SCHOOL READINESS:
DOES IT MATTER IF PARENTS AND CAREGIVERS THINK ALIKE?

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ABSTRACT

DARI JIGJIDSUREN: School readiness: Does it matter
if parents and caregivers think alike?
(Under the direction of Kathleen Rounds and Dick Clifford)

Growing market competition and increasingly high standards for the global workforce have placed a greater emphasis on school readiness, a complex construct that has yet to be understood and achieved. This dissertation study strives to contribute to the body of readiness research by offering new insights into factors associated with improving child outcomes. The study uses the data from the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) to examine parents' and caregivers' views of school readiness and their relationship to children's cognitive outcomes in preschool and kindergarten. Multiple regression analyses were used to investigate the associations between parents' and caregivers' views and child outcomes, and the moderating effects of race/ethnicity and SES on child outcomes. Also, the study measured congruence of school readiness views between parents and caregivers using advanced statistical methodologies such as absolute congruence index, weighted and unweighted kappa statistic (Kw), agreement indices (rWG), and average deviation indices (AD).

This dissertation study advances the existing research on school readiness in several ways. This study is the first of its kind to measure congruence of school readiness views using multiple innovative approaches for a large sample (N = 4,500) of

individually paired parents and caregivers. Next, the study validated and revised the school readiness measure, initially used in the 1993 National Household Education Survey and subsequently used for the ECLS-B. Third, the study offers insights into the complexity of the meaning of school readiness for practitioners working in diverse cultural contexts. The findings from this study support the notion that parents and caregivers play a critical role in children's early development and reveal the associations between the views of parents and caregivers and children's test scores in math and reading. However, given the magnitude of findings and their conflicting nature, the question about the associations between congruence of views and child outcomes remains inconclusive. The study demonstrates the need for more refined instruments to more accurately measure school readiness, and suggests that future research focus on cultural aspects of school readiness.

To the memory of my parents, Naidan Jigjidsuren and Erkhembayar Mishgee,

who instilled in me a love of learning. So much of who I am today is because of you.

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CHAPTER 1

INTRODUCTION

Every year, over a million American students drop out of high school, and one out of every four high school students fails to graduate on time. In today's increasingly complex world of technological advances and demanding job markets, the future for these youth looks graver than ever. High school dropouts are at increased risk for significant negative consequences that affect every aspect of their lives. They are more likely to experience unemployment, poor health, incarceration, and poverty, and have a shorter life span compared to their better educated peers (Levin, 2005; Sum, Khatiwada, & McLaughlin, 2009; Tyler & Loftstrom, 2009).

Dropouts have an intergenerational effect on family members and spread negative influences to family and friends, contributing to neighborhood poverty. Moreover, these adverse effects extend far beyond the dropout youth, their families, peers, and communities. Dropouts impose a heavy cost on the nation's economy as a result of lower tax revenues, greater public assistance expenses and higher crime rates (Belfield & Levin, 2007; Heckman & Masterov, 2007). For every new class of students who fail to graduate from high school, over $200 billion is lost in lifetime tax revenues and increased public expenditures; high school dropouts constitute nearly 50% of the heads of households receiving social welfare and more than 75% of all prison inmates (Melville, 2006). Calls to address the national crisis of high school dropouts have received significant attention in recent years. The results of multiple studies suggest that a complex combination of causes may underlie a youth's

decision to drop out; poor academic performance is frequently cited as one of the key reasons for dropping out of school (Bridgeland, Dilulio, & Morison, 2006; Johnston, 2010; Rumberger, 2001; Rumberger & Lim, 2008).

The manifestations of academic failure may go ignored until much later, the foundation for poor school performance is often laid in early childhood (Entwisle, Alexander, & Olson, 2005; Karoly, Kilburn, & Cannon, 2005; Knudsen, Heckman, Cameron, & Shonkoff, 2006; Pianta, Cox, & Snow, 2007). In fact, when children first come to school, they already vary greatly in their skills and competencies (Brooks-Gunn & Markman, 2005; Carlton & Winsler, 1999; Laosa, 2005), with some children falling far behind their peers (Burchinal et al., 2011; Duncan, Morris, & Rodrigues, 2011; Isaacs, 2012; Jacobson Chernoff, Flanagan, McPhee, & Park, 2007; West, Denton, & Germino-Hausken, 2000). Once in school, children who are not ready for school face the risks of being late in learning to read, write, and do math, and are less proficient compared with children who enter school with mastery of basic skills (Duncan et al., 2007; Layzer & Price, 2008). In 1993, Slavin and colleagues wrote that "[s]uccess in the early grades does not guarantee success throughout the school years and beyond, but failure in the early grades does virtually guarantee failure in later schooling" (p. 10). Researchers confirm that performance in elementary school determines children's academic success and social performance in later years (Campbell, Helms, Sparling, & Ramey, 1998; Fergus-Morrison, Rimm-Kaufman, & Pianta, 2003; Reynolds, 2000). Children who enter school ill-prepared are more likely to experience academic failure, school dropout, emotional problems, juvenile delinquency, and, subsequently, unemployment and less earning power as adults (Barnett, Young, &

Schweinhart, 1998; Baydar, Brooks-Gunn, & Furstenberg, 1993; Duncan, Magnuson, Kalil, & Ziol-Guest, 2012).

The issue of "children's short term cognitive, social and emotional development … [and] their long term success in school and later life" (Organization for Economic Cooperation and Development [OECD], 2001, p. 13) has been emphasized in decades of research. Circumstances such as parenting styles and beliefs, parents' race/ethnicity, home learning environment, neighborhood, and larger social environment along with individual child characteristics are instrumental in shaping child experiences in early ages (Britto, Brooks-Gunn, & Griffin, 2006; Burchinal, Roberts, Zeisel, Hennon, & Hooper, 2006; Carnegie Task Force, 1994; Duncan & Murnane, 2011; Hanson et al., 2011; Martin, Ryan, & Brooks-Gunn, 2010; Shonkoff & Phillips, 2000; Son & Morrison, 2010; Yoshikawa, Gassman-Pines, Morris, Gennetian, & Godfrey, 2010). In particular, the devastating influences of poverty and household socioeconomic status (SES) on children are well documented (Duncan, Ziol-Guest & Kalil, 2010; Isaacs, 2012; Layzer & Price, 2008; McLoyd, 1998; Reardon, 2011). Multiple national and international studies that examined the effects of poverty and SES on early childhood outcomes found that children from low-SES households are statistically less likely "to develop the same level of skills and intellectual capital as children from high-SES backgrounds" (OECD, 2006, p. 34). For example, the preschool follow-up of the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) determined that at age 4, the average receptive vocabulary, literacy, and mathematics scores of children in the highest 20% of SES are at least one standard deviation higher compared to those of children in the lowest 20 percent (Jacobson Chernoff et al., 2007). In a British study, children from low-SES families had a difference in cognitive development of 13 percentage

points at 22 months (*SE* = 2.0) compared to children from high-SES families, and by age 10 the gap reached 28% (*SE* = 2.5) (Feinstein, 2003). The Programme for International Student Assessment (PISA) evaluations (OECD, 2001) also reported that family poverty was correlated with poor educational outcomes.

In all counties, children from middle class families academically perform significantly better compared to their peers from lower-SES families—the difference is attributed to high SES children's "daily access to codes, language and cultural resources valued in mainstream education" (OECD, 2006, p. 35). Economically disadvantaged children may not have role models or may not have been exposed to opportunities to acquire skills and competencies such as language acquisition, self-confidence, and self-regulation that underlie successful learning (OECD, 2006). Researchers (Duncan, Brooks-Gunn, & Klebanov, 1994; Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Duncan et al., 2012; Guo, 1998; Mistry, Benner, Biesanz, & Clark, 2010) further caution that childhood poverty is most destructive at early stages of learning because acquisition of certain skills is essential for progressing to the next stage and poverty may seriously impede children's early learning and acquisition of fundamental skills.

One frequent remedy to help compensate for disadvantages experienced by children in poverty is early childhood intervention (Barnett, 1990, 2011; Dearing, McCartney, & Taylor, 2009; Schweinhart et al., 2005; Votruba-Drzal, Coley, Maldonaldo-Carreno, Li-Grining, & Chase-Lansdale, 2010; Reynolds, 2000). There is ample evidence indicating that effective early intervention programs positively impact the cognitive and social skills of young children (Barnett et al., 1998; Burchinal & Cryer, 2003; Campbell et al., 1998; Li, Farkas, Duncan, & Burchinal, 2011; McCartney, Dearing, Taylor, & Bub, 2007).

Longitudinal studies such as the Carolina Abecedarian Project and the High/Scope Perry Preschool Program demonstrate long-term benefits of early childhood programs for individuals and society (Barnett, 1996, 2000; Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; Heckman & Masterov, 2007; Knudsen et al., 2006).

Nevertheless, parents' responsibility for education of the youngest members of the society cannot be dismissed. Family is the primary context for children's early experiences, and research affirms the central role of parents in children's development (NICHD [National Institute of Child Health and Human Development] Early Child Care Research Network, 2003b). Parents themselves, their attitudes, and the ways they raise their young children have significant, long-lasting impact on children's outcomes (Epstein, Coates, Salinas, Saunders, & Simon, 1997; Ramey & Ramey, 1999; Snow, Burns, & Griffin, 1998). Therefore, effective partnerships among parents, educators and other professionals are needed to help children become prepared for school.

CHAPTER 2

WHAT IS SCHOOL READINESS?

The concept of *school readiness* or children's readiness to start school has been familiar to educators for over 200 years. Swiss educator Johann Heinrich Pestalozzi (1746 - 1827) first mentioned a similar concept in his writings in 1801 (Pestalozzi, 1801/1894). The concept didn't become popular in the English-speaking world until his works were translated into English about a century later. After another century there is still no agreement about the definition of school readiness among parents, educators, researchers, and policymakers (Thompson & Raikes, 2007).

There are several different views of what constitutes school readiness. The most commonly used perspective of school readiness is indicated by chronological age; that is, using a certain cutoff date to determine when children are ready for school. In most countries children start school sometime between the ages of 4 and 7 (OECD, 2006); the United States follows the chronological age requirement of 5 as the typical school entrance age.[1] To determine a child's school readiness, U.S. schools use a cutoff date that varies from state to state—the date can be as early as July 1 or as late as January 1 of the following year (Saluja, Scott-Little, & Clifford, 2000). Other countries have somewhat similar criteria; one exception is New Zealand, where children start school on their 5th birthday (Clifford & Crawford, 2009).

[1] School refers to a type of facility that offers formal educational courses to young children. Because kindergartens in the United States are generally located in elementary schools, they would also be referred to as a "school."

The chronological age definition is common in countries with universal primary education, where children's right to education is exercised equally regardless of economic wealth, social status, and other factors. Although using children's chronological age is a convenient tool for policymakers and administrators, there are arguments about the great range of variability in skills among children of the same age, particularly those at both ends of the age range. Those arguments, coupled with budgetary considerations, often lead to establishing an older age for school entry—for example, the state of North Carolina has recently shifted the school cutoff date from October 16 to September 1.

A new definition of school readiness was proposed by Kagan (1992) in early 1990s. It consisted of two different constructs: *readiness for learning* and *readiness for school* and emphasized the individual child using domains of development and the child's skills and competencies. According to Kagan and Rigby (2003), readiness for learning was a developmental progression to the level when the individual was "ready" to learn specific concepts, and concerned "the domains of physical development, intellectual ability, and emotional maturity and health" (p. 1). Readiness for school was different from readiness for learning, and was understood as a set of skills and competencies, such as cognitive and linguistics skills, needed in order to be successful in the academic environment (Kagan, 1990; Kagan & Rigby, 2003). The National Education Goals Panel (NEGP, 1997) further extended this definition by outlining three different aspects of school readiness: *ready schools, ready children,* and *ready communities*. In this expanded definition, child readiness was based on five domains of child development and learning: (a) physical well-being and motor development; (b) social and emotional development; (c) approaches to learning; (d) language development; and (e) cognition and general knowledge.

By adopting this definition, NEGP also recognized that the burden for children's school readiness should be equally shared by schools, communities, children, and their parents. Still, despite the efforts expended by stakeholders, reaching school readiness remains a complex goal. There is no single "formula" for preparing children for school that is agreed upon by policymakers, educators, parents, and teachers. Nor do there exist universal instructions for identifying school-ready children. No single readiness test may be trusted as a reliable method for measuring school readiness (Kagan, Scott-Little, & Clifford, 2003) given the considerable variability in the range of normal development among children of the same age (Lewit & Baker, 1995), social and cultural differences, varying purposes of assessment and the limited accuracy of assessment instruments (Kagan et al., 2003; La Paro & Pianta, 2000; Meisels, 1989, 2002). Moreover, due to the complexities of the definition of school readiness, parents, caregivers, and teachers do not share a common understanding of the construct of *school readiness*. However, their assumptions about children's educational needs and early learning processes frequently guide their teaching. Considering the significant impact of individual beliefs, values and attitudes on educational practices and child outcomes (Alexander, Entwisle, & Horsey, 1997; Axinn, Barber, & Thornton, 1999; Olsen & Bruner, 1996), there is an emerging need to take a closer look at stakeholders' views related to school readiness. The following section will examine parents' and caregivers' beliefs[2] about school readiness and compare the beliefs held by different stakeholders.

[2] In the educational literature the terms *assumptions*, *views*, *ideas*, *notions*, *understanding*, and *beliefs* are frequently used interchangeably to describe a set of opinions held by individuals. This paper will use *views* and *beliefs about school readiness* as exchangeable terms.

School Readiness Beliefs

Parents are the primary nurturers, supporters, intermediaries, and advocates for their children (Pianta, 2003), regardless of SES, education, ethnic background, and employment. As a child's first teachers, parents make important decisions about the learning experiences to which their young children are exposed before the start of formal schooling; the quality of early experiences may enhance or, conversely, impede child development (Stipek, Milburn, Clements, & Daniels, 1992). Literature suggests that parents' educational decisions are often influenced by their beliefs about early learning and school readiness (Barbarin et al., 2008; Graue, 1992). Parents' beliefs about school readiness are rooted in a particular system of values parents hold and their perceived demands of school (Eisenhart & Graue, 1990). How parents understand school readiness defines their choice of kindergarten, the types of educational activities parents engage with their young children (Bates et al., 1994; Stipek et al., 1992), and the skills and competencies parents nurture in their children (Barbarin et al., 2008).

Studies examining parents' views of school readiness found that parents had differing values. In a study by Eisenhart and Graue (1990), parents of children about to start kindergarten were more concerned about their child's social development and emotional maturity than their academic skills. The sociocultural constitution of the construct of school readiness suggests that the meaning of readiness may differ substantially across diverse groups (Graue, 1993). A handful of studies that closely examined the concept of school readiness indicate that parents' views of school readiness are determined by their education, socioeconomic, racial, and cultural backgrounds (Diamond, Reagan, & Bandyk, 2000; Eisenhart & Graue, 1990; Okanagi & Sternberg, 1993). For example, a study by Stipek et al.

(1992) found that less educated (and, thus, often poorer) parents were more likely to emphasize performance and value formal teaching approaches compared to better educated parents. However, other studies reported minimal differences in the perceptions of parents from different backgrounds (Barbarin et al., 2008; Piotrkowski, Botsko, & Matthews, 2000).

Similar to parents, other influential adults in a child's life such as caregivers and teachers hold their own sets of school readiness perceptions and make decisions guided by these ideas. Caregivers and teachers may emphasize particular developmental domains that they view as important for school success. They may have varying expectations and ratings of child's school readiness. For example, a study that compared preschool and kindergarten teachers' expectations for children's kindergarten entry skills found that preschool teachers had higher expectations of children's performance than their kindergarten teacher colleagues. While preschool teachers marked 78 items (51% of items) as *Important*, kindergarten teachers selected only 6 items or 4% of items (Hains, Fowler, Schwartz, Kottwitz, & Rosenkoetter, 1989).

Studies that explored preschool teachers' thoughts about school readiness found that preschool teachers prioritized socioemotional development, placing less importance on academic skills. A study of Australian preschool teachers (Cuskelly & Detering, 2003) found that *social skills* and *emotional maturity* were the two most important child characteristics essential for school readiness. While 70% of the preschool teachers rated social skills and emotional maturity as *Most important* for school, about 60% rated academic competence as *Important*. Among popular strategies to promote school readiness suggested by preschool teachers, the top three choices included *encouragement/support/praise of children* (49.21% of the teachers), *promoting social skills* (39.68%), and *developing academic skills* (39.69%).

Past studies often focused on kindergarten teachers' perceptions of school readiness. According to the national survey of 7,000 kindergarten teachers conducted by the Carnegie Foundation for the Advancement of Teaching (Boyer, 1991), teachers rated 35% of kindergarteners who entered school in 1990 as not ready for school. Teachers stated deficiencies in the following areas: proficiency in language—88% of entering kindergarteners, emotional maturity—86%, general knowledge—83%, social confidence—80%, moral awareness—60%, and physical well-being—33%. A small study of rural kindergarten teachers' perceptions of school readiness (Espinosa, Thornburg, & Mathews, 1997) revealed that rural teachers viewed a higher percentage of their students as prepared for school than did Boyer's national sample of teachers. Rural teachers reported that 32% of kindergartners were deficient in problem-solving skills, 28% could *not* sit and pay attention when appropriate, 25% were *not* ready to learn expected math and literacy concepts, and 25% could *not* effectively take turns and share with others. Physical development was the area of least concern for teachers, with only 7% of kindergartners rated as *not* physically healthy (Espinosa et al., 1997).

However, these findings are not supported by other studies. In a study of 1,339 public school kindergarten teachers (Heaviside & Farris, 1993), participants identified the three most important qualities for kindergarten readiness were for a child to be: (a) physically healthy, rested, and well-nourished (96%); (b) able to communicate needs, wants, and thoughts verbally (84%); and (c) enthusiastic and curious in approaching new activities (76 %). A small study of 28 Kansas kindergarten teachers found that 80% of teachers rated few items from the academic, self-care, and communication categories, including: (a) identifying body parts; (b) identifying colors; (c) toileting; (d) responding to name, and (d) identifying to

warning words. Others (Johnson, Gallagher, Cook, & Wong, 1995) argued that teachers emphasized independence and self-help skills over academic competence. A more recent study found that kindergarten teachers were primarily concerned about children's social and emotional competencies and behaviors, including being able to follow directions and communicate needs and thoughts, and not be disruptive (Lin, Lawrence, & Gorell, 2003).

Based on these findings, some researchers suggest that parents and teachers may hold different perceptions about attributes and behaviors important for a child's academic success (Ackerman & Barnett, 2005). One of the earliest studies by West, Germino-Hausken, and Collins (1993) compared parents' and kindergarten teachers' responses by examining the 1993 National Household Education Survey (NHES) and the Fast Response Survey System (FRSS). Consistent with their report, parents believed that it was *Very important* or *Essential* that children know the alphabet (58% of parents vs. 10% of kindergarten teachers), are able to count to 20 or more (59% vs. 7%), are able to use a pencil or a paintbrush (65% vs. 21%), and sit still (80% vs. 42%) prior to kindergarten entry. Interestingly, parents' views were found to be associated with their education level—compared to parents with a college degree, significantly more parents who did not graduate from high school rated knowing the alphabet (73% vs.41%), counting to 20 (70% vs. 50%), and being able to use a paintbrush or a pencil (78% vs. 54%) as *Essential* or *Very important*. West and colleagues (1993) also cautioned that when the readiness expectations of teachers and parents differ substantially, some children may be viewed as "unready" and treated differently.

Although some findings indicate that parents' responses substantially differ from teachers' responses, the scarcity of recent research in this area suggests that professionals should proceed cautiously in drawing conclusions. Also, given the disagreement among

previous studies, there is a need to examine their rigor. In addition, with the increased emphasis on academic achievement and on measures of achievement used in high-stakes decisions about schools and teachers, it may be that parents' and teachers' values have reached a point of convergence.

Congruence of School Readiness Views

It seems logical to believe that to facilitate close and effective collaboration between parents and schools and to promote children's academic outcomes, parents' views of school readiness should be aligned with caregivers' and teachers' views (King & Boardman, 2006; Welch & White, 1999). The report by the National Center for Education Statistics (West et al., 1993) stated:

> If parents and teachers hold similar beliefs, then there is a greater opportunity for congruence between the skills parents encourage in their children prior to school entry and the skills teachers look for as children enter kindergarten. Such congruence may contribute to a teacher's positive evaluation of the child early in his or her school life and to the child having a successful early school experience. (p. 1)

Prior research, although not focused on views of school readiness, supports the notion that higher congruence in parent and teacher perceptions and expectations is linked to more positive academic outcomes in children and youth (Benner & Mistry, 2007; Peet, Powell, & Donnel, 1997).

According to Sirotnik (1981), congruence is the notion of agreement or disagreement between matched pairs. Congruence research is widely used by researchers in many fields, including medicine, political science, and psychology to assess attitudes, beliefs, perceptions, expectations, goals, and responses. In education, congruence research (sometimes called concordance studies) has examined congruence in parent and teacher educational expectations and child outcomes (Benner & Mistry, 2007), parent and teacher ratings of child

outcomes (Peet et al., 1997), and ratings of their relationships (Iruka, Winn, Kingsley, & Orthodoxou, 2011). However, despite the recent renewed interest in school readiness, research on the congruence of school readiness views between parents and teachers is virtually non-existent. The few studies that examined congruence between parents and kindergarten teachers or early care providers were conducted more than a decade ago (Hains et al., 1989; Welch & White, 1999). Therefore, the goal of this dissertation study is to close the gap in existing research by examining the congruence level of school readiness views held by parents and caregivers, and the relationship between the congruence of parents' and caregivers' school readiness views and children's cognitive outcomes in preschool and kindergarten.

