the BRIGANCE Technical Manual (French, 2013, p. 107). My analysis in this study utilized the composite score as well as the categorical designations not ready, ready, and ready with enrichments on the BKS. The designations of not ready, ready, and ready with enrichment were based on composite scores on the BKS. Composite scores that fell below 81 were classified as not ready. Students who scored 88-105 were labeled as ready. Scores of 109 and above were considered ready with enrichments. There were some gray areas in the BKS readiness classifications with scores between 82-87 being labeled both not ready or ready, and scores between 106-108 were identified as ready or ready with enrichments.

Table 3. *BRIGANCE Performance Ratings*

BRIGANCE Score	Performance Ratings
<70	Very Weak
70-79	Weak
80-89	Below Average
90-110	Average
111-120	Above Average
121-130	Strong
>130	Very Strong

In summary, the BKS is being utilized in my study due to the holistic domains of school readiness and it is the school readiness screener currently in use in the state and district that serve as the context of my study. The BKS includes information on not only cognitive development but also physical development, language development, adaptive behavior, and social and emotional development. This assessment of readiness provides a big picture of a child's ability, instead of focusing on a narrower definition of readiness as other KEAs do. The BKS also has desired levels reliability, accuracy, and validity.

Participants

Participants in my study were the 6,209 kindergarten students enrolled in JCPS during the 2017-2018 school year who were administered the BKS within their first thirty days of Kindergarten. JCPS is a large urban district in the Commonwealth of Kentucky. Table 4 below summarizes the demographic information on the 6,209 kindergarten students in JCPS included in my study. Of those students, slightly over half are male (51%). The four largest race categories reported in JCPS were: White, African-American, Hispanic, and Two or More Races. The diversity index (DI) is a multiple-component measure that serves as a proxy for socio-economic status and adult educational attainment in the neighborhood in which the student resides. The DI is utilized by JCPS to structure within-school diversity as part of its student assignment plan (SAP). In response to the *Meredith v. Jefferson County Board of Education et al*. case (2007), the district voluntarily adopted the DI. The DI is *approximate* because it does not include information about individual students; rather, it relies upon Census block data of each student's neighborhood. The DI is the weighted average of all students attending a school belonging to one of three categories; category 1, 2, and 3. The placement of a student into a category depends on (a) the household income of a student's Census block, (b) the average level of adult education attained in the student's Census block, and (c) the percentage of non-White people living within the student's Census block. As such, Category 1 represent the lowest SES Census Block. Category 3 represents the highest SES Census Block.

Table 4. *Demographic Information on 2017-2018 Kindergarten Students in JCPS*

	N	%
Total	6,209	
Male	3,174	51
Female	3,035	49
English	5,379	87
Other	433	7
Spanish	411	7
White	2,712	44
African-American	2,067	33
Hispanic	697	11
Two or More Races	406	7
Asian	312	5
Other	12	0.2
Diversity Index Category 1	1,861	30
Diversity Index Category 2	3,155	51
Diversity Index Category 3	1,190	19
State-Funded Preschool	1,817	29
Head Start	551	9
Child Care	1,934	31
Home	1,785	29
Other	483	8

SOURCE: JCPS Data Management, Planning, and Program Evaluation (2018)

Procedures

The BKS will serve as the primary source of data in this study. Within the first 30 days of the academic year, all kindergarteners are assessed using the BKS and results are reported to the state. Since the Commonwealth of Kentucky legally requires the administration of the BKS, the results serve as an important source of data that can be used by educators and educational leaders for both policy and practice decisions (Snow, 2011). My study included all 2017-2018 JCPS composite BKS results. Since the BKS includes information on social and emotional development, I was able to address this call for future research as well as utilize the existing instrument as a measurement of overall Kindergarten readiness. I also included demographic information as well as a child's age (measured as the number of days old when entering Kindergarten). Age will be reported

in the number of days because of the rapid development children undergo in the early years (Mantzicopoulos, 1999). Operationalizing age as the number of days old allowed a more precise interpretation of the relationship between age and school readiness.

The mandated screening and reporting of BKS data ensures information on each child enrolled in JCPS. The required data was requested through the data management department of JCPS. Specifically, I requested BKS results of all Kindergarten students during the 2017-2018 school year, the first year after the change in school entry age legislation in the Commonwealth of Kentucky. Along with BKS composite scores and categorical designations (not ready, ready, ready with enrichments), I also requested demographic information on each child such as: birthdate, race, free/reduced lunch status, and prior setting. This student-level data is not available publicly and thus had to be requested from the data management department. I analyzed the composite scores in the report from JCPS data management. In the following section, I will explain the data analysis procedure to be utilized in my study.

Data Analysis

Data analysis included the use of descriptive statistics, correlation, and hierarchical multiple regression to address my research question. Descriptive statistics were used to report information on the demographic data collected (school entry age, gender, native language, race, diversity index, and prior setting). I utilized a correlation to examine the relationship between SEA and school readiness. Finally, I employed a hierarchical multiple regression to examine the relationship between predictor variables and school readiness as measured by BKS composite score (Petrocelli, 2003). These analyses are subsequently detailed in the following section.

Descriptive statistics are used to summarize, categorize, and describe numerical data (Cronk, 2012). Specifically, descriptive statistics provided the ability to examine the characteristics of the individuals in which data was obtained. For example, descriptive statistics allowed me to report the performance of participants in my study based on their demographic information. These descriptive statistics are reported in the following chapter as percentages.

I also utilized a Chi-square analysis to determine if there was an association between each independent variable and BKS classification of ready/ready with enrichments or not ready. Field (2013) explains the Chi-square test as determining the independence of two categorical variables. Data will be organized into dichotomous variables for this test. BKS results were coded as Not Ready (0) and Ready or Ready with Enrichments (1). Subgroups were coded as Does Not Belong to Subgroup (0) and Member of Subgroup (1). I ran the Chi-square test for each language subgroup individually so the data was in a 3x2 format in this case. I repeated this process for race (5x2), diversity index (3x2), and prior setting (5x2). Chi-square analyses were used to examine the association between key demographic groups and school readiness classification. Specifically, in this study, Chi-square provided the basis to test the independence between pairs of categorical variables (Field, 2013). Of particular interest was whether there were association differences between student gender and race groups on school readiness classification. Hypothesis testing was based on statistically significant Chi-square statistic at the 0.05 level.

