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The Association of Preschool Enrollment and the Predictive Traits of Special Education Identification

Abstract

Early childhood education (ECE) consists of educational programs that serve children in the preschool years and are designed to improve elementary school performance. Colorado early childhood education programming has two preschool classifications that include Colorado Preschool Program (CPP) which is determined by a student's risk factors, and the State Preschool Special Education (Preschool SPED) program which is determined by the student's identified disability prior to attending elementary school. For the two cohorts who participated in Colorado preschool programming during 2009-2010 school year, special education and demographic extant data are compared in order to study the subsequent identification for special education services from kindergarten through third grade. In addition, this study examines student traits including race, gender, and the student's disability type that may predict special education identification during the elementary school years.

This study addresses the following research questions:

1. What is the association between enrollment in either the Colorado Preschool Program or the Preschool Special Education Program and subsequent identification for an Individualized Educational Plan (IEP) in grades K-3?
2. Do student traits predict special education identification as documented by an Individual Educational Plan (IEP) after preschool?

The sample included over 17,000 students who participated in Colorado early education preschool programming during the 2009-2010 school year. Utilizing student special education and demographic extant data, this study examined whether a student's participation in CPP or Preschool SPED had an association with the need for special education services after preschool. In other words, are children who participated in either CPP or Preschool SPED more or less likely to need subsequent special education services?

The research found a student's physical disability was far more likely to predict special education identification than ethnicity and/or gender as represented by an IEP. Students identified for a physical disability in preschool received special education services as documented by an IEP. The initial special education determination in preschool is far more likely to determine special education status in elementary school than any of the other variables including ethnicity and gender.

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Doctor of Philosophy

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Abstract

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2. Do student traits predict special education identification as documented by an Individual Educational Plan (IEP) after preschool?

The sample included over 17,000 students who participated in Colorado early education preschool programming during the 2009-2010 school year. Utilizing student special education and demographic extant data, this study examined whether a student's participation in CPP or Preschool SPED had an association with the need for special education services after preschool. In other words, are children who participated in either CPP or Preschool SPED more or less likely to need subsequent special education services?

The research found a student's physical disability was far more likely to predict special education identification than ethnicity and/or gender as represented by an IEP. Students identified for a physical disability in preschool received special education services as documented by an IEP. The initial special education determination in preschool is far more likely to determine special education status in elementary school than any of the other variables including ethnicity and gender.

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Chapter One

An increasing number of young children in the U.S. participate in Early Childhood Education (ECE) programs, which promote lifelong success, especially for children of color who are also socio-economically disadvantaged (Lowenstein, 2011). There is a strong belief, supported by research that ECE programs lead to improved school performance, increased high school graduation rates, employment and increased earnings, reduced crime and delinquency, and increased international effectiveness (Lowenstein, 2011). “Academic trajectories remain relatively stable over time such that children with positive early school experiences generally experience continued success” (Wildenger & McIntyre, 2012, p. 169). An investigation of kindergarten preparation and positive behavior found that early childhood education experiences significantly predicted positive student teacher relationships and behavior (Wildenger & McIntyre, 2012). Keys et al. (2013) examined the association between observed quality in preschool programs for over 6,000 three to five year olds and their school readiness skills at kindergarten entry. The same study also found a small main effect on children’s language and mathematic outcomes and a general absence of differential preschool quality effects on school readiness for subgroups of children defined by demographic characteristics or child entry skills and behaviors (Keys et al., 2013).

Need for Early Education in Literacy, Math, Music and Play

Preschoolers begin school with different levels of literacy skills, some of which are attributable to their home environments; therefore, the importance of intervening with early literacy instruction at the preschool level is essential. Callaghan and Madelaine (2012) note that “[r]esearch has found phonological awareness skills in preschool to be one of the most robust predictors of early reading success in the child’s first few years of formal schooling” (p. 13). Preschool early literacy intervention is necessary to develop prerequisite skills for decoding, spelling, and reading comprehension at the elementary grade levels (Callaghan & Madelaine, 2012). Unless effective early literacy intervention is delivered at the preschool level, children from disadvantaged economic households are more likely to enter elementary school with low literacy skills that contribute to a pattern of reading failure entrenched before formal reading instruction takes place (Callaghan & Madelaine, 2012). Research shows that children’s participation in ECE is a protective factor for early reading development (Kruk et al., 2011).

Mathematics is a key component of ECE around the world. In the United States, however, common misconceptions regarding teaching and learning mathematics are widespread among prospective and practicing early childhood teachers (Lee & Ginsburg, 2009). Common misconceptions regarding teaching and learning mathematics in the U.S. include the following: 1) simple shapes and numbers are enough because young children are not ready to learn math nor to be assessed for math skills, 2) math is only for really bright children, 3) learning language and literacy is more important in ECE, and 4)

teachers should focus on an enriched physical environment and let children play (Lee & Ginsburg, 2009).

This trend has begun to change. Lee and Ginsburg (2009) found that “in the turn of the 21st century, the early childhood education field in the United States has begun to take a big step forward promoting early child mathematics education” (p. 37). In 2002, the National Association for the Education of Young Children and the National Council of Teachers of Mathematics advocated for accessible high quality preschool mathematics education, resulting in a teacher mandate to teach math to young children (Lee & Ginsburg, 2009). “The majority of children at risk for failure in mathematics are from areas of high socio-economic disadvantage and that there is a need for early intervention in mathematics” (Martin, 2010, p. 271). Researchers have found that there can be a three-year delay in achievement levels in early numeracy by the time a child enters formal education (Martin, 2010). Recent studies have found advantages to highly structured early childhood education and increased performance in mathematics and science attainment in later years (Martin, 2010).

One program, Art as a Way of Learning, is designed to integrate visual and performing arts throughout the preschool curriculum to improve emergent literacy for at-risk children in community based preschool settings (Phillips et al., 2010). Preliminary results showed improvements in children’s literacy skills and a number of targeted and standardized measures after participation in the Art as a Way of Learning program (Phillips et al., 2010). Art education is not viewed as essential to early childhood education and therefore does not require instructional attention. Traditionally, children in

ECE are given brief opportunities for creative expression which is not supported by the teacher or acknowledged as real learning (Phillips et al., 2010). However, traditional views are being challenged and art in ECE is gaining a new momentum (Phillips et al., 2010).

In addition to early literacy and numeracy, research suggests that early music education has important benefits for the “motor, cognitive, social and emotional, and musical abilities of disadvantaged preschoolers” (Persellin, 2008, p. 58). Although, preschool programs are pressured to prepare young children for high stakes testing in elementary school at the expense of early childhood music programs, there are efforts to increase awareness among ECE teachers of the importance of such programs (Persellin, 2008). Additionally, parents of young children are showing a greater interest in exposing their children to music materials (toys, recording, videos) and programs (Persellin, 2008).

“Considerable literature exists on the developmental functions and benefits of children’s play activities, including contributions to cognitive, physical, and social/emotional well-being” (Kenney, 2012, p. 88). Rapid brain development occurs within the first five years of life, which is an important time for establishing optimal developmental patterns, and studies support the value of consistent and sustained play interactions with peers, and caregivers during this time (Kenney, 2012). “Children in minority, poorer, and less educated families in at-risk neighborhoods spend fewer days per week engaged in these activities” (Kenney, 2012, p. 100). Play activities in ECE settings have the potential to enhance children’s development (Kenney, 2012).

A strategy to address negative risk factors on educational outcomes and improve academic success in ECE settings is to encourage children's active engagement in high-quality social interactions with peers (Bulotsky-Shearer et al., 2012). The National Association for the Education of Young Children believes that developmentally appropriate practices in ECE settings and developmental theory support young children's positive engagement with peers; "[c]lassroom interactive peer play skills were associated with higher direct assessment of receptive vocabulary, literacy and mathematic skills, and language interactions" (Bulotsky-Shearer et al., 2012).

In U.S. early childhood settings, there has been a concentration on acquiring skills and knowledge—which is learning-focused—and not on experiencing pleasure or happiness—which is joy-focused:

Joy seems to be a rare element in most U.S. classrooms even in programs serving the youngest learners. Increased accountability and standardization in early childhood programs have caused joy to all but disappear in these settings. Images of school in popular culture often reflect drudgery (Ford & Opitz, 2015, p. 27).

Some children appear not to be motivated to learn or to be engaged in school, and some teachers consider it the child's responsibility to be motivated and engaged in learning at an early age (Ford & Opitz, 2015). This is difficult work, and Ford and Opitz (2015) find that "[t]eachers of young children often grapple with the challenges of the non-cognitive, affective dimension of learning and teaching more than the cognitive aspects" (p.29).

These teachers are looking for ways to create joyful learning environments, because once children are motivated and engaged in learning, academic success follows (Ford & Opitz,

2015). “Unfortunately, many policymakers assume that students who are engaged in joyful learning or being creative with art, music, or dance are not doing real academic work” (Ford & Opitz, 2015, p.29).

Research findings indicate that high-quality ECE programs support the development of social-emotional skills that enable children to enter school ready to learn (Gormley et al., 2011). Developing young children’s pre-academic skills involves addressing their social and emotional needs in order to engage children in learning, and have positive interactions with their teacher and peers (Gormley et al., 2011). Research shows programs that simultaneously support social-emotional competences with an emphasis on academic content better prepare children to enter kindergarten (Gormley et al., 2011).

Response to Intervention and Special Education

Response to Intervention (RtI) was developed as an early system of intervention for young children at risk for learning disabilities (Lieberman-Betz et al., 2013).

Preschool RtI refers to a conceptual decision-making model implemented through tiers of service delivery; empirically-based interventions are used to help prevent academic failure and challenging behaviors (Greenwood et al, 2011; Gajus & Barnett, 2010).

Greenwood et al. (2011) represent this as “a paradigm shift in K-12 education that is affecting early education, early intervention, and early childhood special education as well” (p. 1). The RtI approach provides support to children as they progress through tiered structural levels based on an assessment of needs (Gajus & Barnett, 2010).

RtI is viewed as an alternative approach to identifying students with learning disabilities which provides a framework for problem solving (Musti-Rao et al, 2011). The implementation of RtI supports policies stemming from No Child Left Behind (NCLB) and *Individuals With Disabilities Education Act* (IDEA) that stress improving student outcomes through early and sustained evidence-based practice (Greenwood et al., 2011).

IDEA is intended to improve outcomes for all children with disabilities (Hebbeler et al., 2011). The passage of PL 99-457 in 1986, created national policy that included a provision of intervention services for children with disabilities younger than school age (Hebbeler et al., 2011). The focus of RtI is on identifying students for a specific learning disability (SLD), however there are concerns with RtI implementation when addressing student behavioral issues (Lindstrom, 2013). The IDEA does not require use of an RtI approach prior to a referral for evaluation as part of determining special education or related services (Lindstrom, 2013). “The IDEA and the Part B regulations do not address the use of an RtI model for children suspected of having disabilities other than SLD” (Lindstrom, 2013, p.1).

Research supports the idea that high-quality, early intervention for young children with disabilities in inclusive environments is correlated with positive outcomes for all young children (Barton et al., 2015). Studies show the benefits of providing children with disabilities with the opportunities to learn in inclusive settings (Rakap & Parlak-Rakap, 2011). Early childhood special education is an effective practice to teach young children a range of skills with various developmental delays and disabilities in inclusive

preschool classrooms, who then are able to maintain their learning over time (Rakap & Parlak-Rakap, 2011).

Problem Statement

Many children in the United States enter kindergarten with low levels of school readiness skills. These children are more likely to come from lower socioeconomic status backgrounds (Lonigan et al., 2015).

“Sizable differences in the early literacy and math skills of children are evident in the preschool period and show substantial continuity suggesting that early childhood is a critically important time for both the acquisition of these skills and attempts to improve children’s developmental trajectories” (Lonigan et al., 2015, p. 1774).

Research suggests that during a child’s early years, there is an opportunity to develop a child’s full potential and shape key academic, social, and cognitive skills that determine a child’s success in school and in life (White House, 2016). A disproportionate number of children from low-income backgrounds with deficits in pre-academic competencies are at greater risk of later school underachievement or failure (Baker et al., 2014).

President Obama called upon Congress in his 2013 State of the Union address to expand access to high-quality preschool for every child in America (White House, 2016). The President proposed investments to support a continuum of early learning opportunities, beginning at birth and continuing to age five (White House, 2016). State and national studies have shown that preschool programs and early interventions could be associated with social and learning outcomes in early grades that may improve academic and developmental trajectories (Baker et al., 2014).

In January 2014, the president requested that more Americans - elected officials, business leaders, and philanthropists - support greater access to early education so that children can succeed in school and in life (White House, 2016). The President's Preschool for All initiative was intended to improve quality and expand access to preschool, through a partnership with all 50 states, that provides all low and moderate income four year olds with high-quality preschool (White House, 2016).

Since 1950, under the leadership of the Commissioner of Education, the Colorado Department of Education (CDE) "is dedicated to increasing achievement levels for all students through comprehensive programs of education reform" (CDE, 2015a, para. 1), including challenging assessments, and rigorous accountability measures.

Colorado is "both by citizen preference and State law – a local control State.... This means that many preschools through 12th grade public education decisions – on issues such as curriculum, personnel, school calendars, graduation requirements, and classroom policy – are made by the 178 school districts and the local school boards" (CDE, 2015c, para. 1).

Although Colorado is a local control State, CDE is tasked with providing supervision for accreditation, teacher licensing, school transportation, school nutrition, special education, and early childhood education (CDE, 2015c).

Colorado early childhood education programming has two preschool classifications that includes Colorado Preschool Program (CPP) which is determined by a student's risk factors, and the State Preschool Special Education (Preschool SPED) program which is determined by the student's identified disability prior to attending elementary school.

CPP is a state-funded early childhood education program available to at-risk young children in school districts, child care centers, and community preschools or Head Start programs. It was created by the Colorado General Assembly to support at-risk children and to prevent future academic failure and is administered by CDE to provide children the opportunity to attend a half-day or full day preschool or kindergarten at no cost (CDE, 2015a). CPP's objective is to provide early childhood education in order to reduce dropout rates, dependence on public assistance, and family involvement with criminal activities; this programming is also intended to strengthen families and support them in their child's education (CDE, 2015d). The Colorado Department of Education and local school districts have found some positive outcomes by virtue of participating in the state's preschool program. For instance, the Department of Education studies have found that participation in preschool reduces the rate at which children are held back in grades K-3 (CDE, 2015e).

CPP and the Preschool SPED provide early childhood education interventions for at-risk students and students with disabilities to ensure that these children receive a high quality education. The state education agency's premise is that early education intervention can affect positive learning outcomes in early grades; therefore, early identification is significant.

Preschool special education (or special needs education) is the practice of educating students who have greater needs than the general student body in a way that addresses the students' individual concerns (Hebbeler et al., 2011). States are required to make a free appropriate public education (FAPE) available to all children with specified

disabilities (CDE, 2015a). The term "FAPE" includes special education and related services, provided at no cost to parents, in alignment with the Individual Educational Plan (IEP). Students ranging from three to twenty-one years of age who are unable to receive reasonable benefit from general classroom instruction alone may qualify for special education services (CDE, 2015a). Once a student has been identified as having a disability, an IEP is created to support the student's academic growth by providing interventions related to the disability. The student's IEP is monitored regularly to determine progress and whether there continues to be a need for special educational services. The IEP requires that special education and related services meet each student's unique needs. This establishes the basis for the entitlement of each student with a disability to an individualized and appropriate education (CDE, 2015i). The interventions provided are designed to help a student with special needs progress and develop personal self-sufficiency and success in school and their community; they go beyond what is available to the student via typical classroom instruction.

In order to study the subsequent identification for special education services from kindergarten through third grade two cohorts who participated in Colorado early childhood education preschool programming during the 2009-2010 school year, special education and demographic extant data are compared. In addition, this study examines student traits including race, gender, and the student's disability type that may predict special education identification after preschool.

The Colorado Department of Education does not have a clear picture of whether children enrolled in CPP or Preschool SPED programming are more or less likely to need

special education services in grades K-3. Little is known about patterns of primary grade special education identification over time. Given the increasing number of children nationwide who participate in ECE programming, especially for children of color, and socio-economically disadvantaged children, the need to determine the extent to which the association of preschool participation influences special education identification and student characteristics predict special education services provided during the elementary school years, informs educational policy and educational reform.

This research examines whether students with a disability who participated in the Preschool SPED program were more or less likely to be identified as needing an Individual Educational Plan (IEP) than students with risk factors who qualified to participate in the CPP program. In addition, this research examines if student's racial, gender, or disability type are predictors of the need for special education services in grades K-3.

Purpose of the Study

The purpose of this study is to examine the association of preschool enrollment and special education identification while examining the predictive traits of students identified for special education services. A quantitative study using logistic regression to analyze the association among variables and their ability to predict special education identification outcomes in elementary school.

Traditionally, studies of children with special needs describe data collected from a small number of students. The studies that have explored the early educational experiences of children with special needs tend to focus on outcomes of the children with

a particular type of disability, instead of children across a spectrum of special needs (Lloyd et al., 2009). The sample size of this study includes over 17,000 students who participated in preschool programming. The study employs a non-experimental, ex post facto research design. Utilizing student special education and demographic extant data, this study examines whether a student's participation in Colorado ECE programming has an association with the need for special education services after preschool. In other words, are children who participated in either CPP or Preschool SPED more or less likely to need subsequent special education services?

This research study examines the association of student enrollment in Colorado early childhood education preschool programming to study the subsequent identification for special education services from kindergarten through third grade. In addition, this study seeks to examine student traits that may predict special education identification after preschool that include race, gender, and the student's disability type.

Critical Race Theory (CRT) is the theoretical framework to analyze student traits including race, gender, and the student's disability type that are associated with special education identification. CRT was developed to counter legal scholarship to the positivist and liberal legal discourse of the civil rights, arguing against the stagnant racial reform in the United States (Ladson-Billings, 1998). Ladson-Billings (1998) asserts,

“Critical race theory begins with the notion that racism is normal in American society...and argues that Whites have been the primary beneficiaries of civil rights legislation, since schooling in the USA purports to prepare citizens, CRT looks at how citizenship and race might interact” (p. 7).

CRT is valuable in understanding education inequity, that addresses the civil rights era's legal victories and educational reform moments including multiculturalism (Ladson-Billings, 1998).

The State Department of Education supports effective early childhood education intervention for students who are at-risk and have disabilities in order to improve long term academic success (CDE, 2015a). The purpose of this research is to examine the association of the State's ECE programming on special education identification rates, in order to address the State's goals of "increased student performance, supporting the advancement and improvement of the State's education system to prepare all learners for success in a rapidly changing global workplace" (CDE, 2015a). An assessment can be useful to inform policy makers relative to programs that have an association on the academic success of every student in the State.

The findings of this study provide important data for a range of early childhood stakeholders and address gaps in literature, significance for students, policy and practice implications. As a result, stakeholders may gain a better understanding of whether any children who participate in ECE programming may require special education services, and the extent to which certain traits may predict this trajectory in grades K-3.

Research Questions

This study addresses the following research questions:

1. What is the association between enrollment in either the Colorado Preschool Program or the Preschool Special Education Program and

subsequent identification for an Individualized Educational Plan (IEP) in grades K-3?

2. Do student traits predict special education identification as documented by an Individual Educational Plan (IEP) after preschool?

This research studies the association of student enrollment preschool programming to study the subsequent identification for special education services from kindergarten through third grade, and student traits that may predict elementary school special education identification. Colorado early childhood education preschool programming classifications including CPP which is determined by a student's risk factors, and the State Preschool SPED program which is determined by the student's identified disability prior to attending elementary school are studied.

CDE existing special education and demographic information from two cohorts who participated in Colorado ECE programing during the 2009-2010 school year consists of educational programs that serve children in the preschool years and are designed to improve elementary school performance. Two cohorts' extant data are compared in order to study the subsequent identification for special education services from kindergarten through third grade. In addition, this study examines student traits including race, gender, and the student's disability type that may predict special education identification after preschool.

The study employs a non-experimental, ex post facto research design. Using logistic regression to predict the occurrence of an event, in this case student traits, race,

gender, and the student's disability type are examined for the predictability of special education identification in elementary school.

The sample size includes over 17,000 students who participated in Colorado early education preschool programming. Utilizing student special education and demographic extant data, this study examines whether a student's participation in CPP or Preschool SPED has an association with the need for special education services after preschool. In other words, are children who participated in either CPP or Preschool SPED more or less likely to need subsequent special education services? CRT is the theoretical framework used to analyze student traits including race, gender, and the student's disability type that are associated with special education identification. The research is not causal, but it is intended to assess the statistical significance of factors that are associated with special education identification after preschool.

Organization of the Study

This study is organized into five chapters. Chapter one presents the introduction including the need for ECE, RtI, the research problem statement, purpose for the study, and research questions. Chapter two presents an historical overview of early childhood education and special education, demographic factors related to preschool enrollment, predictive factors of school readiness and an examination of ECE longitudinal outcomes. Chapter three provide a comprehensive description of Colorado ECE programming, restatement of the research questions, research rational, the research design and analysis, data collection and confidentiality, and the anticipated limitations. Chapter four presents the descriptive and inferential statistics, cross-tabulation, chi-square test, logistic

regression, description of the data sample analyzed, data preparation, data inclusion dates, and results for research question one and two. Chapter five provides the research significance for students, policy, and practice implications, interpretation of the research findings, recommendations for future research, research limitations/ethical considerations and the conclusion. Definitions of Key Terminology presented in Appendix H.

This study is being conducted in collaboration with the Colorado Department of Education in compliance with the Agreement (Appendix A). CPP and Preschool SPED provide early childhood education interventions for at-risk students and students with disabilities to give children access to an early childhood education. This study examines the association of student enrollment in CPP or Preschool SPED and the likelihood of students being identified as requiring special education services in grades K-3. This research will examine whether a student's participation in these programs has an association with the need for special education services after kindergarten. The research will measure probability factors that are associated with special education identification across the program areas by demographics including: race, gender, and student's disability type. Extant data from the Colorado Department of Education will be used; no recruitment activity is involved. The results will be based on the researcher's analysis of the extant data provided by the State of Colorado Department of Education. Individual-level confidentiality is maintained by the State, and all identities of students, staff, schools, and districts are masked and managed by State staff. CDE is a State Education Agency responsible for the implementation of education laws adopted by the State of Colorado. In fulfillment of the law found in the Colorado Revised Statutes (C.R.S. 24-

37.5-705), CDE is charged with collecting and securely maintaining unit record data on students enrolled in the state's local education agencies (LEAs).

Chapter Two

Introduction

The literature review is provided in chapter two to summarize the historical overview of ECE, special education, demographic factors related to preschool enrollment, predictive factors of school readiness, and an examination of ECE longitudinal outcomes.

Historical Overview of Early Childhood Education

The federal government has historically avoided intervening in the lives of children during the first five years of the child's life, supporting the family right to make decisions regarding health and education; however, the government has supported programs that target children in need of assistance with basic health, education, and welfare services (Lombardi, 2009). National crises, including World Wars I and II and the War on Poverty, resulted in temporary government funding of services to support children and enable their parents to work and improve their economic situation (Gomez, 2015). Even after these crises had passed, ECE support shifted to the private sector, individual states, and/or localities, because there were increasing pressures on state governments to recognize the importance of ECE (Gomez, 2015). The increasing number of women in the workforce, a heightened attention to the needs of at-risk children, and the desire of affluent parents to provide early socialization and intellectual

development were all factors that led not only to a rise in private nursery schools, but also to pre-kindergarten programs like Head Start (Gomez, 2015).

In the United States, education is a state responsibility; however, ECE grew from a foundation established by the federal government. Kalifeh et al. (2011) found that “Congressional records, agency reports, and newspaper articles trace the evolution of Project Head Start, by far the nation’s largest federal early childhood program, beginning with the Economic Opportunity Act of 1964” (p. 38). Prior to the 1960s, federal and state funding for ECE was inconsistent because of other national priorities, including escalating unemployment rates that heightened a need for child care (Kalifeh et al., 2011). “Federal jobs were created under the Works Progress Administration and day nurseries were established to provide for children of parents on home relief so that parents could work” (Kalifeh et al., 2011, p. 37). The purpose of the day nurseries was to allow parents to fill jobs and provide employment for educators displaced from jobs during the 1930s (Kalifeh et al., 2011). “By 1943, the unemployment rate decreased and most of the day nurseries were subsequently closed (Kalifeh et al., 2011). Women employed for World War II production created a demand for child care, and Congress passed the Lanham Act (1940) and made amendments during 1941-1943, which encouraged communities to match funds for child care, especially for mothers involved in war production (Kalifeh et al., 2011). Up until the mid-1960s, funding for child care was only available for limited periods of crisis, and few programs were able to sustain themselves (Kalifeh et al., 2011).

As poverty and child care became national priorities, however, President Lyndon Johnson's War on Poverty and the Economic Opportunity Act created a steady funding stream for early child care programs, specifically Project Head Start (Kalifeh et al., 2011). Now there are numerous federal programs to support quality child care and education for pre-kindergarten children, such as Head Start and the Child Care Development Block Grant that provides funding designed to aid poor and working poor families (Kalifeh et al., 2011). Federal programs are in place that include the Child and Dependent Care Tax Credit program for people who pay for day care expenses for children under 13 years of age or disabled dependents (Kalifeh et al., 2011). Some states (Florida, Georgia, Maine, New York, Oklahoma, and Pennsylvania) have voted to provide voluntary pre-kindergarten programs to all four-year-olds (Kalifeh et al., 2011).