Significance to Social Work

The effects of school readiness go well beyond the child's academic success and social performance. School readiness also has long lasting implications for the economic and social well-being of individuals, their families, and the overall society. While narrowly defined as an educational concept pertaining to young children, school readiness is essential for raising well-educated, economically productive, and happier individuals in good health, who have better jobs, higher earnings, and more opportunities to contribute to the country's economic and social development (OECD, 2011). Therefore, school readiness must be viewed as a complex concept related to multiple disciplines including education, economics, health, and social science.

Moreover, school readiness, with its extensive impacts on individuals and society has become a critical issue of social and economic justice. Today many preschoolers are already disadvantaged by the time of school entry and lack the important supports necessary to

develop and succeed academically in the years to come. According to a report by Child Trends (Halle et al., 2009), the effects of income and race/ethnicity may be detected as early as 9 months of age. Analysis of the ECLS-B data indicates that only 48% of low income children are ready for school at age 5 compared with 75% of children from more affluent families (Isaacs, 2012). In the 1998 Early Childhood Longitudinal Study (ECLS-K), cognitive scores for African American and Hispanic kindergartners were significantly lower than those of their White peers—about two-thirds of a standard deviation lower in math and half a standard deviation lower in reading (Duncan & Magnuson, 2005).

Adverse effects of poverty and its associated risks on children's wellbeing, such as poor health outcomes (Currie, 2005), lower levels of cognitive and social development (Duncan et al., 1994; Liaw & Brooks-Gunn, 1994; West et al., 2000), and academic underachievement (McLoyd, 1998) have been broadly documented in the literature. In addition, compared to higher income mothers, women in poverty are more likely to be less educated, single, depressed, and have more health problems and poor parenting skills (Hart & Risley, 1995; Isaacs, 2012), which has significant effects on their children. Children from low SES households have lower school readiness and lower scores on cognitive and language assessment tests (West et al., 2000).

Social work researchers with an understanding of wider societal contexts are instrumental in investigating the complex issue of school readiness and the achievement gap for disadvantaged children. The findings from the current study will contribute to promoting a social work knowledge base in early childhood development and inform programs and policies. Improved understanding of school readiness will help practitioners develop and deliver more effective social and educational programs targeting children at risk for school

failure and their families, and raise awareness about school readiness among parents, community members, educators, and policymakers. Finally, equipped with better research evidence and a greater understanding of the importance of school readiness, social workers may be able to initiate and implement reforms in existing social programs and policies.

CHAPTER 3

THEORETICAL AND CONCEPTUAL FRAMEWORKS

Over the past years a number of theoretical perspectives have been applied to the school readiness research. One of them is Gesell's maturational theory informed by Darwin's theory of evolution. Maturational theory is known to emphasize the biological basis of child development and downplay the role of environment. Gesell strongly advocated for the "gift of time"—the belief, that, if given sufficient time, children will master skills following their inner urges. Until then, he believed, children were not ready to learn and any attempts to teach children skills and knowledge in advance were destined to fail (Noel & Newman, 2008; Salkind, 2004). Another theoretical perspective that offered comprehensive insights about the importance of contextual factors in human development is Bronfenbrenner's ecological systems theory (Bronfenbrenner, 1979). In his ecological model, Bronfenbrenner framed child-environment interactions as the key to understanding development, and mapped the systems of relationships surrounding every child and their effects on the child.

Vygotsky's Sociocultural Theory

One theory that has recently received extensive recognition among scholars and educators is the *sociocultural theory of human development* developed by Russian psychologist Lev Semenovich Vygotsky (1896-1934). Unlike other well known theorists, Vygotsky did not have the opportunity for research and professional exchange, nor did he have time for refinement of his theory, given his brief lifespan. Yet Vygotsky is best known

for a sociocultural theory that recognizes human development as a result of a dynamic interaction between individuals and society and emphasizes the importance of culture in human development. This theory suggests that social interaction brings gradual and continuous changes in a child's thought and behavior processes and that learning can vary from one culture to another (Woolfolk, 1998). For Vygotsky, learning results from a child's interactions with more knowledgeable persons such as adult family members or peers in the given social context using cultural tools such as language.

According to Salkind (2004), Vygotsky's theory rests on four major principles:

- Children actively participate in their development and construct their own knowledge. For example, if a child faces the need to learn to read, the child will attempt to learn to read given the appropriate environment.
- Development cannot be separated from its social context. Vygotsky suggested that culture or social context, along with maturation and environmental effects, were instrumental in determining children's development. He asserted that two biologically identical children raised in different social environments will be different in spite of having identical sets of genes.
- Learning can lead development. Vygotsky viewed learning not as actual development but rather as setting the stage for development. By contrast, supporters of learning theory (Gagne, 1968) stated that development was the cumulative effect of learning. Vygotsky argued that development follows learning (Newman & Newman, 2007).
- Language plays a central role in mental development. Vygotsky considered language as a cultural tool.

A critical element in Vygotsky's theory is the *zone of proximal development* (ZPD), defined as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). This concept indicates that children can do more when an adult or other more competent person assists and guides them. The term *proximal* shows that the task goes slightly beyond the child's current competence and that the assistance complements and builds on the child's existing abilities rather than teaches the child new behaviors. Following the increasingly complex path of human development, the ZPD expands upwards as the child masters new skills (Van Geert, 1998).

Several definitions have been applied to the ZPD. Some defined it as the "range of tasks" (e.g., Berk, 2009, pp. 265-266) that a child cannot yet perform independently but can accomplish with some help, whereas others described ZPD as skills and abilities that are in the process of developing (e.g., Green & Piel, 2010). Chaiklin (2007) argued that these definitions are erroneous as "even the classic definition refers to the level of development, not tasks" (p. 41), and suggested that such definitions should be interpreted as indicators of the level of development. Perhaps, a more accurate description is the definition of the ZPD as "an individual range of learning potential" proposed by Zuckerman (2007, p. 181).

Vygotsky's approach has captured the interest of a large number of researchers and practitioners for a number of reasons. First, his theory shifted focus from behavior to cognition. Sociocultural theory combines the social environment and cognition, and asserts that interactions with other people are essential for cognitive development. It also recognizes the importance of culture as a social context and language as a cultural tool. Next, the

concept of the ZPD has important implications for education and parenting. Vygotsky argued that conventional tests were not adequate measures of children's capacity to learn as they could only evaluate the level of a child's accomplishment when working independently. To demonstrate the inadequacy of the conventional assessment, Vygotsky (1934/1986) described a case of two boys who both at the 8-year-old level on a conventional intelligence test. However, when presented with new problems and offered slight assistance, one boy scored at the 9-year-old level and the second scored at the 12-year-old level. Vygotsky believed that in order to assess a child's developmental level, it is important to look into the child's potential for new learning, in addition to the skills and competencies the child has already mastered (Crain, 2000).

Those who came after Vygotsky have further expanded and enriched his theoretical principles with new concepts and practical applications. For example, the concept of *scaffolding*, first brought up by Wood, Bruner and Ross (1976), is currently widely used in educational practice along with the ZPD to describe the process of cognitive learning. In that context, scaffolding refers to various techniques used by a more experienced person to support a child in becoming independent in his/her learning. Depending on the child's level of performance, scaffolding may take different forms including asking focused questions, helping the child break the task into smaller steps, giving encouragement, and providing feedback about progress. For example, a child might not be able to draw with crayons but could do so with the mother's assistance. In that case, the mother acts as a scaffold. The mother's level of assistance, however, will be adjusted as the child's learning progresses. Soon she may only put out crayons and paper on the desk until eventually the child has mastered the level of performance to get the drawing supplies and paint unassisted.

According to postVygotskians there are two aspects of school readiness originating from Vygotsky's theory of child development. The first is social context which includes societal schooling practices and expectations for the child. The other aspect is the child's knowledge of those expectations and his/her ability to meet them. Typically, direct participation in school activities and interaction with teachers and peers is the best way to gain knowledge. Therefore, Vygotsky suggested that school readiness is developed during the first month of schooling, not before school entry. While schools typically do not require specific skills for school entry, there are certain competencies that make it easier for children to develop readiness. They include the child's ability for self-regulation, ability to use cultural tools to solve problems, and ability to undertake the specific position of a "student" (Bodrova & Leong, 2007).

Vygotsky's theory has been criticized for several reasons. Rogoff (2003) challenged the overemphasis on language as the most important cultural tool in the development of higher cognitive processes. Rogoff argued that in contrast to societies where verbal conversation is an essential communication tool, some cultures may have other, equally important tools, or in some communities, verbal language may not be used much as a cultural tool. Others (Davydov & Radzikovskii, 1985) criticized Vygotsky's theory for paying little attention to the effects of biological factors on a child's cognition and neglecting the biological line of human development. Another criticism was that the theory creates a threat to the child's independence because it focuses on assistance and guidance by a competent individual (Crain, 2000).

Despite the criticism, Vygotsky's sociocultural theory seems well formulated and fits well within contemporary research and practice to develop children's school readiness. In

contrast to the maturational viewpoint, which views development leading learning and recommends giving children "the gift of time" before learning, Vygotsky's perspective emphasizes that social interactions and scaffolding experiences lead children's development. According to Vygotsky's perspective, waiting for children to mature enough to demonstrate school success is counterproductive. Instead, parents and early childhood educators should provide children with appropriate social opportunities and scaffold early experiences needed to develop important competencies (Carlton & Winsler, 1999). The terms of scaffolding and ZPD determine *bidirectionality* of school readiness, which means that a child does not mature into readiness but develops the important skills and competencies through early experiences and assisted learning situations (Carlton & Winsler, 1999)

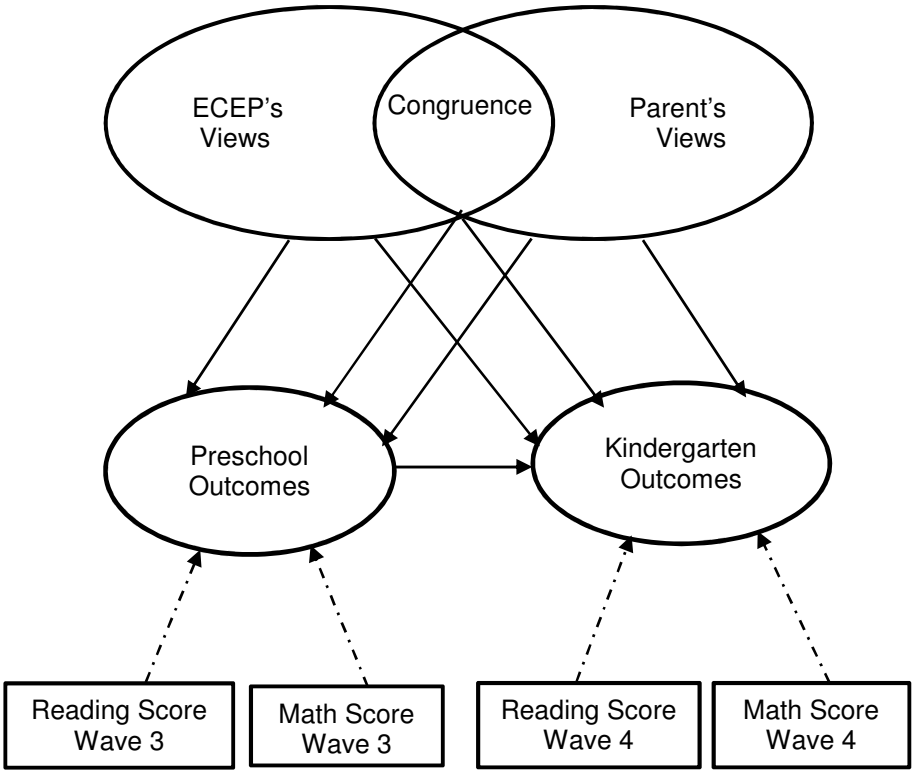
Theories of child development inform research and practice and provide frameworks for understanding the development and early learning of children from diverse cultural and socioeconomic backgrounds. Despite offering different and sometimes conflicting views on child development, all three theories discussed above continue to be used extensively by various child development and medical professionals. Many parents and health care providers still rely heavily on maturation concepts, and the bioecological theory exposing the complexity of interactions in human development remains a well known framework in social science research. Vygotsky's sociocultural theory complements Bronfenbrenner's by adding increased emphasis on social and cultural interactions; recently the concepts of scaffolding and ZPD have been gaining extensive popularity among early childhood educators and scholars.

Conceptual Framework of the Study

This study utilized the conceptual model presented in Figure 1. The conceptual model draws on Vygotsky's sociocultural theory that proposes that social interactions and assisted learning experiences with more knowledgeable persons have major impact on children's learning and development (Woolfolk, 1998). The model supports the hypothesis that parents' and early care and education providers' (ECEPs')[3] views, and, in particular, congruent views, may explain some variation in child outcomes. Although not shown on the conceptual model in order to maintain its simplicity, the model implies bi-directionality of relations between child outcomes and parents' and caregivers' views. The conceptual model further suggests that parents' and caregivers' perceptions may have a combined effect on child outcomes. Based on Vygotsky's theory, the model emphasizes the importance of culture in learning, and implies moderating effects of SES and race/ethnicity on the relationship between parents' and caregivers' views of school readiness and child outcomes. The model also includes control variables such as child demographics, maternal depression status, and caregivers' race/ethnicity and education. Although not shown on the model, moderating effects of child's race/ethnicity and SES are implied.

[3] Early care and education providers, referred to as ECEPs in the ECLS-B, provided regular care and/or education for the study child prior to kindergarten. ECEPs are different from the child's parent or guardian and may include preschool teachers, family daycare providers, babysitters, nannies, or relatives. For the sake of clarity, this paper will use the term *caregivers* when referring to ECEPs except for tables and figures where the term ECEP is preferred for brevity.

Figure 1. Conceptual Framework of the Congruence Model



Control variables:
- Child, parent and ECEP demographics (race, gender, age)
- SES, rural residence
- Child health status (low birth weight)
- Mother's depression
- ECEP's education

Moderator variables:
- Race/ethnicity
- SES

CHAPTER 4

RESEARCH METHODS

Research Questions

The aim of this study is to examine the relationships among parents' and caregivers' views about school readiness in association with children's early cognitive skills (language and literacy, and mathematics). The conceptual model offers the following hypotheses:

- *Hypothesis 1:* There is a relationship between parents' early views[4] of school readiness and child cognitive outcomes in preschool and kindergarten.
- *Hypothesis 2:* There is a relationship between caregivers' early views of school readiness and child cognitive outcomes in preschool and kindergarten.
- *Hypothesis 3:* Parents' views of school readiness are congruent with caregivers' views of school readiness.
- *Hypothesis 4:* The degree of congruence of parents' and caregivers' views of school readiness predicts child cognitive outcomes in preschool and kindergarten.
- *Hypothesis 5:* SES and race moderate the relationship between parents' and caregivers' views and child cognitive outcomes in preschool and kindergarten.

To better understand the role of parents and caregivers in children's cognitive development over time, the study seeks to answer the following questions raised by the conceptual model:

[4] Early views refer to school readiness views measured in preschool wave (Wave 3).

1) Is there a relationship between parents' early views of school readiness and child cognitive outcomes in preschool and kindergarten?
2) Is there a relationship between caregivers' views of school readiness and child cognitive outcomes in preschool and kindergarten?
3) To what degree are parents' views of school readiness congruent with caregivers' views of school readiness?
4) Does the degree of congruence of parents' and caregivers' views of school readiness predict child cognitive outcomes in preschool and kindergarten?
5) Do SES and race moderate the relationship between parents' and caregivers' views and child cognitive outcomes in preschool and kindergarten?

Study Design

To answer the research questions, this study used the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B) dataset. The ECLS-B is a large national study funded by the U.S. Department of Education's National Center for Education Statistics (NCES), and several other federal education and health policy agencies. It is a part of the Early Childhood Longitudinal Study (ECLS), which consists of two cohorts—the birth cohort (ECLS-B) and a kindergarten cohort (ECLS-K). The ECLS-B has a nationally representative sample of children born in the United States in 2001 and followed from birth through first grade. The ECLS-K collected data from a different sample of children from kindergarten through eighth grade. Together these studies provide policymakers, researchers, child care providers, teachers, and parents with valuable information about children's health, nutrition, early learning and development, and educational experiences.

The ECLS-B study focuses on child and family characteristics that influence early development and school readiness for children during the first 6 years of life. Five waves of data were collected from a nationally representative sample of approximately 10,700[5] children born between January and December 2001. The first wave data were collected on about 10,200 children when the children were approximately 9 months of age. The data collection took place between October 2001 and December 2002. The second wave of data collection was conducted with an estimated 9,200 children between January and December 2003 when the children were about 2 years of age. The third or preschool wave data collection took place during the academic year 2005-2006, and approximately 8,750 children were directly assessed. At that time children were approximately 48 months old and many attended preschool. Kindergarten data collection occurred in two consecutive waves—2006 and 2007— as children reached the kindergarten-eligible age in two different years. At the kindergarten 2006 wave the ECLS-B sample was reduced by 15% due to budget limitations. The 2006 data collection included all children in the selected subsample regardless of kindergarten entry; at that point approximately 75% of children were in kindergarten or higher. The final or kindergarten 2007 wave collected data from approximately 1,900 children who entered kindergarten in fall 2007. About 1,550 were first-time kindergartners and nearly 200 were repeating kindergarten. For more information about the sampling design please refer to Appendix A.

The ECLS-B study design utilized several unique elements to produce comprehensive data for researchers and early childhood professionals. The study oversampled specific population groups such as American Indian/Alaska Natives/Multiracial, Chinese Americans,

[5] Hereafter, the unweighted sample sizes have been rounded to the nearest 50 to avoid concerns of participant identification, as specified in the restricted license requirements issued by the Institute of Education Sciences (IES) of the U.S. Department of Education.

twins, and low birth weight (LBW) infants. Data on child development and early experiences was collected longitudinally from children, their parents, caregivers, child care center directors, and school teachers using direct assessments, interviews, observations, audiotaping sessions, video recordings, and computer-assisted interviews.

Sample

This dissertation study used a sample of children who participated in both the preschool and kindergarten 2006 wave cognitive assessments, and who had parent and caregiver interviews from the preschool wave. Data were available on 8,750 child cognitive assessments, 8,950 parent interviews, and 6,000 caregiver interviews in the preschool wave. Of these, overlapping data were available for 6,000 children. In the kindergarten 2006 wave, cognitive assessment scores were available for 6,900 children. Overlapping data on child direct cognitive assessments for the preschool and kindergarten 2006 waves, and parent and caregiver interviews for the preschool wave, were available for a sample of approximately 4,500 children.

Data Collection

During the preschool and kindergarten 2006 waves, data were collected through direct assessments of children's cognitive abilities, in-person home interviews with child's primary caregivers (mostly the child's mother), and telephone interviews with the caregiver with whom the child spent the most time on a weekly basis.

Child Direct Assessments

Children were assessed in two cognitive domains—early reading (language and literacy) and mathematics. The 30- to 45-minute assessments used a computer-assisted personal interview (CAPI) and were conducted one-on-one with each child. The ECLS-B battery required a two-stage assessment approach, in which the first stage in each domain

contained a routing test that determined a child's approximate skills. The child's performance on this routing test determined the difficulty level of the second-stage test. The assessment instruments in both early reading and mathematics assessment had three difficulty levels—easy, middle difficulty, or higher difficulty items.

It is important to note that children with certain physical limitations and those who did not speak English may have been excluded from cognitive assessment. Because of the auditory and visual stimuli required, for example, children who used Braille or sign language were not administered the cognitive component. Additionally, non-Hispanic children who did not speak English were not assessed because the cognitive battery was available only in English and Spanish. However, because too few children took the Spanish cognitive assessment, the Spanish child assessment score was not calculated (Najarian, Snow, Lennon, & Kinsey, 2010).

Parent Interviews

Data from parents/guardians were collected during home visits using a computer-assisted personal interviewing (CAPI) technique with interviewers recording responses on a laptop computer and a self-administered questionnaire when parents/guardians entered their own responses. The preschool and kindergarten 2006 wave parent interviews were practically identical and lasted approximately 80 minutes. The interview collected data about the child's early development, health status, child care arrangements, and learning experiences as well as the respondent's family structure, home environment, attitudes, child care use, and household income.

Typically, the parent interview respondent was a household member identified as most knowledgeable about the child's education and care. Although the child's mother was

preferred by the study design, a father, stepparent, foster parent, grandparent, relative, or a nonrelative guardian could be interviewed. According to the ECLS-B user's manual (Snow et al., 2009), the child's mother or female guardian was the respondent for the majority of cases: 96.0% for the preschool wave and 94.8% for the kindergarten 2006 wave.[6] Interviews were conducted primarily in English; however, instruments in Spanish, bilingual English-Spanish interviewers, and interpreters were available for respondents who spoke other languages.