The next step in my data analysis was a correlation. The use of correlations enriched my understanding of the relationship between my independent (SEA) and

dependent variable (BKS composite score). I utilized the Pearson correlation coefficient to measure the direction and strength of the relationship between two variables (school entry age and school readiness). Determining the relationship among these variables using the comparison model led to a greater understanding of the interrelated components of these variables. This statistical analysis technique allowed me to determine whether there was a positive or negative correlation as well as the strength of the relationship. Field (2013) explains the strength of correlations as slight to negligible |0 to .20|, low |.21 to .40|, moderate |.41 to .70|, high |.71 to .90|, and very high |.91 to 1.00|. Information was also reported about the *p*-value in my study. According to Field (2013), the *p*-value indicates how reliable the relationship is between two variables. For the purposes of my study, I used a *p*-value of .05. Field (2013) explains the use of a *p*-value is to calculate the probability. When the probability value is very large, the model does not fit the data. However, if the *p*-value is small (typically .05 or less), then the model does fit the data, and the conclusion is that we reject the null hypothesis and accept the alternative hypothesis that SEA does lead to higher levels of school readiness.

Hypothesis testing in my study included the use of hierarchical multiple linear regression analysis. Regression analysis falls within a correlational approach to research. Osborne (2000) describes multiple regression analysis as having two primary purposes: prediction and explanation, although there is argument that the two purposes share similarities (Pedhazur, 1997). When looking at multiple regression for the purpose of prediction, which I did in my study, one is attempting to create an equation to predict a specific phenomenon within a population, and that same equation can be used to predict outcomes for people outside of the sample used in the study (Osborne, 2000). I was

looking to predict school readiness (dependent/outcome variable) from multiple predictor variables (independent variables). Since my study has multiple predictor variables (SEA, race, diversity, and prior setting), I will use multiple regression (Field, 2013). This will allow me to say that SEA could be a predictor of school readiness, instead of simply stating that there is a relationship between the two variables.

In my study, I used a hierarchical method of multiple regression. Petrocelli (2003) describes the use of hierarchical regression as a method where the researcher bases the entry of predictor variables entered into the analysis based on theory and/or available research on the variables. Other forms of regression, such as stepwise, forward, and backward methods of regression, have been largely criticized. Petrocelli (2003) explains that the criticism is because the other forms produce results that are sample specific and do not necessarily reveal existing relationships within the population as a whole. The results are not stable between different samples. Due to this criticism, I utilized the hierarchical method of multiple regression. Ho (2014) describes hierarchical multiple regression as being, "more flexible as it allows the researcher to specify the order of entry of the independent variables in the regression equation" (p. 294). This will allow me to enter information in variable blocks.

Student specific demographic variables of gender, race, and native language were entered as the independent(s) variable in Block 1. BKS composite score was selected for the dependent field. For Block 2, outside factors of diversity index and prior setting were entered into independent(s) variable field. Finally, I entered SEA in number of days old when assessed with the BKS into Block 3. By entering data in blocks, I was able to determine how much variance is accounted for by each block. Through my research on

the topic of school readiness, background factors, home factors, and SEA were the overarching themes present when examining school readiness characteristics. Research shows that many parents choose to delay school entry due to concerns about their child's readiness for school. Students who are delayed are more likely to be male (Dagli & Jones, 2013; Mendez, Kim, & Ferron, 2015; Winsler et al., 2012). Dagli and Jones (2013) also found that white children were more likely to be delayed entering school than their African-American, Hispanic, and Asian counterparts. Winsler et al. (2012), however, found no connection between ethnicity and decisions to delay school entry but rather socioeconomic status as measured by eligibility for free or reduced lunch. Students who were not eligible for free or reduced lunch were more likely to be delayed. Pre-kindergarten care is also a critical factor to decisions to delay or not (Dagli & Jones, 2013; Winsler et al., 2012). Children who attended childcare outside of the home are more likely to be delayed (Winsler et al., 2012); however, childcare with a higher cost increased the likelihood of being enrolled in kindergarten early (Dagli & Jones, 2013). The current study sought to determine the relationship between SEA and school readiness. By grouping the factors into blocks, I could further examine the role each type of factor has on school readiness. All analyses were conducted using the Statistical Package for the Social Sciences (SPSS). Wampold and Freund (1987) explain that hierarchical multiple regression allows the researcher to input data in blocks and the order of entry is predetermined based on some rationale. In my study, I began with the demographics because that block is specific to the student. Then, I moved to home factors because that is where the student spends the majority of his/her time. Finally, I inputted school entry age. My rationale was to input the data in blocks beginning with

the student and expanding out to the more external factors. This allowed me to control for the variables in Blocks 1 and 2 to see how school entry age is related to school readiness.

According to Ho (2014) once the blocks are entered into SPSS, a variety of data will be reported within several output tables. The Model Summary table will report the *R* and R^2 values for each of the three blocks of data entered. I was able to determine the percentage of variance attributed to each of the blocks of data as well as the significance of each (based on the significance of *F* change category). As each data block was entered into the analysis, the R^2 value represents the percentage of variance attributed to the specific predictors in each block. As blocks were added in, the R^2 value increases as the variance in BKS scores are explained through the different blocks. The larger the R^2 value, the better fit the equation is. As each variable block was added, I also analyzed the change in R^2 value. This change allowed me to see the contribution of each individual block and its significance to the variance in the BKS scores. The *F*-statistic identified if there a relationship existed between the independent variables and the dependent variable. If there is no variance in the means, then the relationship is not statistically significant. As additional predictor variables were entered, the percentage of variance increased. The *F*-statistic allowed me to see the change in the variance. Again, for the purposes of my study, I used a *p*-value of .05 to determine if variable block significantly contributed to explaining the variance. The ANOVA table showed the significance of each block of data in the prediction equation.

The regression coefficients informed about the relationship between BKS scores and each predictor (Field, 2013). To check for multicollinearity, I will use descriptive

and correlational analyses to ensure none of the predictor variables are too closely related to each other. Stevens (2007) defines multicollinearity as, "when there are moderate to high intercorrelations among the predictors, as is the case when several cognitive measures are used as predictors" (p. 234). The purpose of hierarchical linear regression is to use blocks to examine unique contribution of variable sets to predict or explain variance in the DV (BKS scores) controlling for variables already entered into the model. Within SPSS, I will utilize the variance inflation factor (*VIF*). Bowerman and O'Connell (1990) recommend if there is a *VIF* greater than 10, there could be a problem with multicollinearity; therefore, I will look for *VIF* values that are less than 10.

