Differential benefits of prekindergarten for low-income black children: a quasi-experimental study

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Differential Benefits of Prekindergarten for Low-income Black Children:

A Quasi-experimental Study

By

Janice Marie Parker

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Abstract

Preschool children need essential tools to prepare them for kindergarten and beyond, including a strong foundation in social-emotional and cognitive, reading, writing, and math skills. Exposure to pre-kindergarten programs promotes academic preparedness. Studies have shown that “at-risk” children, including African Americans, and other racial or ethnic groups living in resource-poor communities, are particularly vulnerable to the negative impacts from a lack of pre-K education. This study assessed the impact of pre-K attendance on kindergarten readiness, and examined whether pre-K participation helped to close the achievement gap between Black inner-city students and their White peers. Employing elements of a quasi-experimental design, two groups were compared: 467 pre-K students (Blacks, Hispanics, and Whites) who participated in a district pre-K or Head Start program the year before kindergarten entry, and a comparison group of 229 students (Blacks, Hispanics, and Whites) who did not. Secondary data analyses using multivariate linear regression and analysis of variance compared reading and math scores at kindergarten entry between the two groups. Results showed that pre-K schooling led to statistically significant enhanced reading skills, but not math skills. White students achieved significantly higher math scores compared to their Black and Hispanic peers, but those who did not attend preschool had slightly higher math scores compared to those who did attend. Additionally, results showed that attendance in pre-K programs led to statistically significant enhanced reading skills; however, negligible improvements were found in math scores when Black and Hispanic children attended high-performing K–6 schools. Results suggest that while quality pre-K education is a valuable tool to promote equality and reduce academic performance disparities at kindergarten entry, pre-K is not a panacea for the accumulated disadvantages of persistent, cross-generational poverty.
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Chapter 1: Overview of Study

In his discussion of the theory of education, functionalist theorist, Emile Durkheim have argued that formal education is a social institution through which a society’s children are taught basic academic knowledge, learning skills, and cultural norms” (Durkheim and Sartre, 1956, p. 28). Children’s development is not only rapid but also cumulative. Bowman, Donovan, & Burns (2001) explained that preschool and childcare experiences are crucial for the development of important school readiness skills and later school outcomes. Consequently, appropriate supports are warranted for this critical phase of learning.

In the United States, kindergarten is usually part of the K–12 educational system. It is an institution for young children usually between ages 4 and 6 years. According to the National Center for Education Statistics 2018 report (Aragon, 2015; McFarland, Hussar, Wang, Zhang, Wang, et. al., 2018), the minimum age limit to which free education must be offered in the United States is between ages 4 and 6. Prekindergarten¹, sometimes called kindergarten prep or preschool or pre-K is a classroom-based program for children below the age of 5 that plays a valuable role in children’s development and preparations for learning.

Universal Prekindergarten (UPK) is an educational movement aimed to make access to preschool education available to all children across states, regardless of the child’s abilities and family income. In the state of New York, UPK is state-funded. Ideally, UPK “is a developmentally appropriate, learner-centered educational program to help four-year-olds develop physically, socially, emotionally, linguistically, culturally, and intellectually”

¹ The term preschool has many names including pre-K, prekindergarten, nursery school, toddler school, and if it is publicly funded across a state or city, it is commonly called Universal Pre-Kindergarten (UPK).
(Williamsville Central School District, 2016). The program focuses on early literacy and early math skills (e.g., counting, writing numbers, simple addition) to help prepare children for kindergarten. Furthermore, the care, supervision and learning of children can occur within the context of “early childhood care”, which concentrates on children from birth to 3 years of age and typically refers to infants and toddlers in programs (McCoy, Yoshikawa, Ziol-Guest, Duncan, Schindler, et al., 2017).

This chapter reviews pertinent aspects of kindergarten in the United States, with a focus on the goals of quality intervention as they relate to closing the achievement gap for Black children\(^2\) living in poverty. Next, a summary and brief discussion of the problem facing low-income African American children is provided, followed by the purpose of the study. The chapter concludes with a discussion of the implications and importance to social work.

**Background**

Students with access to challenging and engaging academic programs are better equipped for further education, work, and civic life (Moore, 2018). The current teaching strategies in U.S. schools is based on the GOLD assessment system\(^3\) that suggests that children need essential tools to facilitate their early educational preparedness, including a strong foundation in social-emotional and cognitive development, reading, writing, and math skills (Dodge, 2011). It can therefore be concluded that a child who enters kindergarten healthy, safe, secure, and uninhibited by basic negative home and or community environmental conditions starts with a solid foundation and is better prepared to succeed. Similarly, a student who feels connected to the

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\(^2\) African-American children are individuals under the age of 18 with ancestry in any of the Black racial groups of Africa (US Census).

\(^3\) The GOLD assessment system is a unified system for assessing children from birth through kindergarten.
learning environment (e.g., their teachers, classmates, cultural content of books, class
discussions, and other learning tools) in early schooling is more likely to complete high school
(Klem & Connell, 2009). However, a considerable number of children under six years of age are
unprepared to succeed or thrive academically because they lack school readiness or the ability to
succeed both academically and socially in a school environment. Prekindergarten or preschool or
eyearly childcare is closely linked to school readiness because it is designed to prepare and build
the foundation for school success. Isaacs (2012), of the Brookings Institution\(^4\), has noted that a
child’s probability of being “school ready” is nine percentage points higher if that child has
attended preschool.

Black children from resource-poor families face higher risks for lack of school readiness
due to inadequate knowledge and behavioral skill sets (Waldfogel & Washbrook, 2011; Zigler,
Marsland, & Lord, 2009) as well as a lack of access to resources that enhance learning such as
books (Arnold & Doctoroff, 2003). Impoverished Black children without parental and supportive
services, cognitive (and noncognitive) skill sets (Heckman & Mosso, 2014) will not be prepared
for school; likewise children without appropriate social emotional development and a resource-
enhanced early care and early education environment face greater risks of school failure (Isaacs,
2012). Along with larger social and cultural issues, these disadvantages may be a driving cause
of academic achievement disparities between resource poor students of color and White students.

For this reason, the Civil Rights Act of 1964 tasked the Department of Education to
examine the inequality of educational opportunities in elementary and secondary education

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\(^4\) The Brookings Institution, an American research group founded in 1916 and based in
Washington, D.C., conducts research and provides education primarily in economics,
metropolitan policy, government, foreign policy, and the global economy and economic
development.
across the United States. The emerging seminal report, known as The Coleman Report (1966), written by James Coleman, a Johns Hopkins University sociologist, at the request of the U.S. Department of Education, showed that 87 percent of White students in grade 12 scored above their Black peers in math and reading. In other words, Black students scored in the 13th percentile (Coleman, 1966).

Differences in academic achievement between African American and Caucasian students should have narrowed over time. Numerous early intervention programs such as Head Start, and pre-K services have been implemented to mitigate the lag in academic achievement between African American and White students, albeit the outcomes have fallen short of desired goals. Unfortunately, evidence shows that more than 50 years later, this gap in Black vs. White student performance in math and reading has improved very little since the 1966 Coleman Report. According to data from the 2013 National Assessment for Educational Progress (NAEP), the largest continuing and nationally representative assessment of U.S. student achievement across region, race, socio-economic groups, the average Black student scored at just the 22nd percentile in math and the 19th percentile in reading (NAEP, 2013). This Black-White academic achievement gap appears before children enter kindergarten and extends through high school. Given the persistent Black-White academic achievement gap, a lack of requisite supports and preparation in early childhood may mean that the road to long-term adult poverty for Black children from resource poor communities is paved by the first day of school (Reardon, Robinson, & Weathers, 2016).

Measuring academic achievement early is important and necessary for both student achievement and educational policy making. Data from the National Institute of Child Health and Human Development (NICHD) Study of Early Child Care and Youth Development (2017)
suggest that achievement in school depends upon a combination of factors such as a) parent engagement, b) home stability, c) good health, d) quality early care, and e) high quality early education. According to a report from the Schuyler Center for Analysis and Advocacy of New York (SCAA, 2012), a child’s readiness for school depends on whether the child’s comprehensive needs are met. These needs include mastering physical and motor development, beginning language and literacy comprehension, social and emotional development (i.e., individual regulatory behavior), beginning approaches to learning and cognitive development. If a child enters school with deficits in any one of these areas, catching up is often difficult.

Research assessing the state of preschools indicates that as much as half of school failure is attributable to gaps before children enter school, gaps in early care and development (Barnett, 2013; U.S. Department of Health and Human Services [USDHHS], 2016). Moreover, kindergarten today is characterized by a heightened focus on academic skills (Bassok, Latham, & Rorem, 2016); thus, a child who starts kindergarten ill-prepared for the academic demands of school is likely to lag in achievement scores.

In fact, children’s futures may be shaped by their cognitive and socio-emotional skills as well as access to preschool programs. As wealth inequities increase in the United States, it is likely that more vulnerable Black children will need high-quality early care and preschool education intervention (Barnett, 2013). Extensive research findings have documented the fact that poor children who receive high-quality childcare services as early as infancy reap long-lasting benefits. These benefits include, but are not limited to, a better chance of obtaining a college degree and steady employment (Children’s Defense Fund, 2012; Waldfogel & Washbrook, 2011; Zigler, Gilliam & Barnett, 2011). The evidence-based literature supporting the benefits of early education intervention, that is, participation in quality early care and
learning, is rich and steadily gaining support for optimizing successful educational outcomes (Fitzpatrick, 2008; Gormley & Phillips, 2005). Such effective outcomes are critical as the achievement gap tracks into growing inequality. Black children in low-resource environments are at risk for living in persistent poverty throughout their lifetimes due to the accumulation of adverse experiences such as food insecurity, housing instability, financial stressors, and reports of child abuse and neglect (Bassok, 2010a).

Statement of Problem

Disparities in educational outcomes among racial and socioeconomic segments of U.S. school children are well documented. It has been empirically documented that Black children in urban resource-poor environments begin their formal education, defined as kindergarten, with deficits in language and social-emotional skills (Halle, Forry, Hair, Perper, Wandner, et al., 2009). Recent data indicate that 89% of Black children compared to 54% of White children could not read at grade level in public schools (National Center for Education Statistics, 2016). In 2015, more than 75 percent of fourth and eighth grade Black, Hispanic and American Indian/Alaska Native public-school students could not read at grade level compared with less than 60 percent of White students (Children’s Defense Fund, 2018).

Disparities in early learning and development between White and Black children reportedly begin as early as birth. For example, results from one study (Halle et al., 2009b) suggest that U.S. infants and toddlers from racial/ethnic minority groups whose home language is not English and/or who have mothers with low education levels, tend to score lower on cognitive and positive behavior ratings than children from more advantaged backgrounds. Halle and colleagues also found that the cognitive development of Black babies at nine months was two times lower than White babies; at 24 months they were three times lower, and by age four,
they were farther behind (Halle et al., 2009b). As low-income Black children age, the cognitive
development gap could widen. Clearly, many low-income, Black children could fall farther
behind in being ready for kindergarten compared to White children. Developmental delays in
cognitive growth places many low-income Black children at a grave disadvantage.

Depending on the source of data, the major social determinants contributing to these
cognitive gaps include lack of neighborhood resources, low levels of parental education,
unemployment and underemployment, all of which are associated with income inequality
vital role in lowering academic achievement scores (Ferguson, Bovaird, & Mueller, 2007).
Children raised in poverty are much less likely to have their crucial educational-related needs
met than their more affluent peers. A disproportionately higher number of Black children live in
poverty compared to White children. A 2018 Children’s Defense Fund (CDF) study found that
nearly 20% of U.S. children were poor (based on census data and determined by poverty
thresholds by region, family size, and number of related children under the age of 18) in 2016
(approximately 13.2 million children). However, about 33% of Black children were poor
compared with 11% of White children. They also report that in 2015 nearly 20% of U.S.
children, or 14.8 million, lived in food-insecure households. However, the number of Black and
Hispanic households with food-insecure children was two times greater than that of White

**Poverty**

Parental involvement is crucial to children’s success in school. Students from low-income
families are at higher risk for academic and social problems because correlates of poverty such
as parental depression, single-parenthood, housing and food insecurity, low-paying jobs and job
insecurity can hinder parents’ ability to support their children’s education. Poverty rates are important indicators of a community’s well-being and are critical for understanding the disparities in Black and Latino/a versus White children’s cognitive development. Poverty rates are also used by government agencies and organizations to allocate need-based resources such as a preschool subsidies.

The 2011 American Community Survey (ACS) shows that U.S. poverty rates were 27 percent for American Indians and Alaska Natives and 25.8% for Blacks or African Americans, while poverty rates for Whites were 12% (Macartney, Bishaw, & Fontenot, 2013). In his 2013 book, Stuck in Place, Patrick Sharkey argues that Black children are ten times as likely to live in poor neighborhoods than Whites (Sharkey, 2013, p. 27). A negative consequence of living in disadvantaged communities is that Black children and children from other oppressed minority groups are at risk of failure in the education system. This is due in part to cognitive differences that emerge between them and their White counterparts after birth, which are then compounded over time by insufficient early care and pre-K education, along with the stressors of family poverty (Bartik, 2011; Heckman, 2011; Zeigler et. al., 2009).

Some experts, such as Barnett (2013), have argued that early interventions are most effective in preventing some of the inequities associated with being Black, especially those addressing the consequences of living in poverty. Model programs have emerged that show the differential benefits of such programs. For example, investigators have reviewed the seminal outcomes of the High/Scope Perry Preschool Program, Abecedarian Project, Chicago Child-Parent Centers, and Parent Child Development Centers, widely acclaimed early childhood education intervention programs and have found that they helped advance participants for kindergarten readiness including social-emotional, language, and cognitive
which helps support kindergarten readiness (e.g., Barnett, 1985; Gormley, Gayer, Phillips, & Dawson, 2005).

Additionally, these pre-K education programs are linked to several long-term accomplishments (Barnett, Epstein, Friedman, Sansanelli, & Hustedt, 2009; Halle et al., 2009a; Zigler et al., 2009) as well as several related benefits. The main improvements were increases in low-income students’ academic achievement (e.g., Manning, Homel, & Smith, 2010), improved cognitive skills, improved socio-emotional development, and increased physical health (Reynolds, Richardson, Hayakawa, Englund, Ou, 2016). The related benefits include values that families place on school and education, increases in family health outcomes, contributions to future financial success for the family, strengthening mothers’ career successes and enhancements in parenting skills (Zigler et al., 2009).