Head Start is the nation's largest federal early childhood program and is described as one of the most significant and successful initiatives launched during President Lyndon Johnson's War on Poverty (Kalifeh et al., 2011). In the beginning, Head Start provided preschool programs for all four-year-olds who met eligibility criteria (Kalifeh et al., 2011). When the program began, it served approximately 500,000 disadvantaged preschool children; it has now served more than 23 million children in all 50 states, the District of Columbia, Puerto Rico, the Virgin Islands, and Pacific Insular Areas (Kalifeh et al., 2011). Kalifeh et al. (2011) found that "multiple but high complementary goals have driven Head Start Policy over time, beginning with poverty eradication by improving self-sufficiency and intelligence and ending with school readiness" (p. 56). Head Start intentions were to enhance children's physical, social, emotional, and

cognitive development; to enable parents to be better caregivers to the children and teachers to their children, and to help parents be economically independent (Welshman, 2010). It accomplished these goals through services including “early education in and out of the home; home visits; parent education; comprehensive health services; and case management and peer support groups for parents” (Welshman, 2010, p. 92).

Historical Overview of Early Childhood Special Education

The inclusion of children with disabilities in Head Start has been required since the *Education of All Handicapped Children Act* was passed in 1972 (Kalifeh et al., 2011). Through the reauthorization of the Individuals with Disabilities Education Act (IDEA), a changing view of society gave rise to early childhood inclusion, creating opportunities for all children strengthened by legal, moral, and empirical support (Hurley, 2010). The Division for Early Childhood (DEC) of the Council for Exceptional Children and the National Association for the Education of Young Children (NAEYC) believe early childhood inclusion qualities should include “access to programs, active participation by children and families, and systems-level supports to ensure children and families’ successful access and participation” (Hurley, 2010, p. 336). “When PL 94-142, the federal law that later became IDEA, was passed in 1975, the focus was on ensuring access to public education for children with disabilities (Hebbeler et al., 2011, p. 201). “The federal government has contributed to the development of ECE through support for technical assistance, professional preparation, research, and evaluation under IDEA” (Hebbeler et al., 2011, p. 205). The inclusion of children with disabilities or special needs in ECE regular educational settings is now common; as Lee et al. (2015) suggest, it

“has been boosted by its documented benefits whereby students with special needs in inclusive classrooms are better able to learn, make more progress in academic skills, and develop adaptive behavior when compared with students educated in special schools.”

IDEA and federal early childhood programs such as Head Start encouraged educational services for preschool children with disabilities to be provided in general education classrooms with their normally developing peers; the wording of IDEA, in fact, “asserts that school districts must ensure that all children with disabilities are educated with children without disabilities to the maximum extent appropriate” (Barton et al., 2015, p. 69). IDEA further directs that the removal of children with disabilities from the general education classroom can only be done if the placement is not satisfactory with the provisions of supplementary aid, services, training, and technical assistance for administrators and teachers (Barton et al., 2015).

Response to Intervention (RtI) was created for early intervention for children ages 3 to 5 years and was referred to as “Recognition and Response: An Early Intervening System for Young Children at Risk for Learning Disabilities” (Lieberman-Betz et al, 2013). RtI tier one consists of school and class wide prevention and intervention supports, tier two consists of small group support, and tier three involves more intensive and individualized supports (Gajus & Barnett, 2010). The use of a three tier system is also referred to as Multi-Tier System of Supports (MTSS), which is implemented by gathering, interpreting, and using data to make instructional changes by creating increasing concentrated tiers of support (Metcalf, 2016). “Problem solving through data-based decision making occurs to both increase and decrease supports for students as

needed” (Gajus & Barnett, 2010, p. 871). Preschools are important in providing early intervention to support children’s early academic development (Gajus & Barnett, 2010).

RtI models are more frequently utilized in ECE settings in order to target academic and developmental skills (Lieberman-Betz et al, 2013). The 2004 reauthorization of the IDEA included a framework for early intervening services as a way to provide additional supports and services to students at risk of academic failure (Lieberman-Betz et al, 2013). Early childhood RtI shows potential to contribute to greater effectiveness in the areas of screening and progress monitoring (Greenwood et al., 2011). RtI is supported by federal and state accountability guidelines that require reporting of a child’s individual progress and an expectation of improving results for children served (Greenwood et al., 2011). “The RtI model is currently used to identify children with learning disabilities and to provide student with early intervening services if found to be at-risk per IDEA 2004” (Lieberman-Betz et al, 2013, p. 51).

One approach to giving teachers more skills to prevent challenging behavior is Positive Behavior Support (PBS), a framework of tiered interventions focused on promoting social-emotional developmental (Carter & Van Norman, 2010; Carter & Pool, 2012). PBS works in part by “redesigning environments to reduce problem behaviors and increase adaptive, pro-social behaviors” (Carter & Van Norman, 2010, p. 279-280) and creating a consistent, predictable, positive, and safe environment for children at any grade level. Key components of PBS relate to the classroom structure (planning of physical environment, schedule/routines, and materials); clear student expectations; and acknowledgement of children who are engaged in appropriate behavior (Carter & Van

Norman, 2010). Universal practices of PBS involve creating a common language that teachers, children, and families can use to talk about behavior and to identify and define appropriate behavior expectations (Carter & Pool, 2012). Carter & Van Norman (2010) found that “[h]igh rates of children’s academic engagement were maintained and increased slightly in three out of four classrooms following PBS intervention” (p. 285).

Similarly, PBS showed positive impact on children’s behavior in a study of preschools in rural settings (Steed, Pomerleau, Muscott, Rohde, 2013). In rural settings, a three-tiered intervention was implemented, including a first universal tier for all young preschool children, a secondary tier for children at risk for social emotional difficulties, and a tertiary tier for children who exhibit severe or chronic challenging behavior (Steed et al., 2013). “One critical feature of the universal tier of the program-wide PBS framework is the emphasis on fostering positive relations between teachers, children, and their families (Steed et al., 2013, p. 38). The PBS rural preschool program study found that teachers improved their practices in defining behavioral expectations, teaching expectations, and responding consistently to children’s challenging behavior, providing and organized and predictable environment, using data for decision-making, involving families, and maintaining an effective leadership team (Steed et al., 2013). Research conducted by Steed et al. (2013) suggests that “[t]eachers also improved their use of strategies to support children’s emotional development, provided an organized classroom, and offered differentiated and encouraging instruction over each year” (Steed et al., 2013, p. 43).

In order to be successful in school, children need to be aware of their feelings, monitor them, and modify or adjust when coping with stressful situations at social exchanges (Denham et al., 2012). Children's social emotional skills impact their communication, and relationships with their teacher and peers (Denham et al., 2012). Emotional expression and regulation includes a child's ability to express emotions appropriately and regulate emotions in prosocial ways (Denham et al., 2012). Children who are unable to regulate their emotions are viewed as difficult by peers and teachers (Denham et al., 2012).

The IEP mandated by IDEA legislation is intended to help parents navigate the process, providing the foundation for parents of students with disabilities to have an equal partnership with schools in educating their children (Haley et al., 2013). Parents' reactions to their children entering school may vary depending on whether their child or children are being considered for special education services (Haley et al., 2013). Parents experience a wide range of feelings when their children are beginning identified for special education services. The parent's reaction to learning about a child's disability may include an emotional outpouring, flatness of affect, indifference, confusion, bewilderment, questioning, and they may not fully process the information about their child's educational options (Haley et al., 2013). An IEP by definition enhances the curriculum for a child with a disability, and parental involvement is important. In fact, Haley et al. (2013) note that the

IEP is a mandatory legal agreement between a school located in the United States and a family with a child who has a disability. The IEP is an individualized

academic plan that details the specific educational services, goals, objectives, instructional modifications, and timelines that would be put in place to appropriately accommodate the child (p. 233).

Prior to IDEA legislation, a partnership between parents and the school, and parents' participation in developing a child's educational plan, was non-existent; families often felt excluded by a process that developed educational programs without their input (Haley et al., 2013; Thomas & Dykes 2013). IDEA mandates families be included in the education decision-making for their children receiving special educational services, and research has suggested that family-school partnerships can lead to more positive outcomes for students (Thomas & Dykes, 2013). Thomas & Dykes (2013) found, "Families expect teachers to have an open and respectful communication, and to demonstrate patience, and caring" (p. 60).

The quality of ECE settings is considered to be an important factor in young children's development (Keys et al., 2013). IDEA directs how services are delivered. Hebbeler et al. (2011) suggests that "[s]everal decades of IDEA-supported research has resulted in a body of evidence that illuminates what constitutes effective services provision in early intervention and Early Childhood Special Education" (p. 202). New policy and additional research is needed to address challenges implementing IDEA (Hebbeler et al., 2011). Common state personnel standards for teachers, service providers/coordinators, and special educators, and pre-service preparation for the early intervention and Early Childhood Special Education workforce are necessary to make improvements to the system (Hebbeler et al., 2011). ECE programs will vary based on

the children served, and it is essential for consumers, practitioners, and ECE advocates to promote conversations about what constitutes high-quality inclusive early childhood education (Hurley & Horn, 2010).

Demographic Factors Associated with Preschool Enrollment

Research suggests that adversity in general “undermines lifelong learning [and] behavior” (Shonkoff, 2010, 365). Children’s experiences with racial prejudice, socioeconomic inequity, abuse, and parental problems can have a serious effect on children’s learning. This is both an individual and a systemic issue. For example, early indigenous early childhood education programs, dating back to the 1830 Indian Removal Act, played a central role in a policy of assimilation in which the intent was that indigenous children would be assimilated into the majority social system by stripping them of their native languages and cultures (Niles & Byers, 2008). Indigenous children were forcibly removed from their families to be placed in federally-supervised boarding schools. By 1887, more than 14,000 indigenous children had been placed in some 200 schools, where they faced severe punishment for speaking their native languages or attempting to practice their cultural traditions (Niles & Byers, 2008).

This is just one example of many examples of European colonial values affecting relationships with indigenous people and the policies (Niles & Byers, 2008). Niles & Byers (2008) note that “[a]s a federal early childhood system developed, important lessons learned from interactions with the tribes were often overlooked and ignored” (p. 195). Mainstream developmental theories of child development have ignored indigenous cultural factors including kinship networks and tribal customs in determining attachment

and resiliency in the child's development (Niles & Byers, 2008). Present-day U.S. early childhood policies and practices continue to undercut indigenous cultures; mandating of dominant world best practice and definitions of quality are insensitive to the indigenous culture (Niles & Byers, 2008).

Other elements of a child's home life can affect their learning ability; child abuse and neglect present a threat not only to young children's safety, but also their development. Studies of abused infants, toddlers, and preschoolers found more than half are at risk for developmental impairment (Herman-Smith, 2013). Children subjected to child abuse and neglect are at risk for poor developmental outcomes as a result of chronic exposure to stress, which studies have shown to affect brain development (Dinehart et al., 2012). In 2003, an amendment to the Child Abuse Prevention and Treatment Act required states to ensure that children younger than three, who are victims of substantiated child abuse or neglect, have access to developmental screenings (Herman-Smith, 2013). In addition, federal law requires states' publicly funded early childhood intervention system and child protection agencies to work together to provide services to children younger than three years of age (Herman-Smith, 2013).

Early intervention programs were designed to meet the needs of children, and "some practitioners and researchers question whether early intervention programs should be serving children whose needs are social and emotional rather than cognitive and pre-academic" (Herman-Smith, 2013, p. 394). Working with children who have experienced abuse and neglect presents significant challenges for ECE teachers. However, there are effective strategies that have proven to facilitate healthy social, emotional, and behavioral

development in children who experience maltreatment across diverse cultures, for example positive learning experiences at school and supportive teachers (Dinehart et al., 2012). Early childhood educators need to be trained on best practices to address young children's mental health (Dinehart et al., 2012).

A child's parental situation impacts a child's ECE experience, including whether primary caregivers are employed outside the home, are single, or are not the child's parent (Fromberg, 2006). Parent involvement in preschool is linked to strong pre-literacy skills, acquisition of mathematical skills, positive social skills, and positive attitudes toward school (DeLoatch et al., 2015). Pedro et al. (2012) note that "[h]istorically teachers' knowledge, attitudes and dispositions toward parental involvement have been considerably non-existent and negative" (p. 1). Even when teachers knew that parental involvement is critical, they "reported receiving little formal training and therefore possess minimal knowledge and skill to work with parents" (Pedro et al., 2012). Family-centered practices in early intervention are the preferred approach for parents who have developmentally at-risk children, because family centered practice supports the parent's role in their children receiving early intervention services (Pighini et al., 2014). Seeking out parents' perspectives on the developmental needs of their children supports the effectiveness of early intervention through consultation, assessments, and collaboration (Pighini et al., 2014).

One particular element of parental situation that has been gaining attention in research is father engagement, the degree to which a father is involved in his children's lives. Anderson et al. (2010) have found that "[c]hildren from low-income families are

generally considered at-risk for academic problems, but those who have close positive relationships with their fathers tend to experience greater educational achievement.”

Anderson et al.’s research found that challenges to engaging fathers in ECE programs include father reported role ambiguity, work and family role conflicts, and social marginalization. However, once engaged, “[f]athers emphasized a strong desire for their children to succeed in school and enjoy learning” (Anderson et al., 2015, p. 370). Fathers were excited to see their children learning and making developmental progress, which heightened their interest and enthusiasm for engaging in the program and providing developmental support for their children (Anderson et al., 2015). Fathers engaged in the ECE programs reported feeling valued and included in the program, which supported them in developing their parenting skills to meet the needs of their young children (Anderson et al., 2015). ECE programs are interested in increasing father engagement to promote child learning enjoyment and father-enhanced parenting skills that strengthen father-child relationships (Anderson et al., 2015).

Early childhood education varies for children growing up in the U.S., depending on where they live, socioeconomic status, parents’ educational background, race/ethnicity, and language spoken at home (Fromer, 2006; Kim, 2015). In affluent school districts, students are more likely to be in class with 20 or fewer children, with a state-certified teacher who was prepared to teach early childhood education and an assistant teacher (Fromberg, 2006). In less affluent districts, students may be in a class with 25 to 30 children, and the teacher may not be state-certified or specifically prepared to teach early childhood education or have an assistant (Fromberg, 2006). “Socially

disadvantaged groups, such as students of low socio-economic status, are more likely to be on the receiving end of teacher low expectations” (Kim, 2015).

Children from affluent homes usually have more access to resources at school and at home; they also experience different teaching techniques. Smith (2012) found that “[t]eachers in affluent schools use more implicit teaching techniques while teachers of low-income children are more explicit in their teaching of behavior” (p. 571). In affluent and middle-class schools, behavior is taught indirectly through modeling and using guiding questions, whereas working class and poor schools give children clear directives, telling children “explicitly what they need to do and how it should be done. Consequences are provided for disobedience” which contributes to a punitive school environment (Smith, 2012, p. 571).

The situation is even more serious for homeless children, who are half of all homeless people in the US; “of those, most 50% are under the age six” (Kim, 2013, p. 161). Homeless children have not been a priority in schools due to indifference and stereotypes about homelessness. Kim’s (2013) research found that teachers believed that homeless children were messy, chaotic, and dysfunctional and needed to be fixed. Teachers did not expect the parents of homeless children to be interested in their children’s education (Kim, 2013). Research suggests a need to raise awareness about homeless children and their families as a part of professional development in schools and early childhood teacher preparation programs. “Left unchallenged these deficit perspectives and beliefs could prevent homeless children from having successful school experiences” (Kim, 2013, p. 167). It is critical that teachers examine their beliefs toward

children from socioeconomically different backgrounds, especially homeless children. Research suggests that children from low socio-economic families enter elementary school lagging behind their peers in reading, math, and general knowledge and their lack of academic achievement in early grades is related to social problems including dropping out of high school, unintended pregnancy, criminal activity, and continuing the cycle of poverty (Herman-Smith, 2012). The experience of growing up in poverty, in association with other family hardships, contributes negative academic outcomes for children (Roy & Raver, 2014). It is, in fact, “[t]he inability of parents to provide the kinds of developmental stimulation their young children need for academic success, that preschool programs such as Head Start are designed to remedy” (Herman-Smith, 2012, p. 66). ECE children growing up in poverty are at greater risk for school adjustment difficulties and when transitioning into kindergarten. They demonstrate delays in learning behaviors and emergent literacy skills, have high rates of social difficulties, and manifest disruptive behavior challenges (Lee & Bierman, 2015). Family hardships related to poverty are also associated with lack of support for early childhood cognitive and social emotional development (Lee & Bierman, 2015).

Comparison of cumulative risk factors across racial and ethnic groups found that African American families experienced higher rates of risk than Latino and White families (Roy & Raver, 2014; Caughy & Owen, 2014). Challenges facing parents of color include unique contextual factors resulting from past and present experiences of oppression, racism, and discrimination. Caughy & Owen’s (2014) research shows that parent centered ethnic-racial cultural socialization practices that transmit information

regarding race to children have positive outcomes for children of color, including “greater pre-academic skills, better receptive language, and fewer behavior problems” (p. 391).

Children of color make up 40% of the U.S. population (Brinson, 2012). In the U.S., more children of color are born than White, non-Hispanic children; close to 47% of all children and more than 50% of children under the age of one were children of color (Grisham-Brown et al., 2013). Population experts believe that by 2019, the majority of children in the U.S. will be children from groups that have historically been in the minority (Grisham-Brown et al., 2013). The number of White children in the U.S. has decreased every year since 1994, while the number of Black children has remained steady at around 10 to 11 million (Grisham-Brown et al., 2013). The growth of historically minority groups stems primarily from the number of Hispanic or Latino families living in the U.S. (Grisham-Brown et al., 2013). The number of Hispanic children has increased every year since 1980, growing from 5.3 million in 1980 to 17.4 million in 2010 (Grisham-Brown et al., 2013). About 80% of migrant students are from a Hispanic background, and 90% of migrant students may come from a home where a language other than English is spoken (Grisham-Brown et al., 2013). Diversity has also increased in rural America, which is home to more than 51 million Americans, a growing number of whom are immigrants and people of color (Grisham-Brown et al., 2013).

A challenge that is particular to immigrant families is the need for bilingual children to have instruction that is sensitive to their particular language situation and needs. In the U.S., 16 states have seen an increase of over 200% in children who are

entering school from homes that speak a language other than English (Baecher & Jewkes, 2013), and ECE programs are unlikely to address this fact: “A national study of early childhood teacher preparation curricular content found that working with bilingual children was the least likely subject to be covered,” which is a concern since research shows that teachers hold negative attitudes about non-English speaking learners (Baecher & Jewkes, 2013, p. 39). In fact, while children in the U.S. need to learn English to be prepared for K-12 schooling, linguists suggest that it should not supplant or replace ongoing development of the child’s home language (Baecher & Jewkes, 2013). Concern for children who are not proficient in English extends to students being over referred for special education services, lack of school readiness skills, and retention (Winsler et al., 2012). Children who are learning two or more languages simultaneously or are learning a second language while continuing to master their first language are considered dual language learners (Espinosa, 2015; Baecher & Jewkes, 2013). Enrollment reports in 2011 found that 59% of the children served in Head Start programs were from racial or ethnic minority families, 37% were Hispanic or Latino, and more than 30% were dual language learners (Baecher & Jewkes, 2013). Evidence supports the idea that dual language learners are capable of learning multiple languages during the early childhood years and benefit socially, linguistically, and cognitively from the language processing skills inherent in acquiring two or more languages (Baecher & Jewkes, 2013).

Another form of diversity in preschool children is disability. Wu & Chu (2012) suggest that it is important to promote the development of self-determination in young children with disabilities from culturally and linguistically diverse backgrounds; teachers

need to have a better understanding of diverse cultural values, and adapt how they teach self-determination skills (Wu & Chu, 2012). The increasing diversity in the U.S. calls for early childhood special education services to be responsive and sensitive to the diverse needs of children and families. In particular, special education evaluation practices need to be responsive to children and families representing diverse cultural and linguistic backgrounds (Banerjee & Guiberson, 2012). “The Individuals with Disabilities Education Act requires that evaluation teams take into account a child’s English language proficiency status as well as a child’s experiences and cultural background” (Banerjee & Guiberson, 2012, p. 33). Cultural bias can occur when the evaluation process or assessment procedure requires a child to engage in activities that are unfamiliar, inappropriate, or foreign in their home and culture (Banerjee & Guiberson, 2012). “Culturally and linguistically responsive assessment practices are necessary to appropriately assess these children’s strengths and needs” (Banerjee & Guiberson, 2012, p. 43).

With all of these factors—socioeconomic circumstances, parental involvement, race, linguistic background, disability—research indicates that many White, middle class pre-service teachers understand linguistic diversity as a deficit, or as an issue for other people to deal with (Cheruvu et al., 2014):

These deficit perspectives undoubtedly shape how and what these White prospective teachers will teach children from minoritized (sic) racial and linguistic backgrounds, further contributing to the legacy of inequitable

educational experiences that young children from historically marginalized communities face. (Cheruvu et al., 2014)

Teachers' attitudes and interactions affect children's success in school; therefore, it is necessary that teachers work to challenge Whiteness in their practice in providing early childhood education to improve educational trajectories for children of immigrants (Adair, 2014).

Research shows that children with disabilities function at different academic levels than their peers who do not have a disability in some areas (Fleury et al., 2015). For instance, on one study children with autism spectrum disorder (ASD) performed better than their peers in language and literacy, however demonstrated deficits in social behavior, therefore many of these children require additional support to participate in classroom activities (Fleury et al., 2015).

There is an increasing interest in determining the role children's socioemotional skills play in the development of academic skills (Lonigan et al., 2015). The association between self-regulation and academic skills suggests that children's self-regulation specifically supports the development of academic skills because self-regulation allows optimal management of attention, motivation and stress reactivity in a learning context (Lonigan et al., 2015). Children with self-regulation skills receive more of the instruction being provided because they have enhanced receptivity and responsivity to academic instruction (Lonigan et al., 2015). "Prevalence estimates in urban early childhood educational programs suggest that as many as 30% of children exhibit moderate to clinically significant emotional and behavioral needs" (Bulotsky-Shearer et al., 2011).

Early challenging behavior in structured education activities predict lower academic outcomes in the child's reading and math skills, in addition to lack of motivation, attention, and persistence in academically centered tasks (Bulotsky-Shearer et al., 2011). Challenging behavior also affects peer-to-peer relationships negatively (Bulotsky-Shearer et al., 2011). Peer situations involving challenging behavior predicted lower attitude toward learning, difficulties in self-regulating, and engaging appropriately socially in classroom activities (Bulotsky-Shearer et al., 2011). "Unfortunately, early childhood research substantiates the negative association between problem behavior and reading ability in preschool, kindergarten, and first grade" (Bulotsky-Shearer et al., 2011, p. 41). Reading delays, language deficits, and poor literacy skills are also associated with challenging behaviors including aggression and inattentiveness (Bulotsky-Shearer et al., 2011). "A recent study found that socially reticent and withdrawn behavior in a Head Start classroom were negatively associated with children's expressive and receptive vocabulary skills" (Bulotsky-Shearer et al., 2011, p. 41). Although mathematics skills are important to school readiness, very few studies have examined the association between preschool challenging behaviors' effects on the child's mathematics skills (Bulotsky-Shearer et al., 2011). However, "[t]hree recent studies conducted in Head Start classrooms provide evidence for the negative influence of preschool problem behavior on mathematics outcomes" (Bulotsky-Shearer et al., 2011, p. 41).

"Head Start teachers have reported that up to 40% of their students used challenging behavior at least once every day" (Carter & Pool, 2012, p. 315). Teacher efficacy or the teacher's perception about his or her ability to have a positive effect on a

child's behavior, is an essential factor in the effectiveness of behavioral interventions in the ECE classroom (Gebbie et al., 2011). Teachers, however, report that they lack this efficacy; they do not have enough training on how to support young children's emotional and learning needs. Gebbie et al. (2011) note that in a survey of the training needs of preschool teachers, "the most frequent request was how to address behavior challenges of preschool children with disabilities" (Gebbie et al., 2011, p. 35). The behavior of young children has an impact on all aspects of the classroom environment, including the interactions among teacher and child, child and peers, learning, and safety (Carter & Pool, 2012). The growing number of children with challenging behavior in ECE settings has contributed to the implementation of evidenced-based practices to prevent challenging behavior (Carter & Van Norman, 2010).

Based on U.S. Census data, the majority of preschool-age children in general do not attend a formal preschool program (CDE, 2015e). A small but significant portion of children are retained (i.e., held back in a grade) in a given year. As preschool children transition to elementary school, key indicators of their academic achievement are attributed to the amount of developmental, educational, and behavioral supports they received to engage in the curriculum (Bauer & Msall, 2010). Research has found that the preschool teacher's role has short and long term effect on young children's academic outcomes (Baker et al., 2014). In order to foster preschoolers' academic development, ECE teachers should have an accurate understanding of their student's knowledge and skills (Baker et al., 2014). Since an increasingly homogeneous population of teachers are teaching a growing heterogeneous population of students, it is even more important that

“culturally competent and culturally responsive teachers understand the importance of cultural heritage and identity in addition to more academic content and learning outcomes” (Grisham-Brown et al., 2013).

Schools are not culture-free zones; instead, White middle-class cultures and discourses are highly honored and valued (Brown et al., 2010). Racism is normalized in ECE settings in which “the colonization of people of color continues as rich experiences and culturally relevant knowledge brought to school are negated by the official school curricula at structural and institutional levels” (Brown et al., 2010, p. 514). When racism and social positioning continue to go unquestioned, messages are sent that perpetuate the practices that demean and disenfranchise children, families, schools, and communities, contribute to academic failure, and shape school funding disparities (Brown et al., 2010). Understanding nuances of racialized practices in ECE settings related to how whiteness is manifested and affects learning in tangible ways including setting stands for what is normal and acceptable action (Brown et al., 2010).