Assumptions of the Linear Model

As with any statistical procedure, there are assumptions that must be made in order to generalize the findings outside of the sample I used in my study. Field (2013) recommends, within regression analysis, a close look at the assumptions of additivity and linearity, independent errors, homoscedasticity, and normally distributed errors.

Additivity and linearity refer to the idea that the outcome variable should align in a linear fashion to the predictors. In a multiple regression analysis, several predictors should align. The scatterplots were analyzed and examined using the total sum of squares to determine if a linear line exists or if the scatterplots were unrelated to the outcome variable. I also analyzed the curvilinear line of the histogram to determine the strength of the results. If this is not the case, a multiple regression analysis should not be used. Independent errors mean that any two observations should not be correlated to each other but rather independent. If the assumption of independence is not met, the confidence intervals and significance tests will not be valid. Homoscedasticity refers to

the fact that the variance of residual terms remains constant. If the variances are unequal, the assumption of homoscedasticity is not met. Finally, normally distributed errors means that residuals in the regression model are random and normally distributed (Field, 2013). This was determined through the use of a scatterplot where regression standardized predicted value was on the x-axis and regression standardized residual was plotted on the y-axis. If data is normally distributed, there will be a rectangular shape to the data with all points within the -3 to 3 range. All of these assumptions will be addressed in the data analysis.

Limitations of Research Design

My study was conducted using information from JCPS for the 2017-2018 school year. It is not generalizable to any other district or school. I chose to collect data from all kindergarten students in JCPS during the 2017-2018 school year who were assessed using the BKS. I limited the data to one school district in the Commonwealth of Kentucky rather than students from the entire state. All districts are bound to change due to the new SEA legislation, but I only examined data from JCPS, a large urban district within the Commonwealth of Kentucky.

Due to the correlational design of my study, I was not able to report cause and effect. I can only report on the relationship between SEA and school readiness. In this case, there was a statistically significant relationship between SEA and school readiness scores. Although I cannot report cause and effect, this design allowed me to determine the strength and direction of the relationship between SEA and school readiness. This technique is also valuable in the field of educational research because it is applicable to

the real world. I took a dataset that was naturally occurring and analyzed it, instead of setting up an experimental design that is not feasible in education.

Another limitation of my correlational study was the multitude of variables that contribute to a student's readiness for school (Field, 2013). Children have complex lives prior to starting school. Variables (e.g. socio-economic status, early care, and parents' educational attainment) will be considered as mitigating variables on a child's school readiness. I was able to control for gender, race, language, diversity index, and prior setting through my hierarchical multiple regression design. However, there could have been other mitigating variables that were not included in my analysis. Even though I could not include all mitigating factors, my study included many of the overarching variables discussed in the literature, and thus contributes to the body of literature surrounding SEA and school readiness.

Another limitation of my study was a lack of information regarding why a student might be older or younger for grade. In Kentucky, the compulsory school age is six years old. Many parents choose to delay a child's entry into school for a variety of reasons (e.g. immaturity, perceived advantage in sports, concern about readiness, perceived academic advantage, gender). More qualitative information would be needed to identify why a parent chose to delay school entry for their child. My study included all kindergarten students assessed using the BKS and therefore covers all possible reasons for parents delaying entry.

Moreover, some students enrolled in kindergarten prior to the cutoff date set forth in state law KRS 158.030, which states that students must reach the age of five prior to August 1 of their kindergarten year. There is a petition process to enroll prior to the age

of five. In JCPS, this petition process includes required dates for documentation, assessment protocols, recommendations by staff, and approval by the superintendent. Students must meet qualifications of the BKS in the areas of core assessments, self-help, and social-emotional scales. This policy could have created a problem within my data set due to the requirement of passing the BKS prior to being admitted to kindergarten. This means that all students under the age of five would be guaranteed to score at the ready or above level on the BKS, thus skewing the data.

CHAPTER IV: RESULTS

Chapter IV is divided into three sections that report study findings: *Descriptive Analysis, Correlational Analysis,* and *Hierarchical Multiple Regression Analysis.* In the first section, *Descriptive Analysis,* I report the descriptive statistics of the data collected for each key variable (e.g. school entry age, gender, native language, race, diversity index, prior setting). In the second section, *Correlational Analysis,* I examine the relationship between each independent variable and school readiness. In the third and final section, *Hierarchical Multiple Regression,* I examine the relationship between predictor variables and school readiness. Results are reported from each of the three variable blocks (background factors, outside factors, and school entry age).

Descriptive Analysis

SEA in this study is reported in the number of days old when assessed using the BKS. The youngest student in this data set is 1,756 days old (4.8 years) and the oldest is 2,557 days old (7.0 years). The range was 801 days, which is over two years difference in students being assessed with the BKS. As mentioned previously, state law in the Commonwealth of Kentucky changed during the 2017-2018 school year, requiring all students to reach the age of 5 prior to August 1 of their kindergarten year. There are approximately 60 students who did not meet this cutoff and were less than 5 years old when assessed on the BKS. Nevertheless, since these students were admitted to kindergarten, their scores were included in my analysis. The average age of students was

2,015.84 days (*SD* = 102.57), which equates to 5.5 years, the median age was 2,015 days, and the mode was 2,152 days, with 36 students being that old when assessed.

Table 5 reports the means and standard deviations of BKS scores across key subgroups. BKS scores were reported as the composite score in my study, with a minimum score of 63 and a maximum score of 130, the range was 67 points, and the mean score for all students was 87.16 (*SD* = 15.97). Females, English language speakers, Asian, Other Race, Two or More Races, White, Diversity Index Category 3, State-funded Preschool, Head Start, Private Child Care, Other Prior Setting, and Two or More Prior Setting subgroups all outscored, on average, the mean. Male, Spanish, Other language speakers, African-American, Hispanic, Diversity Index Categories 1 and 2, and students who stayed at home the year prior to kindergarten all scored, on average, lower than the mean. African-American students (*M* = 87.00, *SD* = 16.09) scored almost exactly the same as the overall mean on average. The highest scoring subgroup was the Asian population (*M* = 94.84, *SD* = 16.04), while the students who spoke Spanish (*M* = 76.02, *SD* = 12.81) scored the lowest. When looking at race, White (*M* = 88.16, *SD* = 15.70) and African-American (*M* = 87.00, *SD* = 16.09) students scored about an average of one point apart. Students who participated in childcare (*M* = 93.16, *SD* = 14.81) far outscored students who stayed at home (*M* = 78.14, *SD* = 13.58) the year prior to kindergarten with a fifteen-point average spread between the two groups.