Evidently, the combination of benefits, such as high quality early childcare and early education programs, can contribute to positive outcomes for children’s futures (Schulman, 2005). For instance, the Chicago Child Parent Center demonstrated long lasting, positive effects for the children and their families based on follow-up data (Barnett 2013). Findings from the Chicago Child Parent Center studies revealed that children were less likely to be neglected or abused, held back a grade, placed in special education, arrested for crimes, or become high school dropouts (Reynolds, Temple, Robertson, & Mann, 2001).

In fact, a substantial body of research has established that quality prekindergarten programs assist students in building a foundation for later success in school and in life (Gormley & Phillips, 2005; Howes, Burchinal, Pianta, Bryant, Early, et al., 2008; Ramey & Ramey, 2004). In addition, it appears that the year before kindergarten represents an integral part of formal
education (Ackerman, Barnett, Hawkinson, McGonigle, 2009; Barnett, Carolan, & Squires, 2011).

**Purpose of the Study**

Recent research reveals that children who live in underprivileged, resource-poor communities and attend inadequate, underfunded schools within those communities face various adverse effects (Barnett, Carolan, & Squires, 2011). Adverse effects include lower educational achievement throughout their lifespans, lower economic earning power into adulthood, and higher rates of criminal offences, teenage pregnancy, and mental health problems. In general, such adversities are challenging; however, the negative consequences of these conditions are compounded for young Black and Hispanic children and their families.

Disadvantaged and resource-deprived Black children may begin their formal educational journey without requisite resources to succeed. In fact, in the absence of early learning programs such as city- and state-sponsored pre-K and federally sponsored Head Start programs, and quality subsidized day care services, Black and Latino/a children may begin kindergarten with substantial knowledge gaps when compared to their advantaged counterparts. Research reveals that knowledge gaps may be compounded by the early cognitive deficits that emerge after birth, attributed to poverty and socioeconomic marginalization (Shonkoff & Phillips, 2000).

Concerns about children of color serve as an impetus for parents, educators, social workers, children’s advocates, economists, politicians and policymakers to ensure that all children are well prepared to start the life-long pursuit of education and skills (formal or informal) as competent in all realms — cognitive, language and literacy, social-emotional and physical — so they can achieve the best of their potential. High-quality early childcare and early education programs have been shown to be successful in addressing some of the issues related to
child poverty while simultaneously closing some of the knowledge gaps for children for different socio-economic realms. However, research pointing to the benefits of early childcare and education is inconsistent.

On the one hand, past research has shown that early childcare and preschool experiences are crucial for the development of important school readiness skills and later school outcomes (Bowman et al., 2001; Shonkoff & Phillips, 2000). Many studies have shown that early childhood intervention programs are successful in improving the educational and employment outcomes of children who grow up in poverty. For example, consistent with a cognitive advantage hypothesis, higher quality childcare appeared to promote achievement indirectly via the provision of early school readiness skills (Dearing, McCartney, & Taylor, 2009). Higher quality childcare has also been positively linked to cognitive, language, academic, and literacy development (Howes et al., 2008; Peisner-Feinberg et al., 2001) as well as mathematical thinking skills (Forry, Davis, & Welti, 2013). Intensive early childhood interventions and high-quality preschool programs can foster children’s school readiness but also positively impact other areas in life, including higher education and health (Campbell et al., 2014).

On the other hand, some studies have not supported these findings. For example, Lipsey, Farran, and Hofe (2015) studied whether children who participate in a full-day prekindergarten program achieve greater academic and behavioral gains than peers who did not participate in the program. Lipsey and colleagues (2015) found that the control group of children had caught up with the intervention children at the end of the first grade. In their summary of existing early childhood education programs, Duncan and Murnane (2011) provide evidence that although many early childhood education programs have been shown to boost cognitive ability and early school achievement in the short run, most produce smaller impacts than those found in
exemplary early education programs, such as the Abecedarian and Perry Preschool programs. In fact, their cognitive impacts “largely disappear within a few years” (p. 16–17). Likewise, based on a review of relevant literature, Yoshikawa and colleagues (2016) found that the positive effects of preschool education are largely short-term.

**Knowledge gaps in research on effects of preschool education**

An analysis of the prekindergarten research literature reveals knowledge gaps in three key areas. The first is on the extent to which subsidized early childcare programs prepare children in poverty for the transition to kindergarten. To date, most childcare research has been conducted somewhat restrictively, on samples of fairly advantaged children (Clarke-Stewart & Allhusen, 2005). Most likely due to this limitation of available data on disadvantaged children (possibly related to the low probability of finding rigorous outcomes/impact evaluations), little is known about the school readiness gains made by African American children, particularly those in poverty, who often receive subsidies to attend center-based childcare. Second, research in early childhood education and children’s transition to kindergarten is currently very strong. Interestingly though, much of the development in research stems largely from information gathered from programs that are complex, expensive, and difficult to implement (Barnett, 1985; Heckman, Moon, Pinto, Savelyev, & Yavitz, 2010), rendering inferences nongeneralizable to other populations, namely low-income children of color. Third, UPK is a voluntary program generally aimed at providing learner-centered education to help four-year-olds develop physically, socially, emotionally, linguistically, culturally, and intellectually. Pre-k intervention programs tend to strongly emphasize early literacy and early numeracy to help prepare children for kindergarten. Parents and/or guardians may choose, but are not required, to enroll their children in a UPK program. Because no mandate exists locally or nationally for reporting the
number of four-year-olds attending UPK programs, there is no verifiable documentation of attendance in states and localities, and no Board of Education or state or local education department tracks children’s education or childcare engagement prior to kindergarten entry.

In addition to the above information, data need to be collected to determine the number of children being served by early-education programs, and the types of programs and funding sources across the nation. Needed information includes enrollment data in early childcare and early education programs (e.g., early preschool, UPK, and Head Start), and in private preschool programs; information on the various types of curricula used in early daycare and pre-K programs; data on actual preschool slots available, the amount of public funding designated for pre-K slots, enrollment costs for publicly funded vs. private pre-K programs, along with the government funding allocation process across states, cities, counties and towns.

Actual enrollment statistics and detailed supporting information are also of considerable importance in determining the usefulness and effectiveness of early childhood education. Data from the National Institute for Early Childhood Educational Research in 2017 suggest that nationally only 33% of children eligible for preschool programs were enrolled. What is known is that nationwide from 2002 to 2017, among the current 27 states with state-funded programs, 11 states reduced enrollment of eligible children in preschool, 10 states enrolled 50% of eligible children in preschool, five states enrolled 70% or more, and only the District of Columbia (D.C.) and Vermont enrolled more than 50% (Friedman-Krauss, Barnett, Weisenfeld, Kasmin, DiCrecchio, et al., 2018).

**Implications for and Importance to Social Work**

The age at which children start school varies among U.S. states (NCES, 2010–11). To illustrate, New York State Education law (Educ. §§ 3201, et seq.) sets age six as the compulsory
age that all children must begin school (kindergarten). Given the voluntary nature of UPK participation, it is difficult to identify precisely how many children are not receiving services or admitted in programs. Nationally, these data do not exist. The lack of data on how many children are not in preschool programs is problematic. Yet, what is known is the deleterious effects on children who live in poverty and especially those children who do not enjoy the privilege of participating in high-quality early childcare, and early education preschool programs (Ackerman, Barnett, Hawkinson, & McGonigle, 2009; Barnett, Carolan, & Squires, 2011). Conversely, a 2016 study indicates that wealth disparities continue to exist with White families’ income seven times higher than that of Black families (KIDS COUNT Data Center, 2016). The harmful consequences are magnified for poor Black children from disadvantaged backgrounds. Deleterious consequences are evident in negative health outcomes, insufficient cognitive development, lack in social emotional adjustment, and limited skill development. The inadequate skill development eventually affects the earning potential of poor Black children over a life-time when compared to children whose families are in the moderate to high income brackets (Isaacs, 2012). When considering the positive correlation between living in poverty and the deficiency in kindergarten preparedness, along with the empirical evidence that supports early intervention, informed action is required (Barnett, 2013; Shulman, 2005).

With respect to the relevance for the social work profession and for social workers invested in early care and early education services, this question is crucial: Should social workers take an active role in encouraging, educating, and engaging parents in low-income communities on behalf of their children who are a part of this vulnerable pre-K population? The social work code of ethics points to another broader philosophical question that compels intervention on behalf of children and families: Is promoting early preschool and UPK programs for children
three and four years of age an infringement on parental rights? Answers to these questions will guide inquiries on disparities in educational outcomes.
Chapter 2: Conceptual Theories/Framework & Literature Review

Chapter two focuses on the literature that undergirds the theories and concepts related to early childhood education. The chapter specifically reviews the literature related to Black children who live in resource-poor environments. First, drawing from cumulative advantage/disadvantage theory, as well as the concept that underlies social capital theory, and social mobility, we consider the consequences of early interventions in education and childcare for young Black children. Our focus also considers the accumulation of risk factors faced in impoverished neighborhoods. Following this, a brief history of kindergarten in America is presented. Then, a review of the existing empirical research is discussed with an emphasis on benchmark kindergarten programs, evaluation criteria for prekindergarten programs, and quality programs. The chapter concludes with a brief discussion of the gaps in early childhood education research related to Black children who live in resource-poor environments, and how this study addresses a component of this research gap.

Cumulative Advantages/Disadvantages Theory

Robert K. Merton first coined the term the “Matthew effect” taken from a scripture in the Bible (the Parable of Talents\textsuperscript{5}, Gospel of Matthew) as a way of explaining a phenomenon sometimes summarized by the adage that “the rich get richer and the poor get poorer” (e.g., Jiang & Probst, 2017). More formally, Merton (1968) introduced and described the concept of cumulative advantage in the context of scientific career stratification. He delineated the phenomenon of cumulative disadvantage emphasizing examples of cumulative advantage as its inverse.

\textsuperscript{5} “For to everyone who has will more be given, and he will have an abundance. But from the one who has not, even what he has will be taken away” (Matthew 25:29, RSV) (See Appendix A for full text).
Cumulative advantage is described by Merton (1968) in his seminal article as the ways in which initial comparative advantage of trained capacity, structural location and available resources make for successive increments of advantage (p. 56–63). For an example, Merton described how well-known scientists who are working in a group will often get more credit and visibility than a comparatively unknown researcher, even if their research and findings are similar. In other words, in the process of “cumulative advantage”, extraordinary achievements early in the career of an emerging scientist attracts new resources as well as incentives that inspire continued high performance. Consequently, the incentives along with career prestige both accumulate over time. Furthermore, Merton argued that in the scientific community the Matthew Effect reaches beyond simple reputation to influence wider social and economic systems, playing a part in social selection processes and resulting in an accumulation of resources and success.

The cumulative advantage/disadvantage theory lies at the heart of many large social problems. The notion is often cited as the causal mechanism for the growth of income inequality, corruption, centralization of power, and hardening of class stratification (Entwisle, Alexander, & Olson, 2001; Sheppard & Monden, 2018). Specifically, the cumulative advantage/disadvantage theory can be defined as the systemic tendency for inter-individual divergence in a given characteristic (e.g., money, health, or status) with the passage of time. Such an idea strongly counters the US educational ideals of equal opportunity, merit-based rewards, and merit-based status attainment. Consequently, cumulative disadvantage among persons or groups living in resource-poor environments has long been a concern of scholars and frequently appears in the social science literature, including literature on social mobility, poverty, race, crime, education, and human development (DiPrete & Eirich, 2006; Hannon, 2003; Nurius, Prince, & Rocha, 2015).
Cumulative disadvantage offers a compelling framework to understand how social and material inequalities, alongside experiences of discrimination accumulate over time and influence the life course trajectories of individuals and groups of individuals, particularly oppressed members of a society. The cumulative disadvantage process makes it difficult for an individual or group that is “behind” at a point in time in educational development, income or other characteristics to catch up (DiPrete & Eirich, 2006). Thus, the unequal advantages and disadvantages of cultural and racial groups, for instance, tend to grow over time.

Moreover, early life conditions have also been identified as important roots of later status attainment disparities. For example, markers of physical characteristics, such as birth weight (e.g., Conley, Strully, & Bennett, 2003) and skin tones (Blair, Chapleau, & Judd, 2005; Blair, Judd, & Chapleau, 2004) are often associated with social arrangements and, hence, eventually, affect individuals’ and groups’ employment status and quality of life. Similarly, markers of socioeconomic characteristics, such as poverty in early life, may obstruct physical growth, language and literacy development, cognitive skills, and social emotional progress, and may be associated with multiple life course inequalities (e.g., Hayward & Gorman, 2004).

**Social Capital Theory and Social Mobility**

Social capital was conceptualized by two theorists, Pierre Bourdieu and James Coleman, who introduced the term independently of each other around the same time (Bourdieu, 1986; Coleman, 1988). With some variations, both focused on the benefits accruing to individuals or family by virtue of their social and familial ties. According to Bourdieu, the social world is accumulated history and capital is accumulated labor (Bourdieu, 1986). Together, the term “social capital” is the “process of building trusting relationships, mutual understanding and shared actions that bring together individuals, communities, and institutions” (Tracy, Secret,
Ersing, Stuphen, n.d., p. 7). It also refers to resources inherent in social relations that facilitate collective action such as trust, norms, and networks of association, representing any group that gathers consistently for a common purpose.

Social capital also refers to the individual and collective resources within families and communities that can be mobilized through social relations (Putnam, 2000) and is applicable to children’s educational development. Sampson and colleagues (1997) have made an innovative conceptualization of collective efficacy that emphasizes links between cohesion, social trust, shared expectations, and the willingness of neighborhood residents to act in support of these values to address a task such as neighborhood safety. It is manifested in how residents of a community address their challenges and meet specific task demands.