ECE has been the site of some paradigm shifting (Tobin, 2014) where these issues are concerned. In 1965, the development of Head Start occurred at the crossroads in the Freedom Movement (Hale, 2012). People organized for Head Start and the idea of education for full equality. Hale (2012) notes that Head Start developed alongside the Civil Rights Act of 1964 and the Voting Rights Act of 1965, advocating for equitable education during a time when there was resistance to school desegregation and welfare. “The Head Start program was part of the war on poverty, which in part sought to provide jobs to the unemployed” (Hale, 2012, p. 533). In particular, Head Start volunteers, in

conjunction with the Freedom Movement in Mississippi, expanded the notion of pedagogy to include parent participation, local governance, and culturally relevant pedagogy, and demanded educational opportunity for all people (Hale, 2012).

In the U.S., children participating in ECE programs are becoming more diverse; therefore, teachers, classroom instruction, materials, environments, and communication must be responsive to various languages and cultural values to support academic achievement (Grisham-Brown et al., 2013). Brinson (2012) argues that “[a] primary goal in early childhood programs is to welcome and embrace the diversity of children and families in today multicultural society” (p. 30). Based on the theoretical framework of culturally responsive pedagogy, teachers must go beyond traditional paradigms of classroom environments to be culturally responsive; educators must provide an ecology in which young learners will thrive and grow where their creativity, ethnic identity, and heritage languages are valued (Flores et al., 2011). Knowledge and training enables teachers to create culturally responsive classroom settings that engage diverse students. Culturally responsive teacher education prepares teachers to be sensitive to the diverse cultures and backgrounds of their students, to learn about cultures other than their own, and to use their knowledge about different cultures to influence their instruction supporting student success (Pedro et al., 2012).

Predictive Factors of School Readiness

In 1998, The National Education Goals Panel called for all children to be ready for school by the year 2000 (National Education Goals Panel, 1998). The No Child Left Behind Act (2002) focused accountability on school readiness (Winsler et al., 2012).

Children's academic and social competencies, school readiness at kindergarten entry are important predictors of success throughout school (Jeon et al., 2011). School readiness is in reference to whether a child exhibits, at entrance to kindergarten, the academic, social-emotional, and behavioral competence to perform and engage successfully in the academic setting in elementary school (Classens et al., 2009). "School readiness is best conceived as the qualitative assessment of whether a child exhibits the academic, social emotional, and behavioral competencies needed to facilitate successful transition to formal education" (Pentimonti et al., 2014, p. 568). School readiness is also viewed as the child's transition between preschool and kindergarten (Pentimonti et al., 2014). The transition from pre-school to kindergarten has lasting implication for academic success in later years (Lloyd et al., 2009).

The National Governors Association (NGA, 2005) Task Force of School Readiness provided five areas in which children's school readiness should be exhibited: health and motor skill development; socioemotional development; motivation to learn; language and literacy skills; and conceptual knowledge and applications which are part of the groundwork for learning. Research shows that children who enroll kindergarten with strong cognitive, language, social, and behavioral skills, do better later in school, and are less likely to later repeat grades and/or drop out of school (Winsler et al., 2012).

State and federal early childhood policy makers have drawn on the National Education Goals Panel (1997) which identifies aspects of comprehensive approaches to school readiness that include goals for learning and development in multiple areas. Early childhood education in which children develop school readiness skills including literacy,

math, and socioemotional development is an important precursor to academic success (Lonigan et al., 2015). Children are prepared for elementary school and do best with a certain threshold of skill that will help them thrive in the classroom's academic and social milieu (Pentimonti et al., 2016).

Due to increased academic expectations for kindergarten and the concern of high stakes testing, some parents are choosing to delay their child's entry into kindergarten for a year (Winsler et al., 2012). Despite research that suggests the benefits of preschool participation, a Miami, Florida report reveals the prevalence and predictors of delayed school entry and kindergarten retention among a large ethnically diverse group of children who attended public school prekindergarten programs or received subsidies to attend community based child care (Winsler et al., 2012). Research shows that children in elementary school who participated in preschool programs developed greater skills in print knowledge, phonological processing, oral language, and math than their peers with no preschool participation (Lonigan et al., 2015). Children in elementary school with preschool experience have developed socioemotional skills observed by their ability to self-regulate and pay attention, which contributes to their academic achievement (Lonigan et al., 2015). The National Association for the Education of Young Children (NAEYC; 2009) indicated that states should focus on adopting comprehensive curricula explicitly designed to address school readiness goals.

Research conducted to examine if children demonstrated reliable profiles of readiness skills among those who may be more susceptible to difficulties upon entry to elementary school found the benefits afforded to children by participation in high-quality

early childhood education experiences are especially critical for children who demonstrate less-developed skills and are at-risk for later academic failure (Pentimonti et al., 2014). The children in this research fell into four various profiles of school readiness: socially ready; absolutely average; socially awkward; and limited readiness (Pentimonti et al., 2014). The socially ready children were predominately White males who exhibited slightly above average academic scores, high social skills, and their families had average family annual incomes, and 30% of their mothers had a bachelor's degree or above (Pentimonti et al., 2014). The absolutely average children were the largest group representing primarily White males whose cognitive ability scores were slightly below average, whose families had average family annual incomes, and 31% of the mothers had a bachelor's degree or above (Pentimonti et al., 2014). The socially awkward children also representing primarily White males who had average academic scores, and below average scores on social and behavioral skills, with average family incomes, and 24% of the mothers had a bachelor's degree or above (Pentimonti et al., 2014).

Those children identified as limited readiness demonstrated below average academic and social skills, on average children in this profile group were predominately male and non-White who in comparison to their peers exhibited the lowest cognitive skills in comparison, with average family incomes, at 21% these mothers were least likely to have a bachelor's degree or above (Pentimonti et al., 2014). Research suggest that the differences in early academic achievement among children begins prior to their school entry, and is influenced by families' race/ethnicity, socioeconomic status, parental educational attainment, the child's health, and living environment (Joe & Davis, 2009).

Research studies reveal that there is an over representation of males and minorities in special education (Piechura-Couture et al., 2013). Gender bias is associated with the referral, classification and placement into special education (Piechura-Couture et al., 2013). Piechura-Couture (2013) suggest, “the root of gender bias is due to stereotypical expectations of higher standards for men while tolerating lower achievement in girls” (p. 236). Males are viewed as more active and are seen as acting out or misbehaving in classrooms because of the effect of early social learning which is encouraged outside of school, but not tolerated in school (Piechura-Couture et al., 2013). “Gender bias and early gender socialization have been common arguments used to explain many academic and behavioral differences between boys and girls” (Piechura-Couture et al., 2013, p. 236)

The analysis of variation in gender disproportionality in special education found that the male-to-female ratio hovers somewhere between two to one ratio depending on the severity of the disability (Piechura-Couture et al., 2013). For students who are severely emotional disordered the ratio increasing with African American and Hispanic students representing higher averages respectively (Piechura-Couture et al., 2013). “Minority students are more likely to be found in the judgmental disability categories that requires some degree of subjectivity on the school based team during the evaluation process” (Piechura-Couture et al., 2013, p. 235-236). In addition, the overrepresentation of African American males in emotional and behavioral categories is related to higher rates of involvement in disciplinary action (Piechura-Couture et al., 2013).

African American males lag behind their peers in reading and math, which researchers have found makes it more difficult for them to overcome in later years (Joe & Davis, 2009). Indicators that predicted membership into the four profile groups included home experiences and literacy related activities in the classroom. There were no significant differences in profile membership based on the home experiences, however a significant relationship was found between profile membership and the child's preschool classroom (Pentimonti et al., 2014).

Researchers, educators, parents, and policy makers have examined the disproportionate number of African American males who lack school readiness skills (Joe & Davis, 2009). "This increased interest in the academic performance of your African American males in particular is often linked to negative consequences for future educational and social opportunities (Joe & Davis, 2009, p. 260). Students who attend under-resourced schools with limited access to high quality instructional and learning activities are more likely to lack school readiness skills (Joe & Davis, 2009). "Education research has consistently indicated the underachievement of African American males throughout their academic trajectories" (Joe & Davis, 2009, p. 261). Racial and ethnic minority parents compared to their White peers have higher expectations of their older school-age children's academic performance (Joe & Davis, 2009). "However, a study conducted with a sample of African American families suggests that parents and teachers often report lower expectations for African American boys (ages 6-16) than for girls" (Joe & Davis, 2009, p. 261). The failure to address the African American males' lack of

school readiness skills continues to have an adverse effect of their academic trajectories, which limits their opportunities from the onset (Joe & Davis, 2009).

A study that examines the relation between chronological age and enrollment to kindergarten and with later school readiness found that formal preschool experiences play an important role in preparing children of Hispanic descent who lack financial resources (Furlong & Quirk, 2011). Overall the study findings concluded that age, gender, and preschool experiences were related to Hispanic children's school readiness upon entry to kindergarten (Furlong & Quirk, 2011). Consistent with previous research examining similar populations of children, "specifically, children who had some form of preschool experience were rated significantly higher in terms of their school readiness than children with no preschool experience" (Furlong & Quirk, 2011, p. 88).

The transition to kindergarten is an important developmental milestone for children and families (McIntyre et al., 2010). "Children with disabilities may be especially vulnerable during transition and may lack the academic and behavioral readiness skills essential for kindergarten" (McIntyre et al., 2010, p. 259). School readiness for children with special needs is critical because including these children in the general classroom setting is the goal (Lloyd et al., 2009). By the time a child enters kindergarten, they need to have acquired skills to meet the demands of elementary school (Lloyd et al., 2009). Parents and caregivers of children with disabilities reported significantly more concerns related to their child's behavior, communication, academic skills, and overall school readiness for kindergarten than did the parents and caregivers of general education students (McIntyre et al., 2010). In a study examining caregiver

concerns in a sample of more than one hundred preschool students, approximately one-fifth of the students received special education, although the student received a range of preschool supports that included an IEP and family focused services, parents of special needs children reported more worries regarding their child's transition to kindergarten (McIntyre et al., 2010). "These worries included general kindergarten readiness as well as specific skill areas such as following directions, making needs known, and possessing adequate academic and behavioral readiness" (McIntyre et al., 2010, p. 262). Findings from this study found a trend that families with children with special education needs are less educated and have a lower family income (McIntyre et al., 2010). The study controlled for family sociodemographic variables, and did not eliminate the differences in family worries related to transition to kindergarten for children with and without special needs (McIntyre et al., 2010).

The National Education Goals Panel (1998) aspired to have all children start ready to learn, however children from low-income families are often significantly less ready for school than their peers (Jeon et al., 2011). "Furthermore, researchers agree that income is strongly correlated with child outcomes: poorer children have worse cognitive, academic, and behavioral outcomes especially in the preschool and early school years" (Chazan-Cohen et al., 2009, p. 961). Research recognized that the gap in school achievement between socioeconomically advantaged and disadvantaged children is apparent as early as school entry (Pears et al., 2014).

Research that examines low-income children suggests that environmental factors better predict outcomes for low-income children than children from higher income

groups (Chazan-Cohen et al., 2009). “Children from low-income backgrounds demonstrate poorer school readiness skills than their higher-income peers” (Pears et al., 2014). Income both directly influences child outcomes and is mediated by other family factors associated with poverty (Chazan-Cohen et al., 2009). “Exposure to poverty appears to be a consistent predictor of poor prekindergarten self-regulatory skills” (Pears et al., 2014).

Poverty makes it harder for families to purchase materials that stimulate learning resulting in poorer cognitive and academic achievement outcomes (Chazan-Cohen et al., 2009). In addition, poverty contributes to stress placed on the family that discourages optimal parenting, and adds to negative social emotional outcomes for children (Chazan-Cohen et al., 2009).

Children’s home environment and parental support has a strong impact on their vocabulary development (Chazan-Cohen et al., 2009). A seminal study completed by Hart and Risley (1995) found the differences in children’s experiences related to socioeconomic status (SES) accumulate over the first years of life. Children from low SES backgrounds tend to lack school readiness skills as evidenced by poorer literacy and social skills than their peers (Pears et al., 2014, p. 432). “By age 3, the vocabularies of the children in the low-SES group are half the size of those of children in the high-SES group” (Chazan-Cohen et al., 2009, p. 962). Children in high income families are exposed to and engage in more conversations than children from lower income families (Chazan-Cohen et al., 2009). “Mothers whose children knew and used more words were reading more to these children as they developed, which in turn facilitated further growth

in child vocabulary” (Chazan-Cohen et al., 2009, p. 962). Children receiving early childhood intervention developed greater skills in letter naming, initial sound fluency, and understanding of concepts about print than their peers who did not have early intervention (Pears et al., 2014). Children from more affluent homes demonstrated more optimal approaches to learning that contributed to higher vocabulary scores, and higher letter-word knowledge upon kindergarten entry (Chazan-Cohen et al., 2009). “Young children who are English Language Learners (ELLs) have the additional challenge of mastering a new language during the kindergarten year and performing well academically in that new language” (Winsler et al., 2012, p. 1301).

Research suggests that focused school readiness intervention with low-income children contributes to critical skills for entry into kindergarten (Pears et al., 2014). School readiness interventions that have demonstrated impacts into adolescence and adulthood are usually intensive, and long term lasting a year or more prior to elementary school (Pears et al., 2014). Nationally, state spending on pre-kindergarten programs has declined limiting the available slots for eligible children in programs and leaving families without services (Pears et al., 2014). “Head Start serves fewer than 60% of all eligible children nationally” (Pears et al., 2014, p. 432). In addition, many of these programs do not operate in the summer (Pears et al., 2014). Lack of operation contributes to disadvantaged children loss of reading and math skills and failure to gain skills at the same rate of their advantaged peers over the summer months (Pears et al., 2014). “Kindergarten retention has been linked to previous research to various risk factors such as poverty, low maternal education, single parent status, minority status, English

Language Learner, and male gender” (Winsler et al., 2012, p.1299). When researchers examined the question of whether attendance in different ECE programs contributed to school readiness or failed to prepare children for entry to kindergarten, the outcomes were mixed and varied based on the quality of the program attended and the socioeconomic level of the family (Winsler et al., 2012). “It is clear that, in general, attendance in a high-quality child care or preschool program is beneficial for children’s school readiness because it advances children’s cognitive and language skills” (Winsler et al., 2012, p. 1302).

Examining ECE Longitudinal Outcomes

An ECE longitudinal study with a national sample of children who participated in Head Start found that “[b]enefits were more pronounced for children who had initial cognitive ability or parents with low levels of education, or who attended Head Start more than 20 hours a week” (Lee et al., 2014, p. 202). Research shows that parents whose children participated in Head Start benefited, as they made more significant gains in their own education from baseline to kindergarten compared to parents whose children did not attend Head Start (Sabol & Chase-Lansdale, 2015). “Head Start also strongly promoted African American parents’ education” (Sabol & Chase-Lansdale, 2015, p. 156). Home instruction for parents of preschoolers, which focused on supporting parents as the child’s first teacher, helped to mitigate any potential negative effects on being a child of a teenage mother (Brown, A., 2013).

There appears to be a positive correlation between comprehensive early childhood educational experiences and cognitive achievement, especially for children from

economically disadvantaged or low socio-economic households, children of color, and children who live in urban areas (Fantuzzo et al., 2011). The most utilized program for children living in low socio-economic homes in the U.S. is the Head Start program (Fantuzzo et al., 2011). Research supported evidence confirms positive cognitive outcomes for children who participated in Head Start programs (Fantuzzo et al., 2011). Children who participated in Head Start produced higher performance on cognitive outcomes (i.e., pre-reading, pre-writing, and vocabulary) as compared to other children (Fantuzzo et al., 2011).

Early intervention for emergent literacy development in a preschool program study found the possibility of preventing literacy delays and referrals for specialized, special education services for young children through early intervention at the preschool level (Hilbert & Eis, 2014). The successful development of emergent literacy skills is essential to children's future academic success (Hilbert & Eis, 2014). Emergent literacy skills include phonological awareness, vocabulary, letter naming, word manipulation, which provide young children with a better chance to successfully learn to read (Hilbert & Eis, 2014). "Children from low income families may acquire language skills more slowly, exhibit delayed letter recognition and phonological sensitivity, and are at-risk for reading difficulties" (Xu et al., 2014, p. 295). ECE providers have identified key foundational skills that are necessary for young children entering kindergarten to succeed in learning to read (Xu et al., 2014). The effects of a comprehensive early literacy project to develop preschoolers' language and literacy skills found significant improvement in child outcomes, classroom environments, instructional practices, parent attitudes toward

early literacy, and family involvement in literacy activities (Xu et al., 2014). Study results show that children who participated in literacy programs during preschool had improved letter naming fluency, phonemic segmentation fluency, and nonsense word fluency that lasted through 2nd grade (McCormick & Haack, 2010).

Another study tested the theory that former ECE fifth grade student achievement is mediated by the aggregate school-wide achievement of their elementary school, as defined as the percentage of fifth graders in school who were at or above academic proficiency in reading or math (Curenton et al., 2015). “Results indicated that the children who attended pre-kindergarten and child care outperformed their matched peers who had not attended ECE programs” (Curenton et al., 2015, p. 921).

“Executive function skills have garnered particular interest as measures of school readiness because of their positive associations with academic achievement” (Nesbitt et al., 2015, p. 865). Studies show evidence that supports the hypotheses that children’s executive functioning skills at the beginning of school afford children the ability to adapt to the demand of early childhood classrooms, and exhibit positive learning as related to behavior that contributes to their academic gains (Nesbitt et al., 2015).

The longitudinal study of the Perry preschool project, developed in the 1960s, found that the early education provided to three and four year-old at-risk African American children living in poverty lasted well into adulthood (Persellin, 2008). “Results showed that participants, now adults, continued to outperform those without preschool in terms of educational attainment, income, and socially responsible behavior” (Persellin, 2008, p. 58). Research findings show investments in Head Start funding and

enrollment in preschool programs dramatically increased the high school graduation rates of African American males (McCarthy, 2009).

A University of Chicago longitudinal study determined the effects of preschool in adulthood from a sample that included over 1400 low-income participants, representing 93% of African American children who attended preschool for one to two years, and who were traced until they were 24 years old, found a direct positive effect of preschool on adult well-being on occupational prestige, felony arrest, and depressive symptoms (Reynolds & Ou, 2011).

A national longitudinal study of approximately 8,000 participants examined whether and to what extent children who are racially ethnic minorities are disproportionately represented in early intervention and early childhood special education. Findings indicated that these children are disproportionately underrepresented nationally in ECE programs (Morgan et al., 2012).

A longitudinal early childhood study examined the effectiveness of preschool special education services by comparing reading and math outcomes for children who received special education services at the preschool age to a sample of peers who did not receive services (Sullivan & Field, 2013). Contrary to the preponderance of research on the effectiveness of ECE programs, the results of this study suggest children with delays would demonstrate higher kindergarten academic skills on average if they had not received preschool special education services (Sullivan & Field, 2013). Other studies of early childhood special education suggest in part school readiness profiles may be malleable, supporting the argument that the provision of high-quality early experiences,

particularly in ECE, serves as a means for ensuring that young children arrive in kindergarten with the skills necessary to be prepared for future academic success, especially when the early intervention is focused on the skills shown to encourage achievement (Pentimonti et al., 2014).

In the 1990s, ECE in the U.S. became subject to standard-based education reform and greater emphasis was placed on all students starting school ready to learn (Brown, C., 2010). “As policy-makers continue to implement early childhood education reforms that frame the field as a mechanism that is to ready children for elementary school success” (Brown, C., 2010, p. 133).

“Early education reforms require early childhood programs and their educators to provide young children with a specific set of academic experiences that both mimic and in turn prepare children for elementary/primary school” (Brown, C., 2010, p. 134). ECE programs across the U.S. are aligning with elementary and secondary education systems requiring ECE stakeholders to address young children school readiness (Brown, C., 2010).

Lowenstein also presents the argument that is “ECE literature would recognize that ECE is not a silver bullet and that it is necessary to consider children’s school experience when evaluating their long-term trajectories” (Lowenstein, 2011, p. 108). Some suggest that expecting anything more than school readiness from ECE programs is unrealistic (Lowenstein, 2011). “Quality of the school environment to which a child is exposed subsequent to being in ECE is a factor in the maintenance of gains made during the ECE year” (Lowenstein, 2011, p. 108). The examination of quality in early childhood

education is important because the research demonstrates consistent association between various aspect of classroom quality and improved social and academic outcomes for young children (La Paro et al., 2012). ECE involves learning experiences that encourage developmental growth in children prior to their attendance into elementary school (<http://www.healthofchildren.com/E-F/Early-Childhood-Education.html>).

Colorado ECE programming consists of educational support that serves children in the preschool years and is designed to advance elementary school performance. Colorado preschool programming has two categorizations that include CPP which is determined by student risk factors and Preschool SPED which is determined by the student's identified disability prior to attending elementary school. Students who participated in Colorado preschool programming during 2009-2010 school year special education and demographic extant data are compared in order to study the subsequent identification for special education services from kindergarten through third grade. In addition, this study examines student traits that may predict special education identification after preschool including race, gender, and the student's disability type. This study addresses questions that are important in meeting the needs of students in ECE. President Obama said "a good education is no longer just a pathway to opportunity – it is a pre-requisite" (Whitehouse.gov, 2009).

Chapter Three

Introduction

This chapter provided an explanation of the research method used to conduct this study. This chapter outlines: Colorado ECE programming, population and sample, description of data sample analyzed, restatement of the research questions, rationale, research design, research analysis, data collection and confidentiality, anticipated limitations, and the organization of the study.

Colorado ECE Programming, Population and Sample

In Colorado, public education decisions such as curriculum, personnel, school calendars, graduation requirements, and classroom policy are made by the 178 school districts and the local school boards (CDE, 2015c, para. 1). CDE is responsible for supervision over special and early childhood education (CDE, 2015c).

CPP began in 1988 as the Colorado Preschool Project, authorized by the Colorado General Assembly to serve 2,000 four and five year-olds in need of language development (CDE, 2015e). The number of authorized CPP slots has grown steadily and currently stands at 28,360. As the CPP Act indicates, “[p]rograms must demonstrate their capacity to deliver high quality, developmentally appropriate services as measured by these standards, which are defined in the Colorado Quality Standards for Early Childhood Care and Education Services” (CDE, 2015d, p. 5-6). Researchers have conceptualized

ECE program quality in terms of global quality with two components: structure and process (La Paro et al., 2012). Structural quality consists of classroom materials, curriculum, teacher education, and teacher-child ratio; process quality is dynamic and focuses on human interactions occurring in the classrooms such as the teacher-child and peer-to-peer interactions (La Paro et al., 2012). Other components of ECE program quality include teacher characteristics such as teacher-child relationships, as well as, outdoor play and activity (La Paro et al., 2012).

Early childhood education programs continue to be evaluated based on their effectiveness, which is dependent on how much the stakeholders (parents, educators, and policy makers) understand about the programs and the children who are served (Saracho, 2015). Some ECE guidelines recommend that the children's developmental appropriateness is the primary measure of worth, and other guidelines focus on the knowledge that children acquire in the program to the extent that the knowledge is demonstrated to assist children in their ability to function in society is key (Saracho, 2015).

The overall effectiveness of a program is generally evaluated based on children's academic achievement scores that accurately reflect the academic achievement of students with special needs. It is important that measures being evaluated are appropriate for both the children and the program, including "children from different linguistic, cultural, and ethnic groups as well as children with several abilities and disabilities" (Saracho, 2015, p. 1264).

Colorado program standards are comprehensive and cover components that provide guidelines for early childhood programs statewide. According to the Colorado Preschool Program Handbook, “[t]hese Quality Standards are meant to be commonly applied across all programs receiving State funds” (CDE, 2015d, p. 6). The program guidelines address the children’s environment, curriculum, staffing patterns, interaction among staff and children, health and safety, nutrition, and family/staff partnership (CDE, 2015d). In 1992, the General Assembly passed Senate Bill 92-189, which established CPP as a permanent program (CDE, 2015d). Senate Bill 92-189 extended the population beyond children in need of language development, to include children “who lack overall learning readiness due to significant family risk factors” and children being served by Social Services as neglected or dependent children (CDE, 2015d).

In 2013, the Colorado legislature created 3,200 Early Childhood At-Risk Enhancement (ECARE) slots that allowed school districts the flexibility to provide their choice of half-day preschool, full-day preschool, or full-day kindergarten. In 2014, 5,000 ECARE slots were added, bringing the total possible number of children who could be served in CPP to 28,360 (CDE, 2015d). CPP enrollment is capped at a level set by the State legislature, meaning there are additional eligible children who may not receive a CPP slot. When the legislature funds an expansion of CPP, school districts can apply to CDE; a review panel determines each school district’s need and how many slots it will receive (CDE, 2015d).

To ensure that program decisions are made locally and that stakeholders have the opportunity to provide input, each school district is required by the State statute to have a

CPP advisory council, tasked with the design and implementation of their program (CDE, 2015d). Any actions taken must be approved by the school board, which “has final responsibility for the CPP Annual Report and Reapplication as well as an application to expand CPP...and for operation and maintenance of CPP within the school district” (CDE, 2015d, p. 8).

CPP funding that is made available to districts must “only be used to meet the costs of providing preschool services directly to children enrolled in each school district’s program” (CDE, 2015d). Funding includes the following expenses:

- Teacher and paraprofessional salaries and benefits;
- Supplies and materials;
- Expenses associated with home visits;
- Entire cost of any preschool program contracted services;
- Services provided by the district to children enrolled in CPP or their families;
- Associated professional development activities;
- Costs that a district would not have incurred without the services provided in conjunction with the preschool program; and
- Reasonable allocation of district overhead costs not to exceed 5% of the total CPP funding provided to the district (CDE, 2015d).