There was about an average of 10 points difference between the three categories within the Diversity Index (DI). DI categories are assigned based on information on US Census data in three areas: average household income, average level of adult educational attainment, and percent of non-white population. The value is approximate for each

student because it is assigned based on the Census block in which the student resides. Category 1 consists of students who live in blocks with an average household income of $42,000 or less, adults have less than college or associates degrees, and live in neighborhoods that are less than 73% white. Category 2 students live in blocks with an average household income of $42,000 to $62,000, adults have some college or associates degrees, and live in neighborhoods that are 73% to 88% white. Finally, Category 3 students reside in blocks with average household incomes above $62,000, adults typically have a bachelor's degree or higher, and their neighborhoods have a white population greater than 88% (Orfield & Frankenberg, 2011). Students who lived in the Category 1 blocks scored lower than the other two categories (M = 84.83, SD = 15.89). Students who lived in the Category 3 blocks outscored the other two categories by seven-plus points on average (M = 93.67, SD = 15.21).

Table 5. *Mean Scores for Each Subgroup on BKS*

	Mean	SD
All	87.16	15.97
Male	85.70	15.84
Female	88.68	15.98
English	88.37	15.76
Spanish	76.02	12.81
Other Language	82.53	16.44
African-American	87.00	16.09
Asian	94.84	16.04
Hispanic	79.37	13.73
Other Race	88.53	16.73
Two or More Races	88.63	15.81
White	88.16	15.70
Diversity Index Category 1	84.83	15.89
Diversity Index Category 2	86.08	15.67
Diversity Index Category 3	93.67	15.21
State-Funded Preschool	88.55	15.66
Head Start	88.62	15.40
Private Childcare	93.16	14.81
Home	78.14	13.58
Other Prior Setting	87.36	15.40
Two or More Prior Settings	91.24	16.43

Tables 6-10 report the cross tabulations for the independent variables of gender, native language, race, diversity index, and prior setting respectively, and the dependent variable of school readiness as determined by the BKS. The dependent variable is reported with two categories: ready/ready with enrichments and not ready. The results are reported as a percentage. Each table also includes information for the overall BKS results for all students in my study. To examine the subgroups for each independent variable, I used the Chi-square statistic. The data were organized into dichotomous variables for this test. BKS results were coded as Not Ready (0) and Ready or Ready with Enrichments (1). Subgroups were coded as Does Not Belong to Subgroup (0) and Member of Subgroup (1). A Chi-square test of independence was performed to examine

the relationship between each independent variable and the school readiness category of ready/ready with enrichments or not ready. I ran the Chi-square test for each independent variable, with the exception of SEA. This allowed me to determine if the relationship between the independent variables and school readiness was significantly different than the expected outcome.

As shown in Table 6, more female students were classified as ready with enrichments and ready than males. When both categories were combined, 59.5% of females were considered ready or above, whereas 50.4% of males were labeled ready or above. Female students are 9.1% more likely to score at the ready or above level on the BKS. When looking at the lower rating of not ready for kindergarten, 49.6% of male students were not ready for kindergarten, while 40.5% of female students were not ready for kindergarten. Therefore, male students were 9.1% more likely to score not ready on the BKS than females. A Chi-square statistic was analyzed to determine whether gender made a statistically significant difference on BKS scores, and there was an association between gender and readiness, X^2 (1) = 51.86, $p < .00$.

Table 6. *Gender and Readiness for 2017-2018 Kindergarten Students in JCPS*

	N	Ready or Ready with Enrichments %	Not Ready %
All students	6,209	55.0	45.1
Male	3,174	50.4	49.6
Female	3,035	59.5	40.5

Table 7 contains a breakdown in BKS performance based on Native Language, the language the student first learned to speak. Information is provided on twelve different languages as well as a category labeled other. The other category is comprised

of 48 other languages spoken by JCPS kindergarteners. When looking at the readiness ratings based on Native Language, there were several notable differences. Overall, 55% of kindergarten students were considered ready or ready with enrichments. English speakers scored above the average of all students at 58.3%. On the other hand, Spanish (22.4%) and Other (43.0%) language speakers scored below the average. A 2x3 Chi-square statistic showed, within the native language variable, an association between language and school readiness, X^2 (2, 6209) = 224.74, $p < .01$.

Table 7. *Native Language and Readiness for 2017-2018 Kindergarten Students in JCPS*

	N	Ready or Ready with Enrichments %	Not Ready %
All students	6,209	55.0	45.1
English	5,379	58.3	41.7
Spanish	411	21.7	77.6
Other	419	43.0	57.0

Table 8 includes readiness information disaggregated by race. The range of ready with enrichments went from 4.2% (Hispanic) up to 26.7% (Other). Races that performed higher than the JCPS average were: White (58.8%), two or more races (57.2%), and Asian (73.4%). African-American (53.8%), Hispanic (32.9%), and Other (53.4%) scored below the average in readiness. When looking at the percentage of students classified as not ready, Hispanic students fared the worst with 67.1% labeled not ready. A Chi-square statistic was used to determine significant differences between the groups. Within the race category, I found that there was an association between race and school readiness, X^2 (4, 6194) = 203.12, $p < .01$. The designation of Other in race was not included in the Chi-square analysis since $n = 15$.

Table 8. *Race and Readiness for 2017-2018 Kindergarten Students in JCPS*

	N	Ready or Ready with Enrichments %	Not Ready %
All students	6,209	55.0	45.1
White	2,712	58.8	41.2
African-American	2,067	53.8	46.2
Hispanic	697	32.9	67.1
Two or More	406	57.2	42.9
Asian	312	74.4	25.6
Other	15	53.4	46.7

Table 9 reports the breakdown of students based on their diversity index and their readiness rating. Diversity index is assigned by the district based on data from the United States Census. Students are assigned a category based on the median household income, percentage of non-white residents, and average parent educational attainment in the block in which they reside (Dossett, 2018). Students in Categories 1 and 2 scored similarly with 47.7% and 52.1% respectively, ready or above. Category 3, however, had 73.4% who were rated ready or above. Category 3 also had about twice as many students (18.5%) considered ready with enrichment than the other two categories. Within the independent variable of diversity index, I found that there was an association between diversity index and school readiness, X^2 (2, 6209) = 212.30, $p < .01$.