Telephone Interviews

Data were collected from caregivers of children who regularly received regular nonparental care. In the ECLS-B, *regular nonparental care* was defined as care provided by someone other than the child's parent at least once each week (Snow et al., 2009). In cases when a study child had two or more individuals providing care, the primary provider was the person who provided the most care. A completed parent interview and parent permission to contact the caregiver were required to conduct the telephone interview. The caregiver interviews used computer-assisted interviewing (CAI) technique and lasted 24 and 30 minutes for home-based and center-based cases, respectively.

Measures

Child Assessment Measures

According to the National Education Goals Panel (1997), basic academic skills constitute an important dimension of school readiness. Therefore, a child's early reading and early mathematics direct assessment scores were used as indicators of school readiness. For the ECLS-B, the items for cognitive assessment were adapted from existing child-assessment instruments such as PreLas 2000 (Duncan & De Avila, 1998), the Peabody Picture

[6] Percentages are based on unweighted estimates.

Vocabulary Test—Third Edition (PPVT-III; Dunn & Dunn, 1997), the Preschool Comprehensive Test of Phonological and Print Processing (Pre-CTOPPP; Lonigan, Wagner, Torgesen, & Rashotte, 2002), and the Test of Early Mathematical Ability-3 (TEMA-3; Ginsburg & Baroody, 2003). Some items came from the Family and Child Experiences Survey (FACES) and ECLS-K, or were developed specifically for the ECLS-B (Najarian et al., 2010). These standardized batteries are based on key milestones of child development and early school skills and are frequently used as measures of child cognitive outcomes (Duncan et al., 2007; Magnuson, Meyers, Ruhm, & Waldfogel, 2004; U.S. Department of Education, Institute of Education Sciences [IES], 2008; Wright et al., 2001).

Measures of Parents' and Caregivers' Views of School Readiness

Currently there are no established tools for measuring adults' views of school readiness. The ECLS-B used a 15-item measure in parents' and caregivers' interviews. Further investigation revealed that the described measure was composed from *Developmental accomplishments and difficulties items* (19 items, 5 subscales) and *Teacher feedback items* (11 items, 4 subscales) used in the School Readiness Component of the 1993 National Household Education Survey (U.S. Department of Education, National Center for Education Statistics [NCES], 1999). In the ECLS-B surveys for parents and caregivers these items were used obtain parents' and caregivers' ratings of the skills and behaviors commonly considered as important for school readiness. Responses were based on a 5-point Likert scale and ranged from *Not important* (1) to *Essential* (5) for the caregivers' scale, and from *Essential* (1) to *Not important* (5) for the parents' scale. This dissertation study used the sum of the items in the Likert scale survey in each respective interview to assess parents' and caregivers' views about school readiness. Parents' responses were reverse coded to match the wording in the

caregivers' scale. The 15 items of the ECLS-B school readiness measure[7] are presented in Table 1. More discussion about scale validity and reliability is in the next section.

[7] Hereafter, the 15-item school readiness measure used in ECLS-B will be referred to as the School Readiness Instrument.

Table 1

School Readiness Instrument and Suggested Corresponding Domains of School Readiness

Items*	Domain of school readiness[8]
a. Finishes task	a. Approaches Toward Learning
b. Can count to 20 or more	b. Cognition and General Knowledge/Language Development
c. Takes turns and shares	c. Social and Emotional Development/Approaches Toward Learning
d. Has good problem-solving skills	d. Approaches Toward Learning
e. Is able to use pencils and paintbrushes	e. Physical Well-Being and Motor Development
f. Is not disruptive of the class	f. Social and Emotional Development/Approaches to Learning
g. Knows English language	g. Language Development/Cognition and General Knowledge
h. Is sensitive to other children's feelings	h. Social and Emotional Development
i. Sits still and pays attention	i. Approaches to Learning/Social and Emotional Development
j. Knows most of the letters of the alphabet	j. Language Development/Cognition and General Knowledge
k. Can follow directions	k. Language Development/Cognition and General Knowledge
l. Identifies primary colors and shapes	l. Cognition and General Knowledge/Language Development
m. Communicates needs, wants, and thoughts verbally in primary language	m. Language Development/Cognition and General Development
n. Writes own name	n. Language Development/Motor Development
o. Reads or pretends to read storybooks	o. Language Development/Approaches Toward Learning

*Items derived from Parent Interview (items PA095a-o) and Caregivers' Questionnaire (items CB040a-o).

[8] Domains of school readiness as defined by the National Education Goals Panel (1997).

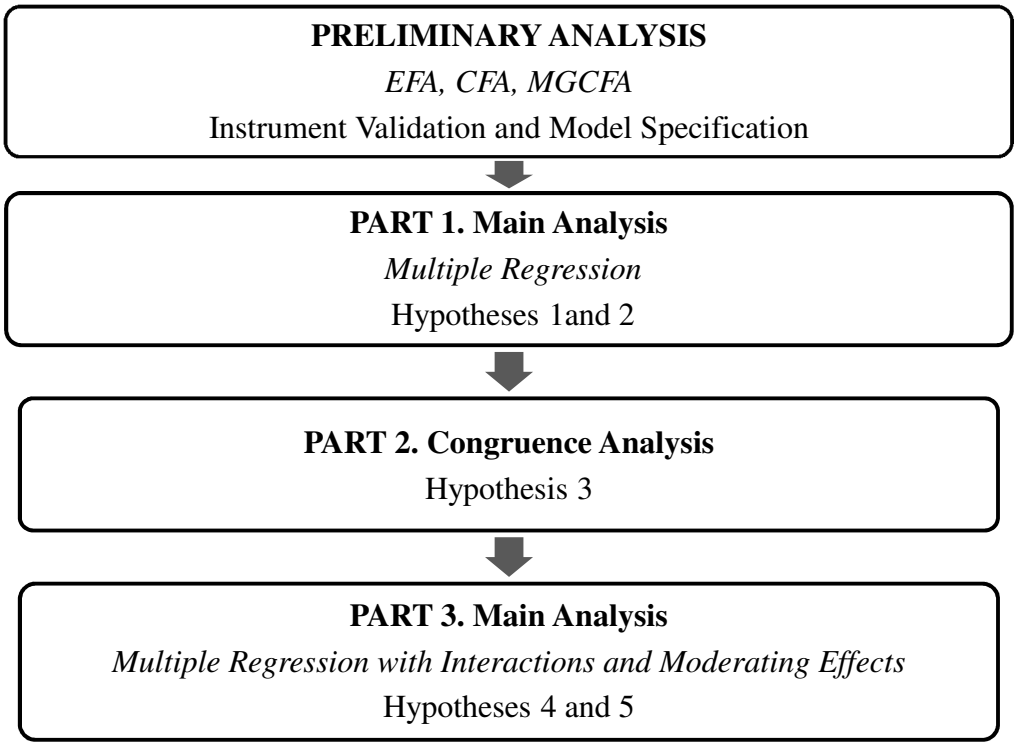
Data Analysis

Data analyses were conducted in several steps, and two of them served as important prerequisites to performing the main analysis. Schematic depiction of the data analysis plan is presented in Figure 2. The preliminary analysis involved examination and validation of the measure of parents' and caregivers' views on school readiness. The sample was randomly split into two equal subsamples for cross-validation. Exploratory factor analysis (EFA) was performed on the first subsample to explore the underlying structure of latent constructs, separately for parents' and caregivers' data. EFA served as an empirical test of the multidimensionality of the construct of school readiness, and further refined the instrument by determining and retaining the influential factors. Next, confirmatory factor analysis (CFA) was performed on the second subsample both for parents' and caregivers' data. CFA examined the EFA findings and developed the best fitting models by applying fit indices. Finally, multiple group confirmatory factor analysis (MGCFA) was conducted to examine measurement invariance and test the equivalence of items and factorial structure of the instrument across two subsamples.

In the main part of analysis, multivariate regression analyses were performed to explore the relationship of parents' and caregivers' views and other predictors to children's cognitive outcomes. In the next step, the congruence of parents' and caregivers' views on school readiness was assessed using multiple statistical techniques ranging from the simplest (calculating absolute difference scores between paired parent and caregiver responses) to the more sophisticated (estimating agreement indices). Then, interactions between congruence of parents' and caregivers' views of school readiness and their relationship with children's cognitive outcomes under the moderating effects of race and SES were investigated. SPSS

20.0, Amos Graphics, and STATA 12.0 versions of statistical software were used in the analyses. More detailed description for each analytic step is provided below.

Figure 2. Data Analysis Plan



Preliminary Analysis: Instrument Validation and Model Specification

As mentioned earlier, a 15-item School Readiness Instrument used by ECLS-B was adapted from the 1993 National Household Education Surveys Program questionnaires. However, the instrument had no known psychometric properties. Based on the review of literature and exploration of suggested domains of school readiness (NEGP, 1997) a priori hypothesis was that the measure consisted of multiple underlying latent factors including *Academic Skills* and *Social and Behavioral Competence* or *Social Skills*.

Several forms of factor analyses were suggested in order to examine validity and reliability of the School Readiness Instrument, to determine the best structure that accounted for the variation in data, and to confirm the factorial structure and test the equivalence of factor structures across different groups. These analyses included exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) for Parents Views (*Study 1*), EFA and CFA for Caregivers' Views (*Study 2*), and multiple group confirmatory factor analysis (MGCFA, *Study 3*). In Studies 1 and 2, EFA was conducted on the randomly drawn split half of the sample using principal axis factoring with oblique rotation in SPSS 20.0. Determining the right number of factors to retain is one of the most important decisions in EFA. The dangers of under and overextraction of factors have been widely discussed in the research literature (Brown, 2009; Hayton, Allen, & Scarpello, 2004; Ledesma & Valero-Mora, 2007; Zwick & Velicer, 1986). Therefore, two factor extraction methods—the Scree test (Cattell, 1966) and Kaiser Criterion or the *K1* method (Kaiser, 1960)—were conducted and supplemented with parallel analysis (Horn, 1965). Next, factors and items were reviewed for conventional cutoff levels. A minimum communality of .30 for each retained item, a minimum loading of .40 on a single factor, and crossloadings less than .32 on two or more factors were used. Additionally, each identifiable factor was required to contain a minimum of three items (Anderson & Rubin, 1956), and the items loading on the same factor had to be theoretically related. Final decisions were based on the careful review of all the findings.

In Study 2, CFA was performed on the second subsample to examine the factor structure suggested by the findings from EFA. Multiple indices of fit were assessed to evaluate and improve the fit of the model. After identifying the best model, MGCFA were

performed for Study 3 to examine measurement invariance in subsamples A and B grouped by the variables *Parent Views* and *ECEP Views*.

Measurement invariance, sometimes referred as *equivalence invariance*, contributes to psychometric validation of an instrument by testing the equivalence of items and factorial structure of the instrument across different groups (Cheung & Rensvold, 2002; Liu, 2011). Equivalence testing starts with the determination of a well-fitting baseline model (*configural model*). Then this model is compared with increasingly restrictive nested models created by imposing cumulative parameter constraints (Byrne, 2008). To establish equivalence, the *measurement model* (equal factor loadings only), the *structural model* (equal latent variable variances and covariances added) and the *residual model* (equal error variances and covariances added) were examined and compared against the configural model. This sequence that proceeds from the least to the most restrictive model, with the residual model being the most restrictive, was proposed by Steenkamp & Baumgartner (1998). Invariance testing is commonly based on examining the changes in the goodness-of-fit indices, such as χ^2, RMSEA, GFI and TLI. More recently, Cheung and Rensvold (2002) suggested CFI as a more practical indicator of establishing the equivalence of models and proposed using ΔCFI values not exceeding .01. Therefore, these fit indices were reviewed in the invariance analyses.

Parts 1 and 3: Main effects and interactions models, and moderating effects of race/ethnicity and SES. Multiple regression was used to explore the effects of child-, parent-, and caregiver-associated predictors on children's cognitive outcomes at different assessment periods. The general form for the multiple regression equation is:

$$\boldsymbol{Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \cdots \beta_n X_n},$$

where Y is the value of the dependent variable, α is the constant or intercept, $\beta_n$is the slope or Beta coefficient for X_n, and X is a predictor variable. To address the research questions posed in this study, separate multiple regression models for each child outcome in preschool (Wave 3) and kindergarten (Wave 4) were investigated as follows.

To test Hypotheses 1 about the association between parents' views of school readiness and children's outcomes, four different full models were considered for each outcome variable—reading score at Wave 3 (READ W3), math score at Wave 3 (MATH W3), reading score at Wave 4 (READ W4), and math score at Wave 4 (MATH W4). The model is:

$$\boldsymbol{Y_1 = \alpha + \beta_1(MALE) + \beta_2(LBW) + \beta_3(AA) + \beta_4(HISPANIC) + \beta_5(ASIAN) + \beta_6(OTHER)} \\ \boldsymbol{+ \beta_7(SES) + \beta_8(RURAL) + \beta_9(AGE) + \beta_{10}(MATDEP) + \beta_{11}(PARVIEW)}$$

The predictors were parent's views (PARVIEW), child's gender (MALE), birth weight status (LWB), child's race/ethnicity—Black/African American (AA), Hispanic (HISPANIC), Asian (ASIAN) and Alaska Native/American Indian/Multiracial (OTHER), child's socioeconomic status (SES), rural residence (RURAL), age in months at the time of assessment (AGE), and reported maternal depression (MATDEP) at Wave 3. For Hypothesis 2 examining the effects of caregivers' views, the following predictors were added to the regression model: caregiver's views (ECEPVIEW), caregiver's race/ethnicity—White (ECEPWHT) and Black/African American (ECEPAA), caregiver has high school diploma or up to associate's degree (ECEPHSD), and caregiver has bachelor's degree or higher (ECEPBA).

To assess Hypothesis 4 and examine whether varying degrees of congruence between parents' and caregivers' views predicted children's outcomes in early reading and math in

preschool and kindergarten, the continuous agreement indices (congruence indices) were entered into the existing models. To address Hypothesis 5 and determine whether children's race/ethnicity and SES affected the relationship between parents and caregivers' school readiness views of varying degrees of congruence and children's cognitive outcomes in preschool and kindergarten, two-way interaction terms were added.

Part 2: Congruence analyses. Methods for assessing congruence between parents' and caregivers' views were identified based on extensive literature review. In general, the studies examining congruence at the group level suggested using a median split of the sum of individual measures to sort into high and low congruence groups (Charlesworth, Hart, Burts & Hernandez, 1991; Donohue, 2006; Houle et al., 2011). Very few educational studies have focused on assessing individual characteristics and their convergence as a group characteristic. Most congruence studies were conducted in the fields of medical and organizational research (LeBreton, James, & Lindell, 2005). In particular, the latter had numerous studies focused on evaluating congruence among different raters. Although congruence in the organizational research literature is frequently defined as *interrater agreement*, the definition of interrater agreement as the absolute consensus in scores among different raters confirms the equivalence of two terms (Cohen, Doveh, & Eick, 2001; James, Demaree, & Wolf, 1993; LeBreton & Senter, 2008). For example, the current study examining the congruence of views between parents and caregivers based on their responses to the School Readiness Instrument, can also be defined as a study assessing the similarity or agreement among raters grouped into pairs.

It is important to note that until recently, researchers used the term interrater agreement interchangeably with *interrater reliability* (Goodwin, 2001), often mistaking one

for another (James, Demaree, & Wolf, 1984). Interrater agreement (IRA) refers to the absolute consensus in scores among different raters (Cohen, 2007; James et al., 1993; LeBreton & Senter, 2008), whereas interrater reliability (IRR) refers to relative consistency in scores among different raters. In other words, IRA means equivalence of scores and is assessed by measures of variability, and IRR means equivalence of relative ranking and is assessed by correlations (Cohen, 2007; LeBreton & Senter, 2008). As interrater agreement is an evolving area of research, several different methods for estimating the agreement have been developed in the last few decades (James et al., 1984).The current study used multiple methods for raters' within-group agreement to assess the congruence between parents' and caregivers' views. Each of these methods is described below.

Absolute congruence index and absolute discrepancy score. Absolute discrepancy between raters is calculated as the absolute difference between their ratings. When the absolute discrepancy score is 0, the raters are absolutely congruent. The disadvantage of this method is that it lacks established cutoff levels for acceptable congruence of Likert-type scales with multiple items.

Percent-agreement estimates. One of the popular methods for measuring interrater agreement is percent-agreement estimates, which are calculated by adding the percentage of cases that were rated similarly by different raters. Percent agreement estimates for ordinal Likert-type scales may be weighted to reflect the varying value of responses. Despite the ease of calculation, the major disadvantage of that method is that it may get artificially inflated (Watkins & Pacheco, 2001). Percentage agreement estimates are criticized for not taking into account the agreement expected by chance. Therefore, it is advised to use the expected percentage of agreement for comparison.

Kappa statistic. Another method for estimating agreement between two raters is Cohen's kappa statistic (Cohen, 1960, 1968). In contrast to percent-agreement estimates, kappa takes into account the amount of agreement that is expected by change alone. Kappa is recommended for interval variables, and weighted kappa is recommended for ordinal Likert-type scales (Norman, 2010). The formula for the linearly weighted Kappa is:

$$K_w = 1 - \frac{\sum w_{ij} p_{ij}}{\sum w_{ij}\ p_{e,ij}}$$

where $w_{i,j}$ is the weight for cell *i,j*, $p_{i,j}$ is the proportion in cell *i,j* and $pe_{,i,j}$ is the expected proportion in cell *i,j* . One disadvantage of kappa is its difficulty to interpret. Kappa may vary depending on the proportion of respondents in each category on a ratings scale (Uebersax, 1987) and, therefore, kappa values for different items or from different studies cannot be meaningfully compared unless they have equal base rate. Consequently, kappa gives some indication comparing the agreement against that expected by chance alone, but often it is difficult to interpret the coefficient across different situations. According to Landis and Koch (1977), kappa values of 0.60 and above are considered substantial (see Table 2).

Agreement indices (r_{WG}). More recently, the need for multilevel data analysis to aggregate data from lower levels (the individuals) and make inferences about higher levels (groups) has resulted in more sophisticated procedures for examining the equivalence of lower-level data to justify data aggregation (Cohen et al., 2001; LeBreton & Senter, 2008). The most popular estimates of IRA are single-item r_{WG} and multi-item or scale $r_{WG(J)}$ proposed by James et al. (1984, 1993), well suited for use with ordinal data in Likert-type responses. The r_{WG} indices are based on the assumption that for each case there exists a single true score on the construct being rated, and, therefore, any variation in ratings is

considered to be error variance (LeBreton & Senter, 2008). The formula for estimating the r_{WG} agreement index for a single item rated by several raters is:

$$r_{WG} = 1 - \frac{S_x^2}{\sigma_e^2} \ ,$$

where S_x^2 is the observed variance on the variable *X* estimated by *K* number of raters, and σ_e^2 is the expected variance when there is a complete disagreement among raters. For multiple items, the formula for estimating $r_{WG(J)}$ is:

$$r_{WG(J)} = \frac{J\left(1 - \frac{\bar{S}_{x_j}^2}{\sigma_e^2}\right)}{J\left(1 - \frac{\bar{S}_{x_j}^2}{\sigma_e^2}\right) + \left(\frac{\bar{S}_{x_j}^2}{\sigma_e^2}\right)} \ ,$$

where $\bar{S}_{x_j}^2$ is the mean of the observed variances for J number of essentially parallel items, and σ_e^2 is the expected variance for a complete disagreement among raters. The formulas assume random rating by raters, and can be estimated for uniform and skewed null response distributions with different expected error variances σ_e^2. Theoretically, the agreement indices may range from 0 to 1. When the index is equal to 1, the raters are in perfect agreement with each other, and the observed variance is, therefore, 0. When the raters are in total disagreement, the observed variance is close to the error variance, and the index equals 0.0.

As a general rule, values of r_{WG} indices greater than .70 are considered an indicator of an acceptable level of interrater agreement. Sometimes the r_{WG} or $r_{WG(J)}$ statistics may go beyond the suggested range of 0 to 1, and have values less than 0 or greater than 1. In those cases, some researchers (James et al., 1984) proposed resetting the out-of-range values to 0 as they indicate a complete lack of agreement. Others (Lindell & Brandt, 1999; Lindell, Brandt, & Whitney, 1999) recommended calculating alternative indices of agreement,

namely, r^*_{WG} and $r^*_{WG(J)}$ statistics. The r^*_{WG} estimate for a single item is calculated using the same formula as r_{WG} , and the $r^*_{WG(J)}$ estimate for multiple items is estimated by the formula below:

$$r^*_{WG(J)} = 1 - \frac{\bar{S}^2_{x_j}}{\sigma^2_e}$$

There are several major disadvantages for using the r_{WG} and $r_{WG(J)}$ statistics, as they must be computed separately for each item and for each pair of raters. As LeBreton and Senter (2008) noted, the individual r_{WG} values may be informative but impractical. Consequently, instead of a single summarizing number, frequently it is more advisable to report descriptive statistics explaining the distributions of the r_{WG} and $r_{WG(J)}$ indices (Cohen et al., 2001; LeBreton & Senter, 2008).

Average deviation indices (AD). Agreement among raters may also be estimated using average deviation index. This index, proposed by Burke, Finkelstein, and Dusig (1999) estimates agreement in the metric (units) of the original scale of the item. Both the mean (AD_M) or the median (AD_{Md}) can be used for calculating the AD index. For a single item the formula is:

$$AD_{M(j)} = \frac{\sum_{k=1}^{K} \left| X_{jk} - \bar{X}_j \right|}{K},$$

where k =1 to K raters, X_{jk} is the kth rater's rating on the jth item, and $\bar{X}_j$ is the item mean among raters. For multiple items J the AD index formula is:

$$AD_{M(J)} = \frac{\sum_{j=1}^{J} AD_{M(j)}}{J},$$

Burke and colleagues (1999) suggested using the AD indices in combination with r_{WG} indices based on the uniform null distribution to assess interrater agreement. The

standards for interpreting an AD index and other interrater agreement statistics are presented in Table 2.