Collective efficacy can help us understand and predict neighborhood cohesiveness and civic engagement, as well as crime and violence (Sampson, 2012, p. 27). In other words, collective efficacy can be described as social cohesion combined with shared expectations of social control. Robert Sampson, a criminologist, highlights in his book, *Great American City*, the consequences of racial residential segregation on neighborhood change and its impact on residents and shows that social isolation, regardless of the source, can reproduce conflict and social and economic stratification. Sampson emphasizes the place- and race-based nature of persistent poverty traps, indicating how individual and family poverty is lodged squarely in place-based, social and economic standing. And he also points out in his book that “disadvantage is not encompassed in a single characteristic but rather is a synergistic composite of social factors” (Sampson, 2012, p. 100)

Various social and cultural phenomena are associated with the ‘terrible trilogy’ of poverty — social and economic exclusion, and social isolation. Families of disadvantaged
communities confront interconnected barriers to opportunity, such as the high hurdles to educational information and high-quality schools, social and employment networks, and educational support, and a dearth of professional role models (e.g., in the STEAM fields), which stem not only from economic deprivation and the cumulative effects of isolation within society itself due to poverty, bias, and cross-generational oppression (Duncan, & Murnane, 2011). Social capital can help the chronically poor and disadvantaged segments of society overcome their subordinate status to participate fully in social life and subsequently improve their capacity to organize collective action for community change (Putnam, 2000). In other words, important social and structural conditions such as inequality can be interrupted by positive effects of collective efficacy.

Collective efficacy does not exist in a social vacuum. It is structurally patterned and contingent on the challenges a group faces, along with cultural contexts, and the stratification of places (which explains why it is manifested in some neighborhoods, but not others). Neighborhood collective effects for children’s education are relevant because early educational outcomes result from social processes that involve collective aspects of community life. Student success is affected in part by positive social capital. This may be influenced in by parental expectations, obligations, and social networks that exist within the family, school, and community. Some scholars, such as Bowles and Gintis (2002), have explicitly connected schooling and work as integrated elements in the system of stratified social reproduction. Social class and a family's socioeconomic status may directly affect a child’s chances for obtaining a quality education and succeeding in life. And because economic status is often transmitted from parents to offspring (Bowles & Gintis, 2002), social capital leads to long-lasting beneficial relationships such as social network connections and the norms of reciprocity and
trustworthiness that arise from them. Evidence suggests that children from socioeconomically disadvantaged households typically have less access to resources that have been associated with learning, such as books in their homes, than do students from more socioeconomically advantaged households. Moreover, they are also less likely to have access to quality preschools, than do students from more socioeconomically advantaged households (Arnold & Doctoroff, 2003). This indicates that the cumulative disadvantages of Black and Latina/o children living in poverty play a central role in shaping their capacities to establish firm foundations for school readiness and inevitably impede their immediate and future success.

Social mobility is defined as the movement of individuals, families, households, ethnic and racial groups (and other categories of individuals) within or between layers or tiers in an open system of social stratification. Simply put, social mobility is a change in social status including changes in occupation, income or wealth relative to and individual’s or group’s current social location within a given society. The movement can be in a downward or upward direction. Education provides one of the most promising chances of upward social mobility into a “higher” (stratified) social class and status, regardless of current social standing in the overall structure of society. The availability of social mobility resources such as education can be important in providing pathways to greater access to wealth, resources, and equality in societies. However, as discussed above, cumulative disadvantage processes make it difficult for the disadvantaged to achieve upward mobility. Furthermore, the stratification in society through different social classes and high wealth inequality directly affects the educational opportunities individuals can obtain and succeed in, and their chances for upward social mobility. In other words, social class and a family's socioeconomic status may directly affect a child’s chances for obtaining a quality education and succeeding in life. For example, evidence
suggests that by age five, there are significant developmental differences between low, middle, and upper class children's cognitive and noncognitive skills (Greenstone, Looney, Patashnik, & Yu, 2013).

Early intervention through education can be the key to reducing the disadvantages of Black children living in poverty (Children’s Defense Fund, 2012; Waldfogel & Washbrook, 2011; Zigler, Gilliam & Barnett, 2011). The above discussed theories and concepts relate to cumulative advantage and disadvantage, social capital and social mobility. These theories and concepts offer a framework for examining the ramifications of living in persistent poverty, experiencing severe material deprivation, lack of family influences and involvement, fragile family units and resource challenged community structures.

The negative impact of poverty

According to the latest U.S. Census (2016), about 15 million or 21% of children in the United States live in families with incomes below the federal poverty threshold (FPT\(^6\)). Multiple inherent challenges exist when a child lives in poverty. The fusion of inequalities may obstruct physical growth, language and literacy development, cognitive development skills, and social emotional progress. However, the literature reveals that the effects are more detrimental for children from birth to five years of age (Greenstone et al., 2013). Moreover, poverty tends to persist for many individuals throughout their life course. For example, Uman (2003) suggests that about 70% of Americans remain in the same socio-economic class in which they are born.

Consequently, living in resource poor environments negatively impedes children’s capacities to establish firm foundations for school readiness and thus may impact lifelong

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\(^6\) FPT for 2016 was $16,543 for a family of two with one child.
Studies have shown that prenatal care, healthy environments in combination with high quality early childhood care and prekindergarten programs, may better position children on positive lifetime socioeconomic trajectories (Ackerman, Barnett, Hawkinson, et al., 2009; Howes, et al., 2008). Some conclusions from these studies on prenatal preschool experiences of children raised in poverty have stimulated the creation of a new frontier for research on the outcomes of early childhood interventions. Early prekindergarten programs have become a recent key approach to achieving educational goals of for 21st century America, goals that include kindergarten readiness and student preparation for K-12 school achievement and college success.

Early education experts such as Heckman (2011) and Bartik (2011) have suggested that by investing in early education, the nation can close cognitive and behavioral disparities. When resource disadvantaged Black children are compared to their White counterparts, gaps in knowledge are significant at an early age (e.g., McCartney, Bishaw, & Fontenot, 2013). Therefore, the earlier age at which resource disadvantaged Black children are enrolled in high quality early care and early education programs, the greater their chances of being equipped for school success. Early interventions may decrease the need for special education and remedial programs. Consistent evidence has documented that disparities in achievement gaps are more difficult to alleviate as children age (Barnett et al., 2016), suggesting that the earlier the investment in poor children, the greater the return. Therefore, the interest in providing quality pre-school childhood education reflects a growing need to better understand and address deficits in skills and cognitive development before kindergarten. Enhanced, well-equipped early care and early pre-K education programs and services are the foundational building blocks and integral to
the development of behaviors and skill sets required to succeed educationally, and positively impact the students’ quality of life over the long term (Fitzpatrick, 2008).

**Overview of High-Quality Early Care and UPK Programs**

Researchers agree that significant components of quality early care and UPK programs include small class sizes, low child-to-staff ratios (e.g. 1:10), staff teacher and assistant teachers with certificates in early childhood education, consistent standards, and ongoing staff training programs (Bassok, 2010; Children’s Defense Fund, 2012; Duncan & Murnane, 2011; Ackerman et al., Barnett et al., 2009, Zigler, 2009). Barnett and colleagues ranked 43 states by 10 quality standards for UPK for three- and four-year-olds. This evaluation also included access (the numbers and percent of children in each state either enrolled or for whom these programs were available). The authors found that nationally, all the programs that reported information, met the early learning quality standards. However, only 57% met the standard for teachers having a BA or higher. Ten programs did not have teachers with training related to Pre-K; less than half of the sample had assistant teachers with a child development associate degree or higher; 50% provided one meal a day; 84% met the standard for class size- under 20, (staff to child ratios under 1:10); 51% staff had in-service training at fifteen hours per year or more; and 55% provided at least one support or referral as well as follow-up monitoring within five years (Barnett et al., 2016).

The 1990 federal Individuals with Disabilities Education Act (IDEA) is aimed to address some of the challenges in identifying preschool-age children with disabilities or developmental delays. Most preschool children with disabilities are eligible to receive special education services, which have been found to have positive results (Müller & Ahearn, 2004). Yet, complying with the IDEA is apparently challenging because many preschool-age children with
disabilities are not in preschool. For low-income families who experience many cumulative social disadvantages, the likelihood is very high of also having to deal with the challenge of having a child with cognitive, physical or other disabilities due to exposure to home and environmental toxins and other risk factors for disabilities (Bauman, Silver, & Stein, 2006) early in life. And even when some of these children do attend preschool, educators may not know what to look for to identify a disability and hence a child’s special needs.

National findings indicate that individual state laws, regulations and policies differ widely in many of the standards, procedures, and practices governing preschool. For example, studies reveal that nationally, there are only minimum federal standards for health and safety and minimum state requirements for class size, child-to-staff ratios, staff qualifications and training, physical environment, and criminal and child abuse/maltreatment background checks (Barnett et al., 2016). Across states, these requirements vary (Ackerman, Barnett, Hawkinson, et al., 2009; Zigler, 2009). State regulations establish minimum requirements to which licensed community-based pre-K programs must adhere. In some states the minimum requirements are higher than others for class size, ratios, and education, training and physical space. However, UPK programs that operate in public schools are not required to meet these regulations; public schools set their own standards. As a result, it makes it difficult to compare states because so many of these factors influence quality (Ackerman, Barnett, Hawkinson, et al.; 2009, Zigler, 2009). To summarize, these findings show the absence of rigorous standards for early care and education. Thus, there is a need on the federal level to advance more systematic attention to minimum standards.

**Historical perspectives on UPK programs**

Head Start was initiated in 1965 is the first national early education program established
in the United States and administered by the Department of Health and Human Services. Head
Start was a program of President Lyndon B. Johnson’s War on Poverty, in response to the efforts
of Civil Rights activists. It began as a half-day preschool program for low-income four-year old
children, one year before they entered kindergarten. Since then, Head Start has grown from an
eight-week demonstration project to include full day/year services and numerous program
options (Zigler et al., 2009). Today, it encompasses Head Start preschool programs, which
primarily serve 3- and 4-year-old children, and Early Head Start programs that support the
health, education and welfare of low-income infants, toddlers, and pregnant women.

Following the lead of Head Start, many states began to institute pre-K programs for low-
income four-year-old children, particularly those from vulnerable populations (Barnett, 2013).
The goal has been to develop educational, behavior and social skill sets to enhance children’s
capacities to succeed in school (Schulman, 2005). While only 10 states sponsored publicly
funded prekindergarten programs before 1980 (Zigler, Gilliam, & Barnett, 2011), a growing
number of states in the 1980s began developing such programs as part of a focus on education
reform and improvement. The movement has increased six-fold over the last 20 years with over
40 states funding pre-K programs, compared to only seven states prior to 1980 (Fitzpatrick,
2008; Shulman, 2005). By 2005, the number of states with some type of tax-funded pre-K
program increased to 38 (Schulman, 2005). By 2014, 40 states plus the District of Columbia had
publicly funded pre-K programs; however, only nine states (less than 25%) served more than
half of all four-year-olds in the state, and 11 (about 25%) served less than 10 percent. Only three
states — Florida, Georgia and Oklahoma — have universal prekindergarten programs (Mead,
2015).
Many factors may have contributed to this increased growth, including higher maternal employment rates, national antipoverty initiatives, and research showing the link between early childhood experiences and the brain development of young children. But more generally, many state leaders also were swayed by emerging research, derived from a series of model programs, documenting the positive effects of UPK. The landmark High/Scope Perry Preschool Project, begun in the 1960s, documented both short- and long-term gains among children exposed to a high-quality pre-K experience. Two other landmark early childhood programs, the Carolina Abecedarian project and the Chicago Child-Parent Centers, demonstrated impressive gains as well (e.g., Ansari & Pianta, 2018; Reynolds et al., 2001).

While the number of pre-K programs has increased, the format of these programs has varied across states. Some states have provided half-day programs, while others have provided full-day programs. Oklahoma, Georgia and Florida have moved to full-day UPK programs (Fitzpatrick, 2008). Perhaps connected to a better understanding of the developing mind, early learning, and the implications of this knowledge for early-care and education settings (Saffran, Aslin, & Newport, 1996; Stager & Werker, 1997), changes in the length of programs have been initiated. In support of this, policy makers in some states have begun to realize that early intervention would be more effective if provided for two years prior to beginning kindergarten. As a result, some states have begun to fund Early Pre-Kindergarten (EPK) (Barnett et al., 2016).

**Benchmark Prekindergarten Programs**

Pre-kindergarten programs have evidence-based advantages. A few benchmark studies — the Oklahoma Study, Abecedarian Project, Perry Pre-school Program, and the Chicago programs — are reviewed below.
The Oklahoma study

Not long after Oklahoma had adopted one of the nation's first universal pre-K programs in 1998, researchers from the Center for Research on Children at Georgetown University began tracking children who graduated from the program. The research team initially tracked and documented the academic progress of student participants into middle school grades. Findings showed that the pre-K program had significant, positive long-term effects on students’ academic outcomes and well-being through middle school, and beyond. For example, Gormley and colleagues found that pre-K participation in the Oklahoma program was associated with higher math test scores, higher attentiveness, greater likeliness to enroll in honors courses, and lower timidity (Gromley, 2017). Another study comparing the Oklahoma pre-K program and Head Start student outcomes found that the Tulsa program students exhibited a significant decrease in timidity (e.g., greater classroom engagement), while Head Start alumni had a marginally significant reduction in timidity (Gormley, Phillips, Newmark, Welti, & Adelstein, 2011).

In another study concentrating on Hispanic students whose parents were either born in Mexico or who spoke Spanish at home, the authors found that Hispanic students enrolled in the Oklahoma pre-K program experienced substantial improvements in pre-reading, pre-writing, and pre-mathematic skills (Gormley, 2017). More generally, another study compared the program effects for a diverse group of children and concluded that Oklahoma’s universal pre-K program had succeeded in enhancing the cognitive development and school readiness of children (Gormley, et. al., 2005).

In a more recent study using data from Tulsa Public Schools, along with three neighboring school districts, and the state of Oklahoma, scholars found enduring effects on math achievement test scores, honors course enrollment, and grade retention for pre-school graduates.
They concluded that some positive effects of a high-quality pre-K program are discernible as late as middle school (Gormley, Phillips, & Anderson, 2018).