Table 9. Diversity Index and Readiness for 2017-2018 Kindergarten Students in JCPS

	N	Ready or Ready with Enrichments %	Not Ready %
All students	6,209	55.0	45.1
Category 1	1,861	47.7	52.3
Category 2	3,155	52.1	47.9
Category 3	1,190	73.4	26.6

Table 10 includes information about prior setting and readiness. Since students could have had more than one prior setting before starting kindergarten, the total here is

greater than the total N of kindergarten students during the 2017-2018 school year. For example, a child might have taken part in the Head Start program as well as being enrolled in state-funded preschool so they would be counted in both categories. There are 351 students with more than one prior setting in my study. When looking at students considered not ready, the largest percentage comes from students who were at home (72.7%) the year before starting kindergarten. Students who fared the best, based on prior setting were those who participated in private childcare outside of the home with 72.8% of those students labeled ready or above. This is followed by students in the two or more prior settings category (67.2%), other (59.2%), state-funded preschool (59.1%), and Head Start (58.4%) who were rated ready or ready with enrichments. Only 27.3% of students who were at home the year before kindergarten were considered ready or above. Finally, when looking at prior setting, I found that there was an association between prior setting and school readiness, X^2 (5, 6209) = 765.00, $p < .01$.

Table 10. *Prior Setting and Readiness for 2017-2018 Kindergarten Students in JCPS*

	N	Ready or Ready with Enrichments %	Not Ready %
All students	6,209	55.0	45.1
State-Funded	1,630	59.1	40.9
Head Start	474	58.4	41.6
Private	1,721	72.8	27.2
Home	1,638	27.3	72.7
Other	395	59.2	40.8
2 or More Prior Settings	351	67.2	32.8

Correlational Analysis

In this section, I will discuss correlations between the independent variable of SEA and the dependent variable. Correlations ascertain the relationship between two

variables (Cronk, 2012). SEA was included as the number of days old the student was when assessed with the BKS. The relationship between SEA and school readiness was statistically significant. The Pearson correlation coefficient was $r = -.10$ and $p < .01$. This correlation, while statistically significant, showed a weak relationship between SEA and school readiness. The relationship is negative which means that as a student's age increases, their score on the BKS decreases.

Multicollinearity Diagnostics

I checked for multicollinearity in a series of tests within SPSS. The test outputs for multicollinearity of the independent variables in my study were reported in the coefficients table that was produced by the hierarchical method of multiple regression. The results showed that multicollinearity is not an issue. Within my correlational analysis, none of the independent variables were highly correlated to each other, with values ranging from $r = .00$ to $r = .47$. When examining tolerance, all values were greater than 0.1 and less than 1. The *VIF*s ranged from 1.00 to 2.26, which clearly fall below 10 for each independent variable. Also, the condition index did not exceed 15 for any variable. I created and analyzed a scatterplot and determined that the residuals in the regression model are random and normally distributed. Taken together, this information supports the fact that the relationship among independent variables is not a concern in terms of multicollinearity, or model assumption.

Hierarchical Multiple Regression Analysis

My research question for this study was as follows:

- What is the relationship between school entry age and school readiness as measured by the BRIGANCE Kindergarten Screen (BKS), controlling for student demographics?

The following are my hypotheses regarding the question that guide this study:

- Null (H_0)—there will be no relationship between SEA and school readiness scores.
- Alternative (H_1)—there will be a positive relationship between SEA and school readiness scores.

This question was answered using the hierarchical method of multiple regression (HMR) procedure using three blocks of variables. Demographic variables were entered into Block 1. Gender, native language, and race were entered into the independent variable(s) field. Within native language, the "Other" language category was comprised of 62 languages that each had 1% or less of the population. In Block 1, I omitted English within native language and White within race to serve as the referent group. This decision was made due to these groups being the largest. BKS composite score was selected for the dependent field. Block 2: home factors of diversity index and prior setting were entered into the independent variable(s) field. Category 2 within Diversity Index and private childcare outside the home were the referent group in this block. Finally, I entered school entry age into Block 3.

Reports for HMR Blocks

In Table 11, I report the amount of variance explained as each Block is added in the model (R^2), the amount of variance contributed by each Block in my analysis (ΔR^2), the unstandardized Beta coefficients (*B*), the standard error statistics (*SE B*), and the

standardized Beta coefficients (β) for the dependent variable of school readiness. Block 1 included the demographic variables of gender, native language, and race, and accounted for 7.6% of the variance in school readiness scores, and was statistically significant $F(8, 6184) = 63.38$, $p < .01$. The referent group in Block 1 included White, English speaking students. The addition of Block 2, which included the outside factor variables of diversity index and prior setting, explained an additional 11.3% of the variance in school readiness scores, bringing the total to 18.9%, which was also statistically significant $F(15, 6177) = 95.83$, $p < .01$. The referent group in Block 2 was comprised of White, English-speaking, Category 2, and students who attended private child care outside of the home. The inclusion of Block 3 provided information on how SEA contributed to the equation for school readiness scores. The addition of SEA in Block 3 explained 1.0% of the variance (19.8% total variance explained), which was statistically significant $F(16, 6176) = 95.49$, $p < .01$. As such, independent variables were significant predictors of school readiness as measured by the BKS. Other notable findings in Block 3 of the HMR analysis included many negative relationships when compared to the referent group. The referent groups were White, English-speaking, Diversity Index Category 2 students who attended private child care outside of the home. From that, I found that males ($B = -3.02$), Spanish speakers ($B = -5.81$), other language speakers ($B = -5.32$), Hispanic ($B = -2.84$), Category 1 ($B = -1.11$), State-funded ($B = -2.00$), Head Start ($B = -1.33$), Home ($B = -11.82$), and Other Prior Setting ($B = -4.13$) scored statistically significantly lower than the referent groups. Once again, students who remained at home the year prior to beginning kindergarten fared the worst amongst the groups scoring 11.82 points lower than the referent group. On the other hand, Asian students fared the best when looking at

the Block 3 of the HMR with B = 8.59. This means that Asian students scored almost nine points higher than the referent group. Furthermore, when controlling for gender, native language, race, diversity index, and prior setting, SEA was a significant predictor of school readiness. The most notable relationship was found when examining Block 3, once SEA was entered as an independent variable. For SEA, B = -0.02. This means that as age increases by one day, BKS scores decrease by 0.02 points. This means, I must accept the alternative hypothesis and reject the null hypothesis. SEA has a statistically significant relationship to school readiness, and that relationship is a negative one.