Table 2

Suggested Standards for Interpreting Interrater Agreement Statistics

Kappa		r_{WG}		*AD*	
Value	Interpretation	Value	Interpretation	Value	Interpretation
Below 0	No agreement	.00 - .30	Lack of agreement	≤.82	Agreement
.01 - .20	Slight agreement	.31 - .50	Weak agreement	.82<	No agreement
.21 - .40	Fair agreement	.51 - .70	Moderate agreement		
.41 - .60	Moderate agreement	.71 - .90	Strong agreement		
.61 - .80	Substantial agreement	.91 - 1.00	Very strong agreement		
.81 - .99	Almost perfect agreement				

CHAPTER 4

RESULTS

Preliminary Analysis

The initial sample had 4,700 cases, rounded to the nearest 50 due to federal regulations for restricted data. After applying listwise deletion to handle incomplete data in parent or caregiver surveys (Allison, 2001; Bell, Kromrey, Ferron, 2009), the sample size was approximately 4,500. About 49% were girls, and 10% of participants had a very low weight at birth. Children were tested at ages 3 and 4. About 51% of households had an annual income less than $50,000 at the time the child was age 3, and 48% were still earning less than $50,000 the following year. At age 3 parent interview, about 7% of mothers reported being depressed; however, over 70% of respondents did not answer the question.

Given the size of the sample, the split-half sample method was used for cross-validation purposes. This strategy, recommended for large samples, allows exploratory analysis on half of the sample to determine an initial model and confirmatory testing of the hypothesis on the other half of the sample (Cliff, 1983). To implement a two-stage analysis for establishing factorial validity (EFA followed by CFA), the study sample (N=4,500) was randomly divided into two approximately equal subsamples, using the SPSS 20.0 random sample selection procedure. Rounded to the nearest 50, the subsample A consisted of 2,250 participants (50.1%) and the subsample B consisted of nearly 2,250 participants (49.9%). Table 3 presents demographic characteristics of the subsamples.

Table 3

Demographic Characteristics of Final Sample (n = 4,500)[a]

Characteristic	Subsample A (*n* = 2,250)		Subsample B (*n* = 2,250)		Total (*N* = 4,500)	
	n	%	*n*	%	*N*	%
Girls	1,100	48.3	1,100	49.6	2,200	48.9
White	1,000	44.2	950	42.9	1,950	43.6
Black/African American	350	16.0	350	15.2	700	15.6
Hispanic	400	18.0	400	17.7	800	17.7
Asian/Hawaiian Native/ Pacific Islander	200	9.7	250	10.9	450	10.3
Other (Alaska Native/ American Indian/Multiracial)	300	12.1	300	13.3	550	12.7
Mean age at the time of testing at age 3 (in months)	52.77	-	52.87	-	52.82	-
Mean age at the time of testing at age 4 (in months)	65.21	-	65.20	-	65.20	-
Very low weight at birth	250	10.6	200	9.9	450	10.3
Rural residence at age 3	350	15.3	400	17.9	750	16.6
Rural residence at age 4	350	15.2	400	17.8	750	16.5
Maternal depression at age 3						
Yes	150	7.1	150	6.2	300	6.7
No	500	21.6	500	21.9	1,000	21.7
NA	1,600	71.3	1,600	71.9	3,200	71.6
Household income at age 3						
Under $25,000	600	25.8	650	28.1	1,200	26.9
$25,001 to $50,000	550	25.1	500	23.0	1,100	24.0
$50,001 or more	1,100	49.1	1,100	48.9	2,200	49.0
Household income at age 4						
Under $25,000	500	22.9	550	24.7	1,100	23.8
$25,001 to $50,000	550	24.4	550	24.0	1,100	24.2
$50,001 or more	1,200	52.7	1,150	51.3	2,350	52.0

Note: [a]As required by the Institute of Educational Studies (IES), the numbers in the unweighted sample are rounded to the nearest 50.

Study 1

Study 1a: Exploratory Factor Analysis of Parents' Views (P3).

Subsample A (*n* = 2,250). The initial EFA aimed to determine the underlying factors measured by the School Readiness Instrument (Tabachnick & Fidell, 2007). A principal axis factoring (PAF) analysis with oblique (promax) rotation was performed on the 15 items constructing the School Readiness Instrument. The analysis demonstrated the appropriateness of the factor analysis and the absence of multicollinearity (Kaiser-Meyer-Olkin measure of sampling adequacy = .938; Bartlett's Test of Sphericity—$\chi^2(105) = 13{,}717.794$, $p < .001$; determinant = .002).

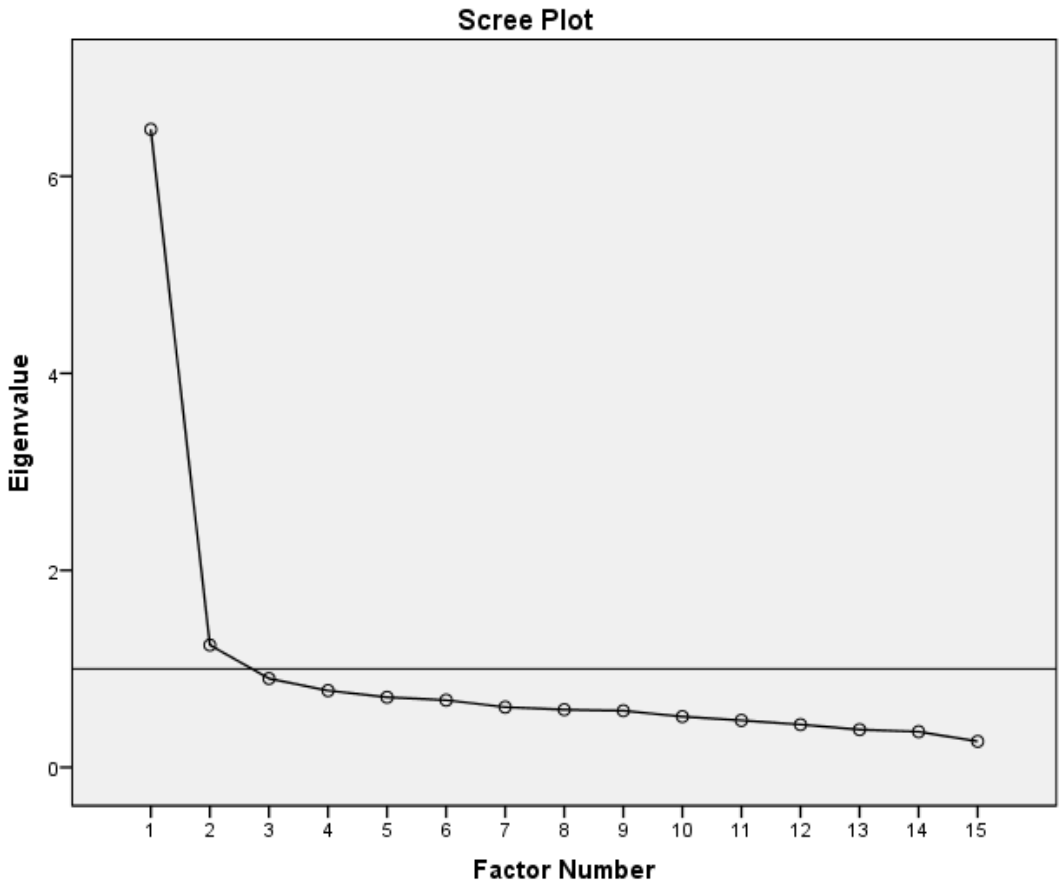
The initial PAF analysis produced two factors with eigenvalues greater than 1 (Kaiser Criterion), which accounted for 51% of the total variance. The eigenvalues for these two factors were 6.48 and 1.24, accounting for 43% and 8% of the variance, respectively (see Table 4). A visual inspection of the scree plot in Figure 3 also indicated two distinctive factors. An examination of items across these two factors indicated that the underlying dimensions corresponded to the academic and social competence dimensions identified in previous research on school readiness (Barbarin et al., 2008). Next, we reviewed the items for low communality indices, low factor loadings, and crossloadings. The results are displayed in Table 5. The items P3FINTSK (.285) and P3KNWENG (.275) did not reach the minimum communality level of .30. These items, P3FINTSK (.343) and P3KNWENG (.391), also failed to satisfy the criteria of .40 on factor loadings. The item P3PRBSLV had low crossloadings on both factors—.321 and .307.

Table 4

Initial PAF with Promax Rotation: Total Variance Explained (n = 2,250)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.476	43.171	43.171	5.949	39.662	39.662
2	1.241	8.273	51.443	.738	4.921	44.583
3	.902	6.014	57.458			
4	.779	5.195	62.652			
5	.712	4.746	67.398			
6	.682	4.548	71.946			
7	.612	4.077	76.023			
8	.586	3.906	79.930			
9	.575	3.831	83.761			
10	.515	3.433	87.194			
11	.477	3.179	90.373			
12	.435	2.897	93.270			
13	.383	2.556	95.826			
14	.362	2.416	98.242			
15	.264	1.758	100.000			

Figure 3. Study 1: Scree Plot of Factors in the Measure of Parents' Views



The parallel analysis using O'Connor's SPSS program (2000) was performed. This method is based on the comparison of the observed eigenvalues to the mean and 95th percentile eigenvalues derived from randomly generated data. The PAF parallel analysis with 1,000 random normally distributed datasets suggested six factors explaining 71.95% of the variance (see Table 5). This multi-factor structure aligns with prior knowledge that the current School Readiness Instrument was composed from two different measures with 9 subscales (NCES, 1999). Further examination revealed that 9 items out of 15 loaded on two dimensions: Factor 1 (5 items) and Factor 2 (4 items). The remaining 6 items—P3FINTSK, P3TKTURN, P3PRBSLV, P3READS, P3VERBAL, and P3KNWENG—loaded on four different factors: Factor 3 (2 items), Factor 4 (2 items), Factor 5 (1 item), and Factor 6 (1

item). These four factors failed to satisfy the criteria for a minimum of three substantial loadings per factor (Zwick & Velicer, 1986).

Table 5

Parallel Analysis: Raw Data Eigenvalues, and Mean and Percentile Random Data Eigenvalues in PAF/Common Factor Analysis (Ncases = 2,250, Ndatasets = 1,000)

Root	Raw Data	Mean	95th percentile
1	5.918304	.147244	.175664
2	.688301	.116360	.138591
3	.263312	.093018	.110535
4	.161948	.073107	.089204
5	.078440	.054306	.069420
6	.071112	.037189	.051464
7	.007853	.020367	.033816
8	-.030708	.003356	.016196
9	-.068939	-.012672	-.000663
10	-.076546	-.028532	-.014891
11	-.109497	-.044970	-.031904
12	-.132327	-.061822	-.047705
13	-.154087	-.079643	-.065129
14	-.162378	-.099888	-.083294
15	-.186134	-.124028	-.104113

Based on the results of three factor extraction methods, the earlier-described criteria for factor retention, and previous research findings, two factors were retained for further

analysis. These factors were operationally named *Academic Skills* (Factor 1) and *Social Skills* (Factor 2). The theoretical arguments that school readiness is a multidimensional construct that includes these factors derives from past research evidence (Barbarin et al., 2008; NCES, 1999). Further, given the failure to fit in both in the two-factor and six-factor models, we made a decision to delete 3 items—P3FINTSK, P3PRBSLV, and P3KNWENG. For now, we retained the items P3TKTURN, P3READS, and P3VERBAL, taking into consideration the significant factor loadings and visual consistency with retained factors. For example, at face value, the item P3READS (*Child reads or pretends to read storybooks*) appears related with other items composing the factor Academic Skills, and P3TKTURN (*Child takes turns and shares*) and P3VERBAL (*Child communicates needs, wants, and thoughts verbally in primary language*) appear related to Social Skills.

The revised pool of 12 items was subjected to a final PAF with promax rotation and two factors extracted. The results suggested that the factor analysis was appropriate (Kaiser-Meyer-Olkin measure of sampling adequacy = .925, Bartlett's Test of Sphericity—$\chi 2(66) = 11{,}336.337$, $p < .001$, determinant = .006). The 12 selected items loaded on their expected factors between .439 and .886, and all items had acceptable communalities except for the item P3SENTIVE that had a communality index of .292. The eigenvalues of two extracted factors were 5.57 and 1.22 respectively, accounting for 46% and 10% of the variance, for a total of about 57% after rounding. In the final two-factor model, correlation between two factors was .695. Cronbach's alpha for 6 items in Factor 1 (*Academic Skills*) was .870, and .807 for 6 items composing Factor 2 (*Social Skills*). The Spearman-Brown coefficient, *r,* was .785, and the Guttman split-coefficient was .752.

Table 6

Study 1: Split-Half Sample PAF Analysis with Promax Rotation: Communalities, and Matrix Characteristics for Parents' Views

Items	Initial model (n = 2,250)			Final model (n =2,250)		
	h^2	F_1	F_2	h^2	F_1	F_2
1. P3ALPHA – Knows the alphabet	.710	**.886**	-.063	.637	**.886**	-.055
2. P3WRTNAM– Writes own name	.581	**.800**	-.055	.519	**.791**	-.041
3. P3COLORS – Identifies colors and shapes	.619	**.747**	.055	.586	**.754**	.062
4. P3COUNT – Counts to 20 or more	.459	**.673**	.007	.433	**.672**	-.006
5. P3READS – Reads or pretends to	.457	**.644**	.044	.424	**.634**	.044
6. P3PENCIL – Uses pencil and paintbrush	.422	**.473**	.222	.384	**.478**	.213
7. P3PRBSLV – Good problem solving	.338	**.321**	.307	-	-	-
8. P3DISRUP–Not disruptive of the class	.501	-.144	**.802**	.393	-.135	**.806**
9. P3SITSTL – Sits still, pays attention	.501	.070	**.656**	.443	.074	**.665**
10. P3TKTURN – Takes turns and shares	.366	-.024	**.622**	.308	.005	**.585**
11. P3SENTIVE – Sensitive to others	.345	.014	**.578**	.292	.037	**.548**
12. P3DIRECT – Follows directions	.508	.252	**.511**	.482	.259	**.515**
13. P3VERBAL – Communicates verbally	.331	.158	**.452**	.324	.175	**.439**
14. P3KNWENG – Knows English	.279	.174	**.391**	-	-	-
15. P3FINTSK – Finishes tasks	.270	.217	**.343**	-	-	-

Study 1b: Confirmatory Factor Analysis of Parents' Views (P3).

Subsample A (*n* = 2,250). CFA was performed on the initial one-factor model and the hypothesized two-factor model of the School Readiness Instrument as derived through exploratory factor analysis. CFA is used to test whether the hypothesized model fits the data and to further improve the model fit by comparing multiple models. The statistical software AMOS 20.0 (IBM SPSS, 2011) was used to evaluate how well the hypothesized two-factor structure fit the selected items and compare it with the baseline one-factor structure. The subsample B was used to perform CFA with Maximum Likelihood Estimation. The chi-square statistic is significantly influenced by large sample sizes and, thus, cannot serve as a reliable indicator of model fit (Byrne, 2001; Hooper, Coughlan, & Mullen, 2008). Therefore, a number of incremental fit indices, including the comparative fit index (CFI), the normed fit index (NFI), the Tucker-Lewis index (TLI), the goodness-of-fit index (GFI), the root mean square error of approximation (RMSEA), and the consistent Akaike's Information Criterion (CAIC) were consulted. For a well-fitting model, values of the NFI, CFI, TLI and GFI are advised to be close to .95 (Bentler, 1990; Hu & Bentler, 1999). RMSEA values less than .05 are indicative of good fit and values falling between .06 and .08 suggest moderate fit (Browne & Cudeck, 1993). Finally, the CAIC is a version of the AIC that takes into account sample size (Bandalos, 1993). CAIC is used for comparison of different models, and smaller CAIC values indicate a better fit for the model (Byrne, 2001).

Evaluation of Model Fit

Baseline one-factor model. CFA of the one-factor full model with 15 items suggested that the default model was of poor fit for the data: $\chi^2(df = 90) = 2244.082$, $p<.0001$, $\chi/df = 24.934$, CFI = .843; NFI = .838; TLI = .817; GFI = .846; RMSEA = .103;

90% confidence interval (CI) = [.100; .107]. The standardized residual covariances included multiple values exceeding 2.58, which indicated model misfit. The largest residual of 8.391 was between items P3DISRUP and P3SITSTL. An examination of modification indices further supported model misfit. Multiple large error covariances between items could not be justified (some modification indices ranged from 80.519 to 105.840) and suggested further respecification of the model.

Respecified one-factor model. We adjusted the one-factor model by deleting 3 items to develop a better-fitting model. Three items—P3FINTSK, P3KNWENG and P3PRBSLV—were deleted based on the suggestions of EFA. Although χ^2 slightly decreased, overall results did not improve the fit indices as expected: $\chi^2(df=54) = 1804.986$, p<.0001, $\chi/df = 33.426$, CFI = .843; NFI = .839; TLI = .808; GFI = .845; RMSEA increased to .120, with the 90% CI = [.115; .125]. Modification indices also confirmed poor fit of the model. Next, we pursued a two-factor model as suggested by EFA.

Two-factor model. The two-factor full model with 15 items provided a better fit to the data: $\chi^2(df=89) = 1210.571$, p<.0001, $\chi/df = 13.602$, CFI = .918; NFI = .912; TLI = .903; GFI = .928; RMSEA = .075, 90% CI = [0.66; 0.76]. The results indicate significant improvement over the default one-factor model, although CFI, NFI, TLI and GFI indices did not reach the cutoff point of .95. The examination of standardized residual covariances and modification indices suggested the possibility of further model improvement.

Respecified two-factor model 1. As suggested by EFA, *w*e adjusted the model by deleting 3 items--P3FINTSK, P3KNWENG and P3PRBSLV. Results show improved fit indices: $\chi^2(df=53) = 651.187$, p<.0001, $\chi/df = 12.287$, CFI = .946; NFI = .942; TLI = .933; GFI = .952; RMSEA = .071, 90% CI = [.066; .076], CAIC = 869.099. However, examination

of the standardized residuals matrix, and modification indices and their expected parameter changes suggest that further model respecification is possible and needed.

Respecified two-factor model 2. The item P3VERBAL that had the largest residual value of 5.950 was deleted as values exceeding 2.58 are considered to be large (Joreskog & Sorbom, 1988). To improve the model fit, the covariances looking for crossloading items with modification index value exceeding 15 units were examined. Large values of modification indices for the regression path predicting P3DISRUP (*MI* = 50.101 with a parameter change of -.042) and P3DIRECT (*MI* = 50.432, par change = .097) from the Academic Skills factor, and P3PENCIL (*MI* = 34.235, par change = .032) from Social Skills were noted. After adjustments, the respecified model had the following indices: $\chi^2(df=40)$ = 347.550, $p<.0001$, χ/df = 8.689, CFI = .970; NFI = .966; TLI = .958; GFI = .972; RMSEA = .059, 90% CI = [.053; .064], CAIC = 574.178.

Final two-factor model 3. Next, the modification indices for errors within each factor were reviewed. A high value of the modification index (*MI*) suggests that the fit of the model may be improved by including correlation arrows. In the pursuit of a best fitting model, criteria for considering modification indices over 15 with expected parameter changes over .025 were established. Upon consideration of item content for items with large error covariances, three error terms—P3WRTNAM and P3READS (*MI* = 60.203; par change = .063), P3PENCIL and P3ALPHA (*MI* = 20.947, par change = -.032), and P3READS and P3ALPHA(*MI* = 17.776, par change = -.029) were correlated. In each case the modification index value exceeded 15 units, and substantive theoretical justification and face validity were present (MacCallum, 1995). Allowing the error terms to covary significantly improved the model fit $\chi^2(df=20)$ =70.119, p<.0001, χ/df = 3.506, CFI = .994; NFI = .992; TLI = .989; GFI

= .993; RMSEA = .033; 90% CI = [.025; .042], CAIC = 288.031). Additional model adjustments were not pursued. The final two-factor model 3, which is proposed as the best-fitting model and presented in Figure 4, consists of 2 factors and 9 items: Social Skills (3 items) and Academic Skills (6 items).