Finally, one of the more thought-provoking studies emerging from this project to date was based on projections that disadvantaged children’s participation in effective high-quality preschool programs in preparation for kindergarten readiness can positively impact adult earnings over a lifetime (Bartik, Gormley, & Adelstein, 2012). The study results also indicate that disadvantaged children yield greater benefits when enrolled in a full-day program. However, benefits are evident in a half-day program, but are less significant. However, since data were limited to the benefits of adult earnings, the authors concluded that actual benefit–cost ratios are likely higher, especially for disadvantaged children. With scarce resources and high demand for accountability, are obligated to enumerate the economic return on investment, specifically, the cost-benefit ratio. However, the challenge is considering the many other variables associated with the outcomes. In fact, the Oklahoma study authors (Gormley et al., 2018) conclude that the actual cost-benefit ratios are likely higher especially for disadvantaged children.

The Abecedarian project

The Abecedarian Project is an ongoing randomized trial begun in 1972 in Orange County, North Carolina in 1972. The researchers’ aim was to examine the extent to which intensive early childhood education could overcome the odds of developmental delays and academic failure for children born into low-income families (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002). As described by Campbell and colleagues (2002), the intervention phase of this study was carried out between 1972 and 1988. Participants were from low-income families, 96% of which were African American. Intervention was provided either for 8, 5, 3, or no years for children assigned to various groups. Follow-up data were collected at ages
12, 15, 21, 30 years and currently are being collected from 40-year-old graduates of the program. Studies show that the Abecedarian children showed many long-term gains.

The children receiving the Abecedarian Approach on average scored higher on achievement tests in math and reading during their elementary and secondary school years. Through age 15, I.Q. scores for the children who received the birth-to-age-5 Abecedarian intervention of five years of full-day enriched pre-K programming were higher than those of the randomly assigned control group, which received nutritional supplements, social services support, and health care to ensure that health, housing or economic issues did not impact the findings (Ramey & Campbell, 1991). At age 21, the intervention group had maintained statistically significant advantages in scores on academic tests of reading and mathematics, and they also had attained more years of education. Finally, by their mid-30s, the intervention group showed signs of having lower rates of prehypertension than those in the control group (Campbell, 2001, 2002, 2012; Masse & Barnett, 2002).

The Perry Preschool project

The Perry Preschool Project was carried out from 1962 to 1967 in Ypsilanti, Michigan. Its aim was to provide high-quality preschool education to three- and four-year-old African-American children living in poverty and assessed to be at high risk of school failure. About 75 percent of the children participated in the preschool program for two school years (at ages 3 and 4); the remainder participated for one year (age 4 only) (Barnett, 1985). Additionally, as explained by Weikart (1967), this program was particularly focused on vulnerable Black children and cognitively challenged children.

The Perry Preschool Project is an experiment with replications designed to assess the longitudinal effects of a 2-year, cognitively oriented, compensatory education program.
Selected from a population which is Negro, functionally retarded, and culturally deprived, control and experimental groups are equated for mean cultural-deprivation rating and mean Stanford-Binet. The educational program consists of (1) daily morning classroom sessions, (2) weekly afternoon home tutorial sessions directed toward the stimulation of maternal involvement in the educative process, and (3) parental group meetings. Concomitant evaluative research consists of the administration, at entrance into the program and yearly thereafter including longitudinal follow-up through the first few years of school, of various measures including (1) Stanford-Binet, (2) Leiter international performance scale, (3) Peabody picture vocabulary test, and (4) Illinois test of psycholinguistic ability. (Weigart, 1966, p. 164)

**Findings for Perry Preschool and Abecedarian Projects**

Data from both the Perry Preschool and Abecedarian project studies reveal statistically significant differences between control and experimental groups (Barnett, 1985; Campbell et al., 2002; Weikart, 1967). Research has also shown long-lasting positive effects of the Abecedarian and Perry Preschool program. This includes long-term academic benefits and health (e.g., Ansari & Pianta, 2018). For example, the treated Abecedarian group maintained more statistically significant advantages both in academic tests and test performance than the control groups. Moreover, the experimental group also had attained more years of education at 21 years of age (Campbell et al., 2014). Additionally, the same study found that those who had received high-quality early care and pre-K education in the 1970s through the Abecedarian project were far healthier (i.e., at a lower risk factor for cardiovascular diseases) than their age cohort peers 30 years later (Campbell et al., 2014).
For more than 40 years, researchers and policy makers have reviewed and compared the successes of these programs with more contemporary programs (Fitzpatrick, 2008). The more recent programs include the Tulsa Public Schools (TPS) (Bartik, Belford, Gormley, & Anderson, 2016), the New Jersey Abbott Pre-K programs, and the Apple Tree Early Learning Public Charter schools in Washington, D.C. (Mead, 2012).

The overarching findings from these more recent studies are that early interventions in the form of pre-K programs are essential. High quality early care and early education programs yield successful preparation for kindergarten, and these programs may have lasting positive effects on future success. Preschool and early care may reduce the gap between Black and White children upon entry to kindergarten (Bartik et al., 2016; Fitzpatrick, 2008; Mead, 2012). Early childcare intervention at multiple points of entry in children’s development has been recognized as paramount (Ackerman et al., 2009; Howes et al., 2008). As a result of these early intervention programs and the following studies about their outcomes, there has been an increase in bipartisan financial support at national, state, and local levels. In addition, media coverage on the cost benefits and the successes of early education and care, along with a renewed focus and interest of politicians has reinforced the preschool movement (Messina & Madden, 2016).

New York State UPK

New York State (NYS) began its commitment to preschool education with the establishment in 1966 of the Experimental Pre-Kindergarten (EPK) program, which later became the Targeted Pre-Kindergarten (TPK) Program (Barnett, 2012). Its goal was to provide early education for “at risk” children in low-income communities. In 1998, NYS pioneered its Universal Pre-Kindergarten program aimed to provide kindergarten readiness for four-year-old children, regardless of income or risk factors (Barnett, 2012; Nolan, 2013; Zigler et al., 2011). In
keeping with national trends, New York educators and policymakers have become increasingly concerned about the quality of programs and the proportion of eligible children served. The quality of care, service and positive outcomes have been a major concern with NYS programs (Barnett et al., 2012).

Lacking are a body of studies using state data that can provide stakeholders with the much-needed information about outcome success in NYS. Replicating long-term studies in NYS, using some of the primary elements of the Abecedarian, Perry Pre-school, and Oklahoma projects can provide rich information on program effectiveness. However, the cost and logistics of implementing such a series of studies is challenging for the NYS Education Department. Given the established needs and deficits of poor Black children and the established benefits of quality preschool programs to alleviate some of these needs, NYS UPK programs must be investigated in order to determine which factors or program offerings positively affect children’s educational outcomes.

Between 2013 and 2016, New York State achieved the highest expansion of UPK programs in the nation, increasing funding significantly (Barnett et al., 2016). In 2013, NYS Governor Andrew Cuomo established the NYS Education Reform Act. It requires the monitoring of access to full-day Universal Pre-K programs for all children in urban resource-poor communities. The NYS Department of Education oversees and funds UPK classes in local school districts. A NYS Education Reform Commission was tasked in 2012 to make recommendations regarding ways to address barriers to student achievement and quality of education for all students.

Briefly, the Commission’s report maintained that in order to actualize statewide UPK, school districts would need to supplement funding at an estimated cost of $648 million annually
and the addition of three-year-olds would further increase the state cost by $1.9 billion and school districts by $2.3 billion (Citizens Budget Commission [CBC], 2013). In response, Governor Cuomo set aside $340 Million in 2014 for UPK funding for 81 school districts, just 10% of approximately 800 NYS school districts. The latest NYS State Preschool Yearbook reveals that the state increased state-funded UPK programs by 66% in 2015. Most of this increase focused on New York City (Barnett et al., 2016). NYS UPK program is both public-based (e.g., district UPK) and community-based (e.g., non-for-profit organizations that receive tax payer funding). There is limited availability of funds to community-based pre-K organizations in local districts outside of New York City.

QUALITYstarsNY

In response to the federal “Race to the Top” initiative, the QUALITYstarsNY program was established to improve the quality of Pre-K programs across New York State. QUALITYstarsNY program funding was awarded from the United Way and other similar organizations to the NYS Education Department to set a five star rating system for early childhood education programs regulated by the NYS Office of Children and Family Services (OCFS). It is a voluntary, quality improvement and rating system for the array of early childhood education programs in New York State serving children from birth through age five. The program is administered by the New York Early Childhood Professional Development Institute of the City University of New York (QUALITYstarsNY Standards, n.d.).

An evaluation report from the 2016 New York Early Childhood Professional Development Institute suggests of the 4,000 statewide programs sponsored by OCFS, 200 or 5% are QUALITYstarsNY programs. The professionals employed in QUALITYstarsNY are referred to as “Quality Scholars.” A high-quality preschool program for children from disadvantaged
backgrounds is a major area of concern for many states. The Quality Scholars Early Childhood Educators program was created to increase the capacity of New York communities to provide quality early child care and to help children receive the education they require to succeed. These scholars are eligible for college scholarships to pursue degrees in early childhood education through the Office of Children and Family Services’ funding (Cleary, 2016).

**Evaluation Criteria for Preschool Programs**

*The State of Preschool 2015*, (Barnett, Friedman-Krauss, Gomez, Horowitz, Weisenfeld, et al., 2016) provide an evaluation of 57 funded preschool programs across the nation based on data derived from the ongoing National Institute for Early Education Research (NIEER) study. The authors ranked states by 10 quality standards, access for three- and four-year-old children, and funding. The states had agreed to report to NIEER on these standards, in addition to access, enrollment, and funding. Such information forms the basis for the NIEER study. The standards resulted in 10 “benchmarks.”

The data included responses to the following questions:

1) Are programs monitored at least once every five years?
2) Do they provide at least one support service or referral?
3) Do the state have comprehensive early learning standards?
4) Are class sizes 20 or fewer?
5) Are staff-to-child ratios 1:10 or better?
6) Do teachers have a minimum education of a Bachelor of Arts degree?
7) Do teachers have specialized training in pre-K?
8) Do assistant teachers have a minimum of a Child Development Associate’s degree?
9) Does the program provide at least one meal a day?
10) Are staff required to have a minimum of 15 hours of in-service training per year?

Data from Florida, Oklahoma, North Carolina, Washington and West Virginia and New York were compared. Results show that while there are national standards for Pre-k, there is great variance across states in terms of implementation. For example, Florida, while ranking third for access, recorded a decline over the three years prior to the questionnaire, from serving 175,000 to 100,000 four-year-old children. Compliance and quality standards are higher for some states, but for others there was a decline in meeting the standards as well as providing services to four-year-olds.

The report also reveals that only three of the 10 quality standards for Florida programs were met. North Carolina, by contrast, is ranked 24th out of a possible 43 as ideal for access and 16th for resources and funding, and met all 10 quality standard targets. Oklahoma is fourth in access with 99% of school districts participating, 28th for resources, and met eight of the 10 targets for quality programming. Washington state was ranked 32nd in terms of access, 8th in state funding, and met nine of the 10 quality targets. West Virginia, in comparison, ranked 5th for access and 13th for resources, and met all quality standard targets (Barnett et al., 2016).

Another important evaluation issue addressed in the study report is the funding of UPK for three-year-olds — a newer trend in state early childhood programs. The report reveals that nationally 28 of the 57 programs received funding.

Evaluation of teachers’ salaries reveals that pay equity was an issue for states that did report such data. The inequity indicated that the average UPK teacher’s salary was 70% of that of public teacher counterparts in the same building. Findings also suggest that school districts’ contracts with community-based UPK organizations may routinely underfund those programs.
(Barnett et al., 2016) making it even more difficult to attract and keep adequately trained and licensed teachers. As a result, the pay inequity between school- and community-based UPKs was greater than that between teachers in the same building. In fact, UPK teachers’ salaries were 40-50% lower than that of public school teachers. The incongruence in wages paid had a cumulative adverse effect on staff on multiple levels. In fact, a lower salary for the same work resulted in less funds for employee contributions to their benefit programs (Gidwaney, n.d.).

Quality in Early Childhood Education

In 2012, the Schuyler Center for Analysis and Advocacy, in their policy brief, *Quality: What It Is and Why It Matters in Early Childhood Education* (SCAA, 2012), reported on the importance and nature of quality in early childhood education. Included in the Schuyler review was an evaluation of structural foundations including policies, programming, environment, curriculum and professional development. In tandem, the policies are assumed to promote health and safety as well as child development and growth, foster nutrition, and ensure observation and evaluation for continuous improvement. While research findings (SCAA, 2012) have indicated the benefits of high-quality early-care programs, researchers have also highlighted concerns that these programs might not be as readily available to children who live in urban resource-poor communities.

More troubling is the finding that because of lack of funding, the most impoverished areas may have lower quality programs. The financial disparities may potentially compound cumulative disadvantages with negative outcomes for poor children. The Schuyler study recommended that the quality of programs be improved with the utilization of *Core Body of Knowledge*, 3rd Ed. (SCAA, 2012), which established categories for the creation of professional competencies for quality early childhood programs in New York State. The categories were
developed by a collaborative of early childhood professionals from the NYS Early Childhood Advisory Council’s Workforce Development Work Group, including the NYS OCFS. The categories were developed to assist professionals in early-care programs to competently engage children in developmentally appropriate interventions tailored to address their needs. These categories with their associated competencies were designed to improve professional strategies and approaches. In addition, the Schuyler Center recognized that these categories and indicators, while significant, could not completely measure the quality of early childhood programs without considering the education and experience of early childhood professionals who impact program quality.

To study this further, the Schuyler Center recommended the use of the nationally recognized, reliable and valid Early Childhood Environment Rating Scale (ECERS) for program improvement. The ECERS scale rates specific indicators of program quality, from 1 to 9 (Harms, Clifford, & Cryer, 2014). Therefore, adopting either this approach or implementing QUALITYstarsNY across New York State should provide enhanced measurement of quality of early childhood education programs.