Table 11. *HMR Analysis of the Relationship of Kindergarten Readiness to Student Demographics, Diversity Index, Prior Setting, and School Entry Age for 2017-2018 Kindergarten Students in JCPS*

				Unstandardized		Standardized
Variable	R^2	ΔR^2	*F*	*B*	*SE B*	β
Block 1	.076	.076	63.38**			
(Constant)				90.11**	0.36	
Gender				-3.03**	0.39	-0.10
Spanish				-8.55**	1.17	-0.13
Other Language				-9.52**	0.84	-0.15
African-American				-0.86	0.45	-0.03
Asian				10.73**	0.99	0.15
Hispanic				-4.10**	0.94	-0.08
Other Race				1.33	3.98	0.00
Two or More Races				0.10	0.82	0.00
Block 2	.189	.113	95.83**			
(Constant)				92.40**	0.48	
Gender				-3.11**	0.37	-0.10
Spanish				-5.82**	1.10	-0.09
Other Language				-5.36**	0.80	-0.08
African-American				1.00*	0.49	0.03
Asian				8.88**	0.93	0.12
Hispanic				-2.68**	0.90	-0.05
Other Race				2.66	3.73	0.00
Two or More Races				1.41	0.78	0.02
Category 1				-1.20*	0.47	-0.03
Category 3				4.81**	0.52	0.12
State-Funded				2.00**	0.54	-0.06
Head Start				-1.49	0.80	-0.03
Home				-11.80**	0.53	-0.33
Other Prior Settings				-4.31**	0.81	-0.07
Two or More Prior Settings				-0.12	0.86	-0.00
Block 3	.198	.010	95.49**			
(Constant)				123.25**	3.63	
Gender				-3.02**	.37	-0.10
Spanish				-5.81**	1.09	-0.09
Other Language				-5.32**	.80	-0.08
African-American				.75	.49	0.02
Asian				8.59**	.92	0.12
Hispanic				-2.84**	.89	-0.06
Other Race				3.34	3.71	0.01
Two or More Races				1.11	.77	0.02
Category 1				-1.11*	.46	-0.03
Category 3				4.90**	.52	0.12
State-Funded				-2.00**	.54	-0.06
Head Start				-1.33	.80	-0.02
Home				-11.82**	.53	-0.33
Other Prior Settings				-4.13**	.81	-0.06
2 or More Prior Settings				-.06	.85	-0.00
School Entry Age				-.02**	.00	-0.10

Notes: * represents $p < .05$; ** represents $p < .01$

Conclusion

Through my statistical analysis, I was able to control for independent variables of gender, native language, race, diversity index, and prior setting. I found that these variables contributed to 18.9% of the variance in school readiness scores and SEA also contributed an additional 1.0% to the variance, bringing the total to 19.8% of the variance explained through this equation. Thus, school entry age is a significant predictor of school readiness in this study. In the following chapter, I will provide a discussion and implications of my findings.

CHAPTER V: DISCUSSION

Since the 1940s, kindergarten screening has become more widespread across the United States with about half of the states mandating the use of a kindergarten screener (Snow, 2011). Mandatory kindergarten screening began in Kentucky during the 2013-2014 school year. State regulation 704 KAR 5:070 requires all kindergarten students to be assessed using a common kindergarten readiness screener. This mandatory screening has led to many questions on how to utilize this assessment in order to enhance educational outcomes for all students.

In JCPS, the results of the BKS clearly show many students are coming to kindergarten without the requisite knowledge and skills to be considered "ready to learn." According to the KDE Open House data (2017), 48.4% of kindergarten students in JCPS were not "kindergarten ready" in the 2016-2017 school year. This accountability testing has now become a part of a student's kindergarten year through the administration of the BKS and subsequent reporting of those scores to the KDE. In response to the increased academic demand of kindergarten and lack of readiness among students, Kentucky state law KRS 158.030 changed the kindergarten entry age, effective the 2017-2018 school year. Previously, students had to reach the age of five by October 1 to be eligible to attend kindergarten; the new statute requires reaching the age of five prior to August 1.

I conducted this study in order to determine research-based evidence on the relationship between school entry age and school readiness under the new SEA legislation. The following research question was explored: What is the relationship

between school entry age and school readiness as measured by the BRIGANCE Kindergarten Screen (BKS), controlling for student demographics? The purpose of this study was to determine if the change in SEA law created significantly better outcomes for students when assessed using the BKS. Sakic et al. (2012) suggested a closer look at SEA by using a child's actual birthdate to determine differences in readiness. In my study, I responded to this call for further research by investigating the relationship between SEA (based on the student's exact age) and school readiness in a large urban district. I included the demographic factors of gender, race, and native language, as well as outside factors of diversity index and prior setting. This allowed a much more detailed picture of the relationship between SEA and school readiness.

Summary of Findings

There were several notable findings within my study. The overall percentage of students who were classified as ready for kindergarten or above has increased from the previous year. Students who had exposure to child care outside of the home fared much better than students who were kept at home the year prior to kindergarten. Female students scored higher than their male counterparts. There were many differences between race and language when looking at performance on the BKS. Students classified as Category 3 on the diversity index far outscored their peers in the other two diversity index categories. When looking at the HMR, I found that older students scored significantly lower than younger students on the BKS, when controlling for demographic factors. This was also the case when analyzing the correlation between SEA and the BKS. Each one of these findings will be discussed with connections to the extant research in the following section.

There was a slight increase (3.3%) in the percentage of students who were identified as ready for school from the 2016-2017 school year to the 2017-2018 school year. This brings the total percentage of students who were labeled ready or ready with enrichments to 55% of all students. This still leaves 45% of students classified as not ready for kindergarten. Dagli and Jones (2013) suggest that kindergarten students are facing a much more challenging experience than their predecessors and younger children are more at risk for falling behind academically due to a lack of readiness. My findings show that, while academic outcomes of being ready have increased overall readiness scores, there are still many students who do not meet the designation of being ready for school.

The largest discrepancy in scores was found when looking at prior setting—where students spent the year prior to starting kindergarten. Students who participated in private childcare outside the home far surpassed all other students. The difference between these two groups was statistically significant. Students who participated in private childcare outside of the home had 72.8% labeled ready or above. On the other hand, students who remained at home during the year prior to kindergarten only had 27.3% labeled ready or above. This finding is supported by previous research on prior setting and school readiness. Students who participate in childcare or preschool outside of the home perform at higher levels on kindergarten readiness screens (Connell & Prinz, 2002; Holliday et al., 2014; Magnuson et al., 2004).