Funding for CPP during the 2013-2014 school year totaled \$79,811,309, and the average funding per pupil slot was \$3,417 (CDE, 2015e).

Special education (or special needs education), the practice of educating students who have greater needs than the general student body in a way that addresses the students' individual concerns (CDE, 2015e), is a major consideration in funding preschool programs. To improve educational opportunities for young children with disabilities, in 1986, the United States federal government passed PL 99-457, a provision of intervention services for children with disabilities who are younger than school aged (Hebbeler et al., 2011). According to Hebbeler (2011), "The Section of the law that addresses special education services for school-age children, was amended to provide the same set of rights and protections, including the right to a free appropriate public education, to children between the ages of 3 and 5" (p. 199). PL 99-457 is now The *Individuals with Disabilities Education Act* (IDEA) (Hebbeler et al., 2011). Section 619, Part B of the IDEA law focuses on the provision of special education services for preschoolers (Hebbeler et al., 2011).

States are required to make a free appropriate public education (FAPE) available to all children with specified disabilities (CDE, 2015a). The term "FAPE" includes special education and related services, provided at no cost to parents, in alignment with the Individual Educational Plan (IEP). Students ranging from three to twenty-one years of age who are unable to receive reasonable benefit from general classroom instruction alone may qualify for special education services (CDE, 2015a). Once a student has been identified as having a disability, an IEP is created to support the student's academic growth by providing interventions related to the disability. The student's IEP is monitored regularly to determine progress and whether there continues to be a need for

special educational services. The IEP requires that special education and related services meet each student's unique needs. This establishes the basis for the entitlement of each student with a disability to an individualized and appropriate education (CDE, 2015i). The interventions provided are designed to help a student with special needs progress and develop personal self-sufficiency and success in school and their community; they go beyond what is available to the student via typical classroom instruction.

The research participants are students who participated in the CPP and Preschool SPED Program. The program descriptions are provided in the introduction of this paper. Participants were statewide students who met the criteria to be selected to participate in either the CPP or Preschool SPED programs. Qualifying criteria involved the consideration of the dropout rates and graduation rates within the districts, number of qualifying un-served children, test scores of children in kindergarten and primary grades within the district, accreditation data and district performance data, demographic data, and districts that demonstrate collaboration within the community to ensure effective use of allocated resources (CDE, 2015d).

The statewide CPP and Preschool SPED function in accordance with the program standards established by the General Assembly. The General Assembly requires early childhood education programs and services to support academic success.

“The CPP Act required to Colorado Department of Education to develop program standards for CPP (22-28-108-91) (A) (C.R.S) Programs must demonstrate their capacity to deliver high quality, developmental appropriate services as measured by these standards, which are defined in the Colorado Quality Standards for Early Childhood Care and Education Services” (CDE, 2015d, pp 5-6).

The local school districts have established policy that determines child eligibility for participation. The eligibility criteria are set in Section 22-28-106 of the Colorado Revised Statutes; the factors include:

- Eligibility for free or reduced price meals
- Homelessness of the child's family
- An abusive adult residing in the home of the child
- Drug or alcohol abuse in the child's family (present or past)
- Either parent of the child was less than eighteen years of age and unmarried at the time of the birth of the child
- The child's parent or guardian has not successfully completed a high school education or its equivalent
- Frequent relocation by the child's family to new residences
- Poor social skills of the child
- Child in need of language development
- Receiving services from the Department of Human Services as a neglected or dependent child (CDE, 2015d).

The determination process is comprehensive and can include family interviews, observations of children in natural settings, collection of demographic data, standardized developmental screenings, and vision and hearing screenings (CDE, 2015d). "Many communities use the same screening tools for all children as part of a comprehensive developmental screening/application process" (CDE, 2015d, p. 12).

CPP funding made available to districts “shall only be used to meet the costs of providing preschool services directly to children enrolled in each school district’s program (22-28-108(5.5) C.R.S.)” (CDE, 2015d). Funding for CPP during 2013-2014 school year totaled \$79,811,309, the average funding per pupil slot was \$3,417 (CDE, 2015e). State funding for the program includes the following expenses: teacher and paraprofessional salaries and benefits, supplies and materials, expenses associated with home visits, the entire cost of any preschool program contracted services, services provided by the district to children enrolled in CPP or their families, associated professional development activities, costs that a district would not have incurred without the services provided in conjunction with the preschool program, and reasonable allocation of district overhead costs not to exceed 5% of the total CPP funding provided to the district (CDE, 2015d). The sample includes children who were identified for CPP using eligibility criteria set in Section 22-28-106 of the Colorado Revised Statutes.

In Colorado, by and large, a student with a disability enrolled in preschool programs is identified as a preschooler with a disability (N. Ortiz, personal communication, November 7, 2015). The specific disability (physical, cognitive, emotional) for which the student is identified is not typically documented in CDE data collections for preschool (N. Ortiz, personal communication, November 7, 2015). However, specific disability type is documented beginning in kindergarten. This data was analyzed to the extent it was available, i.e. grades K-3 (N. Ortiz, personal communication, November 7, 2015).

The children who were identified as participating in the Preschool SPED program were identified as having a disability (N. Ortiz, personal communication, November 7, 2015). The sample included two groups:

- 1) Preschoolers identified with a disability in a specific year;
- 2) Preschoolers enrolled in the Colorado Preschool Program in a specific year.

According to Ortiz (2015), any preschooler identified with a disability are eligible to receive Preschool SPED services. The Colorado Preschool Program serves a limited number of preschoolers who are at-risk for school failure. Preschoolers with disabilities are not eligible to participate in Colorado Preschool Program who were selected to participate in CPP based on eligibility factors. Children received preschool special education services if they were identified with a disability in preschool (N. Ortiz, personal communication, November 7, 2015).

Risk factors only apply to CPP, and eligibility for Preschool SPED is based solely on whether the child is identified with a disability (N. Ortiz, personal communication, November 7, 2015). Certain CPP eligibility factors such as low income, homelessness, and parental substance abuse are identified in Section 22-28-106 of the Colorado Revised Statutes (CDE, 2015d). Local school districts may establish additional eligibility factors (CDE, 2015d). According to the Colorado Preschool Program Handbook (2015), “[b]ecause CPP is capped, it is important to have a well-planned process to ensure that the program serves children with the highest need” (p. 11). Preschool special education is not capped. Any child who is determined to be eligible may receive services; however,

not every child determined eligible is ultimately placed on an IEP for a variety of reasons, including parent choice (N. Ortiz, personal communication, November 7, 2015).

To be eligible to enroll in CPP, four-year-olds must have at least one risk factor present, and three-year-olds must have at least three risk factors present (CDE, 2015e). The majority of the children enrolled in CPP have two or more risk factors. Any of these risk factors can indicate potential problems, since according to the CDE, “[r]isk factors have been shown to be associated with later challenges in school” (CDE, 2015e). Of the children, 81.6% are eligible for Free or Reduced Priced Meals, 42.2% are in need of language development, and 32.1% have poor social skills (CDE, 2015e).

In November 2015, CPP enrolled 359 children younger than three years old: 5,194 three-year-old children, 15,297 four-year-old children, and 1,509 children in kindergarten (CDE, 2015d). Including the Charter School Institute, 97% of Colorado school districts participated in CPP (CDE, 2015d). Of those students, 77.5% were served in public schools; community programs served 13.1%, and Head Start Programs served 8.6% of the children enrolled (CDE, 2015e). The students served were 49% male, 51% female, 54.3% Hispanic or Latino, 31.8% White, 7.6% Black or African American, 2.4% Asian, 2.8% Two or More Races, 0.8% American Indian or Alaska Native, 0.2% Native Hawaiian or Other Pacific Islander (CDE, 2015e).

Restatement of the Research Questions

This study addresses the following research questions:

1. What is the association between enrollment in either the Colorado Preschool Program or the Preschool Special Education Program and subsequent identification for an Individualized Educational Plan (IEP) in grades K-3?
2. Do student traits predict special education identification as documented by an Individual Educational Plan (IEP) after preschool?

The study employed a non-experimental, ex post facto research design using logistic regression to predict the occurrence of an event, in this case student traits, race, gender, and the student's disability type are examined for the predictability of special education identification in elementary school.

The sample size included 17,431 students who participated in Colorado preschool programming during the 2009-2010 school year. Utilizing extant special education and demographic data, this study examines whether a student's participation in CPP or the Preschool SPED had an association with the need for special education services after preschool. In other words, are children who participated in either CPP or Preschool SPED more or less likely to need subsequent special education services?

Using CRT as the theoretical framework to examine student traits including race, gender, and the student's disability type on special education identification in elementary school. The research was not causal, but it is intended to assess the statistical significance of factors that were associated with special education identification after

preschool. Specifically, this study considered the association between student enrollment in either the CPP or Preschool SPED had on the likelihood that students would be identified in grades K-3 requiring special education services, as documented by an IEP.

This analyses intended will yield the odds of group membership (IEP/no IEP) due to special education identification during kindergarten through third grade. Using extant special education and demographic data, this study examined whether a student's participation in Colorado ECE programming had an association with the need for special education services after preschool. This research addressed association between the student's enrollment in the CPP or Preschool SPED had on a student's identification for an IEP in grades K-3, and subsequently did demographic variables affect special education identification in elementary school.

Rationale

Quantitative methods, within the framework of the post-positivist paradigm, most effectively addressed the research question by providing clear data about the association of student enrollment in either the CPP or Preschool SPED programs on a student's identification for an IEP in grades K-3 (Gliner, 2009). Specifically, this study used a non-experimental comparative approach that allows for the comparison and differentiation of a few groups on the dependent variable (Gliner, 2009). Two groups of cohorts who participated in either the CPP or Preschool SPED programs were compared to each other. This comparative approach provided insight about related variables, effective practice, and the probability of being identified for special education services

(Gliner, 2009). As Gliner (2009) notes, independent variables may “include any predictors, antecedents, or presumed causes or influences under investigation in the study” (p. 34). Although non-experimental studies with an independent variable are limited in determining causation, “[t]hey can lead to solid conclusions about the differences between groups and about association between variables” (Gliner, 2009, p. 35).

In the comparative approach, the independent variable usually has two to four levels so that two to four groups of participants are compared, especially if the data are nominal and not ordered data, as when a number of groups are compared (Gliner, 2009). Studies using a comparative approach examine the presumed association of an attribute independent variable, which Gliner (2009) defines as a characteristic specific to the participants and not researcher controlled. These attributes can be demographic variables such as age, gender, ethnicity, or they can be used to compare a few groups based on personality traits, type of disability, or previous experiences such as the type of school that students attended (Gliner, 2009).

It is important to note, as Gliner (2009) does, “that comparative studies do not meet criteria for attributing causality because it is impossible to control for all the other variables that are extraneous to the study” (p. 92). However, when the results are statistically significant, one can report that there is a significant difference between the groups (Gliner, 2009). Using the comparative approach, this study will determine whether there is statistically significant difference among the two cohorts who participated in either the CPP or Preschool SPED programs.

This study did not establish with certainty that the cohorts are equivalent in all respects, as the case of a random assignment to a group was not possible. For this and other reasons, in an ex post facto research design, in which a researcher studies the relationship among variables after the fact, the researcher must be careful not to argue causation, but to analyze the relationships among attribute independent variables (Gliner, 2009).

Research Design

This study used special education and demographic data provided by the Colorado Department of Education. The data used was imported from Excel spreadsheets into the statistical package IBM SPSS version 23 software program. All the data examined for this study was analyzed by both descriptive and inferential statistics and logistic regression techniques using the IBM SPSS version 23 software program to report findings. The results were used to describe the association between participation in ECE preschool programming and special education identification after preschool, in addition to studying student traits that predicted special education identification during elementary school. Both Excel and SPSS were used to generate statistics and analyses.

The research design employed in this study was non-experimental, ex post facto due to the fact that the data being examined are for events that have already occurred (McMillian & Schumacher, 2001). Nothing in this study happened to impact or change the treatment of any participants or the groups. An ex post facto causal-comparative, or non-experimental quantitative approach was used in the evaluation of each cohort

(Kerlinger, 1986). Non-experimental research required that the independent variables were not within the bounds or influence of the researcher's control (Kerlinger, 1986).

Research Analysis

Analytic descriptive studies involve description, comparison, and forecasting which are complex interrelated cognitive activities that are infrequently used singularly or in a linear process (Rossman & Rallis, 2012). The idea of describing a phenomenon of interest as fully as possible is the foundation for subsequent comparing or forecasting (Rossman & Rallis, 2012). "Through a similar logic, making comparison across examples of a program yields rich descriptions and deep understanding that inform judgments" (Rossman & Rallis, 2012, p. 13).

Logistic regression was chosen to give the researcher the tools to measure the relations among factors including categorical and continuous variables having a twofold outcome (Creswell, 2005). This form of statistical analysis creates the ability to show associations between outcomes displayed and the direction, form, and strength of the relationships to be shown (Creswell, 2005).

For example, are there more students identified at each grade level in one group compared to the other? Studying extant data, this research examined whether a student's participation in these programs had an association with the need for special education services in elementary school. CDE provided the data in reports that the researcher interpreted and analyze (N. Ortiz, personal communication, November 7, 2015). The Agreement outlines how the data was utilized for the purpose of the study (Appendix A). In accordance with the Agreement, the data from the two cohorts was analyzed to

determine if there was any significant difference in the number of students receiving special education services documented by an IEP at each grade level from kindergarten through third grade (Appendix A).

When children enter kindergarten, the data reflected student attributes including gender, race, ethnicity, administrative unit/school district, native language, and disability type (N. Ortiz, personal communication, November 7, 2015). The disability type was not recorded during the preschool years (N. Ortiz, personal communication, November 7, 2015). The attributes of the kindergarten through third grade students with an IEP was documented (N. Ortiz, personal communication, November 7, 2015). Demographic data including race, gender, and student's disability type was examined for the purpose of this analysis. The study examined the students' attributes that contribute to special education identification and compare the data to determine any differences among these groups (Appendix A). The study examined each attribute at each grade level and compare each grade level across each cohort (Appendix A). The study was then able to compare each cohort for the different number of students identified for special education services (Appendix A).

The cohorts were sorted as nominal variables. In each case, "the categories are distinct and non-overlapping but not ordered; thus, each category in the variable ethnic group is different from each other, but there is no necessary order to the categories" (Gliner, 2009, p. 138). This study summarizes the data, using descriptive tables and statistics including frequency distribution, variability, number of categories, and association using cross-tabulation (Gliner, 2009). Cross-tabulation tables are designed to

show the association between nominal variables, which have distinct unordered levels or categories, each participant in only one level (Gliner, 2009). This study presents the statistical significance of any difference or correlation in the data among the cohorts (Gliner, 2009).

Critical Race Theory was used to analyze factors that are associated with special education identification across the program areas by demographic areas including race, gender, and student disability type (Creswell, 2012).

One area of theory that has been particularly responsive to issues of cultural difference is Critical Race Theory (CRT), which focuses theoretical attention on race and how racism is deeply embedded within the framework of American society. “Racism has directly shaped the U.S. legal system and the way people think about the law, racial categories, and privilege...Since many stories advance White privilege through majoritarian master narratives, counter-stories by people of color can help to shatter the complacency that may accompany such privilege and challenge the dominant discourses that serve to suppress people on the margins of society “(Creswell, 2012, p. 31-32).

CRT has three goals. First, it aims to present stories about discrimination from the perspective of people of color, which may include qualitative case studies of descriptions and interview. Cases may be drawn together to substantiate against racially biased and discriminatory practices (Creswell, 2012). Second, CRT advocates for the abolition of racial suppression while concurrently recognizing that race is a social construct; in this regard, race is not fixed but subject to political pressures informed by individual lived experiences (Creswell, 2012). The third and final goal of CRT is to address areas of difference including gender, class, and any inequities experienced by individuals (Creswell, 2012). Overall, CRT is “concerned with empowering human

beings to transcend the constraints placed on them by race, class, and gender” (Creswell, 2012, p. 30).

CRT can be useful for considering the ways that whiteness, as a construct of privilege, manifests itself in ways that affect schooling in early educational settings like preschool (Adair, 2014). Through the lens of CRT this study examined whether the demographic data supports the application of CRT or explains any potential variance in the results.

Data Collection and Confidentiality

The data collection in collaboration with CDE dictates the conditions whereby the data can be utilized for the purpose of this research. The researcher agreed to adhere to CDE specified security protocols as outlined in the Agreement (Appendix A). As specified by the CDE, the Agreement details that CDE is charged with collecting and securely maintaining the data collected. It outlines the intent and describes the research question, variables of interest, and analytical approach of the research. The Agreement outlines the objective and intent of the researcher for the purpose of conducting the study and the use of student information and educational records. The Colorado Revised Statutes for collecting student data from CDE, consequences for failure to comply with the Agreement, and any violation of the Agreement is outlined in the Agreement. Appendix A lists the policies and procedures from the Data Sharing Agreement.

This study did not require the development or use of any instruments used for data collection, including questionnaires, surveys, coding protocols, or interview scripts. The study did not require letters to staff, students, or parents seeking permission for

individuals to participate in this study. The results are based on the researcher's analysis of the extant data securely collected by the CDE from local education agencies as part of required annual data collections and warehoused on CDE premises/servers.

The data included the following:

- Cohort 1 December Count: The Special Education data from the December Count for the students who were in the Colorado Preschool Program in 2009-10, were not on an IEP, and enrolled in Kindergarten in 2010-11;
- Cohort 1 October Count: The demographic information from the October Count for the students enrolled in the CPP;
- Cohort 2 December Count: The Special Education data from the December Count for the students who were in special education in preschool in 2009-10 and in kindergarten in 2010-11;
- Cohort 2 October Count: The demographic data from the October Count for the special education preschoolers.

Individual-level confidentiality is maintained by the State, and all the identities of students, staff, schools, and districts were masked and managed by the State staff except to the extent necessary to provide district and demographic information to the Requestor as outlined in the data analysis. Child-level records were stripped of students' first and last name and replaced with encrypted unique student identifiers. Relevant data fields as outlined in the data analysis were then attached to each record.

CDE is a State Education Agency responsible for the implementation of education laws adopted by the State of Colorado. In fulfillment of law found in the Colorado Revised Statutes, CDE is charged with collecting and securely maintaining unit record data on students enrolled in the state's local education agencies (LEAs). A Data Protocol (C.R.S. 24-37.5-705) provides authorization for each state agency to share data with other state agencies, political subdivisions, and non-governmental entities and individuals. CDE was in control of the preparation of the student records, all data files given to the researcher. The CDE's definition of confidentiality reads as follows:

The term confidential information as used in this Agreement means any and all student information provided by the State to the requester which is protected by the Family Educational Rights and Privacy Act (FERPA), 20 U.S.C. Sec. 1232g and all other similar federal and State laws. Such personal information is also exempt from mandatory disclosure by the State under the terms of the State public disclosure laws codified as Title 24, Article 72, regarding Colorado Laws Concerning Public (Open) Records. For the purposes of this Agreement, confidential information also means personally identifiable information (PII). PII includes but is not limited to the student's name; the name of the student's parent or other family members; the address of the student or student's family; a personal identifier, such as the student's social security number, student number, or biometric record; other indirect identifiers, such as the student's date of birth, place of birth, and mother's maiden name; other information that, alone or in combination, is linked or linkable to a specific student that would allow a

reasonable person in the school community, who does not have personal knowledge of the relevant circumstances, to identify the student with reasonable certainty; or information requested by a person who the educational agency or institution reasonably believes knows the identity of the student to whom the education record relates. PII also means a dataset that is linked to a specific individual and that would allow a reasonable person in a school community, who does not have knowledge of the relevant circumstances, to identify the individual with reasonable certainty (CDE, Data Sharing Agreement, 2015).

Neither the researcher nor CDE shall assign its rights or responsibilities under this Agreement without the written authorization of all the other parties (Appendix A). The stewards shall ensure that access to the original data covered by this data sharing agreement shall be limited to eligible personnel between the agencies and the minimum number of individuals necessary to achieve the purposes stated in the IDEA. The use of extant data prohibited acquiring informed consent. Based on the time frame and program, there is a small risk of being able to identify a preschool participant, but no identifiers linked to districts, schools, or individuals was reported.

Anticipated Limitations

The scope of this study was limited to student special education and demographic extant data collected by the Colorado Department of Education on students enrolled in the Colorado ECE programming CPP and Preschool SPED. The extant data used for this study were collected and maintained by CDE, and results are based on the data made available to the researcher (N. Ortiz, personal communication, November 7, 2015).

Chapter Four

Introduction

Chapter four presents the results of the data analysis using descriptive and inferential statistics, cross-tabulation, chi-square test of association, logistic regression, description of the data sample analyzed, data preparation, data inclusion dates, research question one and two results, and limitations/ethical considerations are reported.

Descriptive and Inferential Statistics

A statistic is a characteristic or a fact of a sample (Weiss, 2012). Descriptive statistics involves the collection, organization, summarizing, and graphical displays of data, and these methods are used to examine and analyze information (Weiss, 2012). Data are the values or measurements that variables describing an event can assume (Weiss, 2012). Descriptive statistics is used to summarize and display data (Weiss, 2012). Using descriptive statistics allows for vast amounts of data to be accurately summarized and provides the big picture either graphically or numerically (Weiss, 2012). “Descriptive statistics includes the construction of graphs, charts and tables and the calculation of various measures such as averages, measures of variation, and percentiles” (Weiss, 2012, p. 4).

Inferential statistics includes making inferences, hypothesis testing, determining relationships, and making predictions (Weiss, 2012). “Inferential statistics consists of methods for drawing and measuring the reliability of conclusions about a population

based on information obtained from a sample of the population (Weiss, 2012, p. 4). The purpose of descriptive statistics is to summarize or display data to provide an overview. Inferential statistics allow the researcher to make claims or draw conclusions about the population based on a sample of the data from the population representing all possible outcomes or measurements of interest (Weiss, 2012). Inferential statistics is the logic and procedures concerned with making predictions or inference about the population from an analysis of a sample (Frankfort-Nachmias & Leon-Guerrero, 2011).

Cross-Tabulation

Cross tabulation is a technique for analyzing the relationship between two nominal or ordinal variables that have been organized into a table whose cells are frequency counts (Frankfort-Nachmias & Leon-Guerrero, 2011). Cross tabulation is a type of bivariate analysis, used to detect and describe the relationship between variables that determine whether two variables are associated and to determine the strength of the association (Frankfort-Nachmias & Leon-Guerrero, 2011). The study presents data using cross-tabulation to show whether there is an association between variables (Frankfort-Nachmias & Leon-Guerrero, 2011). Once the cross-tabulation is complete, the next step in the research is to analyze the statistical significance of the association using the chi-square statistic.

Chi-Square Test

The chi-square test is an inferential statistical method designed to test for the significance of relationships between two categorical variables organized on a bivariate table (Frankfort-Nachmias & Leon-Guerrero, 2011). The chi-square test is frequently

used in the social sciences because it has a range of research applications (Frankfort-Nachmias & Leon-Guerrero, 2011). The chi-square test is often used to compare the proportion of cases from a sample with hypothesized values or those obtained from a comparison population (Pallant, 2013). “Chi-square requires no assumptions about the shape of the population distribution from which a sample is drawn” (Frankfort-Nachmias & Leon-Guerrero, 2011, p. 340). Chi-square can be applied to nominally or ordinally measured variables including grouped interval-level data (Frankfort-Nachmias & Leon-Guerrero, 2011).

Logistic Regression

Logistic regression was conducted to address the research questions. Hosmer and Lemeshow (2000) describe logistic regression as a technique that describes the best relationship between the dependent (outcome or response) variable and a set of independent (predictor or explanatory) variables. Logistic regression can be utilized when the dependent variable is dichotomous while the independent variable can be similar to any variable used in linear regression. For this research study, the dependent variable was the student’s special education identification. Hosmer and Lemeshow (1989) proposed a cohort study be devised around a twofold dependent variable and allow the independent (stratification) variables to emerge as possible explanations or predictors for subsequent cohort testing. One unique design that is interesting to consider in the context of logistic regression models is a simultaneous comparison of multiple factors between two groups (Harrell, 2001). The independent comparative variables in the present study were race, gender, and the student’s disability type for special education

identification in elementary school. Logistic regression can be used to predict a dependent variable on the basis of continuous and/or categorical independent variables and to determine the amount of variance in the dependent variable explained by the independents. Logistic regression is also useful in that it allows the researcher to rank the relative importance of independent variables, assess interaction effects, and to ultimately understand the impact of covariate control variables.

This study is being conducted in collaboration with the Colorado Department of Education (CDE). The CDE Data Sharing Agreement (hereafter Agreement, referenced in Appendix A) details the intent to conduct analysis through the use of student information, education records, and data (hereafter student records), in order to assess the association, if any, on a student's identification for an IEP in grades K-3. It was expected by CDE that the protocols outlined in the CDE Data Sharing Agreement will be followed; therefore, the research design for this study was influenced by the terms of the CDE Data Sharing Agreement which outlines the research question, variables, and analyses.

Description of Data Analyzed

Special education and demographic extant data from two cohorts provided by the CDE, also referred to as "the State" within the Agreement, included the following:

Cohort Groups:

1. CPP-funded children in 2009-2010: Children funded with full or half-day CPP slots in the 2009-10 Student October Count, not on an IEP in December Count, enrolled in kindergarten the following year;

2. Children enrolled in Preschool SPED in 2009-10: Children receiving a preschool IEP according to 2009 December Count, in kindergarten the following year.