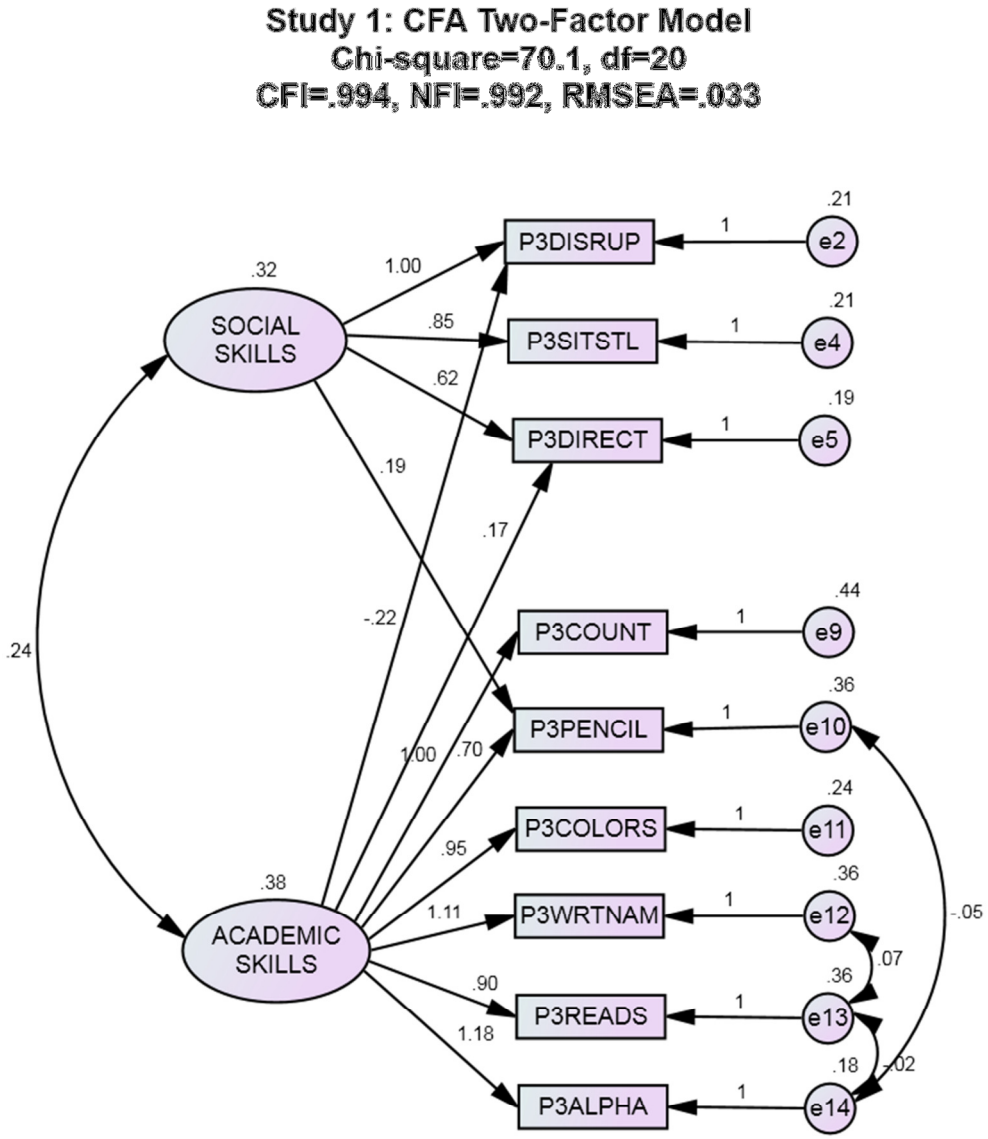
The results of the confirmatory factor analyses are presented in Table 7.

Table 7

Summary of Goodness-of-Fit Indices for Alternate Models of the School Readiness Instrument Measuring Parents' Views, Subsample B (n = 2,250)

Model	Goodness-of-Fit Measures								
	χ^2	*df*	χ^2/df	*CFI*	*NFI*	*TLI*	*GFI*	*RMSEA*	*CAIC*
Optimal values	-	-	<3.0	>.95	>.95	>.95	>.95	<.06	small
One-factor full model (15 items)	2244.082	90	24.934	.843	.838	.817	.846	.103	2505.58
Respecified one-factor model with 12 items	1804.986	54	33.426	.843	.839	.808	.845	.120	2014.18
Two-factor full model (15 items)	1210.571	89	13.602	.918	.912	.903	.928	.075	1480.78
Respecified two-factor model 1	651.187	53	12.287	.946	.942	.933	.952	.071	869.10
Respecified two-factor model 2	347.550	40	8.689	.970	.966	.958	.972	.059	574.178
Final two-factor model 3	70.119	20	3.506	.994	.992	.989	.993	.033	288.031

Figure 4. Study 1: Confirmatory Factor Analysis with Two-Factor Model of Parents' Views



Study 2

Study 2a: Exploratory Factor Analysis of Caregivers' Views (J3).

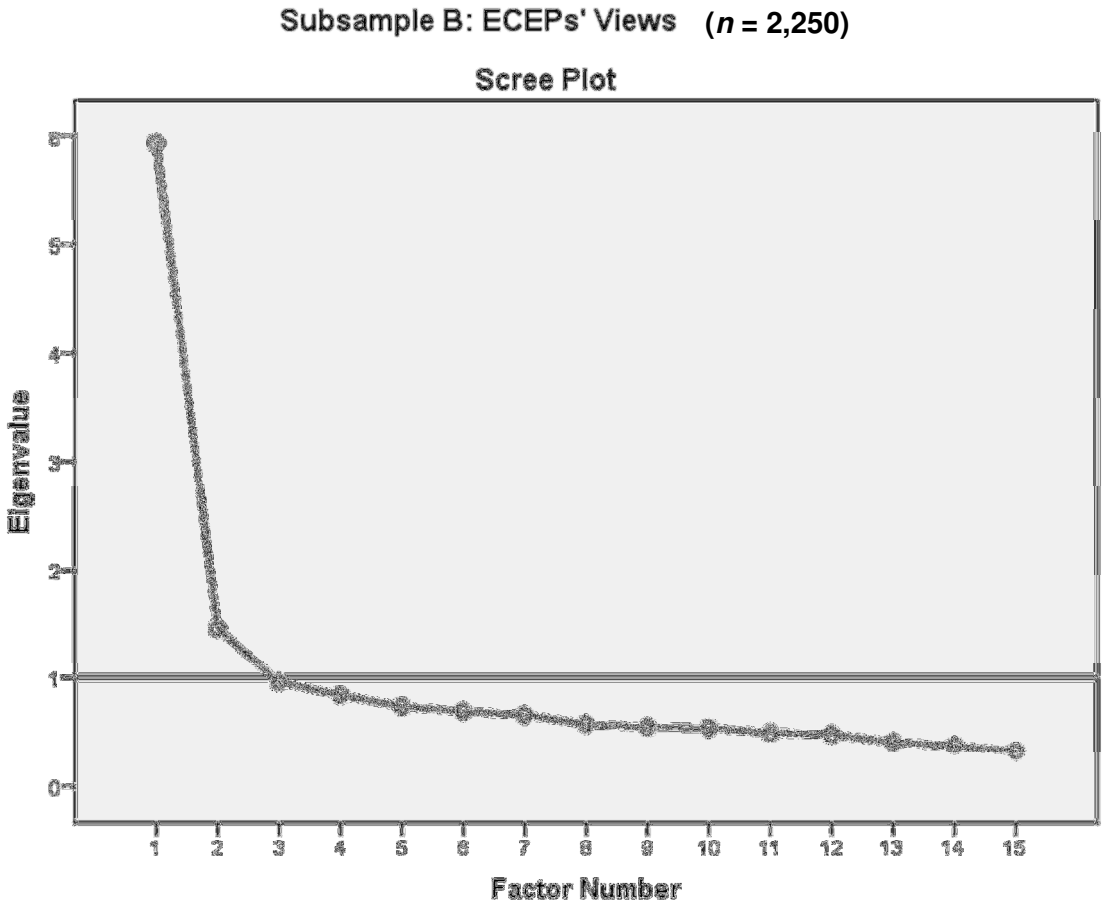
Subsample B (*n* = 2,250). The subsample B with 2,250 participants was used for Study 2. Similar to Study 1, the initial EFA was conducted to examine the factors measured by the School Readiness Instrument. As suggested by Tabachnick and Fiddell (2007), PAF analysis with promax rotation was performed on the subsample B. The sample was free of multicollinearity and was adequate for factor analysis (Kaiser-Meyer-Olkin measure of sampling adequacy = 0.928, Bartlett's Test of Sphericity $\chi^2(105) = 12{,}0978.127$, $p < .0001$; determinant = .004). Criteria similar to those in Study 1 were used to make decisions about the number of factors to retain. PAF analysis indicated that two factors had eigenvalues greater than 1 and accounted for 51.44% of the total variance. More detailed information about the eigenvalues and the variance is presented in Table 8. The scree plot (Figure 5) suggested the existence of two distinct factors.

Table 8

Total Variance Explained

Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	5.933	39.556	39.556
2	1.458	9.721	49.277
3	.956	6.376	55.653
4	.838	5.585	61.238
5	.735	4.898	66.136
6	.689	4.595	70.731
7	.657	4.382	75.113
8	.573	3.818	78.931
9	.548	3.655	82.586
10	.537	3.579	86.165
11	.496	3.306	89.471
12	.478	3.189	92.661
13	.407	2.716	95.376
14	.374	2.494	97.870
15	.319	2.130	100.000

Figure 5. Scree Plot of Factors in the Measure of Caregivers' Views (Subsample B)



Examination of communality indices revealed that one item, J3KNWENG, has a value of .283, which is below the accepted minimum point of 0.3, and revealed a marginally low value for the item J3FINTSK: .308. The pattern matrix indicates that the items loaded on two factors are as follows: Factor 1—J3COUNT, J3PENCIL, J3ALPHA, J3COLORS, J3WRTNAM, and J3READS. Factor 2—J3TKTURN, J3PRBSLV, J3DISRUP, J3SENTIV, J3SITSTL, J3DIRECT, and J3VERBAL. As presented in Table 9, the same two items with

low communalities had factor loadings below the cutoff .40—J3KNWENG (.292) and J3FINTSK (.382).

Table 9

Initial PAF Analysis with Promax Rotation, Subsample B, Caregivers' Responses (n = 2,250)

	Factor		
	1	2	h^2
1. J3ALPHA – Knows the alphabet	**.878**	-.101	.665
2. J3WRTNAM – Writes own name	**.813**	-.049	.611
3. J3COLORS – Identifies colors and shapes	**.746**	.020	.577
4. J3COUNT – Counts to 20 or more	**.691**	-.012	.467
5. J3PENCIL – Uses pencil and paintbrush	**.589**	.133	.467
6. J3READS – Reads or pretends to read	**.497**	.093	.316
7. J3KNWENG – Knows English	**.292**	**.239**	.233
8. J3TKTURN – Takes turns and shares	-.084	**.725**	.453
9. J3DISRUP – Not disruptive of the class	-.079	**.666**	.381
10. J3PRBSLV – Good problem solving	-.014	**.589**	.336
11. J3SENTIVE – Sensitive to other children	.026	**.564**	.338
12. J3VERBAL – Communicates verbally	.045	**.535**	.320
13. J3DIRECT – Follows directions	.216	**.531**	.478
14. J3SITSTL – Sits still and pays attention	.162	**.476**	.354
15. J3FINTSK – Finishes tasks	**.225**	**.382**	.308

Further, parallel analysis was performed using SPSS program developed by O'Connor (2000). All 15 items were used and 1,000 random normally distributed datasets were simulated (Table 10). The PAF parallel analysis suggested 4 distinct factors explaining over 61% of the total variance.

Table 10

Parallel Analysis: Raw Data Eigenvalues, and Mean and Percentile Random Data Eigenvalues in PAF/Common Factor Analysis, Subsample B (Ncases = 2,250, Ndatasets = 1,000)

Root	Raw Data	Means	95th percentile
1	5.344934	.146614	.175393
2	.874128	.116843	.138036
3	.283005	.093601	.113202
4	.191890	.073677	.091488
5	.069013	.053922	.069675
6	.032781	.036241	.050643
7	.002972	.019835	.032886
8	-.027576	.003205	.016176
9	-.067097	-.012229	.000775
10	-.106846	-.028399	-.015985
11	-.122063	-.045129	-.032017
12	-.133050	-.062050	-.048055
13	-.143536	-.079893	-.066069
14	-.177570	-.099445	-.084164
15	-.198889	-.123599	-.104024

PAF analysis with oblique promax rotation and 4 factors produced the following results: 6 items (J3COUNT, J3PENCIL, J3ALPHA, J3COLORS, J3WRTNAM, and J3READS) loaded on the Factor 1; 5 items (J3DISRUP, J3SITSTL, J3DIRECT, J3KNWENG, and J3FINTSK) loaded on Factor 2; 3 items (J3TKTURN, J3PRBSLV, and J3SENTIV) on Factor 3, and 1 item (J3VERBAL) on Factor 4 (see Table 11).

Table 11

PAF Analysis with 4 Factors and Promax Rotation, Subsample B (n = 2,250)

	Factor				
	1	2	3	4	h^2
1. J3ALPHA – Knows the alphabet	**.836**	.143	-.175	-.041	.678
2. J3WRTNAM – Writes own name	**.783**	-.066	-.018	.099	.612
3. J3COUNT – Counts to 20 or more	**.726**	.060	.135	-.297	.565
4. J3COLORS – Identifies colors/shapes	**.725**	-.021	-.096	.235	.625
5. J3PENCIL – Uses pencil and paintbrush	**.575**	.055	.122	-.004	.467
6. J3READS – Reads or pretends to read	**.529**	-.264	.292	.097	.387
7. J3DISRUP – Not disruptive of the class	-.148	**.683**	.106	.030	.472
8. J3SITSTL – Sits still and pays attention	.099	**.630**	-.015	-.026	.452
9. J3DIRECT – Follows directions	.179	**.339**	.109	.241	.497
10. J3KNWENG – Knows English	.251	**.318**	-.084	.094	.262
11. J3FINTSK – Finishes tasks	.219	**.269**	.250	-.108	.338
12. J3PRBSLV – Good problem solving	.000	-.021	**.646**	.067	.441
13. J3SENTIVE – Sensitive to others	.041	.095	**.471**	.082	.365
14. J3TKTURN – Takes turns and shares	-.069	.259	**.433**	.134	.442
15. J3VERBAL – Communicates verbally	-.006	.057	.218	**.534**	.477

Given their repeated failure to meet the minimum cutoff requirements, the items J3KNWENG and J3FINTSK were discarded. The item J3DIRECT had a low loading of .339 but was retained for further examination. Also, Factor 4 and the item J3VERBAL were deleted based on the criteria for factor retention. As a result of applying factor extraction methods, we had 3 factors for further CFA. The final PAF analysis with promax rotation and three factors was performed on the revised pool of 12 items. Item loadings were acceptable, all above the cutoff point of .40 (see Table 12). The items loading on Factor 1 could operationally be named *Academic Skills*, however, items both on Factor 2 and Factor 3 appear to be very similar and belong to social competence. Therefore, Factor 2 was operationally named as *Social Skills*, and Factor 3 as *Socioemotional Skills.*

Table 12

Study 2: Split-Half Sample PAF Analysis with Promax Rotation: Communalities, and Matrix Characteristics for Caregivers' Views

	Final Model			
Items	F_1	F_2	F_3	h^2
1. J3ALPHA — Knows the alphabet	**.851**	.126	-.196	.685
2. J3WRTNAM — Writes own name	**.807**	-.043	.003	.615
3. J3COLORS — Identifies colors and shapes	**.747**	.034	-.010	.579
4. J3COUNT — Counts to 20 or more	**.653**	.006	.034	.457
5. J3PENCIL — Uses pencil and paintbrush	**.579**	.049	.114	.464
6. J3READS — Reads or pretends to read	**.527**	-.243	.335	.394
7. J3KNWENG — Knows English	-	-	-	-
8. J3TKTURN — Takes turns and shares	-.052	.298	**.469**	.445
9. J3DISRUP — Not disruptive of the class	-.122	**.709**	.089	.494
10. J3PRBSLV — Good problem solving	.009	.031	**.606**	.398
11. J3SENTIVE — Sensitive to other children	.028	.091	**.555**	.402
12. J3VERBAL — Communicates verbally	-	-	-	-
13. J3DIRECT — Follows directions	.241	**.407**	.145	.473
14. J3SITSTL — Sits still and pays attention	.139	**.566**	-.012	.420
15. J3FINTSK — Finishes tasks	-	-	-	-

Study 2b: Confirmatory Factor Analysis of Caregivers Views (J3)

Subsample A (*n* = 2,250). CFA was performed on the baseline one-factor model and the hypothesized three-factor model of the School Readiness Instrument as derived through EFA. CFA is important for evaluating the fit of items to the theoretical measurement models and improving the model fit. The results of the hypothesized 3-factor structure were compared with the baseline one-factor structure. The subsample A with 2,250 observations was used to perform CFA with Maximum Likelihood Estimation. Due to the large sample size that affects the chi-square statistic (Byrne, 2001), multiple goodness-of-fit measures described in the Study 1 were used to assess the model fit.

Evaluation of Model Fit

The results of the confirmatory factor analyses conducted with AMOS 20.0 statistical software are presented in Table 13.

Baseline one-factor model. CFA of the one-factor full model with 15 items indicated that the baseline model was of poor fit for the data. Multiple large values of standardized residual covariances and modification indices confirmed model misfit and suggested further respecification of the model.

Respecified one-factor model. The 1-factor model was adjusted by removing 3 items— J3FINTSK, J3KNWENG and J3VERBAL—based on the findings from EFA. The results indicated that model fit was still unacceptable. Therefore, the 3-factor model suggested by EFA was pursued.

Three-factor model. The three-factor model with 12 items suggested by EFA indicated a better fit. The standardized residuals matrix and modification indices suggested the possibility of further model improvement.

Respecified three-factor model. The item P3PRBSLV, with multiple residual loadings exceeding the cutoff point of 2.58 (Joreskog & Sorbom, 1988) was deleted. Although model fit was improved, the factor 2 with 2 items failed to meet the criteria for an adequate factor structure. Given the similarity of the underlying construct, Socioemotional and Social Skills were combined.

Two-factor model. Upon review of standardized residual covariances, the item J3SENTIV was deleted as item with the largest residual value of 4.674 exceeding the conventional cutoff (Joreskog & Sorbom, 1988).

Respecified two factor model 1. To improve the model fit, crossloading items with modification indices exceeding 15 units were examined. Large modification indices for the regression path predicting J3DISRUP (*MI* = 45.040, par change = -.042) and J3DIRECT (*MI* = 23.032, par change = .026) from the Academic Skills factor, and J3PENCIL (*MI* = 16.387, par change = .022) from Social Skills. The model fit substantially improved, but there is the possibility for further improvement.

Final two-factor model 2. The item J3TKTURN, with two residual covariances exceeding the cutoff point, was deleted, and the following correlated error terms — J3WRTNAM and J3READS (*MI* = 20.055; par change = .041), J3PENCIL and J3ALPHA (*MI* = 17.450, par change = -.032). The error terms had modification indices exceeding 15 units, and substantive justification could be claimed. The fit indices for the model were estimated as excellent; therefore, additional model adjustments were not pursued and the 2-factor model 2 was accepted as the best fit. The model is presented in Figure 6 and consists of 2 factors and 9 items: Social Skills (3 items) and Academic Skills (6 items).

Cronbach's alpha, the coefficient of internal consistency, was estimated for final models. For 9 items of the School Readiness Instrument, Cronbach's alpha was .88 for parents and .86 caregivers, suggesting high reliability. All subscales demonstrated acceptable levels of internal consistency. For parents, 6 items of the Academic Skills subscale and 3 items of the Social Skills subscale had $\alpha = .87$ and $\alpha = .75$, respectively; for caregivers, the Academic Skills subscale had internal consistency of .85, and for the Social Skills subscale, $\alpha = .71$.