Within gender, females scored significantly higher than males. When looking at language, English speakers far outscored Spanish speakers. Asian and White students performed at a higher level than Hispanic students. Students from Category 3 on the

diversity index (high SES, adult education level, and low percentage of non-white population) far outscored their counterparts. Protective factors present in a child's life before kindergarten that contribute to closing the achievement gap are better health care, childcare outside the home, speaking English in the home, and parental education level (Holliday et al., 2014). My study did not address health care, but I did find similar results with private childcare outside the home, speaking English in the home, and parental education level. Magnuson et al. (2004) inform that students from lower socioeconomic homes display less school skills than students from more affluent homes. Although, I did not have access to SES, I was able to approximate SES through the use of the diversity index.

One final interesting finding within race was the lack of a significant difference between students who are White and students who are African-American. When looking at standardized testing within JCPS, there is a discrepancy between those two groups. This study illustrated that the gap between White and African-American students does not exist on the BKS. When comparing scores between White students and African-American students within this study, there was no significant difference between the two groups. There was only about one point on average separating these two groups. The largest gap in scores was found between White students and Hispanic students, which had an almost ten-point average gap between, with White students scoring higher.

There was a negative relationship between SEA and school readiness in the correlational analysis. The relationship between these two variables was statistically significant. This correlation, while statistically significant, showed a weak relationship between SEA and school readiness. The relationship is negative which means that as a

student's age increases, their score on the BKS decreases. My study aligns with the findings from Martin (2009), who found that there is little to no academic advantage to delayed school entry.

The most notable relationship was found when examining Block 3 of my HMR analysis, once SEA was entered as an independent variable. When controlling for demographic factors of gender, race, native language, prior setting, and diversity index, as age increases by one day, BKS scores decrease by 0.02 points. My analysis yielded results similar to Martin (2009), who found that older-for-grade students experienced academic disadvantage and younger-for-grade students experienced higher levels of motivation, engagement, and performance. In my study, I found that as students age, their BKS scores decrease. Datar and Gottfried (2015) report, "The case for blanket policies that raise school entry age for all by moving cutoff dates earlier becomes much weaker with the growing evidence that the benefits of delaying entry…are largely short-run" (p. 350). When looking at the results from my study, there is no evidence that the change in SEA legislation created better academic outcomes for students.

Although, through this study, I found that there was a relationship between SEA and school readiness, it was not the relationship I expected to find. The overall relationship between the two was a negative relationship. This means that the new legislation is not increasing student outcomes on the BKS, but rather decreasing their scores. This further supports the idea that blanket entry age legislation is not a viable solution to creating more students who are ready for school.

Implications

Having summarized the findings of my study, I will now discuss the implications of my study for policy, practice, and future research. First, I will discuss the implications for policy makers, focusing on state-level policies, specifically state-level policies mandating mandatory ages for kindergarten attendance. After the implications of state-level education policies, I then discuss the implications for practice, specifically district-level and building level educational leaders. Lastly, I will discuss the implications for future research.

Implications for Policy

My study, and those of others (e.g., Datar & Gottfried, 2015; Martin, 2009) call into question state legislation that arbitrarily mandates entry ages for kindergarten students. In 2012, Kentucky state law KRS 158.030 changed the kindergarten entry age for students and their families effective for the 2017-2018 school year. Prior to this legislation, students had to reach the age of five by October 1 to be eligible to attend kindergarten. The new statute requires reaching the age of five prior to August 1 in order to be eligible for kindergarten enrollment.

My analysis revealed that, after controlling for demographic factors of gender, race, native language, prior setting, and diversity index, kindergartener age is significantly associated with a decrease in BKS scores. This finding highlights the need for states to create more meaningful legislation when it comes to school entry. Byrd et al. (1997) suggest obtaining readiness recommendations from a child's physician. This would allow a different perspective on child's physical and social-emotional readiness. Horstschraer and Muehler (2014) suggest more flexible entry rules based on both age and

readiness screenings that take into account the results of an entrance screener and/or consultation with a physician who may recommend early participation or delayed participation. My study suggests that more information is needed when making school entry decisions, rather than relying on discrete and arbitrary age at a certain date as mandated by legislators.

When looking at policy decisions, there must be more communication and alignment between preschools and kindergarten. Carlton and Winsler (1999) state, "It is essential that a comprehensive outreach program be instituted between the school systems and the area preschools that feed into those schools" (p. 347). If elementary schools are expecting all children to come to school ready to learn, there must be greater communication and collaboration between preschools and elementary schools to ensure this outcome. As policymakers work to eliminate the achievement gap in public education, they should be informed about the relationship of SEA and school readiness. At the time that my study was undertaken, the Commonwealth of Kentucky and its K-12 education system were roiled by policy debates and attempted legislation seeking to address a host of concerns—most notably how to address an underfunded pension system. I do not suggest that additional investments in preschool are easily affordable, but preschool and early education investments may mitigate future academic deficiencies that would be reflected in student outcomes and adverse impacts on state, school, and district accountability outcomes in the future. Recent scholarship of Baker and Weber (2016) find that states with greater overall investments in education and per pupil staffing are positively associated with higher student achievement outcomes for low-income students. In essence, one pays upfront or pays later.

Implications for Practice

As alluded to above, there is the investment in public education. There is also the delivery of education services. Ramey and Ramey (2004) note, "Children whose families have the least resources are those who most need and most benefit from systematic provision of enriched learning activities" (p. 483). They suggest that educators must do a better job providing early childhood learning experiences to our at-risk students. This will allow the prevention of some of the issues contributing to students not being ready for school.

My analysis revealed that an arbitrary age met at an arbitrary date set by legislators arbitrarily makes for an easy policy to deliver but is not necessarily in the best interest of the students served. Indeed, I found that older students scored significantly lower than younger students on the BKS, when controlling for demographic factors. First and foremost, research suggests a need for a clear definition of what kindergarten readiness truly is. Once this definition is in place, better programming can be created to increase school readiness (Ackerman & Barnett, 2005). The complexity of the current definitions of kindergarten readiness creates confusion among parents, teachers, and other stakeholders. Once a definition is in place, information should be provided to all stakeholders about what a "ready" student should be able to do and how this is assessed.

Second, teachers and educational leaders (district-level and building-level) need to utilize kindergarten readiness screening data to positively impact educational experiences for students. Research reveals that kindergarten readiness screens are mandated in 13 states and that almost 70% of all public schools assess students in kindergarten readiness (Ackerman & Barnett, 2005). As is often the case, schools and

districts are “data rich, but analysis poor” (Polnick & Edmondson, 2005, p. 51). The kindergarten readiness data yielded by instruments such as the BKS are a potentially powerful source of data that can be examined to create better early childhood education programs and provide quality opportunities to our at-risk students. District leaders play a role in setting the stage for teachers and leaders at the building and classroom levels. In a review of the research on the use of evidence in school district central offices, Honig and Coburn (2008) found that the process of evidence use is complex and boundary-spanning, thus requiring administrators to make sense of evidence drawn at “local level” as a key source of evidence. In sum, both district and school-level educators play a role in data use to inform the delivery of educational services to students and their families.