Comparison Groups/Filters:

1. Preschoolers in Special Education (2009-10)
 - a. Enrolled in kindergarten the following year
2. Colorado Preschool Program (2009-10)
 - a. Not on an IEP in December Count
 - b. Enrolled in kindergarten the following year (2010-11)
 - c. Not state funding for preschool 2008-09 or 2009-10
 - d. Enrolled in kindergarten in 2010-11

Variables

1. Student Identification Number
2. Years Student participated, Preschool – Third Grade (2010-2014).
3. Grades - Preschool through Third Grade
4. Gender (Male/Female)
5. Collapsed 12 ethnicity categories to 5 categories. The complete list of the 12 ethnicity categories in Appendix B.
6. English Language Learner (ELL) Yes or No
7. Collapsed 9 Language Proficiency categories to 4 categories. The complete list of 9 Language Proficiency categories are listed in Appendix C.

8. The 245 location categories that range from Administrative Unit, School District, District Organization Type, and District of Key Attendance are listed in Appendix D.
9. IEP Status Yes or No (K-3rd grade)
10. Collapsed 18 Disability Type categories to 6 categories. The complete list of 18 Disability Type categories are listed in Appendix E.
11. Retention Codes including: Error, Unreported, No (Not Applicable), Yes (student is being retained in same grade for next school year, and 12 graders who will participate in the ASCENT 5-year program next year.

The use of extant data prohibited acquiring informed consent, based on the timeframe and program. There is minimal risk of being able to identify a preschool participant based on their special education records or demographic information. No identifiers linked to individuals were reported.

Data Preparation

In quantitative research, the researcher begins by converting the raw data into a useful form of data for analysis (Creswell & Plano-Clark, 2011). Data preparation involves scoring the data and assigning numeric values to each response, cleaning data entry errors from the database, and creating special variables that are needed, recoding items or computing new variables that comprise multiple items that form scales (Creswell & Plano-Clark, 2011). The researcher started data cleaning by examining each spreadsheet provided by the Colorado Department of Education noting the different variables among the spreadsheets.

Colorado Preschool Program Cohort One October (CPP C1 OCT) Spreadsheet included –Student Identification number, School Year, Corresponding Grade, Gender, Ethnicity, Language Proficiency, District Number, Individual Educational Plan (IEP) Yes or No, Student Disability Code, Student Retention Code. Data were presented in 10 columns with 64,674 rows of data.

Colorado Preschool Program Cohort One December (CPP C1 DEC) Spreadsheet included – Student Identification Number, School Year, Corresponding Grade, Gender, Ethnicity, English Language Learner Yes or No, Regional Code, District Residence, District Attendance, Student Disability Code. Ten columns and 2,422 rows of data were provided.

Preschool Special Education Program Cohort Two October (SPED C2 OCT) Spreadsheet included – Student Identification Number, School Year, Corresponding Grade, Gender, Ethnicity, Language Proficiency, District Number, Individual Educational Plan (IEP) Yes or No, Student Disability Code, Student Retention Code. Ten columns and 18,558 rows of data were provided.

Preschool Special Education Program Cohort Two December (SPED C2 DEC) Spreadsheet included – Student Identification Number, School Year, Corresponding Grade, Gender, Ethnicity, English Language Learner Yes or No, Regional Code, District Residence, District Attendance, Student Disability Code. Ten columns and 14,225 rows of data were provided.

The following steps were taken in preparing the data provided for analysis:

- CPP C1 OCT - The researcher eliminated District Number that indicates the district location because there are 454 Codes which is too many levels to include in the analysis.
- CPP C1 OCT – The researcher eliminated Student Retention Codes because the data were documented differently by several districts.
- CPP C1 DEC - The researcher eliminated Regional Code that shows school districts and Boards of Cooperative Educational Services (BOCES) because there are 68 Codes which is too many levels to include in the analysis.
- CPP C1 DEC – The Researcher eliminated District Residence Code that shows the specific location of the program because there are 454 codes which is too many levels to include in the analysis.
- CPP C1 DEC – The researcher eliminated District Attendance Code that also shows the specific location of the program because there are 454 codes which is too many levels to include in the analysis.
- SPED C2 OCT – The researcher eliminated District Number that indicates the district location because there are 454 Codes which is too many levels to include in the analysis.
- SPED C2 OCT - The researcher eliminated Student Retention Codes because the data were documented differently by several districts.

- SPED C2 DEC - The researcher eliminated Regional Code that shows school districts and Boards of Cooperative Educational Services (BOCES) because there are 68 Codes which is too many levels to include in the analysis.
- SPED C2 DEC - The researcher eliminated District Residence Code that shows the specific location of the program because there are 454 codes which is too many levels to include in the analysis.
- SPED C2 DEC – The researcher eliminated District Attendance Code that also shows the specific location of the program because there are 454 codes which is too many levels to include in the analysis.
- CODING – The researcher created codes for each variable consistent across the four spreadsheets. Variables that had more than six categories were collapsed into six or fewer categories. Based on the new codes and categories, the Preschool Code book was developed to document how the variables were further defined in a file on IBM Statistical Package for the Social Sciences (SPSS) Version 23.
- Combining Data – The researcher combined the four spreadsheets (CPP C1 OCT, CPP C1 DEC, SPED C2 OCT, and SPED C2 DEC) in Excel by aligning the columns by variable.
- To ensure all of the variables were included, two additional columns were added to reflect data from each spreadsheet including English Language Learners (ELL) and Student Disability.

- To track which data were represented within the four spreadsheets, a column was added indicating the program, cohort, and the month of each spreadsheet (CPP_SPED_STATUS).
- Upload to SPSS – The researcher uploaded combined spreadsheets (CPP C1 OCT, CPP C1 DEC, SPED C2 OCT, and SPED C2 DEC) into IBM SPSS.

Using SPSS, the researcher linked data by student identification number resulting in 17,431 cases. The variables spread across 147 columns and yielded 2,562,357 individual data points. Student ID was consistent for all 17,431 cases. There was no redundancy or missing data, and therefore no changes were made to this column.

The researcher determined data definitions for Grades 1-5 variables, and renamed the variable Preschool, Kinder, Gr1, Gr 2, Gr 3 (previously Grades 1-5). The researcher eliminated Grade.6 through Grade.18 due to a large number of missing data points.

The researcher eliminated Gender.2 through Gender.18 because the variable was repeated in Gender.2 through Gender.5, and Gender.6 through Gender.18 were eliminated due to a large number of missing data points.

The researcher eliminated Ethnicity.2 through Ethnicity.18 because the data were repeated in Ethnicity.2 through Ethnicity.5, and Ethnicity.6 through Ethnicity.18 were eliminated due to a large number of missing data points.

The researcher eliminated Language.6 through Language.18 because there was a large number of missing data points.

The researcher eliminated IEP.6 through IEP.9 because there was a large number of missing data points.

The researcher eliminated DisabilityOCT.6 through Disability OCT.9 because there was a large number of missing data points.

The English Language Learners (ELL) category was eliminated due to the large percentage of missing data and inconsistent statewide reporting.

Data Inclusion Dates

1. Cohort 1 December Count: The Special Education data from the December Count for the students who were in the Colorado Preschool Program in 2009-10, were not on an IEP, and enrolled in Kindergarten in 2010-11.
2. Cohort 1 October Count: The demographic information from the October Count for the students enrolled in the CPP.
3. Cohort 2 December Count: The Special Education data from the December Count for the students who were in special education in preschool in 2009-10 and in kindergarten in 2010-11.
4. Cohort 2 October Count: The demographic data from the October Count for the special education preschoolers.

Research Question One Results

1. What is the association between enrollment in either the Colorado Preschool Program or the Preschool Special Education Program and subsequent identification for an Individualized Educational Plan (IEP) in grades K-3?

The population for the study consisted of 17,431 cases. These cases represent the total number of students who enrolled Colorado ECE programs CPP and Preschool SPED for the 2009-2010 school year (Table 1). The students whose data were available consisted of 9,454 males representing 54.2% of the participants; 7,977 females made up 45.8% of the participants. Table 1 shows the distribution of the population by ethnicity indicates that Hispanic students represented 50.4% of the total of cases, Caucasian students were the next largest group at 38.5% followed by African American students (5.9%), Asian (2.4%), Other including two or more races (1.7%), and American Indian/Alaska Native (1.1%).

Table 1			
<i>Gender and Ethnicity Distribution</i>			
	Variable	N	Percent
Gender	Male	9,454	54.2
	Female	7,977	45.8
	Total	17,431	100.0
Ethnicity	Other	303	1.7
	American Indian/Alaska Native	188	1.1
	Asian	416	2.4
	African American	1,029	5.9
	Hispanic	8,790	50.4
	Caucasian	6,705	38.5
	Total	17,431	100.0

The CPP cohort was triple the size of the Preschool SPED cohort and illustrated the total number of participants in each group shown in Table 2.

Table 2			
<i>Cohort Status of the Population</i>			
		Frequency	Percent
	CPP	13,549	77.7
	SPED	3,882	22.3
	Total	17,431	100.0

Note. CPP = Colorado Preschool Program; SPED = Preschool Special Education

After preschool, the student's disability type was documented as one of 15 categories (Appendix B). The 15 disability types were collapsed into five categories including: No Disability, Physical Disability, Intellectual Disability, Emotional Disability, Other for the purpose of the analysis. Disability type data were missing for 365 cases resulting in 17,066 valid cases to analyze. The students with no disability type represented the highest percentage at 76.3%. The most common disability type was students with a physical disability at 20.4%, intellectual disability type at 1%; emotional and other disability types were less than 1%. Disabilities recorded are presented in Table 3.

Table 3 shows the disability frequencies which indicates the more likely disability type was a physical disability which was 20.4% of all the cases. Physical disability was 21.33 times more likely to be the disability type than intellectual disability which was the next highest category.

Table 3					
<i>Disability Type, Frequency, and Percentage of the Sample</i>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Disability	13,306	76.3	78.0	78.0
	Physical Disability	3,563	20.4	20.9	98.8
	Intellectual Disability	167	1.0	1.0	99.8
	Emotional Disability	11	.1	.1	99.9
	Other	19	.1	.1	100.0
	Total	17,066	97.9	100.0	
Missing		365	2.1		
Total		17,431	100.0		

During elementary school, students with no IEP decreased from 78.8% to 78.7%. Upon initial analysis, results showed that out of the 17,431 cases only 1.3% of the students moved between No-IEP to Yes-IEP. The preschool CPP cases were all No-IEP and the Preschool SPED cases were all Yes-IEP. Students with no disability increased by five cases. There was a high percentage of students with physical disabilities 15.6%. After preschool, the researcher learned that 15.6% of the students have a physical disability in elementary school.

All of the students in Preschool SPED received special education services documented on an IEP, representing 22.3% of the total population as shown in Table 4. During preschool, students were identified as having a specific disability, therefore no disability type was recorded for this group. All of the students participating in CPP did *not* receive special educational services and did *not* have an IEP.

Table 4			
<i>Preschool IEP Status</i>			
		Frequency	Percent
Preschool IEP	NO	13,549	77.7
	YES	3,882	22.3
	Total	17,431	100.0

Note. No = No IEP for the student; Yes = Yes IEP for the student

The cross-tabulation displays the relationship between the CPP population that shows a no response to IEP and the SPED population that showed a yes response to IEP as shown in Table 5. This represents the number of times each of the possible category combinations occurred in the sample data depicting that the 17,187 cases are related variables (Frankfort-Nachmias & Leon-Guerrero, 2011). Table 5 shows that there was an association between IEP identification (Yes/No) and the cohort variables. The test of significance showed that the variables were associated, so now the analysis moved to logistic regression to see if there were significant predictors of special education identification as documented by an IEP.

Table 5				
<i>IEP Cross Tabulation Results</i>				
		IEP		Total
		No	Yes	
Program	CPP	13,726	0	13,726
	SPED	0	3,461	3,461
Total		13,726	3,461	17,187

Research Question Two Results

2. Do student traits predict special education identification as documented by an Individual Educational Plan (IEP) after preschool?

A significant association at $p < .001$ was found, $\chi^2(1) = 17,187.00$. The dependent variable was coded as No = 0, and Yes = 1. Coding of the predictor variables is provided in Table 6.

Table 6						
<i>Logistic Regression Predictor Variable Coding</i>						
		Frequency	Parameter coding			
			(1)	(2)	(3)	(4)
Ethnicity	American Indian Alaska Native	176	1.000	.000	.000	.000
	Asian	454	.000	1.000	.000	.000
	African American	1,031	.000	.000	1.000	.000
	Hispanic Latino	7,593	.000	.000	.000	1.000
	Caucasian	7,517	.000	.000	.000	.000
Disability	No	13,305	1.000			
	Yes	3,466	.000			
Gender	Male	8,981	1.000			
	Female	7,790	.000			

The next step in the research was to analyze through the chi square statistic the significance of the association presented in Table 7. The test of model coefficients provides an overall indication of how well the model performed, in this case $p < .001$,

indicating significant prediction of special education status based on the predictor variables (Table 7). This indicated that when all the predictors were considered together, the model was significant ($\chi^2 = 15,100.67$, $df = 6$, $p < 0.001$).

Table 7				
<i>Omnibus Test of Model Coefficients</i>				
		Chi-square	<i>df</i>	Sig.
Step 1	Step	15,100.67	6	$p < .001$
	Block	15,100.67	6	$p < .001$
	Model	15,100.67	6	$p < .001$

The Hosmer and Lemeshow test is the most reliable test of model fit available in IBM SPSS, and is interpreted differently than the omnibus test (Pallant, 2013). “For the Hosmer-Lemeshow Goodness of Fit Test poor fit is indicated by a significance value less than .05” (Pallant, 2013, p. 183). In this case, the chi-square value with six degrees of freedom for the Hosmer-Lemeshow Test was 23.00, with a significance of $p < .05$, indicating overall inadequate model fit to the data. However, as shown in Table 8, observed and expected values were generally close at most steps in the computation.

Table 8						
<i>Contingency Table for Hosmer and Lemeshow Test</i>						
		IEP = No		IEP = Yes		Total
		Observed	Expected	Observed	Expected	
Step 1	1	503	503.22	1	.79	504
	2	3,301	3,297.55	3	6.45	3,304
	3	490	494.67	6	1.33	496
	4	2,703	2,704.34	10	8.66	2,713
	5	3,214	3,208.20	5	10.80	3,219
	6	2,865	2,869.40	20	15.60	2,885
	7	251	248.68	1124	1,126.32	1,375
	8	71	71.96	2,204	2,203.04	2,275

“The Cox & Snell R Square and the Nagelkerke R Square values provide an indication of the amount of the variation in the dependent variable explained by the model” (Pallant, 2013, p. 183). The Cox and Snell R Square and the Nagelkerke R Square values provide an indication of the amount of the variation in the dependent variable from a minimum value of 0 to a maximum of approximately 1, these are described as pseudo-R square statistics instead of true R square values seen in multiple regression (Pallant, 2013). While the Cox and Snell was 0.59, the Nagelkerke R Square indicates a high pseudo-R square similar to linear regression that applies to the logistic regression. The Nagelkerke R square was 0.94.

The classification table provides an indication of how well the model is able to predict the correct category for each case (Pallant, 2013). “The positive predictive value is the percentage of cases that the model classifies as having the characteristic that is actually observed in this group” (Pallant, 2013, p. 183). The classification tables

illustrate the overall percentage of correctly classified cases. Table 9 shows the correct classification for the constant only model was 79.9%.

Table 9				
<i>Constant Only Model Classification</i>				
		IEP		Percentage Correct
		No	Yes	
IEP	No	13,398	0	100.0
	Yes	3,373	0	.0
Overall Percentage				79.9

Note: Constant is included in the model.

Table 10 shows the overall predicted classification for CPP/SPED was 99.1% accurate during elementary school. Table 10 model correctly predicts the outcome for nearly 99% of the cases, indicating that the model predicted special education identification based on cohort status in preschool with strong accuracy. CPP being No-IEP and, Preschool SPED being Yes-IEP. Cohort status was predicted at 99.2% for CPP, and cohort status was predicted at 99% for Preschool SPED. As mentioned previously, students in Preschool SPED received special education services documented on an IEP. Although, preschool students were not identified as having a specific disability, all of the students who participated in CPP did not receive special educational services and did not have an IEP.

Table 10					
Classification Model with Predictors					
Classification Table ^a					
			Predicted		
			COHORT STATUS		Percentage Correct
			CPP	SPED	
Step 1	COHORT STATUS	CPP	13,358	112	99.2
		SPED	37	3,559	99.0
	Overall Percentage				99.1
	a. The cut value is .500				

Table 11 gives information regarding the contribution or importance of each of the predictor variables. The Wald test provides the value of the statistic for each predictor. The *p* value indicates that the variable contributes significantly or not to the predictive ability of the model (Pallant, 2013). The *df* column indicates the degrees of freedom, which is the number of scores that are free to vary in calculating a statistic (Frankfort-Nachmias & Leon-Guerrero, 2011).

The positive or negative β (slope or regression coefficient) value indicates the direction of the relationship--which factors increase the likelihood of a yes response and which factors decrease it (Pallant, 2013). “Negative β values indicate that an increase in the independent variable score will result in a decreased probability of the case recording a score of 1 in the dependent variable” (Pallant, 2013, p. 184).

The $\text{Exp}(\beta)$ column of the Variables in the Equation table provides odds ratios (OR) for each of the independent variables (Pallant, 2013). “The odds ratio represents

the change in odds of being in one of the categories of outcome when the value of the predictor increases by one unit” (Pallant, 2013, p. 184).

Table 11 displays the summary of model variables from the logistic regression for research question two. Gender, ethnicity, and disability were statistically significant ($p < 0.05$). Gender was a stronger predictor than ethnicity: Male (Gender) $\text{Exp}(\beta) = 1.72$, $\beta = 0.54$, $p < 0.05$, followed by Asian $\text{Exp}(\beta) = 1.36$, $\beta = 0.30$, $p < 0.05$, Hispanic $\text{Exp}(\beta) = 0.61$, $\beta = -0.49$, $p < 0.05$, African American $\text{Exp}(\beta) = 0.48$, $\beta = -0.74$, $p < 0.05$. Table 11 shows males were 1.72 times as likely to be identified for special education services with an IEP than females ($e^{.54}$). This research indicates that gender was a significant predictor as were Hispanic and African American student’s ethnicity, along with students identified with a physical disability.

The odds ratio for Hispanic students was ($\text{OR} = 1/0.61$) 1.64, meaning that Hispanic students were 1.64 times as likely to be identified for special education services as documented by an IEP ($e^{-.49}$) as Caucasian students. The odds ratio for African American students was 2.08, meaning that African American students were 2.08 times as likely to be identified for special education services as documented by an IEP ($e^{-.74}$) as Caucasian students. The data did not show either Native American/Alaska Native ($p = 0.335$) or Asian ($p = 0.541$) ethnicity as significant predictors for special education identification in the model. Native American students were 1.84 times as likely to be identified for special education services as documented by an IEP ($e^{-.62}$) as Caucasian students. Asian students were 0.74 times as likely to be identified for special education

services as documented by an IEP (e^{-30}) as Caucasian students, but neither coefficient was statistically significant.

Table 11 shows physical disability status had an $\text{Exp}(\beta) < 0.001$, significant at $p < .001$ --the largest odds ratio value from the analysis ($\text{OR} > 1,000$) meaning that it had the largest impact in these data (more than 1,000:1 odds of an IEP for students with a physical disability compared to no disability). Students with no disability were the same students who participated in CPP compared to the students with a disability who participated in Preschool SPED programing.

Disability status by far dominated the results so that if a student was identified for a physical disability, that predicted whether the child had special education services as documented by an IEP far beyond any of the other variables. The identification of a physical disability was far more predictive than ethnicity and or gender in special education identification as represented by an IEP in elementary school as shown in Table 11.

Table 11							
<i>Predictors of IEP Status</i>							
Variables in the Equation							
		β	S.E.	Wald	<i>df</i>	<i>p</i>	Exp(β)
Constant Only	Constant	-1.4	.01	5,126.45	1	<.001	.25
Variables in the Equation							
		β	S.E.	Wald	<i>df</i>	<i>p</i>	Exp(β)
Predictor Model	Male (Gender)	.54	.15	12.57	1	<.001	1.72
	All Ethnicity			14.00	4	.007	
	American Indian/Alaska Native	-.62	.64	.93	1	.335	.54
	Asian	.30	.50	.37	1	.541	1.36
	African American	-.74	.31	5.64	1	.018	.48
	Hispanic	-.49	.16	9.46	1	.002	.61
	Disability	-8.81	.17	2,552.05	1	<.001	<.001
	Constant	3.06	.15	442.73	1	<.001	21.37

When students were identified for physical disabilities in preschool, they received an IEP for special education services and were classified into a specific cohort based on that identification, which was far more likely to predict special education status than any of the other disability types. There were 3,369 students identified as having a disability as documented with an IEP. Figure 1 illustrates that of the four student disability types: physical, intellectual, emotional, and other, the most frequent disability type was physical. Physical disability type was 80.65%, followed by intellectual disability type at

16.44%. Students with an emotional disability type was 2.73%, and students with other disabilities types were 0.18%.

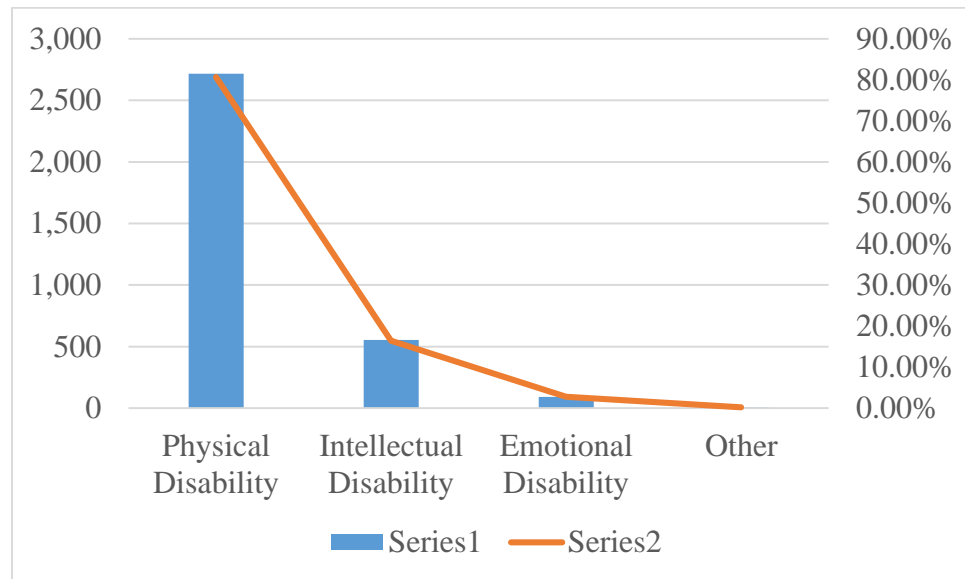


Figure 1. Disability Type Frequencies.

Table 12 shows the ethnic background for each of the cohort groups. The CPP cohort was comprised of 1.9% Two or More Races, 1.0% American Indian/Alaska Native, 2.5% Asian, 6.0% African American, 55.1% Hispanic, and 33.6% Caucasian students. The Preschool SPED cohort was comprised of 2.1% Two or More Races, 1.1% American Indian/Alaska Native, 1.9% Asian, 4.4% African American, 35.1% Hispanic, and 55.5% Caucasian students. According to Table 12, ethnicity does not appear to be a factor of overrepresentation of African American or Hispanic students' identification for special education as documented by an IEP from kindergarten through third grade. Once the cohort groups are separated it appears that both Hispanics and African Americans are underrepresented in special education identification. Hispanics are 50.4% of the total

population and 35.1% of the special education population. African Americans are 5.9% of the total population and 4.4% of the total population.

Table 12				
<i>CPP and Preschool SPED Ethnicity Background</i>				
CPP	Ethnicity	Percent	Valid Percent	Cumulative Percent
	Two or More Races	1.9	1.9	1.9
	American Indian /Alaska Native	1.0	1.0	2.9
	Asian	2.5	2.5	5.3
	African American	6.0	6.0	11.3
	Hispanic	55.1	55.1	66.4
	Caucasian	33.6	33.6	100.0
	Total	100.0	100.0	
	Ethnicity	Percent	Valid Percent	Cumulative Percent
Preschool SPED	Two or More Races	2.1	2.1	2.1
	American Indian /Alaska Native	1.1	1.1	3.2
	Asian	1.9	1.9	5.0
	African American	4.4	4.4	9.4
	Hispanic	35.1	35.1	44.5
	Caucasian	55.5	55.5	100.0
	Total	100.0	100.0	

The researcher did not use grade to determine predictive factors or longitudinal analysis. The data set did not have consistent chronological grades and years in tandem that could be linked to the student identification number.

Chapter Five

Introduction

Chapter five presents the significance of the research for students, policy, and practice, interpretation of key findings, implications, limitations and ethical considerations, and the recommendations for future research.

Significance for Students, Policy and Practice Implications

Research showed children struggling academically are more likely to come from lower socioeconomic status backgrounds (Lonigan et al., 2015). It is essential that children who participated in ECE programming acquire academic knowledge and skills to improve their developmental trajectories upon enrolling primary and secondary education (Lonigan et al., 2015). The White House (2016) asserts that during a child's early years, there is an opportunity to develop a child's full potential and shape key academic, social, and cognitive skills.