Conclusions
Numerous studies support the findings that birth to five years of age is the most critical time for cognitive development in a child’s life. The lived experiences, be they privileged or laden with disadvantages, have a profound effect over the life course. Heckman (2011) maintains that early assessment aligned with the appropriate intervention, especially during the preschool and middle school years, is the most effective means of mitigating the achievement gaps and the concomitant deficiencies characteristically notable in economically disadvantaged children upon entering kindergarten.
Early learning and care can have long-term positive impacts on a child’s educational trajectory. The evidence is mounting for the value of quality early child care and pre-K learning programs. The combined effect of the theories and concepts reviewed above can help to explain the complexities inherent in the accessibility and usefulness of UPK programs. The studies cited above suggest that there may be negative consequences of non-attendance/non-participation in these early child care and learning programs. Many low-income children need education as a common pathway for upward mobility and as a route to becoming productive members in society. The research studies cited above suggest that early care and learning must move beyond helping children learn to count or recite the alphabet. What is warranted is broader quality indicators such as staff training and preparedness.

Early education programs need to address the barriers faced by children from resource poor families. As Social Capital theory suggests, factors that help create a sense of belonging in a community may be very useful for achieving early education success. Poor families need resources such as social networks (family and friends and community support), access to jobs, mentors, functional services (electricity, water, etc.), in addition to awareness of what is needed to support success in their children. Social capital is linked to empowerment that can be useful in improving life-long educational trajectories for young children.

The goals of quality early care intervention are to ensure that the achievement gap between economically advantaged and disadvantaged children is closed, and that the school-to-prison pipeline is not inevitable for children from economically distressed communities (Barnett, 2013; Waldfogel & Washbrook, 2011). Universal prekindergarten incorporates early learning standards within the domains of language, literacy, and mathematics in a developmentally appropriate context. Prekindergarten therefore serves as an introduction to formal education for
many children, and thus is an important experience. The adverse effects of living in poverty have
been outlined discussed, including low educational achievement for children living in resource
poor home and community environments, and attending inadequate, underfunded schools within
those communities. Disadvantaged and resource deprived Black and Latina/o children may begin
their formal educational journey unprepared to succeed. In fact, absent early learning and care
programs such as prekindergarten, Black and Hispanic children may begin kindergarten with
substantial gaps in knowledge, and social and cognitive skills when compared to their
advantaged counterparts.

Benchmark studies on early childcare and learning programs suggest that high quality
approaches have been successful in addressing some of the problems related to child poverty
while working toward closing the knowledge gap for rich and poor children. Overall, the
research suggests that pre-K programs that are universal and high quality will provide net
benefits to individuals, communities of color and the larger society. However, an important
consideration when assessing the beneficial effects of high-quality early childhood education
programs is that there is a dearth of studies on prekindergarten programs that specifically
compare Black versus non-Black children’s outcomes. Moreover, there is a paucity of research
on prekindergarten in low-resourced communities with African American children.

Given the need for studies exploring this shortage, this dissertation research examined the
impact of preschool attendance on kindergarten readiness, and specifically whether
prekindergarten participation ameliorates some of the negative effects of growing up in poverty
and narrows the achievement gap between Black students and their peers. Furthermore, this
study identifies the differential benefits of prekindergarten programs for low-income Black
children and some of the important explanatory variables that may account for their success.
Such research will add to the empirical literature on prekindergarten implications for Black and non-Black children and may help to further address the persistent educational achievement gaps.
Chapter 3: Research Methodology

Research Questions

Educators, policymakers, parents, politicians and the broader general public need to better understand the impact of preschool participation on kindergarten readiness, with specific attention to the achievement of Black students relative to their peers. This study draws on educational and demographic data from a city school district in New York State. Research was conducted in a high poverty, urban district serving nearly 10,000 students. The majority of students come from economically disadvantaged homes, with a city-wide poverty rate of 47% among households with children under 18 years of age (American Community Survey [ACS] 5 year estimates: 2011-2015, n.d.). At the time of data procurement, specific income information for student households was not available because the school district was funded to provide free meals to all students; therefore free- or reduced-price lunch eligibility is not a meaningful indicator of income levels. More than half of all students in the district, however, live in ZIP Codes that are among the city’s poorest, as measured by median household income (ACS, n.d.).

Like many districts serving similar low-income populations, improving academic achievement has been both a priority and a challenge in recent years. Despite modest improvements, high school graduation rates hover around 60%, and only about 20% of elementary and middle school students are proficient in English and Math (New York State Education Department, n.d.). More than two-thirds (69%) of the student population identifies as either African-American or Hispanic. The district is comprised of elementary and middle schools and a comprehensive high school.

A quasi-experimental design as defined in Vogt and Johnson (2016) was used in this study to compare two independent samples of students who entered kindergarten in the Fall of
Secondary data analysis was conducted to compare reading and math ability at kindergarten entry between the two groups. Analysis of existing data was chosen as a non-invasive method that did not require additional commitment from a struggling and under-resourced school district. Analyses were conducted to address the following research questions:

- Do students from a high-poverty urban community who attend district-administered preschool demonstrate progress on early literacy and math skills during the preschool year?
- Do students from a high poverty urban community who attend district-administered preschool demonstrate improved reading and math achievement at kindergarten entry?
- Is there an achievement gap between Black children and their peers at kindergarten entry?
- If so, does attending a district-administered preschool close the achievement gap between Black children and their peers at kindergarten entry in a high-poverty urban district?

Methodology

Data Sources

Two sources of secondary data were analyzed for this research. First, data were derived from all district preschool assessments conducted during the 2016–17 school year. Collected data allowed for analysis of student learning during the preschool year. The district conducts assessments four times each year (Fall, Winter, Spring, Exit), for all students in the year prior to kindergarten entry. The locally designed measure is not standardized but is based on the NYS State Department of Education’s Quality Indicator Review and Resource Guides for Literacy (2014). The instrument is administered by teachers in classrooms during the school day.
The second data source used for this research was the assessment from the Fall 2017 Northwest Evaluation Association Measures of Academic Progress (NWEA–MAP). This instrument was developed by the University of Portland, Oregon, and has been used for the past three years with over 50 school districts nationwide. Known as the MAP Growth instrument, it is administered three times per year by the district; in the Fall, upon entry into kindergarten, then subsequently in the Winter and Spring terms.

The district uses both the reading and math tests of the MAP Growth instrument. The measure has a strong research base and has been recognized nationally for its reliability and validity. The assessment is administered by the district in an on-line format in 45-minute segments for both reading and math readiness at the kindergarten level. To accommodate reading ability of students, the on-line program provides audio questions to which students respond, with the support of a teacher trained in administering the MAP Growth instrument. In addition, the MAP program provides specific support for visually-impaired students.

MAP Growth K–2 has three computer-based assessment components: Screening, Skills Checklists and Growth. The Screening assessments provide baseline information for new students entering kindergarten. The Skills Checklist assessments provide information about specific skills and concepts. The Growth assessments within MAP Growth and MAP Growth K–2 are recognized by the Center on Response to Intervention as universal screening tools (NWEA –MAP). Based on student responses, the instruments adapt to the level of difficulty appropriate for each student. They provide growth data using the Rasch Unit Scale or RIT to track growth within and across grades, and a Lexile® range for reading. The RIT scale is an equal interval scale that uses individual item difficulty to measure student achievement across grades. A RIT score has the same meaning, in terms of knowledge acquired (level of achievement), regardless
of the age or grade of the student, which gives the scale stability. A Lexile range is a numeric estimation of a student’s reading ability, and reflects the readability or difficulty level of texts. Schools often use Lexiles to match student ability to appropriate texts. The key content areas assessed are Early Literacy and Early Mathematics. The Early Literacy component includes 33 items that assess:

- Phonological Awareness
- Matching sounds
- Rhyming
- Manipulating sounds
- Visual Discrimination/Phonics
- Visual discrimination
- Letter identifications
- Matching sounds to letters
- Concepts of print understanding: prereading behaviors, orientation to the page
- Identify title/author
- Counting words

The Early Numeracy component includes 34 items that measure:

- Number Sense Rote counting:
  - One-to-one correspondence
  - Counts to 1–10
  - Counts to 11–20
  - Matches and identifies numerals 1–10
  - Matches and identifies numerals 11–20
Identifies numbers of objects:

- More/fewer
- Computation computes with manipulatives:
  - moving objects
  - numerical answers

All kindergarten classrooms in the district administered reading and math NWEA tests during September of 2017. Assessments were completed using computer monitors and headphones. Questions were read aloud through a computer program, while classroom teachers monitored and facilitated administration.

**Sample**

For this research, the intervention sample attended the district’s UPK the year before kindergarten entry. Some UPK classrooms were in public school buildings, while others were subcontracted to Head Start or community childcare providers. All locations supported through UPK funds were required to provide programming consistent with the state Early Learning Standards and UPK guidelines. As of 2016, the UPK program served about half of New York’s four-year-olds in predominantly full-day classroom settings. Teachers are required to hold a BA with specialization in Early Childhood, and programs must meet State Early Learning Standards. With a state investment of approximately $6,500 per child, the quality of the UPK program has received generally positive reviews (National Institute for Early Education Research, 2017).

Data were available to confirm that students in the comparison sample were not enrolled in UPK or Head Start; however, these children may have been involved in some other kind of early care or education program. Data were not available from family daycare providers or from early care and learning centers that did not provide UPK, so students in the comparison sample
may have attended one or more such programs for all or part of their year as four-year olds. The quality of these programs and settings is also unknown.

Both the intervention and comparison samples were drawn from the population of students in the 2017 kindergarten cohort who completed the NWEA-MAP assessment in the Fall semester 2017. A total of 696 students had valid NWEA assessments, which represented 95% of kindergarteners who were enrolled in one of the district’s elementary schools. Inclusion in the intervention group was based on whether a student had completed prekindergarten assessments in the Spring semester of 2017, at the end of their district preschool year. Children who completed the Spring assessment and had fewer than 40 recorded absences during the year were categorized as preschool attendees (N = 467). The comparison group included students who took the NWEA reading exam as kindergarteners in the Fall term when they entered kindergarten but had no data on reading proficiency recorded from the preschool assessment the previous school year (N = 229). Thus, it was inferred that they were not in district preschool. To discern if there were differential learning benefits among children with district preschool versus those who did not attend such preschool, several measures were selected.

Measures

Dependent Variable. The main dependent variable in these analyses was achievement in math and reading. This was measured by the percentile score on the NWEA-MAPs tests in reading and math, and all tests of significance were two-tailed, analyzing for impact in either a positive or negative direction.

Independent Variables. Independent variables included preschool participation status, race/ethnicity, gender, English as a New Language status, and special education status. For the demographic comparison between the intervention and comparison groups, a “School” variable
was included, which reflects which elementary school a student attended in the Fall of his or her kindergarten year. This variable was included to assess whether school district feeder patterns were different among children who participated in preschool. Regression and ANOVA analyses included an “At-Risk School” variable, which created two groups of schools, defined by whether the average NWEA percentile score was below or above 40. Unique At-Risk School variables were created for reading and math. Participation in district preschool was coded dichotomously (0 = not a district preschool participant, 1 = district preschool participant), with not a district preschool participant as the reference category.

Given the importance of the role of race/ethnicity in the current study, dummy variables were created to specify five race and ethnicity categories —White, Black, Asian, Hispanic/Latino, and “Other” races. Only six children across both the intervention and comparison groups identified in the “Other” race category, which included Pacific Islander/Native Hawaiian and Alaska Native/American Indian. For the regression analysis, the race/ethnicity variable was reduced to two categories (0 = non-African-American/Hispanic, 1 = African-American/Hispanic) in order to maintain sufficient power to see an effect of preschool status on test scores. Non-African-American/Hispanic (or Asian/White/Other) is the reference category.

Gender was coded dichotomously (0 = male, 1 = female). Male is the reference group. English as new language was coded dichotomously (0 = non-classified ENL, 1 = classified ENL). Not classified English as a New Language learners is the reference. Special education status was coded dichotomously (0 = not identified with disability, 1 = identified with disability). Student participants without disabilities is the reference. Whether the child attended a higher risk school was defined as those schools with mean percentile scores below 40. The variable “At risk
school” was coded dichotomously (0 = does not attend at-risk school, 1 = attends at-risk school). Attendance in a “not-at risk school” is the reference group.

Finally, mean improvement scores for specific pre-literacy and math skills were computed for district preschool participants. These scores reflect changes in student achievement from a Fall assessment in September of the preschool year, to a Spring semester assessment the following May or June.

**Human Subjects Protections**

Because analyses used only de-identified secondary data collected as part of normal school operations, no human subject protections were necessary. The State University of New York at Albany Institutional Review Board issued an exemption since the current study does not constitute Human Subjects Research.

**Analytic Strategy**

Analyses were run to address each research question. First, frequency statistics were run to generate a demographic comparison between groups. Because group assignment could not be randomized, the possibility existed that the intervention and comparison groups would significantly differ. Where necessary, these differences were controlled in subsequent analyses using regression models. Second, descriptive statistics were run to assess the degree of literacy and math growth demonstrated by students during their preschool year. Average change from entry to exit was assessed using the preschool assessment data set.

A third set of analyses was run to compare average NWEA percentile scores between the intervention and control group. Groups were compared in both reading and math, and independent sample t-tests were used to identify significant group differences. NWEA percentile scores were disaggregated by race to assess whether there were achievement differences and, if
so, whether the achievement gap between Black students and their peers was impacted by preschool participation.

Finally, to control for potential group differences in demographics, a linear regression model was computed. For these analyses, the dependent variables were percentile scores on the NWEA MAP tests, while independent variables included preschool participation and demographic considerations such as ethnicity, gender, ZIP Code, English as a New Language status, and special education status.
Chapter 4: Results

Bivariate Analysis: Sociodemographic Comparisons

The first set of analyses, shown in Table 1, generated a demographic comparison between the groups. Identifying group differences is important because the impacts of factors such as gender, ethnicity, school, and disability status must be controlled to isolate the effect of prekindergarten attendance.