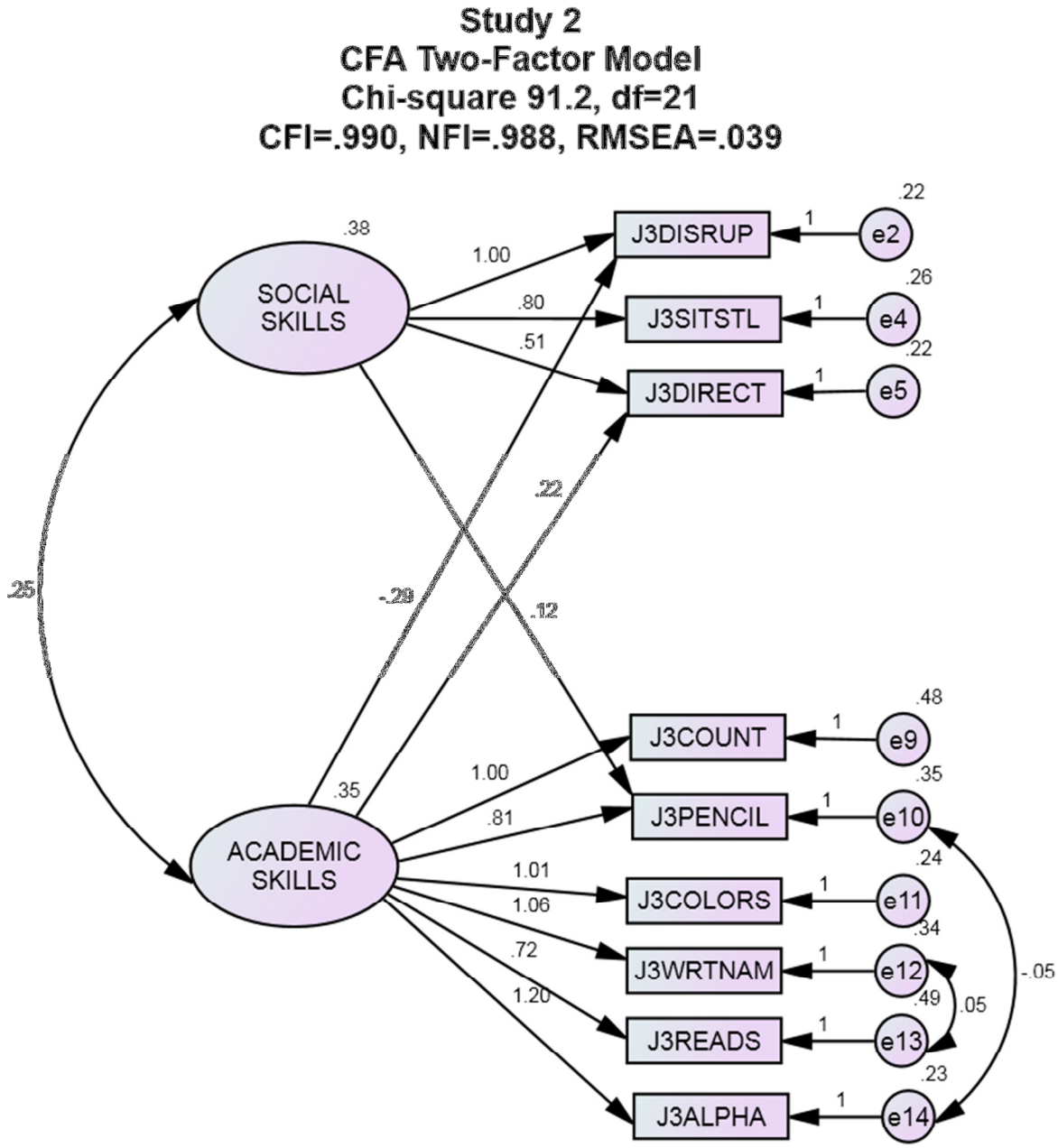
Table 13

Summary of Goodness-of-Fit Indices for Alternate Models of the School Readiness Instrument Measuring Caregivers' Views, Subsample A (n = 2,250)

Model	Goodness-of-Fit Measures								
	χ^2	*df*	χ^2/df	*CFI*	*NFI*	*TLI*	*GFI*	*RMSEA, 90% CI*	*CAIC*
Optimal values	-	-	<3.0	>.95	>.95	>.95	>.95	<.06	small
One-factor full model (15 items)	1908.558	90	21.206	.841	.834	.814	.874	.095, [.091, .099]	2170.12
Respecified one-factor model with 12 items	1454.940	54	26.943	.850	.845	.817	.881	.107, [.103, .112]	1664.19
Three-factor model	555.392	51	10.89	.946	.941	.930	.960	.066, [.061, .071]	790.80
Respecified three factor model 1	406.115	41	9.905	.958	.953	.943	.968	.063, [.057, .069]	624.08
Two-factor model	353.017	34	10.383	.960	.956	.947	.970	.065, [.057, .071]	536.110
Respecified two-factor model 1	237.053	31	7.647	.974	.971	.963	.979	.054, [.048, .061]	446.302
Respecified two factor model 2	91.221	21	4.344	.990	.988	.984	.991	.039, [.031, .047]	300.469

Note: 90% CI = 90% confidence interval.

Figure 6. Study 2: Confirmatory Factor Analysis with Two-Factor Model of Caregivers' Views



Study 3

Multi-group Analysis of Measurement Invariance

In Study 3, parents' responses on the School Readiness Instrument in the subsamples A and B were compared using the same factor structure. Table 14 presents a summary of goodness-of-fit statistics of parent groups in different invariance testing models. The analysis of the unconstrained baseline model produced excellent fit indices establishing the model as the best-fitting. Testing for measurement invariance involved imposing subsequent constraints and comparing the increasingly restrictive models against the baseline model. At each step the change in chi-square values was examined. Generally, insignificant $\Delta\chi^2$ would mean that no variance exists across the groups. To address the sensitivity of χ^2 to sample size, additional indicators— ΔCFI and ΔRMSEA— were consulted. Cheung and Rensvold (2002) proposed .01 as the CFI threshold for significance. Across two groups of caregivers, χ^2 changes in all three models were found nonsignificant: measurement model (p = .904), structural model (p = .835) and residual model (p = .428) indicating that the early care providers responses were invariant across subsamples A and B (see Table 14). Parent groups were invariant in the measurement model (p = .078), marginally invariant (p = .048) in the structural model, but noninvariant in the residual model (p = .028).

One measure for compensating for full measurement invariance is partial invariance proposed by Byrne, Shavelson, and Muthen (1989), who argued that full equivalence is not a necessary requirement for making valid comparisons across groups. To establish partial invariance in the residual model, tests were performed with 13 model variations by setting free the invariance constraints on error variances (see Table 14). All

models tested invariant except for two: the residual variances on the items P3DIRECT and P3COLORS produced significant chi squares, although the change in CFI was minimal (less than the cutoff level of .01) and, therefore, indicative of equivalence (Cheung & Rensvold, 2002). We also tested for invariance of marker items—P3DISRUP and P3COUNT—and found that the items were metrically variant.

The results of EFA, CFA, and measurement invariance analysis, strengthened by cross-validation, confirmed the multidimentionality of the construct of school readiness. The two-factor model was determined as the best fitting model for the School Readiness Instrument, and this finding was supported both by parents' and caregivers' groups. Through measurement invariance testing we concluded that the items in the School Readiness Instrument measured the same construct for all caregivers, and the same construct for parents.

Table 14

Tests for Invariance of Parents' Views (P3) Using the School Readiness Instrument: Goodness-of-Fit Statistics

Model Description	χ^2	*df*	$\Delta\chi^2$	*Δdf*	*CFI*	*ΔCFI*	*RMSEA*	*ΔRMSEA*	*p-value*
1. Baseline model 1	149.298	40	-	-	.994	-	.025	-	-
2. Measurement model 2	166.118	50	16.820	10	.993	.001	.023	.002	.078
3. Structural model 3	171.819	53	22.521	13	.993	.001	.022	.003	.048
4. Residual model 4	189.496	65	40.198	25	.993	.001	.021	.004	.028
5. Model 3 and residuals v1 constrained equal	173.454	40	24.156	14	.993	.001	.022	.003	.044
6. Model 3 and residuals v1 and v2 constrained equal	173.477	55	24.179	15	.993	.001	.022	.003	.062
7. Model 3 and residuals v1,v2, and v3 constrained equal	176.655	56	27.367	16	.993	.001	.022	.003	.038*
8. Model 4 and residuals v1, v2, v3, and v4 constrained equal	176.910	57	27.612	17	.993	.001	.022	.003	.050
9. Model 4 and residuals v1, v2, and v4 constrained equal	173.709	56	24.411	16	.993	.001	.022	.003	.081
10. Model 3 and residuals v1, v2, v4, and v5 constrained equal	173.884	57	24.585	17	.993	.001	.021	.004	.104
11. Model 3 and residuals v1, v2, v4, v5, and v6 constrained equal	180.591	58	31.293	18	.993	.001	.022	.003	.027*
12. Model 3 and residuals v1, v2, v4, v5 and v7 constrained equal	175.954	58	26.656	18	.993	.001	.021	.004	.086

Table 14 (continued)

Tests for Invariance of Parents' Views (P3) using the School Readiness Instrument: Goodness-of-Fit Statistics

Model Description	χ^2	***df***	$\Delta\chi^2$	***Δdf***	***CFI***	***ΔCFI***	***RMSEA***	***ΔRMSEA***	***p-value***
13. Model 3 and residuals v1, v2, v4, v5, v7**,** and v8 constrained equal	177.792	59	28.494	19	.993	.001	.021	.004	.074
14. Model 3 and residuals v1, v2, v4, v5, v7, v8**,** and v9 constrained equal	177.815	60	28.517	20	.993	.001	.021	.004	.098
15. Model 3 and residuals v1,v2, v4, v5,v7, v8, v9**,** and c1 constrained equal	179.877	61	30.579	21	.993	.001	.021	.004	.081
16. Model 3 and residual v1, v2, v4, v5, v7, v8, v9, c1**,** and c2 constrained equal	180.542	62	31.244	22	.993	.001	.021	.004	.091
17. Model 3 and residuals v1, v2, v4, v5, v7, v8, v9, c1,c2**,** and c3 constrained equal	180.545	63	31.247	23	.993	.001	.020	.005	.117

Note. $\Delta\chi^2$ = difference in χ^2 values between models; Δdf = difference in number of degrees of freedom between models; $\Delta RMSEA$ = differences in RMSEA respective values between models. ΔCFI threshold for significance is .002 (Meade, Johnson, & Braddy, 2008). v1- residual for P3COUNT; v2 - residual for P3PENCIL; v3 – for P3DISRUP; v4 – for P3SITSTL; v5 – for P3ALPHA; v6 – for P3DIRECT; v7 – P3COLORS; v8 – P3WRTNAM, and v9 – P3READS.

*$p < .05$

Table 15

Tests for Invariance of Caregivers' Views (J3) using the School Readiness Instrument: Goodness-of-Fit Statistics

Model Description	χ^2	*df*	$\Delta\chi^2$	Δdf	*CFI*	ΔCFI	*RMSEA*	$\Delta RMSEA$	*p*-value
1.Unconstrained model	192.734	42	-	-	.990	-	.028	-	-
2.Measurement weights	197.536	52	4.803	10	.990	.000	.025	.003	.904
3.Structural covariances	200.866	55	8.132	13	.990	.000	.024	.004	.835
4.Measurement residuals	217.332	66	24.599	24	.990	.000	.023	.005	.428

Note. $\Delta\chi^2$ = difference in χ^2 values between models; Δdf = difference in number of degrees of freedom between models; $\Delta RMSEA$ = differences in RMSEA respective values between models. ΔCFI threshold for significance is .002 (Meade, Johnson, & Braddy, 2008).

*$p < .05$

Congruence Analysis

Congruence analyses were conducted to assess the level of congruence between parent-caregiver pairs. To ensure the accuracy of the analyses, multiple methods for estimating congruence were consulted. First, descriptive statistics of overall responses to individual items on the School Readiness Instrument, which is a 5-point Likert type scale, were examined to detect general patterns in responses by parents and caregivers (see Table 16). The least popular response categories were *Not important at all* and *Not very important*; the frequency of responses increased for consequent categories until peaking at *Very important* and slightly decreasing for *Essential*. For all 9 items in the School Readiness Instrument, the response category *Very important* drew the highest number of responses from both parents and caregivers. Visual examination of graphical displays in Figure 7 confirmed consistent patterns in the direction and intensity of responses for parents and caregivers. However, these results are not paired for parents and caregivers and need to be interpreted cautiously.

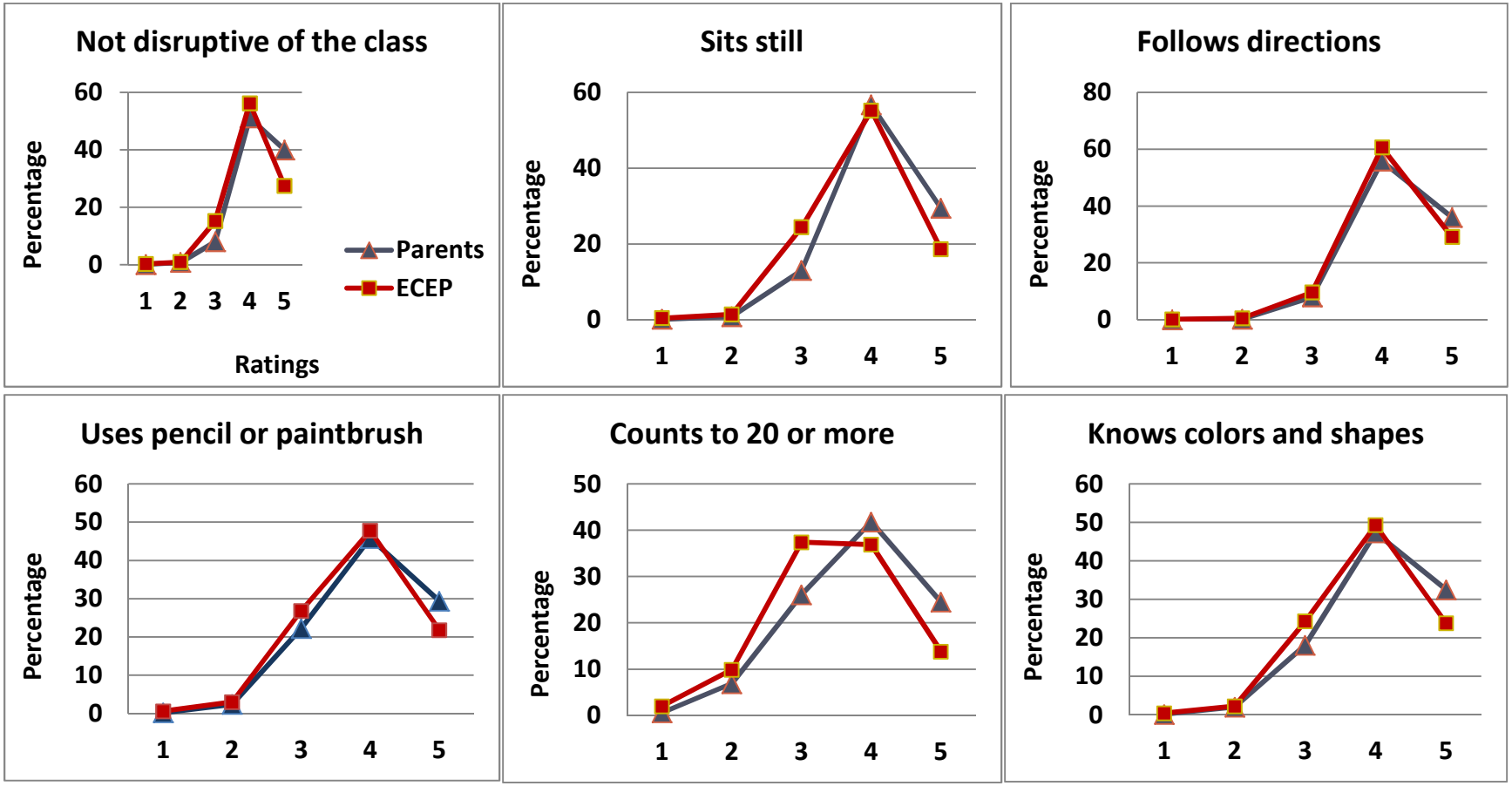
Next, the paired parents' and caregivers' responses to the School Readiness Instrument were crosstabulated. By summing up identical responses in each Likert scale category, between 31.6 and 47.1% of parent-caregiver pairs were estimated to have absolutely congruent responses to each individual item. This value, called an *index of absolute congruence* (Sirotnik, 1981), is presented in Table 17. This statistic accounts for absolute overlap only and dismisses nearly congruent responses in 2 consecutive categories (e.g., *Very important* and *Essential*) and the proportion of agreement expected by chance.

Table 16

Distribution Percentage of Parent and Caregiver Responses to the School Readiness Instrument

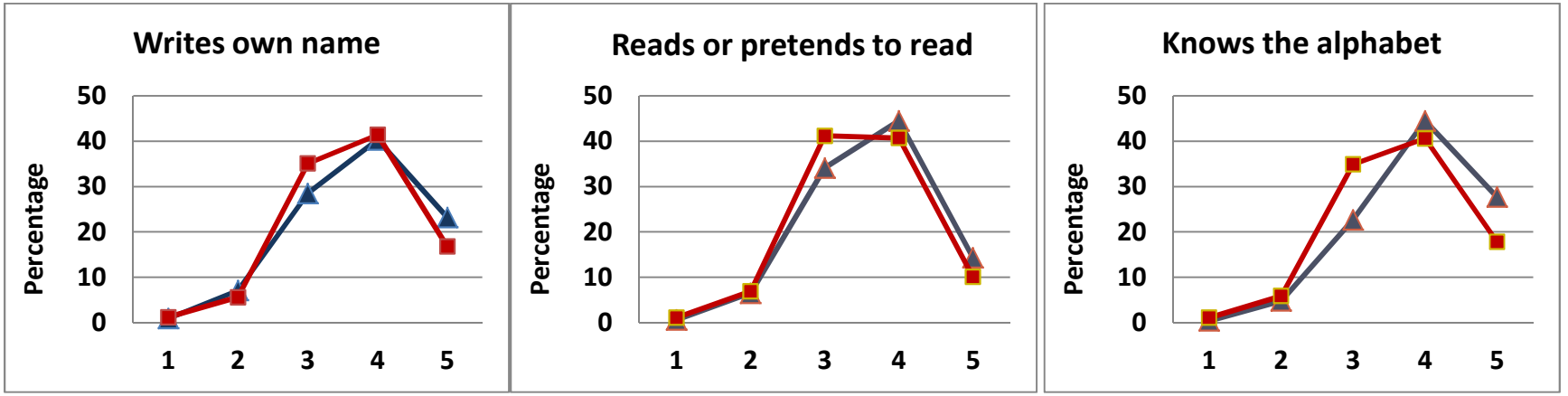
Item	*Not important*	*Not very important*	*Somewhat important*	*Very important*	*Essential*
	Parent (ECEP)	Parent (ECEP)	Parent (ECEP)	Parent (ECEP)	Parent (ECEP)
1. Not disruptive of the class	.1 (.3)	.8 (.9)	8.0 (15.2)	51.1 (56.2)	40.0 (27.4)
2. Sits still and pays attention	.1 (.4)	.8 (1.4)	13.0 (24.4)	56.7 (55.2)	29.4 (18.6)
3. Follows directions	0 (.1)	.2 (.5)	8.0 (9.6)	55.8 (60.6)	36.0 (29.1)
4. Counts to 20 or more	.6 (2.0)	6.9 (9.9)	26.1 (37.4)	41.8 (36.9)	24.5 (13.8)
5. Uses pencil and paintbrush	.2 (.6)	2.4 (3.0)	22.2 (26.8)	45.8 (47.8)	29.4 (21.8)
6. Identifies colors and shapes	.1 (.4)	2.0 (2.2)	18.1 (24.3)	47.3 (49.3)	32.5 (23.8)
7. Writes own name	.9 (1.2)	7.1 (5.6)	28.5 (35.1)	40.3 (41.4)	23.2 (16.8)
8. Reads or pretends to read	.6 (1.1)	6.5 (6.9)	34.1 (41.2)	44.5 (40.7)	14.3 (10.1)
9. Knows the alphabet	.4 (1.1)	4.8 (5.9)	22.7 (34.9)	44.5 (40.6)	27.7 (17.8)

Figure 7. Distribution Frequency of Parents and Caregivers' Responses to 9 Items of the School Readiness Instrument



Note: Corresponding values of ratings for 1 = *Not important at all*; 2 = *Not very important*; 3 = *Somewhat important*; 4 = *Very Important*; 5 = *Essential*.

Figure 7 *(continued)*. Distribution Frequency of Parents and Caregivers' Responses to 9 Items of the School Readiness Instrument



Note: Corresponding values of ratings for 1 = *Not important at all*; 2 = *Not very important*; 3 = *Somewhat important*; 4 = *Very Important*; 5 = *Essential*.

Table 17

Absolute Congruence Index of Parent-Caregiver Responses by Individual Item (n = 4,500)

Item	Congruent parent-caregiver responses, %					Index of Absolute Congruence [a]
	Not at all important	*Not very important*	*Somewhat important*	*Very important*	*Essential*	
1. Not disruptive of the class	0	0	1.5	28.3	11.4	41.2
2. Sits still and pays attention	0	0	3.7	31.3	6.0	41.0
3. Follows directions	0	0	1.0	34.5	11.6	47.1
4. Counts to 20 or more	0	1.2	10.7	15.9	3.8	31.6
5. Uses pencil and paintbrush	0	.1	6.3	21.8	6.5	34.7
6. Identifies color and shapes	0	0	4.6	22.9	8.4	35.9
7. Writes own name	0	.5	10.9	17.6	4.4	33.4
8. Reads or pretends to read	0	.5	14.5	18.6	2.1	35.7
9. Knows the alphabet	0	.6	8.1	18.9	6.1	33.7

Note: $*p < .05$. $**p < .01$. $***p < .001$.

[a] Slight discrepancy in decimal points with results in Table 16 is due to rounding.

To further assess the distribution of congruence, the *absolute discrepancy* or *difference scores* were calculated for each pair of responses for all items of the School Readiness Instrument. This measure is frequently used in medical, social, and organizational research (e.g., Garber, Van Slyke, & Walker, 1998; Grice, Jones, & Paulsen, 2002; Houle et al., 2011; Polzer, Milton, & Swann, 2002). The results of parent-caregiver responses for each item grouped by absolute difference score are displayed in Table 18. As a customary practice, a smaller value of the discrepancy score indicates higher congruence. Three items that are characteristics of Social Skills yielded the highest proportion of congruent responses per individual item, with 41% or more responses by parents and caregivers being absolutely congruent and over 47% of responses falling within one unit of discrepancy score. The least congruent item on the School Readiness Instrument was *Counts to 20 or more* with less than a third of parent and caregiver responses being absolutely congruent.