The Colorado Department of Education, is committed to increasing achievement levels for all students through comprehensive early childhood education programs and educational reform (CDE, 2015a). CDE is responsible for providing supervision for accreditation, teacher licensing, school transportation, school nutrition, special education, and early childhood education (CDE, 2015c). Colorado early childhood education programming has two preschool classifications that include CPP, which is determined by

a student's risk factors, and the State Preschool SPED program, which is determined by the student's identified disability prior to attending elementary school. CPP is a state-funded early childhood education program available to at-risk young children in school districts, child care centers, and community preschools or Head Start programs. The aim of CPP is to provide early childhood education in order to reduce dropout rates, dependence on public assistance, and family involvement with criminal activities; this programming is also intended to strengthen families and support them in their child's education (CDE, 2015d). Preschool SPED provides special education services to students who have greater needs than the general student body in a way that addresses the students' individual concerns thus requiring a student to have an IEP (Hebbeler et al., 2011). CPP and the Preschool SPED provide early childhood education interventions for at-risk students and students with disabilities to ensure that these children receive access ECE programming.

Two cohorts who participated in Colorado early childhood education preschool programming during 2009-2010 school year, special education and demographic extant data were compared in order to study the subsequent identification for special education services from kindergarten through third grade. In addition, this study examined student traits including race, gender, and the student's disability type that may predict special education identification after preschool to provide CDE with a clear picture of whether children enrolled in CPP or Preschool SPED programming are more or less likely to need special education services in grades K-3. Nationally, the number of children who participate in ECE programming has grown, especially for children of color and socio-

economically disadvantaged children. The need to determine the extent to which the association of preschool participation influenced special education identification and the student traits that predicted special education services provided during the elementary school years informs educational policy and educational reform.

This research examined whether students with a disability who participated in the Preschool SPED program were more or less likely to be identified as needing an Individual Educational Plan (IEP) than students with risk factors who qualified to participate in the CPP program. In addition, this research study examined if student race/ethnicity, gender, or disability type were predictors of the need for special education services in elementary school.

The study of the association of preschool enrollment and special education identification with the examination of predictive traits of students identified for special education services can be used to predict special education identification outcomes in elementary school. Historically, studies of children with special education needs examined data collected from a small number of students. The sample size of this study included over 17,000 students who participated in preschool programming statewide. This research study examined the association of student enrollment statewide in early childhood education preschool programming to study the subsequent identification for special education services from kindergarten through third grade. In addition, this study addressed student traits that predict special education identification after preschool that include race/ethnicity, gender, and the student's disability type.

Interpretation of Key Findings

Data analyses were conducted to address two research questions:

1. What is the association between enrollment in either the Colorado Preschool Program or the Preschool Special Education Program and subsequent identification for an Individualized Educational Plan (IEP) in grades K-3?
2. Do student traits predict special education identification as documented by an Individual Educational Plan (IEP) after preschool?

Key findings from the research analysis include:

After preschool, we learn that 20.4% of the total number of cases have a physical disability in elementary school. The most frequent disability type was students with a physical disability at 80.65% of the students in elementary school who had a disability. Students with an intellectual disability type were 16.44% of the students in elementary school with a disability. Students with an emotional disability type was 2.73% and students with other disability types were less than 1% of the students in elementary school with a disability. The literature review suggests that children with disabilities function at different academic levels than their peers who do not have a disability in some areas (Fleury et al., 2015). The findings of this study support the research suggesting that children with a physical disability need special education supportive services during elementary school.

The findings suggest that during elementary school, students with no IEP only decreased from 78.8% to 78.7%, which demonstrates little movement with this indicator.

Upon initial analysis, results show that out of the 17,431 cases only 1.3% of the students moved between No-IEP to Yes-IEP. The preschool CPP cases were all No-IEP and the Preschool SPED cases were all Yes-IEP. The number of students with no disability increased by five cases. Of the total preschool cases, those who were Yes-IEP was 19.9% of the cases.

The cross-tabulation table shows that there was a strong association between the cohort (CPP/ Preschool SPED) and IEP status. All the CPP cases had the indicator for No-IEP and all the Preschool SPED cases indicate Yes-IEP, therefore the cross-tabulation table reflected an association between the cohort and IEP status. The research analysis shows those students who participated in the Preschool SPED were identified for special education services measured by an IEP in elementary school. The majority of the disability types were physical, which may not be mitigated by differentiated instruction.

The logistic regression analysis indicated that the Nagelkerke R square of 0.94 was a very high pseudo-R square. Gender was a statistically significant predictor at $p < .001$. Males were 1.72 times as likely to be identified with an IEP as females. The results presented support for research that asserts there was an overrepresentation of males in special education, in addition to minorities (Piechura-Couture et al., 2013). As stated in the literature review, the primary reason for a referral for special education services usually involves a behavior issue and delayed academic progress (Piechura-Couture et al., 2013).

The logistic regression results indicated that ethnicity category was a significant predictor for African American ($p = 0.018$), and Hispanic ($p = 0.002$) students when

compared to Caucasian students. Using odds ratios, Hispanic students were 1.64 times more likely to be identified for an IEP than Caucasian students. African American students were 2.08 times more likely than Caucasian students to be identified for special education services as documented by an IEP than Caucasian students in elementary school.

The research found a student's physical disability was far more likely to predict special education identification than ethnicity and or gender as represented by an IEP in elementary school. Students identified for a physical disability in preschool received special education services as documented by an IEP. The initial special education determination in preschool is far more likely to determine special education status in elementary school than any of the other variables including ethnicity and gender.

The research results showed ethnicity was not a factor of overrepresentation of African American or Hispanic students' identification for special education as documented by an IEP from kindergarten through third grade.

Limitations and Ethical Considerations

This study was based on extant special education and demographic student data provided by the Colorado Department of Education (CDE). This study examined whether a student's participation in ECE programs had an impact on the need for special education services after preschool from a limited sample for only a specified period of time. The results do not assert causation, and do not generalize to other ECE programs across the United States.

Utilizing student special education and demographic extant data, this study examined whether a student's participation in Colorado ECE programming had an association with the need for special education services after preschool. In other words, were the children who participated in either CPP or Preschool SPED more or less likely to need subsequent special education services? The study examined whether a student's participation in ECE programs had an impact on the need for special education services after preschool during the kindergarten through third grade years.

The CDE Data Sharing Agreement details the intent to conduct analysis through the use of student information, education records, and data in order to assess the impact, on a student's identification for an IEP in grades K-3. It was expected by CDE that the protocols outlined in the CDE Data Sharing Agreement would be followed; therefore, the research design for this study was controlled by the terms of the CDE Data Sharing Agreement. According to the Agreement, the researcher followed the protocols outlined in the CDE Data Sharing Agreement which specifies the Colorado Department of Education is a State Education Agency responsible for the implementation of education laws adopted by the State of Colorado. In fulfillment of law found in the Colorado Revised Statutes, CDE was charged with collecting and securely maintaining unit record data on students enrolled in the state's local education agencies (LEAs). Data Protocol (C.R.S. 24-37.5-705) provides authorization for each state agency to share data with other state agencies, political subdivisions, and nongovernmental entities and individuals. The research was conducted on behalf of the State to examine the research questions.

The researcher shall:

- a. Provide the State with a list of researchers participating in the project to be responsible for the student records obtained;
- b. Use student records appropriately, only for authorized purposes, and never for commercial purposes in accordance with federal and state law and as specified in this Agreement, including the Confidentiality provisions contained herein;
- c. Shall implement appropriate electronic safeguards to prevent use or disclosure of data not authorized by this agreement.
- d. Shall ensure that the data are kept in a secured environment at all times and that only authorized users have access. Any breach in security is to be immediately reported to the Colorado Department of Education.
- e. Destroy student records that have been provided from the State pursuant to time limitations defined in the Agreement and, if requested, provide certification that such records have been destroyed;
- f. Prior to public dissemination/release, if requested in writing by the State at least thirty (30) days before scheduled release, and subject to the following, provide reports generated as a result of using student records received from State to permit the State to verify that the intended purpose has been adhered to and that the publication contains no confidential student information;
- g. The State will ensure that the access to the report is permitted on a need-to-know basis only for this varication purpose and will protect the report from public dissemination or release.

The researcher adhered to policy that specifies that deliberate or accidental misuse of student records that could result in one or more of the following: loss of access, dismissal from work, legal action including prosecution under the scope of any applicable federal and state laws. In addition, sharing student records with any individuals or third parties was not included in the Agreement.

Any requests for additional information or changes to the Agreement required a new proposal to be submitted to the Colorado Department of Education for approval. The approval process took several months. Therefore, any modifications to the Agreement would have interfered with the timeline also specified by the Agreement. So as additional questions arose throughout the process, there was not an additional opportunity to modify the research design within a timely manner.

Recommendations for Future Research

The recommendations for future research include identifying how many English language learners participate in preschool programs statewide. The findings show 0.6% of the total population consisted of Spanish speaking families. This could be due to data collection and reporting inconsistencies, or this could be that Spanish speaking families are more reluctant to place their children into preschool programs. Further research is needed to address these questions. More should be done to examine the difference between the variable of language proficiency and English language learner data. The data sets were not collected consistently to measure different aspects of language mastery. In Colorado, there is a focus on Spanish speaking English Language Learners

without examination of the impact for other languages that are in school districts statewide.

More research is needed to address the difference between quality childcare and early childhood education. There is differing research on what consists of a “quality” program and how this is defined as educational or child care. In the same vein, more research on early childhood educational quality assurance is needed. This could come through as research examining instructional delivery and curriculum in ECE juxtaposed with quality child care.

There is research on specific disability types with smaller populations, however there is limited research on large scale samples which is needed specifically to address subjective disability categories like emotional disturbance. The CDE extant data did not provide a specific disability type in the preschool setting. Preschoolers were identified as having a disability, however, additional research should specify the disability preschoolers are receiving special educational services to address. The lack of preschool disability types prevented the researcher from comparing these data with the later data in elementary school for students. The research needs to also examine the trajectory by year. In other words, the researcher could not see whether students went on and off special education services throughout elementary school because of inconsistent data collection. More research is needed to examine the effects of special education and student retention rates. The way the retention data were collected and reported by CDE did not allow this study to consider how retention impacted the predictive nature of the research questions.

Future research should include on the impact of the student location and its interaction with the student's predictive factors. The extant data provided to the researcher included 454 locations which were too many to analyze. Additional research is needed to understand if the location was an important or significant factor in predicting special education identification. For instance, does the student's school district, city, county, region, or specific site (i.e., Department of Corrections or Division of Youth Services) predict if students are more or less likely to be identified for special educational services.

This research just touched on the challenges homeless students encounter, and future research should examine the impact of mobility on a student's ability to sustain academic progress or to make academic gains.

The CDE extant data did not address teacher qualifications, experience, and education level. Future research should examine the if these factors predict academic success particularly for students with special needs.

Conclusion

The objective of early childhood education objective is to provide educational programs that serve children in the preschool years that are proposed to improve elementary school performance. Colorado early childhood education programming includes CPP, which is intended to support students with risk factors, and the State Preschool Special Education program, which supports student's identified as having a disability prior to attending elementary school. Two cohorts who participated in Colorado preschool programming during 2009-2010 school year special education and

demographic extant data were compared in order to study the subsequent identification for special education services from kindergarten through third grade. In addition, this study examines student traits including race, gender, and the student's disability type that predicted special education identification during the elementary school years.

The data from two cohorts was analyzed to determine if there was a significant difference in the number of students receiving special education services documented by an IEP at each grade level from kindergarten through third grade. When children enter kindergarten, the CDE data reflect student attributes including gender, race, ethnicity, administrative unit/school district, language proficiency, and student disability type. Student disability type was not distinguished clearly during the preschool years. In contrast, the disability type for students enrolled in kindergarten through third grade with an IEP was recorded. The study examined the students' attributes that contribute to special education identification, and compared the data to determine any differences among these groups.

Using logistic regression to predict the occurrence of an event, in this case an IEP versus not, the student traits of race/ethnicity, gender, and the student's disability type were examined as predictors of special education identification in elementary school. The sample included over 17,000 students who participated in Colorado early education preschool programming during the 2009-2010 school year.

The study shows that there was an association between the cohort CPP and the cohort Preschool SPED. All the CPP cases had the indicator for No-IEP and all the Preschool SPED cases indicate Yes-IEP, therefore the research reflected an association

between the cohort and the presence of an IEP. The analysis showed those students who participated in the Preschool SPED were identified for special education services measured by an IEP in elementary school. The majority of the disability types were physical which may not be mitigated by differentiated instruction.

This study reveals male, African American, and Hispanic students, along with students identified with a physical disability type were more likely to receive special education services as documented by an IEP in elementary school.

Critical race theory was used as the theoretical framework to interpret results of analyses of student traits that are associated with special education identification. Although the research depicts that males are more likely than females to be identified for special education services, and the odds ratio for African American students was 2.08, meaning that African American students were 2.08 times as likely to be identified for special education services as documented by an IEP than Caucasian students. When the cohorts were analyzed separately by race the actual number of African American males who were identified for special education services does indicate there was an overrepresentation in the Preschool SPED cohort compared to the CPP cohort. Students who were identified as having a physical disability were a thousand times more likely to be identified for special education services as documented by an IEP than any other group.

The research was not causal, but it intended to assess the statistical significance of factors that were associated with special education identification after preschool. The

results were based on the researcher's analysis of the extant special education and demographic data provided by the State of Colorado Department of Education.

The findings of this study provide important information for a range of early childhood stakeholders as a result, stakeholders gain a better understanding that children who participate in ECE programming who may or may not require special education services, and the extent to which certain traits have predicted this trajectory into elementary school.

References

- Adair, J. K. (2014). Examining whiteness as an obstacle to positively approaching immigrant families in US early childhood educational settings. *Race Ethnicity and Education, 17*(5), 643-666.
- Anderson, S., Aller, T., Piercy, K., & Roggman, L. (2015). 'Helping us find our own selves': Exploring father-role construction and early childhood programme engagement. *Early Child Development and Care, 185*(3), 360-376.
- Baecher, L., & Jewkes, A. M. (2014). TESOL and early childhood collaborative inquiry: Joining forces and crossing boundaries. *Journal of Early Childhood Teacher Education, 35*(1), 39-53.
- Bailey, L. B. (2013). A review of the research: Common core state standards for improving rural children's school readiness. *Early Childhood Education Journal, 42*(6), 389-396.
- Baker, C. N., Tichovolsky, M. H., Kupersmidt, J. B., Voegler-Lee, M. E., & Arnold, D. H. (2014). Teacher (mis) perceptions of preschoolers' academic skills: Predictors and associations with longitudinal outcomes. *Journal of Educational Psychology, 107*(3), 805-820. Doi: 10.1037/edu000008
- Banerjee, R., & Guiberson, M. (2012). Evaluating young children from culturally and linguistically diverse backgrounds for special education services. *Young Exceptional Children, 109*6250611435368.

- Barton, E. E., & Smith, B. J. (2015). Advancing high-quality preschool inclusion: A discussion and recommendations for the field. *Topics in Early Childhood Special Education, 35*(2), 69-78. doi: 10.1177/0271121415583048
- Bauer, S. C., & Msall, M. E. (2010). Kindergarten readiness after prematurity: Integrating health, development, and behavioral functioning to optimize educational outcomes of vulnerable children. *Developmental Disabilities Research Reviews, 16*, 313-322.
- Brinson, S. A. (2012). Knowledge of multicultural literature among early childhood educators. *Multicultural Education, 19*(2), 30-33.
- Brown, A. L. (2013). The impact of early intervention on the school readiness of children born to teenage mothers. *Journal of Early Childhood Research, 14*(7), 1476718X13479048.
- Brown, C. P. (2010). Balancing the readiness equation in early childhood education reform. *Journal of Early Childhood Research, 8*(2), 133-160.
- Brown, S., Souto-Manning, M., & Tropp Laman, T. (2010). Seeing the strange in the familiar: Unpacking racialized practices in early childhood settings. *Race Ethnicity and Education, 13*(4), 513-532.
- Bulotsky-Shearer, R. J., Fernandez, V., Dominguez, X., & Rouse, H. L. (2011). Behavior problems in learning activities and social interactions in head start classrooms and early reading, mathematics, and approaches to learning. *School Psychology Review, 40*(1), 39.

- Bulotsky-Shearer, R. J., Manz, P. H., Mendez, J. L., McWayne, C. M., Sekino, Y., & Fantuzzo, J. W. (2012). Peer play interactions and readiness to learn: A protective influence for African American preschool children from low-income households. *Child Development Perspectives*, 6(3), 225-231.
- Callaghan, G., & Madelaine, A. (2012). Levelling the playing field for kindergarten entry: Research implications for preschool early literacy instruction. *Australasian Journal of Early Childhood*, 37(1), 13-23.
- Carter, D. R., & Pool, J. L. (2012). Appropriate social behavior: Teaching expectations to young children. *Early Childhood Education Journal*, 40(5), 315-321.
- Carter, D. R., & Van Norman, R. K. (2010). Class-wide positive behavior support in preschool: Improving teacher implementation through consultation. *Early Childhood Education Journal*, 38(4), 279-288.
- Caughy, M. O., & Owen, M. T. (2014). Cultural socialization and school readiness of African American and Latino preschoolers.
- Chazan-Cohen, R., Raikes, H., Brooks-Gunn, J., Ayoub, C., Pan, B. A., Kisker, E. E., Roggman, L., & Fuligni, A. S. (2009). Low-income children's school readiness: Parent contribution over the first five years. *Early Education and Development*, 20(6), 958-977. doi: 10.1080/10409280903362402
- Cheruvu, R., Souto-Manning, M., Lenc, T., & Chin-Calubaquib, M. (2014). Race, isolation, and exclusion: What early childhood teacher educators need to know about the experiences of pre-service teachers of color. *The Urban Review*, 47(2), 237-265.

- Claessens, A., Duncan, G. and Engel, M. (2009). Kindergarten skills and fifth-grade achievement: evidence from the ECLSK. *Economics of Education Review*, 28, 415-427.
- Colorado Department of Education (CDE). (2015a). Retrieved from <http://www.cde.state.co.us/>
- Colorado Department of Education (CDE). (2015b, July 1). *Brief History of the Colorado Department of Education*. Retrieved from <http://www.cde.state.co.us/cdecomm/historycde>
- Colorado Department of Education (CDE). (2015c, July 13). *CDE's tasks and responsibilities*. Retrieved from <http://www.cde.state.co.us/cdecomm/cdetasks>
- Colorado Department of Education (CDE). (2015d, May 6). *Colorado Preschool Program handbook*. Retrieved from <http://www.cde.state.co.us/cpp/cpphandbook>
- Colorado Department of Education (CDE). (2015e). *Colorado Preschool Program legislative report 2015*. Retrieved from <http://www.cde.state.co.us/cpp/cpp2015legislativereport>
- Colorado Department of Education (CDE). (2015f). *Data pipeline snapshots-Special education December count*. Retrieved from https://www.cde.state.co.us/datapipeline/snap_sped-december
- Colorado Department of Education (CDE). (2015g). *Data pipeline snapshots-student October*. Retrieved from https://www.cde.state.co.us/datapipeline/snap_studentoctober

- Colorado Department of Education (CDE). (2015h, August). *Guidebook on designing, delivering and evaluating services for English Learners (ELs)*. Retrieved from http://www.cde.state.co.us/cde_english/guidebookaug15
- Colorado Department of Education (CDE). (2015i, November 4). *Special education rules and regulations*. Retrieved from <http://www.cde.state.co.us/spedlaw/rules.htm>
- Creswell, J. W. (2005). Educational research: Planning, conducting, and evaluating quantitative and qualitative research. Pearson Education Inc., New Jersey, 38-58.
- Creswell, J. W., & Plano Clark, V.L. (2011). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks: Sage Publications, Inc.
- Creswell, J. W. (2012). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). Los Angeles: Sage Publishing.
- Curenton, S. M., Dong, N., & Shen, X. (2015). Does aggregate school-wide achievement mediate fifth grade outcomes for former early childhood education participants? *Developmental Psychology*, 51(7), 921.
- DeLoatche, K. (2015). Increasing parent involvement among head start families: A randomized control group study. *Early Childhood Education Journal*, 43(4), 271.
- Denham, S. A., Bassett, H. H., Thayer, S. K., Mincic, M. S., Sirotkin, Y. S., & Zinsser, K. (2012). Observing preschoolers' social-emotional behavior: Structure, foundations, and prediction of early school success. *The Journal of Genetic Psychology*, 173(3), 246-278.

- Dinehart, L. H., Katz, L. F., Manfra, L., & Ullery, M. A. (2012). Providing quality early care and education to young children who experience maltreatment: A review of the literature. *Early Childhood Education Journal*, 41(4), 283-290.
- Espinosa, L. M. (2015). Challenges and benefits of early bilingualism in the US context. *Global Education Review*, 2(1)
- Fantuzzo, J. W., Gadsden, V. L., & McDermott, P. A. (2011). An integrated curriculum to improve mathematics, language, and literacy for head start children. *American Educational Research Journal*, 48(3), 763-793.
- Fleury, V. P., Thompson, J. L., & Wong, C. (2015). Learning how to be a student: An overview of instructional practices targeting school readiness skills for preschoolers with autism spectrum disorder. *Behavior Modification*, 39(1), 69-97. doi: 10.1177/0145445514551384
- Flores, B. B., Casebeer, C. M., & Riojas-Cortez, M. (2011). Validation of the early childhood ecology scale-revised: A reflective tool for teacher candidates. *Journal of Early Childhood Teacher Education*, 32(3), 266-286.
- Ford, M. P., & Opitz, M. F. (2015). Helping young children discover the joy of learning. *Review of Human Factor Studies*, 21(1)
- Frankfort-Nachmias, C., & Leon-Guerrero, A. (2011). *Social statistics for a diverse society* (6th ed.). Thousand Oaks: Sage Publications, Inc.

- Fromberg, D. (2006). Kindergarten education and early childhood teacher education in the United States: Status at the start of the 21st century. *Journal of Early Childhood Teacher Education*, 27(1), 65.
- Fundus, J. L. (2015). Exploring the relationship between success on evaluations of preschool programs and children's pre-academic progress. *Delta Kappa Gamma Bulletin*, 81(4)
- Furlong, M. & Quirk, M. (2011). The relative effects of chronological age on Hispanic students: School readiness in grade 2 academic achievement. *Contemporary School Psychology*, 15, 81-92
- Gajus, J., & Barnett, D. (2010). Class wide consultation in preschools: A case study of comprehensive supports. *Psychology in the Schools*, 47(9), 871-886.
- Gebbie, D. H., Ceglowski, D., Taylor, L. K., & Miels, J. (2011). The role of teacher efficacy in strengthening classroom support for preschool children with disabilities who exhibit challenging behaviors. *Early Childhood Education Journal*, 40(1), 35-46.
- Gliner, J. A., Morgan, G. A., & Leech, N. L. (2009). *Research methods in applied settings*. New York, NY: Taylor & Francis Group.
- Gomez, R. (2015). Professional development of the early childhood education teaching workforce in the United States: An overview. *Professional Development in Education*, 41(2), 169.

- Gormley Jr, W. T., Phillips, D. A., Newmark, K., Welti, K., & Adelstein, S. (2011). Social-emotional effects of early childhood education programs in Tulsa. *Child Development, 82*(6), 2095-2109.
- Greenwood, C. R., Bradfield, T., Kaminski, R., Linas, M., Carta, J. J., & Nylander, D. (2011). The response to intervention (RTI) approach in early childhood. *Focus on Exceptional Children, 43*(9), 1-22.
- Grisham-Brown, J., & McCormick, K. M. (2013). Lessons learned from work with international partners to inform rural practices for early childhood intervention. *Rural Special Education Quarterly, 32*(1), 3.
- Gullo, D. F. (2013). Improving instructional practices, policies, and student outcomes for early childhood language and literacy through data-driven decision making. *Early Childhood Education Journal, 41*(6), 413-421.
- Hale, J. N. (2012). The struggle begins early: Head Start and the Mississippi freedom movement. *History of Education Quarterly, 52*(4), 506-534.
- Haley, M., Hammond, H., Ingalls, L. & Marin, M. R. (2013). Parental reactions to the special education individual education program process: Looking through the lens of grief. *Improving Schools, 16*(3), 232-243. doi: 10.1177/1365480213505180
- Hart, B., & Risley, T. (1995). Meaningful difference in the early experiences of young American children. Baltimore: Brookes.
- Hebbeler, K., Spiker, D., & Kahn, L. (2011). Individuals with Disabilities Education Act's early childhood programs: Powerful vision and pesky details. *Topics in Early Childhood Special Education, 31*(2), 0271121411429077.

- Herman-Smith, R. L. (2013). Early childhood interventionists' perceptions of the Child Abuse Prevention and Treatment Act: Provider characteristics and organizational climate. *Early Education & Development, 24*(3), 393-407.
- Herman-Smith, R. (2013). Do preschool programs affect social disadvantage? What social workers should know. *Social Work, 58*(1), 65-73.
- Hilbert, D. D., & Eis, S. D. (2014). Early intervention for emergent literacy development in a collaborative community pre-kindergarten. *Early Childhood Education Journal, 42*(2), 105-113.
- Hosmer, D. W., & Lemeshow, S. (1989). *Applied logistic regression*. New York: Wiley.
- Hosmer, D. W., & Lemeshow, S. (2000). *Applied Logistic Regression, 2nd ed.* John Wiley & Sons Inc.
- Hurley, J. J., & Horn, E. M. (2010). Family and professional priorities for inclusive early childhood settings. *Journal of Early Intervention, 32*(5), 335-350.
- Hyson, M., Tomlinson, H. B., & Morris, C. A. (2009). Quality improvement in early childhood teacher education: Faculty perspectives and recommendations for the future. *Early Childhood Research & Practice, 11*(1), n1.
- Jeon, H., Peterson, C. A., Wall, S., Carta, J. J., Luze, G., Eshbaugh, E. M., & Swanson, M. (2011). Predicting school readiness for low-income children with disability risk identified early. *Exceptional Children, 77*(4). 435-452.
- Joe, E. M., & Davis, J. E. (2009). Parental influence, school readiness and early academic achievement of African American boys. *The Journal of Negro Education, 78*(3). 260-276.