Table 1  Demographics of Study Sample Preschool Students by Prekindergarten Participation

<table>
<thead>
<tr>
<th></th>
<th>No Pre-K (N = 229)</th>
<th>Pre-K (N = 467)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Female</td>
<td>44%</td>
<td>52%</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>10%</td>
<td>11%</td>
</tr>
<tr>
<td>Black/AA*</td>
<td>41%</td>
<td>50%</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>20%</td>
<td>21%</td>
</tr>
<tr>
<td>White*</td>
<td>28%</td>
<td>18%</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>% identified SpEd*</td>
<td>16%</td>
<td>9%</td>
</tr>
<tr>
<td>% ENL*</td>
<td>10%</td>
<td>4%</td>
</tr>
<tr>
<td>School at K Entry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School-01*</td>
<td>14%</td>
<td>8%</td>
</tr>
<tr>
<td>School-02</td>
<td>13%</td>
<td>10%</td>
</tr>
<tr>
<td>School-03</td>
<td>11%</td>
<td>11%</td>
</tr>
<tr>
<td>School-04</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>School-05</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>School-06</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>School-07</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>School-08</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>School-09</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>School-10</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>School-11*</td>
<td>4%</td>
<td>10%</td>
</tr>
<tr>
<td>School-12*</td>
<td>3%</td>
<td>11%</td>
</tr>
</tbody>
</table>

* Group difference significant at $p < .05$
As shown in Table 1, several significant group differences between preschool attendees and non-attendees were found. District preschool attendees were more likely to be female compared to nonparticipants. The district preschool population was 50% Black/African-American compared to 41% of those who did not participate in the preschool program. In addition, students who did not attend district preschool were nearly twice as likely to be identified as having a disability compared to attendees (16% vs. 9%) and were more likely to be designated English as a New Language learners\(^7\) (10% vs. 4%). These differences were significant at the \(p < .05\) level. Finally, groups were compared based on which elementary school students attended in the Fall semester of their kindergarten year. District preschool attendance was associated with the likelihood of enrolling in three (lower income ZIP code schools) of the 12 elementary schools. Compared to students in the comparison group, preschool attendees were significantly more likely to attend two of these three schools and were less likely to attend the other.

Group differences were tested using independent sample t-tests to compare the distribution of dichotomous variables between the samples. “Dummy”, or dichotomous yes/no variables were created for each demographic characteristic. A t-test was run for each demographic attribute to assess the likelihood of the group difference occurring by chance.

**Student Growth in Reading and Math**

A second set of analyses focused on Research Question #1: *Do students from a high poverty urban community who attend district-administered preschool demonstrate progress on early literacy and math skills during the preschool year?* It should be noted again that these data exist only for school district prekindergarten students and not for those who had no early care

\(^7\) Often classified as English as Second Language (ESL) learners, English Language Learners (ELL), English Speakers of other languages (ESOL) or Culturally and Linguistically Diverse (CLD) learners.
and pre-K or those who attended other nondistrict prekindergarten programs. Achievement at entry and exit was compared, using all items on the district’s preschool assessment. Table 2 below presents results.

**Table 2**  Mean Improvement Scores for Preschool Assessment Indicators for Fall entry and End of Year (Exit) for 2016 to 2017

<table>
<thead>
<tr>
<th></th>
<th>Fall 2016 Mean</th>
<th>Exit 2017 Mean</th>
<th>Average Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Early Literacy Skills</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recognizes Rhyming Words (N = 556)</td>
<td>1.46</td>
<td>3.48</td>
<td>2.02</td>
</tr>
<tr>
<td>Produces Rhyming Words (N = 556)</td>
<td>0.71</td>
<td>2.96</td>
<td>2.25</td>
</tr>
<tr>
<td>Isolates Beg. Sounds (N = 555)</td>
<td>1.42</td>
<td>3.77</td>
<td>2.35</td>
</tr>
<tr>
<td>Syllables (N = 540)</td>
<td>1.40</td>
<td>3.48</td>
<td>2.08</td>
</tr>
<tr>
<td>Counts Words (N = 541)</td>
<td>1.28</td>
<td>3.16</td>
<td>1.88</td>
</tr>
<tr>
<td>Cap Letter ID (N = 560)</td>
<td>9.82</td>
<td>20.29</td>
<td>10.48</td>
</tr>
<tr>
<td>LC Letter ID (N = 559)</td>
<td>7.47</td>
<td>18.48</td>
<td>11.01</td>
</tr>
<tr>
<td>Letter Sound Rel. (N = 559)</td>
<td>4.04</td>
<td>16.83</td>
<td>12.79</td>
</tr>
<tr>
<td><strong>Early Math Skills</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify Shapes (N = 559)</td>
<td>2.65</td>
<td>3.60</td>
<td>0.95</td>
</tr>
<tr>
<td>Identify Colors (N = 555)</td>
<td>8.54</td>
<td>9.77</td>
<td>1.23</td>
</tr>
<tr>
<td>Identify Numbers (N = 553)</td>
<td>4.95</td>
<td>8.89</td>
<td>3.93</td>
</tr>
<tr>
<td>Counts Orally (N = 537)</td>
<td>13.42</td>
<td>28.36</td>
<td>14.94</td>
</tr>
<tr>
<td>Counts Objects (N = 542)</td>
<td>11.16</td>
<td>23.85</td>
<td>12.69</td>
</tr>
<tr>
<td>Sorts Objects (N = 544)</td>
<td>56.8% Yes</td>
<td>90.3% Yes</td>
<td>33.5%</td>
</tr>
<tr>
<td>Creates Patterns (N = 566)</td>
<td>25.8% Yes</td>
<td>77.6% Yes</td>
<td>51.8%</td>
</tr>
</tbody>
</table>

Data from the district preschool year show considerable student growth in both literacy and mathematics’ skill areas for the students. On average, children were able to identify 10 more capital letters and 11 more lowercase letters at the end of the year compared to at the time of
Ability to recognize letter/sound relationships quadrupled over the course of the year. Impacts on math skills included an average increase of 15 in student counting ability and considerable increases in the percentage of children who could sort objects or create patterns. The significance or qualitative magnitude of these changes was difficult to discern, given that the preschool assessment was not a standardized instrument, and no viable comparison group was available.

Data from the preschool year were included to partially address limitations to information available regarding preschool experiences of the comparison group. Some portion of the comparison group likely attended a non-UPK early care program. The educational content and quality of these programs are unknown. If group comparisons were presented as “preschool versus no preschool”, the risk would be introduced that preschool impact would be underestimated due to “contamination” of the comparison group. Since data were available to directly measure the extent of preliteracy and early mathematics skills growth among UPK attendees, these data lend greater credence to this study’s assumption that preschool participation directly impacts subsequent kindergarten readiness. No corollary measure was available to compare learning during the preschool year among the comparison group.

**NWEA-MAP Assessment**

An additional set of analyses focused on the NWEA scores from the Fall semester of 2017, and addressed Research Question #2: Do students from a high poverty urban community who attend district-administered preschool demonstrate improved reading and math achievement at kindergarten entry? These data comprise test scores from the same cohort who had attended district preschool the prior year and introduced classmates whose preschool and related early childhood education experience could not be established. The goal of these analyses
was to assess whether gains demonstrated in preschool resulted in improved kindergarten readiness compared to peers who did not participate in district preschool.

Tables 3 and 4 present mean NWEA MAP scores by group. Table 3 includes student performance on the reading assessment while Table 4 contains scores for math. Both scaled (RIT) and percentile scores are shown.

**Table 3  Mean NWEA Reading Achievements by Pre-K Participation**

<table>
<thead>
<tr>
<th></th>
<th>No District Preschool (N = 229)</th>
<th>District Preschool (N = 467)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2017 RIT*</td>
<td>135.6</td>
<td>138.6</td>
</tr>
<tr>
<td>Fall 2017 Percentile*</td>
<td>36.9</td>
<td>43.6</td>
</tr>
</tbody>
</table>

*Group difference significant at p < .05

**Table 4  Mean NWEA Math Achievement by Pre-K Participation**

<table>
<thead>
<tr>
<th></th>
<th>No District Preschool (N = 222)</th>
<th>District Preschool (N = 436)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2017 RIT</td>
<td>134.7</td>
<td>136.1</td>
</tr>
<tr>
<td>Fall 2017 Percentile</td>
<td>37.6</td>
<td>40.3</td>
</tr>
</tbody>
</table>

Students who attended district preschool demonstrated moderately higher levels of achievement in reading compared to peers who did not attend, with an average difference of about 7 percentile points. NWEA percentiles are based on a national sample of kindergarteners. Both groups scored well below the median of 50. The group difference in math was less pronounced, with district preschool attendees demonstrating higher scores by about 3 percentile points but fell short of significance. Independent samples t-tests revealed the group differences to be significant at $p < .05$ for the reading scores, but not for the math scores. Given the significant group differences in special education and English as a New Language status, disparities in achievement must be interpreted with caution, especially in skill areas related to language.
Since addressing the achievement gap is a critical role that quality preschools can fill, further analyses were run to see if Black/African America and Hispanic/Latino children enter kindergarten closer in reading and math ability to their White peers, stratified by district preschool attendance versus non-attendance (i.e., prekindergarten vs. non-prekindergarten). These analyses address Research Questions #3 and #4: Is there an achievement gap between Black children and their peers at kindergarten entry? If so, does attending a district-administered preschool close the achievement gap between Black children and their peers at kindergarten entry in a high poverty urban district?

Table 5 below presents these data using average percentile scores on the NWEA-MAP reading assessment. District preschool attendance was associated with higher levels of reading achievement for students of all ethnic backgrounds. Differences across ethnicities were roughly equal whether a child had participated in a district preschool or not. In both the intervention (preschool) and comparison (nonpreschool) groups, White students demonstrated an advantage of approximately 10 percentile points over African-American or Hispanic peers. District preschool was associated with an increase of between 7 and 9 percentile points for each ethnic group. Only White students who attended district preschool performed above the national mean for NWEA reading (50th percentile).

Student performance in NWEA math assessments showed a different pattern when disaggregated by ethnicity. Both Black and Hispanic students performed modestly better if they had attended district preschool, but this advantage was not evident among White students. Overall, White students achieved significantly higher NWEA math percentile scores compared to Black and Hispanic peers, but those who did not attend district preschool performed slightly better compared to those who had attended. As a result, the racial achievement gap in math
closed from about 20 percentile points for the comparison group to 12 points among preschool participants. While preschool attendance was associated with improved NWEA math scores among students who identified as ethnic minorities, overall performance remained well below national means. Mean percentile scores for African-American or Hispanic students increased from 30 in the comparison group to 36 in the intervention group.

Table 5 Mean NWEA Percentile Scores by Preschool Participation and Ethnicity

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>READING</th>
<th>MATH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Pre-K</td>
<td>District Pre-K</td>
</tr>
<tr>
<td>Black/AA</td>
<td>35 (N = 94)</td>
<td>42* (N = 233)</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>32 (N = 45)</td>
<td>41* (N = 96)</td>
</tr>
<tr>
<td>White</td>
<td>45 (N = 63)</td>
<td>53* (N = 83)</td>
</tr>
</tbody>
</table>

* Group difference between preschool attendees and non-attendees significant at $p = .05$

Independent sample t-tests revealed that group differences were significant at $p = .05$ for all ethnicities in reading, but only for African American students in math. The smaller sample size among Hispanic/Latino students may have limited the sensitivity of the t-test.

Multivariate Linear Regression

To account for group differences in demographics, linear regression models were run to assess whether district preschool participation continued to show a significant impact on the NWEA percentile score when controlling for various demographics. The regression model included gender, ethnicity (Black or Hispanic vs. Asian, White, or Other), special education status, English as a New Language status, and whether the child attended a “higher risk” or “lower performing” school (defined as schools in which entering kindergarten students achieved mean NWEA percentile scores below 40). All variables in the model were dichotomous and coded versus a reference group that did not meet the defined criterion (i.e., they
were not Black or Latino, male, and had not identified disability, etc.). The ethnicity criterion included both African American and Hispanic/Latino students because the school district’s definition of Hispanic includes children of all races who identify as Hispanic/Latino. Many of these students define themselves as Black Hispanic, so combining categories was deemed reasonable. This approach enables students who identify as White Hispanic to be included in the comparison (non-reference) group, which presents a potential limitation to findings regarding ethnicity. The number of students who identify as such is likely small, and as a group, students who identified as Hispanic tended to show deficits similar to their African-American peers.

As presented in Table 6, district preschool participation remained a significant predictor of NWEA performance in reading ($p < .05$) but fell short of significance for math. Predicted scores in reading were about 5 percentile points higher for district preschool attendees, while the predicted advantage in math was about 3 points. All variables in the equation were significant except for gender (in either model), and ENL for math.

### Table 6  Regression Results for Fall Semester NWEA Assessment

<table>
<thead>
<tr>
<th></th>
<th>Reading</th>
<th>Math</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient.</td>
<td>Sig ($p$)</td>
</tr>
<tr>
<td>African Am or Latino</td>
<td>-5.7</td>
<td>.003</td>
</tr>
<tr>
<td>Female</td>
<td>1.7</td>
<td>.313</td>
</tr>
<tr>
<td>Students w/ Disability</td>
<td>-8.3</td>
<td>.001</td>
</tr>
<tr>
<td>English as New Lang.</td>
<td>-16.1</td>
<td>.000</td>
</tr>
<tr>
<td>Attends Risk School</td>
<td>-9.4</td>
<td>.000</td>
</tr>
<tr>
<td>Attended Preschool</td>
<td>5.1</td>
<td>.004</td>
</tr>
</tbody>
</table>

Race/ethnicity is statistically significant for both reading and math scores. According to the beta coefficients, African-American/Hispanic students’ predicted scores are 5.7 percentile points
lower for reading and 12.6 percentile points lower in math than the predicted scores for their White and Asian peers. Students with disabilities performed nearly 10 percentile points lower than peers on both assessments. Similar deficits of about 10 percentile points were found for students attending at-risk schools, even when controlling for other risk factors in the model. Finally, students for whom English was a new language were well behind their peers in reading (beta coefficient = -16.1) but did not differ from their peers in math achievement (beta coefficient = 3.7).
Univariate Factorial ANOVA

Finally, to further define the effects of student characteristics included in the regression model, a 2 x 2 x 2 x 2 between-subjects factorial ANOVA was conducted to explore interaction effects among ethnicity, gender, school type, and preschool involvement. For NWEA reading percentile scores, a significant interaction effect was found for ethnicity and school type. As shown in Figure 1, Black and Hispanic students scored significantly lower than their peers in higher performing schools, but outperformed their peers by a small margin in lower performing schools. (Lower-performing schools are the same as at-risk schools as defined by kindergarten students’ NWEA scores.) Percentile scores among White and Asian students dropped by 20 points depending on school type, while the comparative decline was only 7 points among Black and Hispanic students.