However, when the items are combined to compose scales, the absolute discrepancy scores of scales assume wider range, making it more complicated to determine the degree of congruence among parents and caregivers. The scale-level congruence was evaluated by combining the absolute discrepancy scores across related items. For example, the congruence of the Social Skills subscale was assessed by summing up the absolute discrepancy scores for 3 individual items –*Not disruptive of the class*, *Sits still and pays attention*, and *Follows directions*. According to Table 18, 13.5 % of parent-caregiver pairs had an absolute congruence score of 0 on the Social Skills subscale. In other words, 13.5% of parent and caregiver pairs had absolutely identical answers to each of 3 items on this scale. Respectively, about 26% of parent-caregiver

Table 18

Distribution of Parent-Caregiver Responses by Absolute Difference Score (n = 4,500)

Item	Frequency by absolute difference score, %										
	0	1	2	3	4	5	6	7	8	9	10 or more
1. Not disruptive of the class	41.2	49.6	8.5	.6	.1						
2. Sits still and pays attention	41.0	48.2	10.0	.6	.2						
3. Follows directions	47.1	47.1	5.5	.2	.1						
4. Counts to 20 or more	31.6	46.9	17.2	3.9	.4						
5. Uses pencil or paintbrush	34.5	49.3	14.4	1.6	.2						
6. Identifies color and shapes	36.0	49.8	12.7	1.4	.2						
7. Writes own name	33.4	46.4	17.3	2.6	.3						
8. Reads or pretends to read	35.8	47.9	14.4	1.7	.2						
9. Knows the alphabet	33.7	45.9	17.9	2.1	.4						
Social Skills subscale (items 1-3)	13.5	25.9	27.8	20.8	7.7	2.7	1.3	.2			
Academic Skills subscale (items 4-9)	1.6	4.7	9.0	13.7	15.9	15.4	13.5	8.5	5.4	4.4	7.9
School Readiness Instrument (items 1-9)	.5	2.1	3.1	6.0	10.4	12.3	13.2	11.4	11.3	8.5	21.2

pairs had an absolute congruence score of 1 on the Social Skills subscale, which means 26% of pairs provided two identical responses and one response differing by 1 point. Approximately 28% of pairs differed by 2 points on the Social Skills subscale. For the Academic Skills subscale only 1.6% of parent-caregiver pairs provided identical responses to each of 6 items. About 27.4% of all parent-caregiver pairs differed by 1 to 3 points in their responses to the Academic Skills subscale. For the 9-item School Readiness Instrument, only 0.5% of parent-caregiver pairs responded identically to all items. The absolute discrepancy score gives the sense of the distribution of responses but lacks guidelines for interpretation of results, and thus, needs to be used cautiously.

The next statistic for interrater agreement is weighted kappa, recommended for ordinal Likert scale items. Using STATA statistical software, weighted kappa values and observed and expected percentage agreements were estimated. To calculate quadratic kappa, the following weights were assigned based on the suggestions by Landis and Koch (1977): weight of 1.0 when absolute discrepancy score was 0, weight of .80 when absolute discrepancy score was 1.0, weight of .30 when the score was 2.0, and weight of 0.0 for all other scores. Table 19 presents statistical results for weighted kappa and percentage agreements; unweighted kappa and raw percentage agreements are presented for comparison. When compared, both weighted and unweighted kappa coefficients were mostly significant, but their magnitude consistently fell into the range of 0 to .20, indicating slight agreement (Landish & Koch, 1977). Also, both the raw and weighted observed agreements were substantial, and the expected agreement values were proportionately high. It should also be noted that the raw percentage agreement was equal

to the index of absolute congruence described in the study by Sirotnik (1981) and, respectively, to the proportion of responses with the absolute discrepancy score of 0.

Table 19

Percentage Agreement and Kappa Statistics, Weighted and Unweighted (n = 4,500)

Item	Raw Percentage Agreement		Kappa	Percentage Agreement, weighted		Weighted Kappa
	Observed	Expected	k	Observed	Expected	k_w
1. Counts to 20 or more	31.61	29.29	.033***	74.27	71.73	.090***
2. Uses pencil or paintbrush	34.53	34.32	.003	78.27	77.54	.032**
3. Not disruptive of the class	41.22	40.88	.006	83.47	82.80	.039***
4. Sits still and pays attention	40.98	39.96	.017*	82.53	81.72	.044**
5. Knows the alphabet	33.73	31.12	.038***	75.82	74.14	.065***
6. Follows directions	17.14	45.11	.037***	86.45	85.64	.057***
7. Identifies colors and shapes	36.0	35.49	.008	79.64	78.67	.045***
8. Writes own name	33.41	30.94	.036***	75.74	73.76	.075***
9. Reads or pretends to read	35.8	34.06	.026**	78.43	76.89	.067***

Next, the single item r_{WG} and AD_M indices were estimated to assess agreement among raters responding to individual items on the School Readiness Instrument. The initial analyses yielded a small number of negative r_{WG} values ranging between 14 (.3%) to 193 (4.3%) counts per item. Therefore, as suggested by Lindell and his colleagues (Lindell & Brandt, 1999; Lindell et al., 1999), the alternative index of agreement— r^*_{WG} that allows for negative values was considered. Due to the excessive number of paired

estimates (n = 4,500), only descriptive information for the uniform null distribution of r^*_{WG} and AD_M indices is presented in Table 20.

LeBreton and Senter (2008) proposed values of r_{WG} as low as .51 as indicative of moderate agreement; however, in single-item analyses r^*_{WG} assumed few values: r^*_{WG}= .75, r^*_{WG}=1.0, and $r^*_{WG} \leq 0$. Therefore, the cutoff point was .75, which means higher degree of agreement with 75% reduction in error variance, and 25% of the observed variance due to error variance (LeBreton, Burgess, Kaiser, Atchley, & James, 2003). A value of 1.0 means absolute agreement with no error variance. Table 20 indicates that parents and caregivers exercised high levels of agreement on single items with less 11.5% of the observed variance due to error. The item *Follows directions* had the highest proportion of interrater agreement – 94.2% of parent-caregiver pairs were in agreement.

The estimates were calculated for single-item AD_M index as well. Interpretations of the AD_M index are similar to r^*_{WG} index, except for the cutoff point. The acceptable level of agreement for average deviation index AD_M suggested by Burke and Dunlap (2002) is .82 for Likert-type items and scales with 5 response choices within each item. Similar to the r^*_{WG} index, AD_M assumed few values in the individual item analyses: AD_M = 0, , AD_M = .50 and , $AD_M \leq 1$. Thus, in Table 20 a AD_M value of .50 indicates acceptable agreement and a value of 0 indicates absolute agreement. When compared, absolute and acceptable agreements for single item AD_M and r^*_{WG} are equal.

Next, to assess agreement on the 9 items composing the School Readiness Instrument and its subscales, the multiple item indices $AD_{M(J)}$ and $r^*_{WG(J)}$ were estimated (see Table 20). For $AD_{M(J)}$, the proportion of pairs that responded in agreement to the full School Readiness Instrument was 97.4%; the number was 94.3% and 98.1% for

Academic and Social Skills subscales, respectively. These estimates are consistent with the results for $r^*_{WG(J)}$ index, where moderate or higher agreement was indicated by 93.8%, 89.3%, and 94.8% of raters responding to the School Readiness Instrument, Academic Skills subscale, and Social Skills subscale, respectively.

Table 20

Means, Standard Deviations, and Distributions of Interrater Agreement Indices for Single Items (n = 4,500)

Item	AD_M Agreement Index							r^*_{WG} Agreement Index						
	M	*SD*	*Min*	*Max*	*0*	*.50*	*1.0≤*	*M*	*SD*	*Min*	*Max*	≤0	.75	1.0
1. Counts to 20 or more.	.47	.41	0	2.0	**31.6**	**46.9**	21.5	.61	.56	-3.0	1.0	21.5	**46.9**	**31.6**
2. Uses pencil and paintbrush	.42	.37	0	2.0	**34.5**	**49.3**	16.2	.69	.44	-3.0	1.0	16.2	**49.3**	**34.5**
3. Not disruptive of the class	.34	.33	0	2.0	**41.2**	**49.6**	9.2	.77	.33	-3.0	1.0	9.1	**49.6**	**41.2**
4. Sits still and pays attention	.35	.34	0	2.0	**41.0**	**48.2**	10.8	.76	.36	-3.0	1.0	10.8	**48.2**	**41.0**
5. Knows the alphabet	.45	.40	0	2.0	**33.7**	**45.9**	20.4	.64	.50	-3.0	1.0	20.4	**45.9**	**33.7**
6. Follows directions	.30	.31	0	2.0	**47.1**	**47.1**	5.8	.82	.28	-3.0	1.0	5.8	**47.1**	**47.1**
7. Identifies color and shapes	.40	.36	0	2.0	**36.0**	**49.8**	14.2	.71	.41	-3.0	1.0	14.2	**49.8**	**36.0**
8. Writes own name	.45	.40	0	2.0	**33.4**	**46.4**	20.2	.64	.50	-3.0	1.0	20.2	**46.4**	**33.4**
9. Reads or pretends to read	.41	.37	0	2.0	**35.8**	**47.9**	16.3	.69	.44	-3.0	1.0	16.3	**47.9**	**35.8**

Table 21

Means, Standard Deviations, and Distribution of Interrater Agreement Indices for Multiple Items (n = 4,500)

Item	$AD_{M(J)}$ *Agreement Index*						$r^*_{WG(J)}$ Index								
	M	*SD*	*Min*	*Max*	≤.82	.83-2.0	*M*	*SD*	Min	Max	≤.30	≤.50	≤.70	≤.90	.91-1.0
1. School Readiness Instrument (9 items)	.40	.20	0.0	2.0	**97.4**	2.6	.70	.25	-3.0	1.0	6.2	**8.7**	**23.4**	**52.5**	**9.2**
2. Academic Skills Scale (6 items)	..43	.24	0.0	2.0	**94.3**	5.7	.66	.31	-3.0	1.0	10.7	**10**	**23.3**	**45.4**	**10.6**
3. Social Skills Scale (3 items)	.33	.23	0.0	2.0	**98.1**	1.9	.78	.24	-3.0	1.0	5.2	**6.9**	**13.4**	**55.2**	**19.3**

Main Analyses

The study sample was previously described in Tables 1 and 4. Descriptive statistics and simple correlations were examined for measures of parents' (PARVIEW) and caregivers' (ECEPVIEW) views on early school readiness, child, parents' and caregivers' characteristics, and child math and reading scores at Wave 3 (preschool) and Wave 4 (kindergarten). Child demographics include gender (MALE), birth weight (LBW), race/ethnicity (White, AA, Hispanic, Asian, and Other), child socioeconomic status (SES), residence status (RURAL), and age in months at the time of assessment (AGE). Reported maternal depression at Wave 3 was coded as MATDEP. Caregiver characteristics included caregivers' race as White (ECEP WHT) or Black (ECEP AA), caregiver has high school diploma or some college education (ECEP HSD), and caregiver has bachelor's degree or higher (ECEP BA). Predictors defining parents' and caregivers' views of school readiness were centered at zero. Table 22 presents descriptive statistics of the main variables, and the means and standard deviations for the overall sample and by race/ethnicity. The statistics indicate statistically significant differences among groups. It is noted that although the variable SES is a centered variable, its overall mean at Wave 3 is slightly skewed as a result of the weighting performed on the ECLS-B baseline sample.

Due to violations of normality assumptions and homogeneity of variance, the one-way analysis of variance (ANOVA) test was replaced by a nonparametric test. The Kruskal Wallis K independent samples test, used for non-normal ordinal and interval data, does not assume normal distribution nor homogeneity of variance, and can handle unequal groups. Table 22 shows that the nonparametric test of predictors grouped by race/ethnicity produced significant results with $p < .001$, suggesting the need for group comparisons. Follow-up analyses with the Kruskal Wallis H Test were performed to

assess pairwise differences among groups by SES, parents' and caregivers' views, and reading and math scores at Waves 3 and 4. Post hoc tests found statistically significant differences for most group pairs. The pairs White-African American, White-Hispanic, African American-Asian, and African American-Other were found to be different on every variable. White-Asian, Hispanic-Asian, Hispanic-Other, and Asian-Other pairs differed in all variables except on the variable of caregivers' views of school readiness (ECEPVIEW). No significant differences were found for Hispanic and African American groups on SES ($\chi^2 = 1.71$, $p = .191$), and all cognitive outcomes: Read W3 ($\chi^2 = 2.46$, $p = .116$), Math W3 ($\chi^2 = 3.09$, $p = .079$), Read W4 ($\chi^2 = .412$, $p = .521$), and Math W4 ($\chi^2 = 2.959$, $p = .085$). More information about the Kruskal Wallis post hoc tests is presented in Table 23.

Correlational analyses conducted next suggest weak associations between child math and reading scores at Waves 3 and 4 and parents' scores on the School Readiness Instrument. The results of the simple correlation analysis presented in Table 24 were supplemented with partial correlation analyses to examine the association between parents' and caregivers' early views of school readiness and child cognitive outcomes at Waves 3 and 4. Controlling for child demographics, parents' early views of school readiness were weakly associated with children's reading ($r = .05$, $p < .001$) and math scores ($r = .06$, $p < .001$) at Wave 3, and reading ($r = .06$, $p < .001$) and math scores ($r = .04$, $p = .009$) at Wave 4. Controlling for the same variables, there was no partial correlation between caregivers' early views of school readiness and children's reading score at Wave 3 ($r = .02$, $p = .114$), but caregivers' views had a weak correlation with math score at Wave 3 ($r = .038$, $p = .011$), and reading ($r = .06$, $p < .001$) and math scores

Table 22

Means and Standard Deviations by Race/Ethnicity

Predictors	Overall (n = 4,500[a])		White (n = 1,950[a])		African American (n = 700[a])		Hispanic (n = 700[a])		Asian/ Native Hawaiian (n = 450[a])		Alaska Native/Other (n = 550[a])		
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	χ^{2b}
PARVIEW	0.0	5.04	-.72	5.0	1.46	4.78	.81	4.73	.07	5.26	-.52	5.16	124.75***
ECEPVIEW	0.0	4.90	-.32	4.87	1.05	4.93	.04	4.82	-.17	4.72	-.07	5.14	40.69***
SES W3	0.09	0.85	0.32	0.74	-0.42	0.75	-0.34	0.73	0.79	0.82	0.0	0.80	905.78***
Reading score W3	26.25	10.71	27.32	10.11	23.00	9.59	22.05	8.85	34.21	12.64	25.48	10.16	462.05***
Math score W3	30.19	9.97	31.10	9.28	26.46	9.27	27.19	8.77	38.19	10.18	28.90	10.11	449.21***
Reading score W4	40.60	15.40	41.29	14.28	36.64	14.46	36.24	14.92	52.65	15.77	39.29	15.19	349.98***
Math score W4	41.49	10.86	42.70	10.10	36.88	10.11	38.00	10.22	49.67	10.07	41.12	11.06	488.87***

Note. PARVIEW = parents' early views of school readiness; ECEPVIEW = early care and education providers' (caregivers') early views of school readiness; SES W3 = child socioeconomic status at Wave 3.

[a] Sample size is rounded to the nearest 50.

[b] Kruskal Wallis Test, $df = 4$.

*** $p < 0.001$.

Table 23

Summary of Kruskal Wallis H Test for Paired Group Comparison

Groups	χ^2 (df = 1)						
	PARVIEW	ECEPVIEW	SES W3	READ W3	MATH W3	READ W4	MATH W4
White/African American	92.89***	39.58***	407.90***	127.00***	122.51***	52.84***	160.09***
White/Hispanic	57.63**	4.75*	391.67***	188.00***	96.52***	68.01***	122.63***
White/Asian	10.55***	.438	146.91***	123.74***	175.54***	177.93***	156.87***
White/Other	.887	1.593	81.21***	21.09***	24.70***	8.84**	9.60**
African American/Hispanic	4.52*	12.83***	1.71	2.46	3.09	.41	2.96
African American/Asian	17.37***	16.80***	406.91***	234.02***	298.74***	240.25***	332.80***
African American/Other	44.57***	14.71***	77.50***	28.02***	17.79***	9.55**	49.95***
Hispanic/Asian	6.00**	1.00	400.54***	284.28***	289.35***	255.06***	301.34***
Hispanic/Other	23.04***	.35	63.86***	48.77***	8.51**	13.61***	32.23***
Asian/Other	3.85*	.16	200.21***	136.58***	180.03***	154.16***	145.60***

Note:

*$p < 0.05$, two-tailed test. ** $p < 0.01$, two-tailed test.

Table 24

Simple Correlations between Predictors (N = 4,500 [a])

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Male	-	-.01	-.01	-.03	.02	.02	.01	.00	.00	-.01	-.02	-.02	.02	-.01	-.01	.02	-.02	-.08**	-.06**	-.08**	-.04*
2. LBW		-	.04**	.08**	.00	-.10**	-.07**	-.05**	.01	.02	.06**	.02	-.01	.06**	-.01	.01	-.03	-.08**	-.12**	-.09**	-.17**
3. White			-	-.38**	-.41**	-.30**	-.34**	.23**	.16**	-.07**	.13**	-.13**	.39**	-.26**	.01	.03	-.06**	.09**	.08**	.04**	.10**
4. Black/AA				-	-.20**	-.17**	-.16**	-.26**	-.07**	-.02	-.08**	.13**	-.38**	.57**	.03	-.04**	.09**	-.13**	-.16**	-.11**	-.18**
5. Hispanic					-	-.16**	-.18**	-.24**	-.13**	.07**	-.04*	.08**	-.19**	-.04**	-.03*	-.04*	.00	-.18**	-.13**	-.13**	-.15**
6. Asian						-	-.13**	.28**	-.13**	.05**	-.07**	.00	-.04**	-.09**	-.04**	.08**	-.01	.25**	.28**	.27**	.26**
7. Other							-	-.04**	.11**	.00	-.01	-.04**	.01	-.10**	.03	-.02	-.01	-.03	-.05**	-.03*	-.01
8. SES								-	-.10**	-.02	.02	-.07**	.21**	-.22**	-.05**	.13**	-.04*	.46**	.46**	.41**	.44**
9. Rural									-	.00	.02	-.029	.11**	-.09**	.06**	-.05**	.01	-.09**	-.09**	-.07**	-.06**
10. Age										-	.015	.09**	-.03*	-.03	-.07**	.07**	.03	.26**	.32**	.28**	.27**
11. MATDEP											-	-.01	.09**	-.07**	-.01	.01	-.03*	.02	-.00	-.01	-.01
12. PARVIEW												-	-.13**	.14**	.03	-.06**	.11**	.04*	.04**	.06**	.04*
13. ECEP WHT													-	-.66**	-.09**	.15**	-.10**	.10**	.10**	.07**	.12**
14. ECEP AA														-	.11**	-.12**	.10**	-.11**	-.13**	-.09**	-.15**
15. ECEP HSD															-	-.85**	.09**	-.07**	-.06**	-.07**	-.06**
16. ECEP BA≤																-	-.12**	.14**	.12**	.12**	.11**
17. ECEPVIEW																	-	.02	.02	.04**	.03*
18. Read W3																		-	.79**	.69**	.65**
19. Math W3																			-	.69**	.74**
20. Read W4																				-	.82**
21. Math W4																					-

Note. Complete notes are on following page.

Table 24 *(continued)*

Simple Correlations between Predictors (N = 4,500 [a])

Note. Very LBW = very low birth weight; AA = African American; Asian/NH/PI = Asian/Native Hawaiian/Pacific Islander; Alaska/AI/M = Alaska Native/American Indian/Multiracial; SES W3 = socioeconomic status at Wave 3; Rural W3 = rural residence at the time of assessment at Wave 3; Age W3 = age in months at the time of assessment at Wave 3; MATDEP = reported maternal depression at Wave 3; PARVIEW = parents' early views of school readiness; ECEP WHT = caregivers, race white; ECEP AA = caregivers, race African American; ECEP HSD = caregivers with high school diploma, vocation training or some college education; ECEP BA≤ = caregivers with bachelor's degree or higher; ECEPVIEW = caregivers' early views of school readiness; Read W3 = reading score at Wave 3 assessment; Math W3 = math score at Wave 3 assessment; Read W4 = reading score at Wave 4 assessment; Math W4 = math score at Wave 4 assessment.

[a] Sample size is rounded to the nearest 50.

*$p < 0.05$, two-tailed test. ** $p < 0.01$, two-tailed test.

(r =.05, p =.002) at Wave 4. The results of the partial correlation analysis were comparable to the simple correlation outputs presented in Table 24, which indicate weak associations between parents' views and child reading and math outcomes at Waves 3 and 4, and between caregivers' views and child reading and math outcomes at Wave 4.

Further multiple regression analyses were conducted to evaluate the relationship between predictors and children's reading and math scores at Waves 3 and 4 (Table 25). The predictors included child gender, birth weight, race/ethnicity, SES, rural residence, age, maternal depression, parents' views of school readiness, caregivers' views of school readiness and caregiver's race and education variables. Four outcome variables—reading scores at Wave 3, math scores at Wave 3, reading scores at Wave 4, and math scores at Wave 4—were examined. At this point, additional predictors of parents' and caregivers' views of school readiness were created based on the Academic and Social Skills subscales. The predictors for parents' views on academic (PVIEW_AC) and social skills (PVIEW_SOC), and caregivers' views on academic (EVIEW_AC) and social skills (EVIEW_SOC) were calculated and centered based on the mean.