- Kalifeh, P., Cohen-Vogel, L., & Grass, S. (2011). The federal role in early childhood education: Evolution in the goals, governance, and policy instruments of Project Head Start. *Educational Policy*, 25(1), 36-64.
- Kenney, M. K. (2012). Child, family, and neighborhood associations with parent and peer interactive play during early childhood. *Maternal and Child Health Journal*, 16(1), 88-101.
- Kerlinger, F. N. (1986). Foundations of behavioral research 3rd ed. New York: Holt, Rinehart & Winston.
- Keys, T. D., Farkas, G., Burchinal, M. R., Duncan, G. J., Vandell, D. L., Li, W. . . .
Howes, C. (2013). Preschool center quality and school readiness: Quality effects and variation by demographic and child characteristics. *Child Development*, 84(4), 1171-1190.
- Kim, H. (2015). Foregone opportunities: Unveiling teacher expectancy effects in kindergarten using counterfactual predictions. *Social Psychology of Education*, 18(2), 273.
- Kim, J. (2013). Confronting invisibility: Early childhood pre-service teachers' beliefs toward homeless children. *Early Childhood Education Journal*, 41(2), 161-169.
- Kruk, R. S., Prentice, S., & Moen, K. B. (2011). Early childhood education and care (ECEC) and reading acquisition in at-risk readers: Does quantity matter? *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement*, 45(1), 49.

- Ladson-Billings, G. (1998). Just what is critical race theory and what's it doing in a nice field like education? *International Journal of Qualitative Studies in Education*, 11(1), 7-24. doi:10.1080/095183998236863
- La Paro, K. M., Thomason, A. C., Lower, J. K., Kintner-Duffy, V. L., & Cassidy, D. J. (2012). Examining the definition and measurement of quality in early childhood education: A review of studies using the ECERS-R from 2003 to 2010. *Early Childhood Research & Practice*, 14(1), n1.
- Lee, F. L. M., Yeung, A. S., Tracey, D., & Barker, K. (2015). Inclusion of children with special needs in early childhood education what teacher characteristics matter. *Topics in Early Childhood Special Education*, 0271121414566014.
- Lee, J., & Ginsburg, H. P. (2009). Early childhood teachers' misconceptions about mathematics education for young children in the United States. *Australasian Journal of Early Childhood*, 34(4), 37.
- Lee, P., & Bierman, K. L. (2015). Classroom and teacher support in kindergarten: Associations with the behavioral and academic adjustment of low-income students. *Merrill-Palmer Quarterly*, 61(3), 383-411.
- Lee, R., Zhai, F., Brooks-Gunn, J., Han, W., & Waldfogel, J. (2014). Head start participation and school readiness: Evidence from the early childhood longitudinal study–birth cohort. *Developmental Psychology*, 50(1), 202.
- Lieberman-Betz, R. G., Vail, C. O., & Chai, Z. (2013). Examining response to intervention using a framework of best practice from early childhood special education. *Exceptionality*, 21, 51-67. doi: 10.1080/09362835.2013.750122

- Lindstrom, J. H. (2013). Introduction to the special issue: Response to intervention within the context of specific learning disabilities, emotional disturbance, autism spectrum disorders, and early special education. *Exceptionality*, 21, 1-4. doi: 10.1080/09362835.2013.750109
- Lloyd, J. E. V., Irwin, L. G., & Hertzman, C. (2009). Kindergarten school readiness and fourth-grade literacy and numeracy outcomes of children with special needs: A population based study. *Educational Psychology* 29(5), 583-602. doi: 10.1080/014434109031365391
- Lombardi, J. (2009). *Time to care: Redesigning childcare to promote education, support families, and build communities*. Philadelphia: Temple University Press.
- Lonigan, C. J., Phillips, B. M., Clancy, J. L., Landry, S. H., Swank, P. R., Assel, M., Taylor, H. B., ... Barnes, M. (2015). Impacts of a comprehensive school readiness curriculum for preschool children at risk for educational difficulties. *Child Development*, 86(4), 1773-1793.
- Lowenstein, A. E. (2011). Early care and education as educational panacea: What do we really know about its effectiveness? *Educational Policy*, 25(1), 92-114.
- Martin, S. (2010). An early childhood intervention programme and the long-term outcomes for students. *Child Care in Practice*, 16(3), 257-274.
- McCarthy, P. (2009). The link between investment in early childhood preschools and high school graduation rates for African American males in the United States of America. *Contemporary Issues in Early Childhood*, 10(3), 232.

- McCormick, C. E., & Haack, R. (2010). Early literacy individual growth and development indicators (EL-IGDIs) as predictors of reading skills in kindergarten through second grade. *Tarptautinis Psichologijos Žurnalas: Biopsichosocialinis Požiūris* (7), 29-40.
- McIntyre, L. L., Eckert, T. L., Fiese, B. H., Reed, F. D. D., & Wildenger, L. K. (2010). Family concerns surrounding kindergarten transition: A comparison of students in special and general education. *Early Childhood Education Journal*, 38, 259-263.
doi: 10.1007/s10643-010-0416-y
- McMillian, J. H., & Schumacher, S. (2001). *Research in Education: A Conceptual Introduction* 5th ed. New York, NY: Longman.
- Metcalf, T., (2016). What's your plan? Accurate Decision Making within a multi-tier system of supports: Critical areas in tier 1. *RTI Action Network*. Retrieved from <http://www.rtinetwork.org/essential/tieredinstruction/tier1/accurate-decision-making-within-a-multi-tier-system-of-supports-critical-areas-in-tier-1>
- Morgan, P. L., Farkas, G., Hillemeier, M. M., & Maczuga, S. (2012). Are minority children disproportionately represented in early intervention and early childhood special education? *Educational Researcher*, 41(9), 339-351.
- Musti-Rao, S., Hawkins, R. O., & Tan, C. (2011). A practitioner's guide to consultation and problem solving in inclusive settings. *Teaching Exceptional Children*, 44(1), 18-26.

- National Association for the Education of Young Children. (2009). *Developmentally appropriate practice in early childhood programs serving young children from birth through age 8*. Washington, DC: Author.
- National Educational Goals Panel. (1997). *Getting a good start in school*. Washington, DC: U.S. Government Printing Office. Retrieved from <http://files.eric.ed.gov/fulltext/ED412025.pdf>
- National Educational Goals Panel. (1998). *Ready Schools*. Washington, DC: U.S. Government Printing Office. Retrieved from <http://govinfo.library.unt.edu/negp/reports/readyschoo.pdf>
- National Governors Association. (2005). *Building the foundation for bright futures: Final report of the NGA task force on school readiness*. Retrieved from <http://www.nga.org/cms/home/nga-center-for-best-practices/center-publications/page-edu-publications/col2-content/main-content-list/building-the-foundation-for-brig.html>
- Nesbitt, K. (2015). Executive function skills and academic achievement gains in prekindergarten: Contributions of learning-related behaviors. *Developmental Psychology*, 51(7), 865.
- Niles, M. D., & Byers, L. G. (2008). History matters: United States policy and indigenous early childhood intervention. *Contemporary Issues in Early Childhood*, 9(3), 191-201.
- No Child Left Behind Act of 2001, Pub. L. 107-110, 115 Stat. 1425 (2002).
- Ortiz, N. (2015). Personal Communication.

- Pears, K. C., Healey, C. V., Fisher, P. A., Braun, D., Gill, C., Conte, H. M., Newman, J., & Ticer, S. (2014). Immediate effects of a program to promote school readiness in low-income children: Results of a pilot study. *Education and Treatment of Children*, 37(3), 431-460. doi: 10.1353/etc.2014.0021
- Pedro, J. Y., Miller, R., & Bray, P. (2012). Teacher knowledge and dispositions towards parents and families: Rethinking influences and education of early childhood pre-service teachers. *Forum on Public Policy Online*, 2012(1).
- Pentimonti, J. M., Justice, L. M., & Kaderavek, J. N. (2014). School-readiness profiles of children with language impairment: Linkages to home and classroom experiences. *International Journal of Language & Communication Disorders*, 49(5), 567-583.
- Pentimonti, J. M., Muphy, K. A., Justice, L. M., Logan, J. A. R., & Kaderavek, J. N. (2016). School readiness of children with language impairment: Predicting literacy skills from pre-literacy and social-behavioral dimensions. *International Journal of Language & Communication Disorders*, 51(2), 148-161.
- Persellin, D. C. (2008). Policies, practices, and promises: Challenges to early childhood music education in the United States. *Arts Education Policy Review*, 109(2), 54-61.
- Phillips, R. D., Gorton, R. L., Pinciotti, P., & Sachdev, A. (2010). Promising findings on preschoolers' emergent literacy and school readiness in art-integrated early childhood settings. *Early Childhood Education Journal*, 38, 111-122. doi: 10.1007/s10643-010-0397-x

- Piechura-Couture, K., Heins, E., & Tichenor, M. (2013). The boy factor: can single-gender classes reduce the over-representation of boys in special education? *College Student Journal*, 47(2), 235-243.
- Pighini, M. J., Goelman, H., Buchanan, M., Schonert-Reichl, K., & Brynensen, D. (2014). Learning from parents' stories about what works in early intervention. *International Journal of Psychology*, 49(4), 263-270.
- Rakap, S. & Parlak-Rakap, A. (2011). Effectiveness of embedded instruction in early childhood special education: A literature review. *European Early Childhood Education Research Journal*, 19(1), 79-96. doi: 10.1080/1350293x.2011.548946
- Reynolds, A. J., & Ou, S. (2011). Paths of effects from preschool to adult well-being: A confirmatory analysis of the child-parent center program. *Child Development*, 82(2), 555-582.
- Rossmann, G. B., & Rallis, S. F. (2012). *Learning in the field: An introduction to qualitative research* (3rd ed.). Thousand Oaks: Sage Publications, Inc.
- Roy, A. L., & Raver, C. C. (2014). Are all risks equal? Early experiences of poverty-related risk and children's functioning. *Journal of Family Psychology*, 28(3), 391.
- Sabol, T. J., & Chase-Lansdale, P. L. (2015). The influence of low-income children's participation in head start on their parents' education and employment. *Journal of Policy Analysis and Management*, 34(1), 136-161.
- Saracho, O. N. (2015). Historical and contemporary evaluations of early childhood programmes. *Early Child Development and Care*, 185(8), 1255-1267.

- Shonkoff, J. P. (2010). Building a new bio developmental framework to guide the future of early childhood policy. *Child Development*, 81(1), 357-367.
- Smith, S. C. (2012). Cultural relay in early childhood education: Methods of teaching school behavior to low-income children. *The Urban Review*, 44(5), 571-588.
- Steed, E. A., Pomerleau, T., Muscott, H., & Rohde, L. (2013). Program-wide positive behavioral interventions and supports in rural preschools. *Rural Special Education Quarterly*, 32(1), 38.
- Sullivan, A. L., & Field, S. (2013). Do preschool special education services make a difference in kindergarten reading and mathematics skills?: A propensity score weighting analysis. *Journal of School Psychology*, 51(2), 243-260.
- Thomas, S. B., & Dykes, F. (2013). Families speak to early childhood teachers: Impressions and expectations. *SRATE Journal*, 22(2), 55-64.
- Tobin, J. (2014). Comparative, diachronic, ethnographic research on education. *Current Issues in Comparative Education*, 16(2), 6-13.
- Vesely, C. K., & Ginsberg, M. R. (2011). Strategies and practices for working with immigrant families in early education programs. *YC Young Children*, 66(1), 84.
- Weiss, N. A., (2012). *Introductory statistics* (9th ed.). Boston: Pearson Education, Inc.
- Welshman, J. (2010). From head start to sure start: Reflections on policy transfer. *Children & Society*, 24(2), 89.
- White House. (2009). *Expanding High-Quality Preschool*. Retrieved from <https://www.whitehouse.gov/issues/education/early-childhood>

- White House. (2016). *Expanding High-Quality Preschool*. Retrieved from <https://www.whitehouse.gov/issues/education/early-childhood>
- Wildenger, L. K., & McIntyre, L. L. (2012). Investigating the relation between kindergarten preparation and child socio-behavioral school outcomes. *Early Childhood Education Journal*, 40(3), 169-176.
- Wu, H., & Chu, S. (2012). Self-determination of young children with special needs from culturally and linguistically diverse backgrounds. *Preventing School Failure: Alternative Education for Children and Youth*, 56(3), 149-156.
- Xu, Y., Chin, C., Reed, E., & Hutchinson, C. (2014). The effects of a comprehensive early literacy project on preschoolers' language and literacy skills. *Early Childhood Education Journal*, 42(5), 295-304.

Appendix A



Research Data Sharing Agreement: Between The Colorado Department of Education And Sarie Ates-Patterson/University of Denver

This DATA ACCESS AND USE AGREEMENT (the “Agreement”) by and between **COLORADO DEPARTMENT OF EDUCATION** (the “State”), and **Sarie Ates-Patterson/Morgridge College of Education, University of Denver** (the “Requester” or “Organization”), is entered into effective as of June, 18, and 2015 (the “Effective Date”) and ends as of June, 18, and 2016.

I. SUMMARY

1. The Colorado Department of Education is a State Education Agency responsible for the implementation of education laws adopted by the State of Colorado. In fulfillment of law found in the Colorado Revised Statutes, CDE is charged with collecting and securely maintaining unit record data on students enrolled in the state’s local education agencies (LEAs). Data Protocol (C.R.S. 24-37.5-705) provides authorization for each state agency to share data with other state agencies, political subdivisions, and nongovernmental entities and individuals.
2. Sarie Ates-Patterson is conducting research for and on behalf of the State to ascertain what is the impact of student enrollment in the Colorado Preschool Program or Preschool Special Education on a student’s identification for an Individualized Education Plan in grades K-3?

Table 1. Research questions, variables of interest, and analytic approach

Question	Variables	Analysis
<ul style="list-style-type: none"> What is the impact of student enrollment in the Colorado Preschool Program or Preschool Special Education on a student’s identification for an Individualized Education Plan in grades K-3? 	Cohort Groups/Filters: <ol style="list-style-type: none"> 3. 2009-2010 students enrolled in CPP – children enrolled full or half-day CPP 2009-10 (October Count) not on an IEP in December Count, in kindergarten the following year 4. 2009-2010 students enrolled in Preschool SPED on IEPs 2009-10 (December Count), in 	The data from the three cohorts will be analyzed to determine if there is any significant difference in the number of students receiving special education services documented by an IEP at each grade level from kindergarten through third grade. When children enter kindergarten, the data reflects student attributes including gender, race, ethnicity, administrative unit/school district, language proficiency, and disability type. Disability type is not

Question	Variables	Analysis
	<p>kindergarten the following year</p> <p>5. Students with no history of preschool according to the CDE data related to no “eligible” funding codes (October Count) 2008-09 or 2009-10, in kindergarten 2010-11</p> <p>Variables (for each grade K-3):</p> <ol style="list-style-type: none"> 1. Gender 2. Race 3. Ethnicity 4. Administrative Unit 5. School District 6. Language Proficiency 7. IEP Status 8. (If # 7 = Yes) Disability Type 	<p>distinguished clearly during the preschool years. The attributes of the kindergarten through third grade students with an IEP will be recorded. The study will examine the students’ attributes that contribute to special education identification, and comparing the data to determine any differences among these groups. The study will examine each attribute at each grade level and compare each grade level across each cohort. The study will then be able to compare longitudinally and across each cohort for the different number of students identified for special education services.</p>

As shown in the table, this project requires the use of de-identified student-level data on students’ gender, race/ethnicity, language proficiency, administrative unit/school district, IEP status (Yes/No k-3rd grade), disability type.

3. Both parties agree that this project will potentially lead to a greater understanding of the impact(s) of whether any children who participate in these programs require special education after kindergarten, if so what factors predict this trajectory.

NOW, THEREFORE, in consideration of the mutual promises contained herein, the parties hereby agree as follows:

II. AGREEMENT

1. **Objective; Intent of the Parties.** To conduct analysis through the use of student information, educational records, and data (hereinafter “student records”) in order to assess the impacts (if any) on the effect student enrollment in CPP or Preschool SPED had on the likelihood that students would later be identified in grades K-3 as requiring special education services as documented by an Individual Educational Plan.

2. To effectively address the research questions outlined above including potential impacts. The specific minimum data points to be provided are outlined in Appendix A.

3. Period of Performance. Subject to its other provisions, the period of performance of this Agreement shall commence on June, 18, 2015 regardless of the date of execution, and be completed on June, 18,

2016, unless terminated sooner as provided herein.

4. **Responsibilities of the State.** During the term of this Agreement, the State shall:

- a. Prepare data files as defined in *Appendix A - Data File Description*.

5. **Responsibilities of the Requestor.** The Requester, representing all members of the research team supporting the aforementioned research study, shall:

- a. Provide the State with a list of researchers participating in the project to be responsible for the student records obtained;
- h. Use student records appropriately, only for authorized purposes, and never for commercial purposes in accordance with federal and state law and as specified in this Agreement, including the Confidentiality provisions contained herein;
- i. Shall implement appropriate electronic safeguards to prevent use or disclosure of data not authorized by this agreement.
- j. Shall ensure that the data are kept in a secured environment at all times and that only authorized users have access. Any breach in security is to be immediately reported to the Colorado Department of Education.
- k. Destroy student records that have been provided from the State pursuant to time limitations defined in the Agreement and, if requested, provide certification that such records have been destroyed;
- l. Prior to public dissemination/release, if requested in writing by the State at least thirty (30) days before scheduled release, and subject to the following, provide reports generated as a result of using student records received from State to permit the State to verify that the intended purpose has been adhered to and that the publication contains no confidential student information;
 - The State will ensure that access to the report is permitted on a need-to-know basis only for this verification purpose and will protect the report from public dissemination or release.
 - Understand that deliberate or accidental misuse of student records may result in one or more of the following: loss of access, dismissal from work, legal action including prosecution under the scope of any applicable federal and state laws.

The Requester shall not:

- a. Share student records with any individuals or third parties not included in the Agreement;
- a. Make or allow any unauthorized use of information provided/generated;
- b. Publish reports with a cell size of less than 16. (Reports must mask these cells so that results are not revealed.)

6. **Review by the State.** The State reserves the right to review at least fifteen (15) days before release any report using this student data if the report is to be released publicly; the State's review will be limited to ensuring that the publication contains no confidential student information and that the intended purpose has been adhered to.

7. **Legal Obligations**

Both parties acknowledge separate obligations in accordance with the requirements of Public Law 93-380-Privacy Rights of Parents and Students, commonly known as the "Buckley Amendment", the Federal Family Educational Rights and Privacy Act (FERPA), 20 U.S.C. § 1232g and 34 CFR Part 99.

III. AGREEMENT TERMINATION

The State may terminate this Agreement at any time, for its own convenience, for any reason, with written notice to the Requester. The Requester may terminate this Agreement for any reason, with 30 days written notice to the State. Otherwise, the Agreement will end December 31, 2015.

IV. CONFIDENTIALITY

1. The term “confidential information” as used in this Agreement means any and all student information provided by the State to REQUESTER which is protected by the Family Educational Rights and Privacy Act (FERPA), 20 U.S.C. Sec. 1232g and all other similar federal and state laws. Such personal information is also exempt from mandatory disclosure by the State under the terms of the state public disclosure laws codified as Title 24, Article 72, regarding Colorado Laws Concerning Public (Open) Records. For the purposes of this agreement, confidential information also means personally identifiable information (PII). PII includes, but is not limited to the student's name; the name of the student's parent or other family members; the address of the student or student's family; a personal identifier, such as the student's social security number, student number, or biometric record; other indirect identifiers, such as the student's date of birth, place of birth, and mother's maiden name; other information that, alone or in combination, is linked or linkable to a specific student that would allow a reasonable person in the school community, who does not have personal knowledge of the relevant circumstances, to identify the student with reasonable certainty; or information requested by a person who the educational agency or institution reasonably believes knows the identity of the student to whom the education record relates. PII also means a dataset that is linked to a specific individual and that would allow a reasonable person in a school community, who does not have knowledge of the relevant circumstances, to identify the individual with reasonable certainty.
2. To effect the transfer of data and information that is subject to federal and state confidentiality laws and to ensure that the required confidentiality of personally identifiable information shall always be maintained, Requestor agrees to the following in compliance with 34 C.F.R. Sec. 99.31 (a) (6):
 - a. In all respects, Requestor will comply with the provisions of FERPA. Nothing in this Agreement may be construed to allow either party to maintain, use, disclose, or share student record information in a manner not allowed under Federal or state law or regulation;
 - b. For purposes of this Agreement and ensuring Requestor's compliance with the terms of this Agreement and all applicable state and Federal laws, Requestor designates **Sarie Ates-Patterson** the temporary custodians of the data that the State shares with Requestor. The State will release all data and information under this Agreement to a named temporary custodian. **Sarie Ates-Patterson** shall be responsible for transmitting all data requests and maintaining a log or other record of all data requested and received pursuant to the Agreement, including confirmation of the return or destruction of data as described below. The State or its agents may, upon requests, review the records Requestor is required to keep under this Agreement. The State designates **Dan Jorgensen, Ph.D.** as its liaison for all communications with **Sarie Ates-Patterson** regarding this Agreement;
 - c. Requestor will use data shared under this Agreement for no purpose other than the goals outlined in this Agreement. Nothing in the Agreement shall be construed to authorize Requestor to have access to additional data from the State that is not included in the scope

of the Agreement (or addenda). Requestor understands that the Agreement does not convey ownership of data to Requestor;

- d. Requestor will require all employees, contractors, and agents of any kind to comply with the Agreement and all applicable provisions of FERPA and other laws and regulations with respect to the data and information shared under this Agreement. Requestor agrees to require and maintain an appropriate confidentiality agreement from each employee, contractor, or agency with access to data pursuant to the Agreement. Nothing in this section authorizes Requestor to share data and information provided under this Agreement with any other individual, agency, or entity for any purpose other than completing Requestor's work as authorized by the State for and on behalf of the State, consistent with this Agreement;
- e. Requestor will not disclose data produced to it under this Agreement in any manner that could identify any individual student or teacher, except as authorized by FERPA, to any entity other than the State or authorized employees, contractors, or agents of Requestor also working for and on behalf of the State pursuant to the terms of this Agreement. Publications and reports of data and information shared, including preliminary descriptions and draft reports, shall involve only aggregate data and no personally identifiable information or other information that could lead to the identification of any student or teacher;
- f. Requestor will not provide any data obtained under this Agreement to any individual, agency, or entity without the prior written consent of the State, unless required to make such disclosure under an applicable law or court order;
- g. Upon termination of the Agreement, Requestor will return all data files and hard copy records to the State and purge any copies of data from its computer systems. Requestor agrees to require all employees, contractors, or agents of any kind using the State data to comply with this provision. No other entity is authorized to continue research using the data obtained under this Agreement upon termination of the Agreement. Requestor will destroy all data obtained under the Agreement and addenda when no longer needed for the purpose for which it was released by the State. Upon request, Requestor agrees to provide certification to the State that such records have been destroyed;
- h. Requestor agrees that disclosure of confidential student information, without permission of the State, is just cause for the State to immediately terminate the Agreement.
- i. Requestor shall notify the State immediately of any breach or suspected breach, but in no event no later than twenty-four (24) hours after Requestor learns of suspected breach.
- j. If Requestor becomes aware of a data security breach, it shall cooperate with the State regarding recovery, remediation, and the necessity to involve law enforcement, if any. Requestor shall be responsible for performing an analysis to determine the cause of the breach, and for producing a remediation plan to reduce the risk of incurring a similar type of breach in the future. The State reserves the right to adjust this plan, in its sole discretion. A breach of PII shall have occurred when there has been unauthorized acquisition of unencrypted PII data (electronic or otherwise) used in performance of the Agreement, or any subcontract from the Requestor's or any agent's possession which compromises security, confidentiality, or integrity of such PII.
- k. If Requestor provides physical or logical storage, processing or transmission of confidential or

sensitive State data, Requestor shall provide, and shall cause its agents to provide, physical and logical protection for State hardware, software, applications and data that meet or exceed industry standards and requirements as set forth in the Agreement. Requestor, if it retains, stores, or is given protected or confidential information, at all times shall maintain, and shall cause its agents to maintain, network, system, '3rd application security, which includes network firewalls, intrusion detection, and annual security testing. Requestor, if it retains, stores, or is given protected or confidential information, shall comply and shall cause its agents to comply, with State and federal regulations and guidelines related to security, confidentiality and auditing, including but not limited to regulations and guidelines issued by the Federal Bureau of Investigation (FBI), the U.S. Department of Homeland Security (DHS), the Governor's Office of Homeland Security (DHS), the Colorado Bureau of Investigation (CBI), the Governor's Office of Information Security (OIS), or related to the Health Insurance Portability and Accountability Act (HIPAA) Guidelines, 45 C.F.R. Parts 160, 162, and 164, the Health Information Technology for Economic and Clinical Health Act (HITECH), Title XIII of Division A and Title IV of Division B of the American Recovery and Reinvestment Act of 2009 (ARRA), Pub. L No. 111-S (Feb. 17, 2009), codified at 42 USC Sections 300jj et seq.; Sections 17901et seq., the Family Educational Rights and Privacy Act (FERPA), 20 U.S.C. 1232g and 34 C.F.R. Part 99. Requestor, if it retains, stores, or is given protected or confidential information shall ensure, and shall cause its agents to ensure that security is not compromised by unauthorized access to computers, program, software, databases, or other electronic environments and shall promptly report all breaches or attempted breaches to a representative of the OIS. Neither requestor nor its agents shall have any rights to use or access any OIT or other State agency data or information, except with the prior approval of the State. Requestor shall review, on a semi-annual basis, the Colorado Cyber Security Program (CCSP), posted at: <http://www.colorado.gov/cs/Satellite/Cyber/CISO/1207820732279>, and its related documents, including its policies and procedures to ensure compliance with the standards and guidelines published therein. Requestor shall cooperate, and shall cause its agents to cooperate, with the performance of security audit and penetration tests by OIS. Requestor shall follow, and shall cause its agents to follow, the State's Data Handling and Disposal policy, which can be found at www.colorado.gov/oit/security_policies. Requestor shall perform, and shall cause its agents to perform, in a form reasonably acceptable to the State, background checks on all of its respective employees and agents performing services or having access to State confidential information provided under the agreement.