*Figure 1.* Interaction between ethnicity and school risk category for reading scores.
Results of the ANOVAs are shown in Tables 7 (reading) and 8 (math) below. For NWEA reading, significant main effects were found for school type (high or low performing), and for district preschool attendance, with district preschool participants scoring higher. For both variables, effects were significant at $p < .01$. Findings from the ANOVA analysis approximate regression results, except that when interaction effects are considered, ethnicity no longer shows a significant main effect on reading scores ($p = .154$). The impact of ethnicity appears to be moderated by school type, with Black and Hispanic students at a disadvantage only in higher performing schools.

**Table 7 ANOVA Effects on NWEA Reading Scores**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Effects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attends Risk School</td>
<td>1</td>
<td>42.582</td>
<td>.000*</td>
</tr>
<tr>
<td>AA or Latino</td>
<td>1</td>
<td>2.038</td>
<td>.154</td>
</tr>
<tr>
<td>Attended Preschool</td>
<td>1</td>
<td>13.137</td>
<td>.000*</td>
</tr>
<tr>
<td>Gender</td>
<td>1</td>
<td>1.548</td>
<td>.214</td>
</tr>
<tr>
<td><strong>Interaction Effects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At-Risk School x Ethnicity</td>
<td>1</td>
<td>13.551</td>
<td>.000*</td>
</tr>
<tr>
<td>At-Risk School x Preschool</td>
<td>1</td>
<td>.912</td>
<td>.340</td>
</tr>
<tr>
<td>At-Risk School x Gender</td>
<td>1</td>
<td>1.868</td>
<td>.172</td>
</tr>
<tr>
<td>Ethnicity x Preschool</td>
<td>1</td>
<td>.240</td>
<td>.625</td>
</tr>
<tr>
<td>Ethnicity x Gender</td>
<td>1</td>
<td>.181</td>
<td>.671</td>
</tr>
<tr>
<td>Preschool x Gender</td>
<td>1</td>
<td>.172</td>
<td>.679</td>
</tr>
</tbody>
</table>
As for math scores, gender shows a significant main effect favoring female students ($p = .021$). Main effects were also evident for school type and ethnicity ($p < .01$). Participation in district preschools fell just short of significance, with a $p$ value of .076. No significant interactions were found for NWEA math scores.
**Table 8** ANOVA Effects on NWEA Math Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Effects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attends Risk School</td>
<td>1</td>
<td>25.702</td>
<td>.000*</td>
</tr>
<tr>
<td>AA or Latino</td>
<td>1</td>
<td>46.477</td>
<td>.000*</td>
</tr>
<tr>
<td>Attended Preschool</td>
<td>1</td>
<td>3.152</td>
<td>.076</td>
</tr>
<tr>
<td>Gender</td>
<td>1</td>
<td>5.374</td>
<td>.021*</td>
</tr>
<tr>
<td><strong>Interaction Effects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At-Risk School x Ethnicity</td>
<td>1</td>
<td>1.912</td>
<td>.167</td>
</tr>
<tr>
<td>At-Risk School x Preschool</td>
<td>1</td>
<td>1.947</td>
<td>.163</td>
</tr>
<tr>
<td>At-Risk School x Gender</td>
<td>1</td>
<td>.129</td>
<td>.720</td>
</tr>
<tr>
<td>Ethnicity x Preschool</td>
<td>1</td>
<td>1.431</td>
<td>.232</td>
</tr>
<tr>
<td>Ethnicity x Gender</td>
<td>1</td>
<td>1.790</td>
<td>.181</td>
</tr>
<tr>
<td>Preschool x Gender</td>
<td>1</td>
<td>.392</td>
<td>.531</td>
</tr>
</tbody>
</table>

Although models were significant for both reading and math scores, adjusted R-squared values were relatively small (.105 for reading and .146 for math). This means that only about 10% of variation in NWEA reading scores was explained by the ANOVA model, and only about 15% for NWEA math. The considerable unexplained variance suggests the likelihood of other student, teacher, school, and community factors that were not included in this analysis but exert significant influence on student performance.
**Figure 2. 2017 kindergarten cohort state-level testing schedule.**

<table>
<thead>
<tr>
<th></th>
<th>Fall 2015</th>
<th>Winter 2016</th>
<th>Spring 2016</th>
<th>Exit 2016</th>
<th>Fall 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>District PK Assessment</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>NWEA MAPs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
Chapter 5: Conclusions

This chapter discusses the implications and conclusions regarding the study results. The chapter starts with an overview of the research and summary of major findings. Next, it describes the contributions to the literature. Then, policy implications of the findings are discussed briefly. Following this, a discussion of the limitations of the study are provided. The chapter ends with suggestions for future research.

Summary

Concerns about the future of children serve as an impetus for parents, educators, social workers, advocates, economists, and policymakers to act on the behalf of children on a number of fronts. They should work to ensure that all children are well prepared to start the life-long pursuit of education and skills (formal or informal) as physically, cognitively, language and literacy competent, and socially- emotionally equipped to the best of their potential.

Forty-two states provide public pre-kindergarten programs. State-funded programs are operated by school districts and comprise of about 1.4 million students (Barnett, 2016). Understanding the effectiveness of state-funded preschool attendance to provide kindergarten readiness is important because public prekindergarten is the largest provider of U.S. early childhood education. As discussed in Chapter 2, several benefits are associated with district pre-K participation. Similarly, in the absence of early childhood education, children face higher chances of several negative life-course consequences. Positive results in the area of academic achievement were found at the end of large-scale pre-K studies, including the Oklahoma Pre-K Program (Gromley, et al., 2010), while long-term gains in domains such as health, employment, and criminal involvement, have been demonstrated in studies of the Perry and Abecedarian programs. Several studies have shown that children who are identified as at-risk, including
African American children and other minorities living in resource-poor communities are particularly vulnerable to negative impacts of not having an early pre-K education (Wilson, 2012). Based on the literature findings on the effects pre-K education, it was expected that preschool attendees would demonstrate a higher level of kindergarten readiness, as assessed by their reading and math scores, compared to peers who did not attend pre-K programs. Furthermore, based on the literature (Winsler et al., 2008), it was expected that district preschool attendance would narrow the achievement gap between Black students and their White peers, as demonstrated by reading and math assessment scores.

The research conducted in this dissertation employed elements of a quasi-experimental design. Two groups were compared, an intervention group of students who participated in district preschool or Head Start the year before kindergarten entry (n = 467), and a comparison group of students who did not (n = 229). Using data derived from all district preschool assessments conducted during the 2016–17 school year, secondary data analysis was conducted to compare reading and math skills at kindergarten entry between the two groups. The following three specific research questions were addressed:

1. Do students from a high-poverty urban community who attend district-administered preschool demonstrate progress on early literacy and math skills during the preschool year?
2. Do students from a high-poverty urban community who attend district-administered preschool demonstrate improved reading and math achievement at kindergarten entry?
3. Is there an achievement gap between Black children and their peers at kindergarten entry?
4. If so, does attending a district-administered preschool reduce the achievement gap between Black children and their peers at kindergarten entry in a high-poverty urban district?

Analyses, including univariate and bivariate descriptive analysis, multivariate linear regression, and univariate factorial analysis of variance were run to address each research question.

Findings

Findings revealed that the intervention sample was predominantly female (52%), while the comparison sample was predominantly male (56%). But this gender difference was not statistically significant. Several other demographic differences between groups proved to be significant. The intervention group comprised a statistically significant lower percentage of students identified as English as a New Language learners (4%) compared to the comparison group (9%). The intervention group comprised a statistically significant lower percentage of students identified as having a disability (9%) compared to the comparison group (16%). The intervention group involved a statistically significant higher percentage of students identified as Black or African American (50%) compared to the comparison group (41%). However, the intervention group comprised a statistically significant lower percentage of students identified as White (18%) compared to the comparison group (28%).

Analyses focused on district preschool students’ achievement in reading and math at kindergarten entry. Findings show a significant advantage of preschool students over their non-preschool peers in literacy, but not in mathematics. Thus, the findings show that preschool attendance improved kindergarten readiness for literacy skills but not for math skills. That is, children who attended district pre-K were ahead of their peers who did not attend pre-K in
reading skills but not in math skills. One possible explanation for the difference in reading and math scores is that more preschool resources were focused on teaching literacy and reading skills than math skills.

This study’s findings are supported by the literature. Research conducted for over the past five decades show that high-quality preschool prepares children for kindergarten (Wakabayashi, Lower, & Hardin, 2017). Previous studies on the impact of prekindergarten attendance on kindergarten readiness have consistently shown a positive short-term effect, but the long-term effect has proven less consistent. The present findings of a positive impact of district prekindergarten attendance on reading scores augment results that have been reported in other studies. Haslip (2018), for example, has found that prekindergarten attendees met reading benchmarks in the beginning and middle of first grade, while students who did not attend preschool were reading below the benchmarks at both time points. Similarly, Haung and colleagues (2012) found that attending a prekindergarten program was positively associated with meeting or exceeding minimum literacy competencies. Lipsey and colleagues found overall measures of children’s achievement in composition, literacy, language, and math among the group that attended pre-K (Lipsey et al., 2015). Notably, the largest effect was found in literacy. The present findings of a positive but non-significant impact of district Prekindergarten attendance on math scores, given the finding of a significant positive impact on literacy scores, though unexpected, might be explained by attendance. Ehrlich (2014) found that regular attendance is critically important for higher kindergarten readiness scores especially among students entering with low skills. They found that the more days of preschool a student missed at age four, the lower his/her scores on the math, letter recognition, and social-emotional skills upon entering kindergarten. Unfortunately, in this study the measure for district preschool
participation did not include information on actual preschool attendance; it was not possible to adjust for this difference in the study. Two studies have found that preschool participation, although positively associated with higher cognitive outcomes at kindergarten entry than their peers who did not attend preschool, also found that some of the gains faded by first grade (Bassok, Gibb, & Latham, 2016), and had a negative association by third grade (Lipsey et al., 2015).

Analyses conducted in this dissertation study to investigate race/ethnicity group differences on reading and math scores showed that for reading, the intervention group demonstrated higher reading achievement scores for students of all ethnic backgrounds. But, differences across race/ethnicity were roughly equal whether or not a child had participated in a district preschool program. In addition, results revealed that White students who attended district preschool performed above the national mean for NWEA reading (50th percentile) while Black and Hispanic peers lagged behind at just the 40th percentile. Participation in district preschool appears to have built pre-literacy skills for all student groups, but racial achievement gaps at both the local and national levels persisted. In terms of math achievement, both Black and Hispanic students performed modestly better if they had attended district preschool, but this advantage was not evident among White students. Overall, White students achieved significantly higher NWEA math percentile scores compared to Black and Hispanic peers; surprisingly, those who did not attend district preschool performed slightly better compared to those who had attended.

Also examined in this present work is the progress made by children attending At-Risk Schools and not-At-Risk Schools as an approach to measuring low-performing schools. Results from the multivariable linear regression models in which gender, race/ethnicity, special education status, disability, and attendance in an At-Risk School were controlled for, showed that
district preschool participation remained a significant predictor of reading achievement but not math achievement. An interesting finding from the ANOVA analyses also indicated that the impact of ethnicity on reading achievement might be moderated by school type. Black and Hispanic students scored significantly lower in reading than peers in higher performing or not-at-risk schools, but outperformed peers in math scores by a small margin in lower-performing or at-risk schools.

While these results were surprising, given the goals of this study, possible explanations can be theorized. It is quite possible that the low-performing schools had a larger proportion of low-income Black, White and Asian students who were English as a New Language learners. One reason Black and Hispanic students might have performed on par with their White peers is because their peers might not have had the parental and outside support (e.g., tutors) that would usually give them advantages, especially supports related to income (e.g., high levels of parental education and more free time than their lower-income peers). A second explanation might be correlated with the characteristics of the students in the lower-performing schools. Presumably, these schools also lack resources and have similar economic disadvantages comparable to their student body (e.g., poorer facilities, lack of computer labs, books, a well-stocked library, parent volunteers).

Three studies lend support to understanding poor performing schools. First, Cascio (2017) reported a statistically significant higher impact of universal pre-K programs for low-income children than for their peers. Second, Magnusun, Ruhm, and Waldfogel (2004) showed that disadvantaged children benefit most from quality prekindergarten instruction. The third study suggests that academic gains associated with improved learning scores in reading, math, and science were largest for children from low-SES households and smaller for children from
middle- and high-SES households (NCES 2010–11). All told, African American children need culturally aware, responsive, and dedicated professionals (e.g., teachers, staff, and social workers), as well as engaged parents so that academic performance into the future can be actualized. It is also significant that, at a minimum, the financial resources must be in place in order to attract and retain qualified staff.

In conclusion, consistent with prior literature and also in support of a general notion that prekindergarten is advantageous, this study provides evidence that prekindergarten attendance is associated with and enhances reading skills for all students regardless of race or ethnicity (Winsler et al., 2008). Results of this study revealed that district Pre-K participation predicted higher reading achievement and that Black and Hispanic students may only be at a disadvantage in higher-performing schools. Consequently, such data suggest that attending a district-administered preschool can close the achievement gap between Black children and their peers at kindergarten entry in a high-poverty urban district, among students attending at-risk schools, but not among students attending non-at-risk, or higher performing schools. Furthermore, the findings also showed that when at-risk schools, which can be regarded as a rough proxy measure of poverty (i.e., the measure reflects resource-poor communities) were controlled for, district pre-K participation remained a significant predictor of reading achievement.

To the contrary, the expectation of significantly higher math scores among pre-K attendees was not realized. Results demonstrated that math achievement by students who attended preschool was not significantly accelerated compared to their peers who did not attend preschools. Noted exceptions included the finding that both Black and Hispanic students performed modestly better (at a non-significant level) in math achievement if they had attended district preschool. This finding is not unique. It is similar to those previously reported by Cascio
(2017) on the positive effects of attending pre-K on cognitive test scores. In this study, the author found a substantial positive effect of attending pre-K on cognitive test scores at age 4, but only for low-income children enrolled in universal pre-K programs (Cascio, 2017).