Implications for Future Research

According to Shepard and Smith (1998) there is a much greater academic demand in kindergarten than in the past. Due to the differences in both quality and design of early learning centers, it is difficult to ascertain the connection between school readiness and prior setting (Magnuson et al., 2004). There is a need for further studies to examine elements of successful preschool programming that produce students who are ready for school. If educators can identify the factors that have the greatest impact on kindergarten readiness, we can exact changes within our early childhood education system. Further research is needed on prior setting. Fram, Kim, and Sinha (2012) call for more in-depth study of early care centers that “fully accounts for both the nuances of child care participation and also the nuances of child development and behavior and the cultural, economic, and political contexts in which developmental expectations are produced and sustained,” (p. 501). There were clearly differences between students who participated

in childcare or preschool outside of the home when looking at BKS results. Future research may seek to identify qualities of high performing prior settings. Moyer (2017) suggests high performing prior settings include a child-centered curriculum with opportunities to learn through hands-on activities and play. Lonigan et al. (2015) found that preschools that include "thoughtful, well-organized curricula" and an "explicit socioemotional focus" (p. 1790) led to increased school readiness and socioemotional skills. Once qualities of successful preschool programs are identified, that information could be used not only in the preschool setting but the information could also be shared with parents who provide care for their children within their homes.

When looking at a child's development prior to beginning kindergarten Sheridan et al. (2010) posit that school readiness begins at home and the first five years in a child's life are crucial to their future functioning. Protective factors present in a child's life before kindergarten that contribute to closing the achievement gap are better health care, private childcare outside the home, speaking English in the home, and parental education level (Holliday et al., 2014). Magnuson et al. (2004) inform that students from lower socioeconomic homes display less school skills than students from more affluent homes. Magnuson et al. (2004) propose this could be due to being less likely to participate in preschool as well as being less likely to receive "stimulating" care at home. Once again, the importance of childcare outside of the home is found to be a significant contributor to a child's success at school, and further research needs to be completed to see what qualities of that early care are most beneficial and those results can be shared with families who choose to keep their children at home.

Finally, when looking at the advantages found for students who participated in childcare outside of the home, it highlights the need for quality preschool experiences for all children. Students who participate in childcare or preschool outside of the home perform at higher levels on kindergarten readiness screens (Connell & Prinz, 2002; Holliday et al., 2014; Magnuson et al., 2004). There must be adequate public funding to support kindergarten readiness for all children (Ackerman & Barnett, 2005). As evidenced through research and my study, preschool and even childcare outside of the home contribute to a child's readiness for school. Participation in pre-kindergarten has stronger effects on school readiness than gender, free lunch eligibility, race/ethnicity, mother's education level, and whether the father lives at home when looking at pre-reading and pre-writing (Gormley et al., 2008). Research shows early childhood education makes a difference for all students, especially those who are at-risk. If there is any chance of eliminating the achievement gap, it must begin before students enter kindergarten. The only way to ensure this is to fully fund public preschool and make it available to all. Moyer (2017) reports that in 2015, state-funded preschool programs spend approximately $4,500 per enrolled child. Such investments in pre-kindergarten care, while expensive, may mitigate future academic deficiencies that would then be reflected in student outcomes. As we are operating in an educational system of high stakes accountability, we can choose to invest in our students prior to their elementary education or spend the money down the road in a reactionary manner.

Although SEA was a significant predictor of school readiness in my study, further research should be conducted. My study was conducted using information from JCPS for the 2017-2018 school year. I limited the data to one school district in the Commonwealth

of Kentucky rather than students from the entire state. All districts are bound to change due to the new SEA legislation, but I only examined data from JCPS, a large urban district within the Commonwealth of Kentucky, as such, my study is only generalizable to this school district. Future research in other districts or multiple districts across the Commonwealth will add to our knowledge and identify trends across districts. In my study, I was only provided with BKS composite scores. It might be more beneficial to have another academic measure when looking at SEA and academic performance in kindergarten. All K-12 students in JCPS are being assessed using the Measure of Academic Progress, in both Math and Reading, three times a year. This would allow researchers to not only identify relationships between SEA and school readiness, but they could also follow the student's progress as they are exposed to formal education in elementary school. Also, additional research is needed when determining reasons why students may have had a delayed entry into school (Mendez et al., 2015). As mentioned previously, parents identified a variety of reasons to delay their child's kindergarten year from sports to academic concerns. This information would be helpful when looking at the relationship between SEA and school readiness.

Summary

In this study, I identified a negative relationship between SEA and school readiness when controlling for demographic factors. Early childhood experiences- in the home and in preschool- lay the foundations for future experiences in K-12 and postsecondary education. Accountability pressures in K-12 emphasize the importance of ensuring students arrive ready to learn. This study demonstrates that changing SEA, based on an arbitrary date, is not necessarily the best solution. As further policies and

laws regarding SEA are created, policymakers need to know that an older starting age does not necessarily ensure better readiness outcomes.

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Employment

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Responsible for teaching a diverse student population. Able to differentiate instruction to reach all students. Fostering a classroom environment of respect and rapport where all students will be and feel successful. Developing and implementing lesson plans for students in grades K-5. Incorporating Common Core Standards into Arts instruction. Serving as a member of a Professional Learning Community to move students to proficiency. STC for the 2007-2008 school year. Integrating technology to enhance the effectiveness of lessons. Co-Literacy Lead teacher, 2006-2009, in charge of distributing District information to fellow teachers. Supervising U of L methods students and KTIP intern teacher.

Leadership Experiences

- TPGES Teacher Leader (2014-2018)-
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- PBIS Committee Chair (2014-2015)-
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- Program Review Coordinator (2011-2015)-
  Analyzing current program performance as well as creating action plans to continue improving over time.
- Special Area Team Leader (2013-2014, 2014-2015)-
  Responsible for maintaining schedules to best meet needs of 660 students, fund raising, and parent communication.
- Member of Site Based Decision Making committee- Responsible for hiring teachers and other staff members, assisting with budget decisions, and creating policies to best serve the needs of the school.
- Instructional Leadership Team (2006-2008, 2013-2014, 2016-2018)-
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