- I. Requestor agrees that the Colorado Department of Education has the right to conduct audits or other monitoring activities of the authorized representative's data stewardship policies, procedures, and systems.
3. The Requestor has the right consistent with scientific standards, to present, publish, or use student results it has gained in the course of the research for and on behalf of the State under this Agreement, but only if the publication, presentation, or use does not permit personal identification of parents, students, or teachers by individuals other than representatives of the Requestor. Any violation of this Agreement and/or the provisions of FERPA or accompanying regulations related to the nondisclosure of protected student information may result in a determination by the Department of Education that the violating party is prohibited from accessing student education records for up to five (5) years, pursuant to 34 CFR Sec. 99.31 (a) (6) (iv).
4. **Sarie Ates-Patterson** will be reporting findings to the Colorado Department of Education, provided that

the presentations, publications, and/or reporting of such findings do not contain personal identification of parents, students, or teachers by individuals. The reporting will be intended to:

- a. Increase State understanding of the impact of the impact of student enrollment in the Colorado Preschool Program or Preschool Special Education on a student's identification for an Individualized Education Plan in grades K-3.

V. NONDISCRIMINATION

Both the State and the Requestor agree that no individual shall be excluded from participation in, denied the benefits of, subjected to discrimination under, or denied employment in the administration of or in connection with any aspect of this Agreement because of sex, race, creed, religion, color, national origin, age, honorably discharged veteran or military status, sexual orientation including gender expression or identity, the presence of any sensory, mental or physical disability, or the use of trained dog guide or service animal by a person with a disability. The parties agree to abide by the standards of responsibility toward the disabled as specified by the Americans with Disabilities Act and Colorado Law against Discrimination. In the event that one of the parties hereto refuses to comply with the above provision, this Agreement may be canceled, terminated, or suspended in whole or in part by the other party.

VI. ASSIGNMENT

Neither party shall assign its rights or responsibilities under this Agreement without the written authorization of all the other parties.

VII. SEVERABILITY

If any term of this Agreement is held invalid or unenforceable, the remainder of the Agreement will not be affected, but continue in full force.

VIII. INDEMNITY

The State will be held harmless from all claims, liabilities, damages, or judgments involving a third party, including the State's costs and attorney's fees, resulting from Sarie Ates-Patterson breach of its obligations under this Agreement.

IX. INTEGRATION

This writing contains all terms and conditions of the Agreement. Modifications to the Agreement must be in writing and be signed by each party.

X. NOTICE

Any notice required or permitted by the terms of the Agreement shall be sent to:

If to the State:	Colorado Department of Education Dan D. Jorgensen, Ph.D., Accountability & Research Manager Accountability & Data Analysis Unit 201 East Colfax, Denver, Colorado 80203 Phone: 303-866-6763 Email: Jorgensen_d@cde.state.co.us
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If to the Requestor: Sarie Ates-Patterson, PhD. Student
Morgridge College of Education/University of Denver
1999 E. Evans, Denver, CO 80208
Phone: 303-507-0585
Email: Sarie.Ates-Patterson@du.edu

XI. Stewards

The Stewards shall ensure that access to the original data covered by this data sharing agreement shall be limited to eligible personnel between the agencies and the minimum number of individuals necessary to achieve the purposes stated in the IDSA.

XII. Signatures

To further the collection and analysis of Colorado educational data, the Colorado Department of Education, represented by the Commissioner of Education Robert Hammond and **Sarie Ates-Patterson/Morgridge College of Education, University of Denver** represented by Sarie Ates-Patterson, agree to the cooperative sharing of data between the two agencies pursuant to the conditions set forth herein.

Robert Hammond
Commissioner of Education
Colorado Department of Education

Name
Title
Organization

Appendix A. Data File Description

Cohort Groups:

1. 2009-2010 students enrolled in Colorado Preschool Program (CPP) – children enrolled full or half-day CPP 2009-10 (October Count) not on an IEP in December Count, in kindergarten the following year
2. 2009-2010 students enrolled in Preschool SPED on IEPs 2009-10 (December Count), in kindergarten the following year
3. Students with no history of preschool according to the CDE data related to no “eligible” funding codes (October Count) 2008-2009, in kindergarten 2010-11

Comparison Groups/Filters:

3. Preschoolers in Special Education (2009-10)
 - a. Enrolled in kindergarten the following year
4. Colorado Preschool Program (2009-10)
 - a. Not on an IEP in December Count
 - b. Enrolled in kindergarten the following year 2010-11
5. No History of Preschool
 - a. Not eligible funding codes in preschool 2008-09 or 2009-10
 - b. Enrolled in kindergarten in 2010-11

Data Fields:

12. Gender
13. Race/Ethnicity
14. Language Proficiency

15. Administrative Unit/School District
16. IEP Status Yes/No (K-3rd grade)
17. Disability Type.

Appendix B

Ethnicity categories:

- Unreported/Not Applicable
- American Indian or Alaska Native
- Asian
- Black
- Hispanic
- White
- Hawaiian/Pacific Islander
- Two or More Races
- I prefer not to respond
- Mexican-American/Chicano/Latino
- No
- Error

Appendix C

Language Proficiency Categories:

- Error
- Unreported
- Not Applicable
- NEP – Non English Proficient
- LEP – Limited English Proficient
- FEP – Fluent English Proficient
- PHLOTE – Primary or Home Language Other Than English
- FELL – Former ELL
- FEP, PHLOTE, or FELL

Appendix D

Location Categories:

- COLORADO
- Error
- Unreported
- MAPLETON 1
- NORTHGLENN-THORNTON 12
- ADAMS COUNTY 14
- BRIGHTON 27J
- BENNETT 29J
- STRASBURG 31J
- WESTMINSTER 50
- ALAMOSA RE-11J
- SANGRE DE CRISTO RE-22J
- ENGLEWOOD 1
- SHERIDAN 2
- CHERRY CREEK 5
- LITTLETON 6
- DEER TRAIL 26J
- ADAMS-ARAPAHOE 28J
- BYERS 32J
- ARCHULETA COUNTY 50 JT

- WALSH RE-1
- PRITCHETT RE-3
- SPRINGFIELD RE-4
- VILAS RE-5
- CAMPO RE-6
- LAS ANIMAS RE-1
- MC CLAVE RE-2
- ST VRAIN VALLEY RE 1J
- BOULDER VALLEY RE 2
- BUENA VISTA R-31
- SALIDA R-32
- KIT CARSON R-1
- CHEYENNE COUNTY RE-5
- CLEAR CREEK RE-1
- NORTH CONEJOS RE-1J
- SANFORD 6J
- SOUTH CONEJOS RE-10
- CENTENNIAL R-1
- SIERRA GRANDE R-30
- CROWLEY COUNTY RE-1-J
- CONSOLIDATED C-1
- DELTA COUNTY 50(J)

- DENVER COUNTY 1
- DOLORES COUNTY RE NO.2
- DOUGLAS COUNTY RE 1
- EAGLE COUNTY RE 50
- ELIZABETH C-1
- KIOWA C-2
- BIG SANDY 100J
- ELBERT 200
- AGATE 300
- CALHAN RJ-1
- HARRISON 2
- WIDEFIELD 3
- FOUNTAIN 8
- COLORADO SPRINGS 11
- CHEYENNE MOUNTAIN 12
- MANITOU SPRINGS 14
- ACADEMY 20
- ELLICOTT 22
- PEYTON 23 JT
- HANOVER 28
- LEWIS-PALMER 38
- FALCON 49

- EDISON 54 JT
- MIAMI/YODER 60 JT
- CANON CITY RE-1
- FLORENCE RE-2
- COTOPAXI RE-3
- ROARING FORK RE-1
- GARFIELD RE-2
- GARFIELD 16
- GILPIN COUNTY RE-1
- WEST GRAND 1-JT.
- EAST GRAND 2
- GUNNISON WATERSHED RE1J
- HINSDALE COUNTY RE 1
- HUERFANO RE-1
- LA VETA RE-2
- NORTH PARK R-1
- JEFFERSON COUNTY R-1
- EADS RE-1
- PLAINVIEW RE-2
- ARRIBA-FLAGLER C-20
- HI-PLAINS R-23
- STRATTON R-4

- BETHUNE R-5
- BURLINGTON RE-6J
- LAKE COUNTY R-1
- DURANGO 9-R
- BAYFIELD 10 JT-R
- IGNACIO 11 JT
- POUDRE R-1
- THOMPSON R-2J
- PARK (ESTES PARK) R-3
- TRINIDAD 1
- PRIMERO REORGANIZED 2
- HOEHNE REORGANIZED 3
- AGUILAR REORGANIZED 6
- BRANSON REORGANIZED 82
- KIM REORGANIZED 88
- GENOA-HUGO C113
- LIMON RE-4J
- KARVAL RE-23
- VALLEY RE-1
- FRENCHMAN RE-3
- BUFFALO RE-4
- PLATEAU RE-5

- DE BEQUE 49JT
- PLATEAU VALLEY 50
- MESA COUNTY VALLEY 51
- CREEDE CONSOLIDATED 1
- MOFFAT COUNTY RE:NO 1
- MONTEZUMA-CORTEZ RE-1
- DOLORES RE-4A
- MANCOS RE-6
- MONTROSE COUNTY RE-1J
- WEST END RE-2
- BRUSH RE-2(J)
- FORT MORGAN RE-3
- WELDON VALLEY RE-20(J)
- WIGGINS RE-50(J)
- EAST OTERO R-1
- ROCKY FORD R-2
- MANZANOLA 3J
- FOWLER R-4J
- CHERAW 31
- SWINK 33
- OURAY R-1
- RIDGWAY R-2

- PLATTE CANYON 1
- PARK COUNTY RE-2
- HOLYOKE RE-1J
- HAXTUN RE-2J
- ASPEN 1
- GRANADA RE-1
- LAMAR RE-2
- HOLLY RE-3
- WILEY RE-13 JT
- PUEBLO CITY 60
- PUEBLO COUNTY 70
- MEEKER RE1
- RANGELY RE-4
- DEL NORTE C-7
- MONTE VISTA C-8
- SARGENT RE-33J
- HAYDEN RE-1
- STEAMBOAT SPRINGS RE-2
- SOUTH ROUTT RE 3
- MOUNTAIN VALLEY RE 1
- MOFFAT 2
- CENTER 26 JT

- SILVERTON 1
- TELLURIDE R-1
- NORWOOD R-2J
- JULESBURG RE-1
- PLATTE VALLEY RE-3
- SUMMIT RE-1
- CRIPPLE CREEK-VICTOR RE-1
- WOODLAND PARK RE-2
- AKRON R-1
- ARICKAREE R-2
- OTIS R-3
- LONE STAR 101
- WOODLIN R-104
- GILCREST RE-1
- EATON RE-2
- KEENESBURG RE-3(J)
- WINDSOR RE-4
- JOHNSTOWN-MILLIKEN RE-5J
- GREELEY 6
- PLATTE VALLEY RE-7
- WELD COUNTY S/D RE-8
- AULT-HIGHLAND RE-9

- BRIGGSDALE RE-10
- PRAIRIE RE-11
- PAWNEE RE-12
- WEST YUMA COUNTY RJ-1
- EAST YUMA COUNTY RJ-2
- ARKANSAS VALLEY BOCES
- EAST CENTRAL BOCES
- MOUNTAIN BOCES
- CENTENNIAL BOCS
- NORTHEAST BOCES
- PIKES PEAK BOCES
- SAN JUAN BOCS
- SAN LUIS VALLEY BOCES
- SOUTH CENTRAL BOCES
- SOUTH PLATTE VALLEY BOCES
- SOUTHEAST METRO BOCS
- SOUTHEASTERN BOCES
- SOUTHWEST BOCES
- WELD BOCES
- WEST CENTRAL BOCES
- NORTHWEST COLO BOCES
- DELTA-MONTROSE AREA VOC TECH

- SAN JUAN BASIN AVTS
- LARIMER BOCES
- ADAMS COUNTY BOCES
- RIO BLANCO BOCES
- EXPEDITIONARY BOCES
- GRAND VALLEY BOCES
- MT EVANS BOCES
- UNCOMPAHGRE BOCS
- SANTA FE TRAIL BOCES
- COLORADO DOE
- DISTRICT-WIDE
- WELD COUNTY RE-1
- YUMA 1
- WRAY RD-2
- IDALIA RJ-3
- LIBERTY J-4
- WEST YUMA COUNTY RJ-1
- EAST YUMA COUNTY RJ-2
- ARKANSAS VALLEY BOCES
- CENTENNIAL BOCES
- SOUTHEAST METRO BOCS
- WELD BOCES

- DELTA-MONTROSE AREA VOC TECH
- SAN JUAN BASIN AVTS
- FRONT RANGE BOCES
- CUSTER COUNTY SCHOOL DISTRICT C-1
- FOR DISTRICT WIDE SCHOOL (9980)
- WEST CENTRAL BOCES
- ADAMS 12 FIVE STAR SCHOOLS
- FACILITY
- CHARTER SCHOOL INSTITUTE
- UTE PASS BOCES
- CREEDE SCHOOL DISTRICT
- SAN JUAN BOCES
- Colorado School for the Deaf and Blind
- FREMONT RE-2
- BUFFALO RE-4J
- THOMPSON R2-J
- ESTES PARK R-3
- SCHOOL DISTRICT 27J
- COLORADO DIGITAL BOCES
- REVERE SCHOOL DISTRICT
- WELD COUNTY SCHOOL DISTRICT RE-3J
- WEST GRAND 1-JT

- UNCOMPAHGRE BOCES
- COLORADO SCHOOL FOR THE DEAF AND BLIND
- CMHI, PUEBLO
- DEPARTMENT OF CORRECTIONS
- DIVISION OF YOUTH SERVICES

Appendix E

Disability Type Categories:

- Error
- Unreported
- None
- Intellectual Disability
- Serious Emotional Disability
- Specific Learning Disability
- Hearing Impairment, including Deafness
- Visual Impairment, including Blindness
- Physical Disability
- Speech/Language Disability
- Deaf-Blindness
- Multiple Disabilities
- Autism Spectrum Disorders
- Traumatic Brain Injury
- Developmental Delay/Preschooler with A Disability
- Infant with a Disability
- Orthopedic Impairment
- Other Health Impairment

Appendix F

Data Coding Chart

COHORT	
CPP OCT	1
CPP DEC	2
SPED OCT	3
SPED DEC	4
STUDENT GRADE	
PK	10
K	11
GRADE 1	12
GRADE 2	13
GRADE 3	14
GENDER	
MALE	0
FEMALE	1
ETHNICITY	
OTHER/TWO OR MORE RACES	0
AMERICAN INDIAN/ALASKA NATIVE/HAWAIIAN/PACIFIC ISLANDER	1
ASIAN	2

AFRICAN AMERICAN (BLACK)	3
HISPANIC/MEXICAN AMERICAN/CHICANO/LATINO	4
CAUCASIAN (WHITE)	5
LANGUAGE PROFICIENCY	
NON ENGLISH PROFICIENT (NEP)	0
LIMITED ENGLISH PROFICIENT (LEP)	1
FLUENT ENGLISH PROFICIENT (FEP)	2
UNREPORTED/NOT APPLICABLE (ENGLISH SPEAKERS)	3
ENGLISH LANGUAGE LEARNER (ELL)	
NO	0
YES	1
BLANK	2
INDIVIDUAL EDUCATIONAL PLAN (IEP)	
NO	0
YES	1
DISABILITY	
NO DISABILITY (NONE)	0
PHYSICAL (HEARING INCLUDING DEAFNESS, VISUAL INCLUDING	1

BLINDNESS, SPEECH AND LANGUAGE, TRAUMATIC BRAIN INJURY, DEVELOPMENTAL DELAY, INFANT WITH DISABILITY, ORTHOPEDIC)	
INTELLECTUAL (SPECIFIC LEARNING DISABILITY, AUTISM	2
EMOTIONAL DISABILITY	3
MULTIPLE DISABILITIES	4
OTHER	5
MISSING DATA	CODE 99
ETHNICITY UNREPORTED	
ETHNICITY ERROR	
ETHNICITY NO RESPONSE	
ETHNICITY NO	
LANGUAGE ERROR	
LANGUAGE UNREPORTED	
LANGUAGE NOT APPLICABLE	
LANGUAGE- PRIMARY OR HOME LANGUAGE OTHER THAN ENGLISH (PHLOTE)	

LANGUAGE- FORMER ENGLISH LANGUAGE LEARNER (FELL)	
LANGUAGE - FEP, PHLOTE, FELL	
DISABILITY ERROR	
DISABILITY UNREPORTED MISSING DATA	
C1 CPP OCT RETENTION DATA DELETED DUE TO LACK OF INFORMATION FROM THE DATA SOURCE, NO EXPLANATION FOR THE BLANK CELLS 13314/64674 21% OF THE DATA. RETENTION DATA DELETED FROM THIS POINT ON 05/27/16	

Appendix G

Description of SPSS Spreadsheet

Variable	Column(s)
Student Identification Number	1
Grade.1- Grade.18	2-19
Gender.1- Gender.18	20-37
Ethnicity.1- Ethnicity.18	38-56
Language.1- Language.18	57-74
IEP.1- IEP.9	75-83
DisabilityOCT.1-DisabilityOCT.9	84-92
ELL.1-ELL.18	93-110
DisabilityDEC.1-DisabilityDEC.18	111-128
CPP_SPED_STATUS.1- CPP_SPED_STATUS.18	129-146
Filter_\$	147

Appendix H

Definitions of Key Terminology

Adequate Growth Percentile. Growth percentiles needed to get to English proficiency within a set timeline (CDE, 2015h).

Affective Needs - AN (Grades K-12). Self-contained classrooms for students with emotional disabilities provide a strong emphasis on affective education, academics, and social skills programming. Emphasis is on replacing inappropriate behaviors with more socially acceptable ones. A highly structured environment with individualized behavior management strategies and plans exists within these center classrooms CDE, 2015i).

Auditory/Oral Program. The auditory/oral program emphasizes the development of listening skills, speech, and language acquisition across the curriculum CDE, 2015i).

Body of Evidence. Multiple data sources used for monitoring and reclassifying a student (CDE, 2015h).

Colorado Academic Standards. Expectations of what students need to know and be able to do by the end of each grade (CDE, 2015h).

Conceptual knowledge and application. Addresses vocabulary, reasoning, associations, and problem solving (Fleury et al., 2015).

Culturally and Linguistically Diverse. Term used to describe students of differing cultural and or linguistic backgrounds (CDE, 2015h).

Developmental Learning Center - DLC (Kindergarten). The DLC program emphasizes a developmental curriculum, evenly balanced among the areas of cognition, communication, motor, self- help and social skills for five- and six-year-olds with

significant delays in these areas. Opportunity for integration with typical peers is heavily emphasized throughout the school day (CDE, 2015i).

Early Learning Center - ELC (Preschool). The ELC program emphasizes a developmental curriculum, evenly balanced among the areas of cognition, communication, motor, self- help and social skills for 3, 4 and 5 year olds with significant delays in these areas. Opportunity for integration with typical peers as well as family involvement is emphasized throughout the school day. The amount of time spent in the program depends on the age and needs of the student (CDE, 2015i).

English Proficient. A student, new to a district, who has a Primary or Home Language Other Than English (PHLOTE), has never been served in a language instruction education program (i.e.: ELA, ESL, Bilingual), and after initial screening and review of a body of evidence is determined to be proficient in English (CDE, 2015h).

Exceptional. Students who are gifted/talented, students with disabilities, and English learners who have special learning needs are considered exceptional (CDE, 2015h).

First Language. The language a child learns as his or her native language (CDE, 2015h).

Fluent English Proficient. A student who has spoken, or currently speaks, a language other than English, but who is able to comprehend, speak, read, and write English on a level comparable to his or her monolingual English-speaking peers (CDE, 2015h).

Former EL. A student, new to a district, who has a Primary or Home Language Other Than English (PHLOTE), previously received language instruction education program (i.e.: ELA, ESL, Bilingual services in a different district, and after initial screening and a review of a body of evidence is determined to be proficient in English (CDE, 2015h).

Gifted and Talented. Students who give evidence of high performance capability in intellectual, creative, artistic, leadership, or specific academic areas (CDE, 2015h).

Health and Motor Skill Development. Includes addressing student's vision, hearing, gross and fine motor skills (Fleury et al., 2015).

Hearing Disability - HD (Grades K-12). The programs for students with a hearing disability provide modifications of instructional methods and materials, amplification, and other forms of supplementary assistance to facilitate the ability to communicate, function, and learn. Inclusion, with appropriate supports, is a major emphasis when developing the student's IEP CDE, 2015i).

Individuals with Disabilities Education Act (IDEA). The federal law pertaining to Special Education (Reauthorized in 1997) (CDE, 2015h).

Intensive Communicative - I-COMM (Grades 1-5). It is the intent of this language-based program to serve children whose primary educational disabilities and needs are for intense developmental and/or compensatory services of a communicative nature CDE, 2015i).

Language and Literacy Skills. The student's ability to listen, story comprehension, phonemic awareness, and print concepts (Fleury et al., 2015).

Language Proficiency. A student's English language proficiency is described by his or her ability to speak, listen, read, and write in English (CDE, 2015h).

Limited English Proficient. A student who comprehends, speaks, reads, or writes some English, but whose predominant comprehension or speech is in a language other than English (CDE, 2015h).

Local Education Agency (LEA). The local school district or BOCES.

Motivation to Learn. The student's persistence and sustained attention to educational task (Fleury et al., 2015).

Multi Intensive - MI (Grades K-12). Adaptive/functional (A/F) center classrooms provide a functional approach to academics and life skills for students with moderate to severe delays in cognition, academic achievement and/or adaptive behaviors. Programming provides students with opportunities to develop competencies essential to becoming productive citizens of their communities. Students are taught lifelong skills that will maximize the potential to live, work, and participate within society. Some A/F centers are more specifically geared to meeting the needs of students with autism or autistic-like behaviors CDE, 2015i).

Multi Intensive - Severe MI-S (Grades K-12). This program serves pupils who frequently present with multiple disabilities. Curriculum emphasis is in skill development in the domain areas of basic skills and concepts (including functional academics), recreation and leisure, community, vocational, and domestic. Motor, communication, and social skills are infused throughout all areas CDE, 2015i).

Multi-Tiered System of Support (MTSS). This is a whole-school, data driven, prevention-based framework for improving learning outcomes for every student through layered continuum of evidence-based practices and systems (CDE, 2015h).

No Child Left Behind (NCLB). The No Child Left Behind Act of 2001 reauthorized the Elementary and Secondary Education Act (ESEA), the main federal law affecting education from kindergarten through high school. NCLB is built on four principles: accountability for results, more choices for parents, greater local control and flexibility, and an emphasis on doing what works based on scientific research (CDE, 2015h).

Non English Proficient. A student who speaks a language other than English and does not comprehend, speak, read, or write English (CDE, 2015h).

Physical Disability - PD (Grades K-12). The program for students identified with a physical disability provides services to students by general and special education teachers. The primary model is supported inclusion. The special education teacher consults with regular education teachers regarding strategies for increasing participation and possible curricular adaptations leading to the student's achieving maximum independence in the learning environment. The resource room is also available to the students for more intensive direct individualized instruction (CDE, 2015i).

Second Language. A language an individual learns in addition to his or her first language (CDE, 2015h).

Self-Regulations Skills. Behaviors related to attention, executive function, and effortful control (Lonigan et al., 2015).

Socioemotional Development. Includes student's ability to self-regulate, establishing reciprocal relationships with peers and adults (Fleury et al., 2015).

Special Education December Count. CDE-administered data collection. Annual count of eligible students under Part B of the Individuals with Disabilities Education Act (IDEA) as of December 1st used to generate federal funding to provide specialized student services. Special Education December Staff Data is also required to obtain actual data on special education staff employed by administrative units on December 1st of each year so that appropriate licensure and endorsement of staff can be verified; and reports can be made to the State Legislature, Federal government, local administrative units, and the public (CDE, 2015f).

Student October Count. CDE-administered fall pupil enrollment data collection. Information is used primarily to determine school demographics, number of students in instructional programs, free and reduced lunch counts, and distribution of school finances across the state (CDE, 2015g).

Supported Living Institute - SLI (Ages 18-21 years). Serving students with severe disabilities who are 18-21 years old, the Supported Living Institute is a transition program which addresses student needs in a holistic manner. The program attempts to facilitate a closer, more supportive link among the student, the family, and community and to put in place the supports needed to allow the student to live as independent and integrated a life as possible in his or her community. Utilizing the student's home and community as the classroom, acquisition of daily living skills to maximize the student's

independence is the goal. An important component of the program is a parent education/support group (CDE, 2015i).

Total Communication Program The total communication program has a philosophy in which teachers use whatever method of communication is appropriate for each child. The teachers primarily use the method of Simultaneous Communication (signing and speaking at the same time) (CDE, 2015i).