Conclusions

Heckman (2011) argues that inequality in early childhood experiences and learning (i.e., preschool experiences) produces over the long-run inequality in ability, achievement, health, and adult success. Moreover, he points out that “adverse impacts of genetic, parental, and environmental resources can be overturned through investments in quality early childhood education that provides children and their parents the resources they need to properly develop the cognitive and personality skills that create productivity” (Heckman, 2011, p. 2). Conversely, Heckman suggests that “investment in early education for disadvantaged children from birth to age 5 years helps reduce the achievement gap, reduce the need for special education, increase the likelihood of healthier lifestyles, lower the crime rate, and reduce overall social costs” (Heckman, 2011, p. 2).

Early intervention programs offer the potential for children to attain school readiness skills and the value of prekindergarten attendance has been well documented (e.g., Campbell et al., 2014; Heckman et al., 2010). An important point to consider is the great diversity in state prekindergarten programs. This dissertation study’s findings reflect the benefits of one specific program type — the publicly funded city district prekindergarten (public preschool). Overall, results show that preschool attendance improved kindergarten readiness for literacy and that Black and Hispanic students outperformed their White peers by a small margin in lower-performing schools.
The main objective of this study was to examine whether attendance in public preschool, and prekindergarten programs (i.e., school district preschools and Head Start programs) is beneficial. In addition, this study was undertaken to determine whether such programs can mitigate the Black-White achievement gap in kindergarten readiness. Findings support the evidence established over the past five decades based in educational literature that attendance in public preschool or prekindergarten programs can improve children’s literacy achievement. However, similar gains were not observed for math proficiency. Moreover, counter to expectations, results revealed that the narrowing of the achievement gap was small, and that school factors may play an important role in moderating the relationship between race and achievement.

Results suggest that while quality early education is a valuable component of programs that aim to promote equality at school entry, it is by no means a panacea for the accumulated disadvantages of communities of color who live in persistent poverty. Black and Hispanic children who attended preschool demonstrated superior pre-literacy skills compared to their Black and Hispanic peers who did not attend preschool, but they still lagged behind their White classmates by more than 10 percentile points. Among the preschool population, White students performed slightly above national means while their Black peers averaged the 42nd percentile. Preschool participation appeared to boost academic skills for all children but did not counteract the cumulative disadvantage nor narrow the reading achievement gap. On the math assessment in this study’s sample, racial gaps in performance did narrow, yet Black and Hispanic students remained 12 percentile points behind their White peers. Data support the argument that while preschool may be a necessary component of an effective solution to closing the achievement gap,
far more comprehensive and cross-system approaches must be developed to more systematically begin to counteract the ravages of poverty.

**Limitations of the study**

This dissertation includes some limitations. First, secondary data analysis was conducted to compare reading and math ability at kindergarten entry between two groups. The intervention group consisted of children who attended the district’s UPK program. Using data from an existing source limits the type of variables and questions that can be addressed because the data pre-exist and cannot be altered.

Poverty is an important influence on school readiness. Poor children in the United States start school at a disadvantage in terms of their early literacy and math skills, social-emotional behaviors, and health. Fewer poor children are ready for school at age five, compared to non-poor children (Isaacs, 2012). Living in poverty has even more severe consequences for Black children (Wilson, 2010). However, individual level economic data on the students were not available. In the absence of such information, the variable “at-risk school” was used as a proxy for poverty in terms of resources, but this variable was not ideal. Therefore, an observable difference could not have been tested between poor and non-poor children. Additionally, it was not possible to specifically determine the role that poverty and race/ethnicity might jointly play in the relationship between preschool programs and cognitive achievements.

Also missing for potential analysis was information on age. Some previous studies have shown the importance of age in cognitive testing. In this current study, NWEA percentile scores are based on year in school and at what point during the year the assessment was completed, and whether a student is at grade level for reading and math skills. Since NWEA was the primary
dependent variable and scores are age-blind, child age was not considered an important independent variable.

An additional limitation is associated with the study design. The present study used a quasi-experimental design in which two independent samples of students were compared. Given, that exposure to a school district prekindergarten preceded the collection of data, it was not possible to randomly assign subjects to intervention and control groups. Consequently, it was not possible to completely remove this source of selection bias. A useful strategy typically employed to mitigate selection effects is frequency matching on common demographic characteristics such as age and gender. This current study had fewer children in the nonexperimental comparison group (229 students) than in the intervention group (467 students), which might have limited the potential for equal matching and created a problem of lost data. Therefore, it was not advantageous to implement matching.

A third limitation relates to the potential for information misclassification. First, this study was based on secondary data; thus information could not be independently verified. Importantly, participation in district prekindergarten programs may, in fact, not represent actual class attendance. For example, the ethnicity criterion included both African American and Hispanic/Latino students because the school district’s definition of Hispanic includes children of all races who identify as Hispanic/Latino. The integration of these children allowed for the possibility of including students whose identified them as White Hispanic in the comparison (non-reference) group, which could have biased the findings regarding ethnicity. However, the potential negative consequence of this limitation is probably not significant because the number of students identified as such is small.
As a group, students who identified as Hispanic tended to show deficits similar to their African-American peers. As defined by the district, these two “racial” groups in some studies have been found to lag behind peers in reading and math proficiency rates, NWEA growth percentiles, school attendance, and ultimately graduation rate and post-secondary enrollment. Exclusion of students who identified in “Other” in the race/ethnicity category in the comparison group is unlikely to have impacted results because only six students (two in the intervention group and four in the comparison group) identified as such.

Another potential source of misclassification of information is the assignment of students to the “intervention” or “control/comparison” group. The analysis performed in this study focused on district prekindergarten programs. Although students in the comparison sample were not enrolled in district preschool or Head Start, some them may have been involved in some other kind of early care or childcare setting or non-district preschool or nursery school. Such misclassification may have yielded conservative estimates of impact.

Implications

Poverty and readiness for school affects a child’s ability to succeed both academically and socially in school. Cumulative advantages provided early in life accumulate with time. Likewise, cumulative disadvantages that begin with childhood poverty, including aspects of health, home life, housing insecurity, food insecurity, parental education, parenting styles, quality of childcare and preschools in poor neighborhoods can combine to decrease a child’s readiness for school. Such disadvantages may accumulate over time. Environmental characteristics such as the concentration of poverty, poor physical environment (high neighborhood crime and violence rates) and school characteristics (poorly funded schools) have a particularly strong impact on school readiness. Children from low-income communities may
not receive the cognitive stimulation and may not learn the social skills required to prepare them for school. Children from low-performing schools or at risk schools may not receive the relatively high-quality learning experience essential for preparing them for kindergarten.

Quality education, which includes a coherent, comprehensive, and child-centered framework, is needed for children to learn optimally. Quality education makes a difference. In order to sustain advances made via preschool education, and to thwart or minimize the fade out effects (diminishment of gains achieved) over time, attention to other variables is required. Beyond academic impacts, quality preschool may develop social and emotional skills critical to school success such as tenacity, confidence and ability to focus. At the end of each day, however, children go home to environments where continued supports are often necessary to reinforce benefits gained at school. The depth and breadth of disadvantages faced by families in poverty must be met with solutions that are equally complex and comprehensive.

Providing children with school-readiness skills must be a collaborative effort involving educators, families, and the city or town (community) in which child live and the broader society. Resources available to children include family income, extended family members, and other family resources such as parental time and parenting practices, and community resources such as quality non-parental childcare and family support programs. In addition, based on Sampson et al.’s (1997) concept of collective efficacy, many ecological neighborhood effects impact a child’s academic trajectory. These collective aspects of community life may also impact school readiness and opportunities for success.

The social work profession seeks to address the social welfare of society by enhancing the well-being of individuals within their social context (Reamer, 2013). Consequently, according to the most recent National Association of Social Workers (NASW) Code of Ethics,
an important objective of social workers is to “strengthen relationships among people in a purposeful effort to promote, restore, maintain, and enhance the well-being of individuals, families, social groups, organizations, and communities” (2017).

A key component of social work is helping underprivileged and vulnerable members of society. Children are the most vulnerable members of our society. Educating children is an important aspect of their well-being and it starts with early care and learning such as preschool. Pre-K is important because it provides a foundation of skills, social behaviors, and emotional skills along with language and pre-math skills for kindergarten. These skills, which promote early educational success, can fuel children’s enthusiasm and capacity for lifelong learning. Prekindergarten programs also can facilitate transformation and growth by helping them learn valuable social-emotional and self-regulation skills through interactions with peers and teachers. Participation in prekindergarten can also help children to become familiar with literacy, language development, mathematics and science, which also promote problem-solving strategies.

The academic benefits and social developments in children are more pronounced and sustainable when family engagement and support systems are integrated. The combination of preschool attendance, family presence and informed involvement are integral elements in narrowing the knowledge gaps for disadvantaged children.

In contrast, children who are not exposed to quality early childcare and preschool enter school behind their peers and often lag behind them their entire life (Isaacs, Sawhill, & Haskins, 2008). This dissertation research was conducted in a high-poverty, urban school district serving nearly 10,000 students, the majority of whom are minority students. If social workers could attend to the early care and educational needs of impoverished children in community-based childcare organizations, the social work profession might make important impacts on
future learning outcomes, especially for African American children. To carry out these goals, quality research on how communities can access resources, recruit and pay high-quality, certified teachers, and cover the costs associated with quality education need to be conducted in order to both achieve and monitor progress. However, in order for the social work profession to be involved in community-based childcare organizations, at least two entities must be identified or created: 1) an organization must be identified or developed that can allocate funds to support a salaried social worker and 2) a dedicated reporting institution that oversees the identified needs and service provision to the children, must be created. As it stands today, social workers are much needed, but cannot perform their duties without monetary support. Therefore, policymakers and practitioners must advocate for funding to fill the gap in the service sector that would help enhance the quality of experience provided in Pre-K at the district level.

**Directions for future research**

The main approach of this study was to estimate the short-term cognitive benefits of prekindergarten participation using district preschool information. The focus of future studies should include analyses of long-term cognitive benefits of pre-K attendance. In addition, it may be helpful for future studies to consider other potential benefits of district prekindergarten attendance such as social-emotional gains. These have been clearly documented in prior studies (Gormley et al., 2011) and could be explored using more comprehensive data.

The availability of student and school-level data was critical to the success of this study. Early education is delivered in complex contexts, where child, family, teacher, school, and community factors interact to influence program impact. More nuanced analyses that consider the interplay among these factors could identify program attributes most critical to success with minority populations in disadvantaged communities.
In closing, the main objective of this study was to better understand the impact of preschool attendance on kindergarten readiness, and specifically on the achievement gap between Black students and their peers. Given this research goal, the roles of race/ethnicity and poverty did not receive extensive consideration in this study. Although race differences were examined, detailed data on race and ethnicity were limited. Although results from this study suggest that children from a high-poverty urban community who attend district preschool programs demonstrated gains in reading skills during their preschool year, the current study could not address the role of poverty due to the unavailability of individual data on poverty. Therefore, future research can benefit from exploring more extensive data on the interplay of race/ethnicity and poverty. Finally, despite this study’s value in building the knowledge base on preschool impacts on children’s kindergarten readiness, it was not possible to test the direct positive impacts of collective efficacy, social capital and social mobility on school readiness. Neither was it possible to test the direct negative impacts of cumulative disadvantages. For this reason, future research designs are needed that combine preschool and neighborhood effects.
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Appendix A: Parable of Talents: The Matthew Effect

Matthew 25:14–30

“For it is as if a man, going on a journey, summoned his slaves and entrusted his property to them; to one he gave five talents, to another two, to another one, to each according to his ability. Then he went away. The one who had received the five talents went off at once and traded with them and made five more talents. In the same way, the one who had the two talents made two more talents. But the one who had received the one talent went off and dug a hole in the ground and hid his master’s money. After a long time the master of those slaves came and settled accounts with them. Then the one who had received the five talents came forward, bringing five more talents, saying, ‘Master, you handed over to me five talents; see, I have made five more talents.’ His master said to him, ‘Well done, good and trustworthy slave; you have been trustworthy in a few things, I will put you in charge of many things; enter into the joy of your master.’ And the one with the two talents also came forward, saying, ‘Master, you handed over to me two talents; see, I have made two more talents.’ His master said to him, ‘Well done, good and trustworthy slave; you have been trustworthy in a few things, I will put you in charge of many things; enter into the joy of your master.’ Then the one who had received the one talent also came forward, saying, ‘Master, I knew that you were a harsh man, reaping where you did not sow, and gathering where you did not scatter seed; so I was afraid, and I went and hid your talent in the ground. Here you have what is yours.’ But his master replied, ‘You wicked and lazy slave! You knew, did you, that I reap where I did not sow, and gather where I did not scatter? Then you ought to have invested my money with the bankers, and on my return I would have received what was
my own with interest. 28 So take the talent from him, and give it to the one with the ten talents. 29 For to all those who have, more will be given, and they will have an abundance; but from those who have nothing, even what they have will be taken away. 30 As for this worthless slave, throw him into the outer darkness, where there will be weeping and gnashing of teeth. (The Revised Standard Version Bible)
## Appendix B: Definition of Terms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>CBC</td>
<td>Citizen Budget Commission</td>
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<tr>
<td>ENL</td>
<td>English as a New Language</td>
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<tr>
<td>MAP-Growth</td>
<td>Measures of Academic Progress (NWEA - MAP) assessment</td>
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<tr>
<td>NYSED</td>
<td>New York State Education Department</td>
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<td>NASW</td>
<td>National Association of Social Workers</td>
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<td>NIEER</td>
<td>The National Institute for Early Education Research</td>
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<tr>
<td>NICHD</td>
<td>National Institute of Child Health and Human Development</td>
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<td>NIH</td>
<td>National Institutes of Health</td>
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<td>NCES</td>
<td>National Center for Education Statistics</td>
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<tr>
<td>NWEA - MAP</td>
<td>Northwest Evaluation Association Measures of Academic Progress</td>
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<tr>
<td>RIT</td>
<td>RIT scale (Rasch Unit Scale) is an equal interval scale that uses individual item difficulty to measure student achievement across grades.</td>
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<td></td>
<td>Study of Early Child Care and Youth Development</td>
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<td>UPK</td>
<td>Universal Prekindergarten</td>
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<td>USDHH</td>
<td>U.S. Department of Health and Human Services</td>
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