Two multiple regression models were explored. Model 1 addressed Hypotheses 1 and 2 by examining the effects of the school readiness views of parents and caregivers as measured by the 9-item School Readiness Instrument. Model 2 addressed the same hypotheses, but used the parents and caregivers' views measured by subscales for academic and social skills. Overall, both models confirmed that the selected predictors were strongly associated with child outcomes in preschool and kindergarten. Models explained between 29% and 37% of the variance in children's reading and math scores. The highest variance was explained for variance in math scores at Wave 3. The slight

differences were due to the use of the total school readiness score or academic and social subscale scores. When a total score was used, the highest variance explained by Model 1 was 36% with $R^2 = .362$, $F = 146.93$, $p < .001$. At the same time, Model 2, which used Academic and Social Skills Subscale-based scores, accounted for 0.3% more variance, with $R^2 = .365$, $F = 132.72$, $p < .001$. In both models, maternal depression and caregivers' race/ethnicity were consistently not related with child cognitive outcomes.

To further test the hypotheses that parents' and caregivers' views of school readiness are related with children's cognitive outcomes in preschool and kindergarten, and to assess the magnitude of the effect, hierarchical multiple regression analyses were performed. Before conducting hierarchical multiple regression analysis, the independent variables were examined for multicollinearity. Tests indicated low levels of multicollinearity with results of the variance inflation factor (all less than 2.0), and collinearity tolerance (all greater than .70). In hierarchical regression the predictors were entered into the analysis in several blocks. All child–related predictors were entered in the first block, parents' views of school readiness were entered next, followed by caregivers' characteristics, and caregivers' views of school readiness were entered in the final block. Again, two models were examined, with parents' and caregivers' school readiness views measured as a total score and as separate subscale scores. The results of the regression analyses presented in Tables 26 and 27 confirmed the research hypotheses that significant associations were present between parents and caregivers' views and children's outcomes in preschool and kindergarten.

Table 25

Predictors of Child Cognitive Outcomes at Waves 3 and 4, Total Score versus Academic and Social subscales

	Model 1				Model 2			
Predictor	Reading W3	Math W3	Reading W4	Math W4	Reading W3	Math W3	Reading W4	Math W4
Intercept	-13.3(1.95)***	-13.1(1.77)***	-17.9(2.8)***	-2.96(1.95)	-12.98(1.95)***	-12.8(1.76)***	-17.59(2.83)***	3.14(1.95)
Gender [a]	-1.84(.27)***	-1.28(.25)***	-2.55(.4)***	-.96(.28)**	-1.83(.27)***	-1.27(.25)***	-2.45(.40)***	-.94(.28)***
LBW [b]	-2.03(.46)***	-3.26(.42)***	-3.74(.67)***	-5.0(.46)***	-2.00(.46)***	-3.22(.42)***	-3.71(.67)***	-4.92(.46)***
AA [c]	-1.39(.51)**	-1.60(.46)**	-.69(.74)	-2.31(.51)***	-1.45(.51)**	-1.67(.46)***	-.78(.74)	-2.38(.51)***
Hispanic	-3.06(.43)***	-2.03(.39)***	-2.2(.62)***	-2.48(.43)***	-3.17(.43)***	-2.13(.39)***	-2.34(.63)***	-2.56(.43)***
Asian	3.33(.50)***	3.62(.45)***	6.61(.73)***	3.48(.50)***	3.21(.50)***	3.50(.45)***	6.49(.73)***	3.4(.50)***
Other	-.50(.44)	-1.22(.40)**	-.45(.65)	-.41(.45)	-.48(.44)	-1.24(.40)**	-.49(.65)	-.44(.45)
SES W3	5.0(.19)***	4.63(.17)***	6.31(.27)***	4.67(.19)***	5.01(.19)***	4.66(.17)***	6.33(.27)***	4.68(.19)***
Rural W3 [d]	-1.25(.38)**	-.98(.34)**	-.77(.55)	-.51(.38)	-1.26(.38)***	-.99(.34)**	-.79(.55)	-.53(.38)
Age W3	.72(.04)***	.81(.03)***	1.09(.05)***	.73(.04)***	.71(.04)***	.80(.03)***	1.08(.05)***	.73(.04)***
MATDEP[e]	.07(.55)	-.63(.50)	-.94(.81)	-.81(.56)	.08(.55)	-.60(.50)	-.94(.81)	-.81(.56)
PARVIEW	.13(.03)***	.13(.03)***	.19(.04)***	.13(.03)***	-	-	-	-
ECEP WHT[f]	.73(.44)	.18(.40)	-.32(.63)	.43(.44)	.85(.44)*	.30(.40)	.44(.63)	.52(.44)
ECEP AA	1.1(.59)	.07(.53)	.49(.85)	-.15(.59)	1.12(.59)$^{+}$	.11(.53)	.52(.85)	-.32(.59)
ECEP HSD	1.53(.54)**	1.4(.48)**	1.19(.77)	.37(.53)	1.53(.54)**	1.39(.48)**	1.19(.77)	.38(.53)
ECEP BA≤	2.70(.54)***	1.91(.49)***	2.46(.78)**	.98(.54)	2.74(.54)***	1.93(.49)***	2.52(.78)***	1.03(.54)*
ECEPVIEW	.07(.03)*	.07(.03)**	.16(.04)***	.10(.03)***	-	-	-	-

Table 25 *(continued)*

Predictors of Child Cognitive Outcomes at Waves 3 and 4, Total Score versus Academic and Social Subscales

	Model 1				Model 2			
Predictor	Reading W3	Math W3	Reading W4	Math W4	Reading W3	Math W3	Reading W4	Math W4
PVIEW_AC					.24(.04)***	.25(.04)***	.29(.06)***	.18(.04)***
PVIEW_SOC					-.21(.11)*	-.26(.10)**	-.11(.16)	-.04(.11)
EVIEW_AC					.15(.04)***	.15(.04)***	.27(.06)***	.18(.04)***
EVIEW_SOC					-.18(.10)$^{+}$	-.16(.09)$^{+}$	-.17(.15)	-.12(.10)
R^2	.327	.362	.288	.318	.330	.365	.290	.319
F	126.40***	146.93***	108.14***	124.66***	113.74***	132.72***	96.83***	111.42***

Note: Unstandardized coefficients are reported with standard errors in parentheses. Very LBW = very low birth weight; AA = African American; Asian = includes Asian/Native Hawaiian/Pacific Islander; OTHER = includes Alaska Native/American Indian/Multiracial; SES W3 = socioeconomic status at Wave 3; Rural W3 = rural residence at the time of assessment at Wave 3; Age W3 = age in months at the time of assessment at Wave 3; MATDEP = reported maternal depression at Wave 3; PARVIEW = parents' views of school readiness measured by 9-item School Readiness Instrument; ECEP WHT = caregivers' race is White; ECEP AA = caregivers' race is African American; ECEP HSD = caregivers with high school diploma, vocation training or some college education; ECEP BA≤ = caregivers with bachelor's degree or higher; ECEPVIEW = caregivers' views of school readiness measured by 9-item School Readiness Instrument; PVIEW_AC = parents' views of school readiness measured by 6-item Academic subscale; PVIEW_SOC = parents' views of school readiness measured by 3-item Social subscale; EVIEW_AC = caregivers' views of school readiness measured by 6-item Academic subscale; EVIEW_SOC = caregivers' views of school readiness measured by 3-item Social subscale; Read W3 = reading score at Wave 3 assessment; Math W3 = math score at Wave 3 assessment; Read W4 = reading score at Wave 4 assessment; Math W4 = math score at Wave 4 assessment.

[a] Female is the reference category.

[b] Combined normal and moderately low birth weight is the reference category.

[c] White is the reference category for child race/ethnicity.

[d] Urban is the reference category.

[e] Not reported maternal depression is the reference category.

[f] Other race is the reference category.

^{+}p <.10; *p < .05. **p < .01. ***p < .001.

For hierarchical regression, unstandardized coefficients based on the total score of parents' views on the school readiness were as follows: for reading scores at Wave 3, $B = .126$, $t = 4.533$, $p < .001$; for math scores at Wave 3, $B = .126$, $t = 5.014$, $p < .001$; for reading scores at Wave 4, $B = .196$, $t = 4.851$, $p < .001$; and for math at Wave 4, $B = .13$, $t = 4.674$, $p < .001$. For caregivers' views of school readiness: for reading scores at Wave 3, $B = .065$, $t = 2.29$, $p = .022$; for math at Wave 3, $B = .035$, $t = 2.79$, $p = .005$; for reading at Wave 4, $B = .158$, $t = 3.826$, $p < .001$; and for math at Wave 4, $B = .045$, $t = 3.52$, $p < .001$. The change in variance accounted for (R^2 change) was slightly larger for parents compared to caregivers, all values significantly different from zero. For example, reading score at Wave 4 was predicted significantly by parents' views of school readiness (R2 change = .004, F change = 23.53, p < .001), and by caregivers' views (R2 change = .002, F change = 14.64, p < .001). However, despite statistical significance, addition of predictors PARVIEW and ECEPVIEW to the model did not substantially improve prediction for child outcomes. For example, changing parents' views by one point, while holding all other predictors constant, would results in less than .2 units of change in children's reading scores at Wave 4.

A similar trend was observed when using parents' and caregivers' views assessed on academic and social subscales (see Table 27). The relationship was statistically significant, but the magnitude of effect was trivial with R2 change values falling between .001 and .007. Interestingly, parents' and caregivers' views assessed using the 3-item Social Skills subscale indicated trivial but persistent reverse association with children's outcomes for all assessments.

Table 26

Summary of Hierarchical Regression Analyses for Variables Predicting Child Outcomes in Waves 3 and 4, Using the 9-item School Readiness Instrument

	Reading W3			Math W3			Reading W4			Math W4		
Predictor	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*
Block 1												
Control variables[a]	.317	193.51***	-	.354	227.93***	-	.279	166.16***	-	.311	193.73***	-
Block 2												
PARVIEW	.003	20.55***	**.126*** **	.004	25.14***	**.126*** **	.004	23.53***	**.196*** **	.003	21.85***	**.13*** **
Block 3												
Control variables	.006	8.90***	-	.002	3.81**	-	.002	3.20**	-	.001	1.74	-
Block 4												
ECEPVIEW	.001	5.25**	**.065** **	.001	7.79**	**.072** **	.002	14.64***	**.158*** **	.002	12.42***	**.10*** **

Note: ΔR^2 = *R* square change; ΔF = change in *F*; *B* = unstandardized beta. PARVIEW = parents' views of school readiness; ECEPVIEW = caregivers' views of school readiness.

[a] Control variables include child gender, birth weight, race, SES, rural residence, age, and reported maternal depression.

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 27

Summary of Hierarchical Regression Analyses for Variables Predicting Child Outcomes in Waves 3 and 4, Using the Academic and Social Skills Subscales

	Reading Wave 3			Math Wave 3			Reading Wave 4			Math Wave 4 (n = 4,300)		
Predictor	ΔR^2	ΔF	B	ΔR^2	ΔF	B	ΔR^2	ΔF	B	ΔR^2	ΔF	B
Block 1												
Control variables[a]	.317	193.51***	-	.354	227.93***	-	.279	166.16***	-	.311	193.73***	-
Block 2												
PVIEW_AC	.005	16.07***	**.24*** **	.007	22.10***	**.26*** **	.005	14.07***	**.30*** **	.004	12.37***	**.19*** **
PVIEW_SOC			**-.23***			**-.28****			-.13			-.05
Block 3												
Control Variables	.006	8.83***	-	.002	3.66**	-	.002	3.14**	-	.001	1.74	-
Block 4												
EVIEW_AC	.001	5.67**	**.15*** **	.002	7.27***	**.15*** **	.003	9.93***	**.27*** **	.003	8.81***	**.18*** **
EVIEW_SOC			**-.18**$^{+}$			**-.16**$^{+}$			-.17			-.12

Note: ΔR^2 = R square change; ΔF = change in F; B = unstandardized beta. PVIEW_AC = parents' views of school readiness measured by 6-item Academic Skills subscale; PVIEW_SOC = parents' views of school readiness measured by 3-item Social Skills subscale; EVIEW_AC = caregivers' views of school readiness measured by 6-item Academic Skills subscale; EVIEW_SOC = caregivers' views of school readiness measured by 3-item Social Skills subscale;

[a] Control variables include child gender, birth weight, race, SES, rural residence, age, and reported maternal depression.

$^{+}$ p <.10; *p < .05. **p < .01. ***p < .001.

Table 28

Hierarchical Multiple Regression Analyses Predicting the Effects of Congruence of School Readiness Views, Race/Ethnicity and SES on Child Cognitive Outcomes, Using the School Readiness Instrument (9 items)

	Reading W3			Math W3			Reading W4			Math W4		
Predictor	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*
Block 1	.322	165.78***		.360	196.14***		.286	144.16***		.318	167.33***	
Control variables [a]												
Block 2	.000	.54		.000	.12		.000	1.01		.000	.84	
SR_CON[b]			-.44			-.18			-.86			-.54
Block 3	.000	..34		.001	1.64		.001	1.42		.001	2.20	
PARVIEW X SES			-.01			-.04			**-.08**$^{+}$			**-.08***
ECEPVIEW X SES			.04			**.05**$^{+}$			.01			.01
SR_CON X SES			-.133			-.86			-1.26			-.64
Block 4	.002	1.05		.001	.56		.003	1.30		.002	1.05	
SR_CON X AA			1.56			-.86			-3.47			-1.47
SR_CON X Hisp			1.11			-.96			.31			.55
SR_CON X Asian			.64			1.99			.88			**4.49***
SR_CON X Other			2.44			-.52			-1.64			.16
PARVIEW X AA			.07			.09			.12			.10
PARVIEW X HISP			-.04			. 01			.13			.08
PARVIEW X ASIA			**-.16**$^{+}$			-.05			.21			-.01
PARVIEW X OTHE			-.13			-.09			**-.24**$^{+}$			-.12
ECEPVIEW X AA			-.03			.06			-.09			.10

Table 28 *(continued)*

Hierarchical Multiple Regression Analyses Predicting the Effects of Congruence of School Readiness Views, Race/Ethnicity and SES on Child Cognitive Outcomes, Using the School Readiness Instrument (9 items)

	Reading Wave 3			Math Wave 3			Reading Wave 4			Math Wave 4		
Predictor	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*
Block 4 *(continued)*												
ECEPVIEW X HISP			-.14			.07			-.10			.01
ECEPVIEW X ASIA			.00			-.02			-.22			-.05
ECEPVIEW X OTHE			-.14			.08			-.05			.01

Note: B = unstandardized beta coefficient; SR_Con = congruence of parents and caregivers' views on the School Readiness Instrument;

[a] Control variables include gender, birth weight, race/ethnicity, SES, rural residence status, age, caregivers' education (high school diploma or some college), caregiver has BA degree or higher, sum of parents views of school readiness (sum of parents' scores to the School Readiness Instrument), and caregivers' views (sum of caregivers' scores to the School Readiness Instrument)

[b] Medium congruence is the reference category.

$^{+}p < .10$. $*p < .05$. $**p < .01$.

Table 29

Hierarchical Multiple Regression Analyses Predicting the Effects of Congruent Views, Race/Ethnicity and SES on Child Cognitive Outcomes, Using the Academic Skills and Social Skills Subscales

	Reading Wave 3			Math Wave 3			Reading Wave 4			Math Wave 4		
Predictor	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*
Block 1	.330	113.74***		.365	132.72***		.290	96.83***		.319	154.22***	
Control variables												
Block 2	.000	.28		.000	.66		.001	2.11		.000	1.24	
CON_AC			-.05			.13			.32			.06
CON_SOC			-.43			-.68			**-1.94***			-1.00
Block 3	.000	.32		.001	1.18		.001	1.03		.002	1.96^{+}	
PVIEW_AC X SES			-.03			**-.08^{+}**			-.08			**-.12***
PVIEW_SOC_ X SES			-.03			.03			-.12			.04
EVIEW_AC X SES			.03			.06			-.03			-.06
EVIEW_SOC X SES			.04			.06			.12			.20
CON_AC X SES			-.44			-.61			-1.07			-.31
CON_SOC X SES			.30			-.35			-.31			-.29
Block 4	.004	.94		.003	.76		.005	1.36		.005	1.33	
PVIEW_AC X AA			.06			.09			.06			.08
PVIEW_SOC_ X AA			.14			1.0			.29			.24
EVIEW_AC X AA			-.15			-.05			**-.49***			-.11
EVIEW_SOC X AA			.31			.42			**1.19***			**.82***
CON_AC X AA			1.10			.61			-.04			.47
CON_SOC X AA			.91			-2.05			-4.24			-2.46
PVIEW_AC X HISP			.09			.05			.28			.15
PVIEW_SOC_ X HISP			-.25			.00			-.22			-.04

Table 29 *(continued)*

Hierarchical Multiple Regression Analyses Predicting the Effects of Congruent Views, Race/Ethnicity and SES on Child Cognitive Outcomes, Using the Academic Skills (6 items) and Social Skills (3 items) Subscales

Predictor	Reading W3			Math W3			Reading W4			Math W4		
	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*	ΔR^2	ΔF	*B*
Block 4 *(continued)*												
EVIEW_AC X HISP			**-.25**$^{+}$			.07			**-.47***			-.14
EVIEW_SOC X HISP			.17			.10			**1.00***			.46
CON_AC X HISP			1.66			-.38			2.85			1.19
CON_SOC X HISP			-.97			-.15			-4.83			-1.17
PVIEW_AC X ASIAN			-.13			.04			.25			-.01
PVIEW_SOC_ X ASIAN			-.16			-.26			.11			.02
EVIEW_AC X ASIAN			.10			.15			**-.42***			-.14
EVIEW_SOC X ASIAN			-.18			-.35			.55			.41
CON_AC X ASIAN			1.20			1.45			2.67			**4.65****
CON_SOC X ASIAN			-3.07			-2.08			**-6.51**$^{+}$			**-4.31**$^{+}$
PVIEW_AC X OTHER			-.22			-.11			-.29			-.13
PVIEW_SOC_ X OTHER			.17			-.04			-.03			-.03
EVIEW_AC X OTHER			-.22			-.10			**-.38***			**-.34***
EVIEW_SOC X OTHER			.07			**.66***			**.94**$^{+}$			**1.09****
CON_AC X OTHER			.84			.67			-.55			1.24
CON_SOC X OTHER			2.25			-1.69			-1.10			-1.69

Note: CON_AC = congruence on Academic Skills Subscale; Con_SOC = congruence on Social Skills subscale; PVIEW_AC = parents' views measured by Academic Skills subscale; EVIEW_SOC = caregivers' views measured by Social Skills subscale.
$^{+}p < .10$. $*p < .05$. $**p < .01$.

Lastly, to address hypotheses 4 and 5, hierarchical regression analyses were performed with predictors of parents' and caregivers' views and congruence predictor indices r*WG(J) under moderating effects of SES and race/ethnicity. As before, two different models were examined to test for differences in the outcomes. The first model investigated total school readiness views (PARVIEW and ECEPVIEW) and their congruence (SR_CON) and included two-way interactions with SES (e.g., PARVIEW x SES, EVIEW x SES, SR_CON x SES) and child race/ethnicity (e.g., PARVIEW x Asian, EVIEW x HISP, SR_CON x Other). The second model focused on distinctions of academic and social skills, and examined parents and caregiver views categorized into subscales (PVIEW_AC and PVIEW_SOC, EVIEW_AC and EVIEW_SOC) and similarly differentiated congruence (Con_AC and CON_SOC), and their interactions with SES and race/ethnicity. The findings are presented in Table 29.

The first model using the full School Readiness Instrument (Table 28) did not find association between the congruence of parents and caregivers' views and children's reading and math scores. One significant outcome emerged in the second model that examined academic and social skills congruence separately. The finding indicates that there is a statistically significant negative association between reading scores at Wave 4 and congruence on the Social Skills subscale (B = -1.94, t = 2.837, $p < .05$).

In the next step, interactions between SES and congruent views were added. The SES-moderated effects of total parents' views on the School Readiness Instrument were statistically significant for predicting reading (B = -.08, $p <.10$) and math scores at Wave 4 (B = -.08, t = 1.962, $p < .05$). Another marginally significant interaction between SES and caregivers' views on math scores at Wave 3 was detected (B = .05, $p < .05$). No significant results were determined for interactions between SES and total congruence (SR_CON). When school

readiness views were assessed separately on academic and social subscales, one significant moderated interaction emerged. The SES-moderated effects of parents' views on academic skills were significant for math scores at Wave 3 (B = -.08, p < .10).

Finally, the effects of congruence moderated by race/ethnicity on child outcomes were investigated. One significant and two marginally significant interactions were identified for the full School Readiness Instrument. The interactions indicated that the slope of congruence and math scores at Wave 4 are 4.49 points higher for Asian children (B = 4.49, t = 2.914, p < .05). But being Asian predicted slightly lower reading scores (.16 points) at Wave 3 associated with the effect of parents' views 3 (B = -.16, p < .10). Similarly, the effects of parents' views on readings scores at Wave 4 were .24 points lower for children who were Alaskan Native/American Indian/Multiracial (B = -.24, p < .10).

When the predictors were separately estimated on the Academic and Social Skills Scales, over a dozen significant interactions emerged. About half were associated with math scores at Wave 3. Three significant interactions between congruence and caregivers' views measured on the Social Skills subscale suggested that being Alaskan Native/American Indian/Multiracial predicted higher effects of caregivers' views about social skills on math tests at Waves 3 and 4 (B = .66, t = 2.06, p = .039; B = 1.09, t= 3.089, p = .002) and reading test at Wave 4 (B = .94, t = 1.82, p = .067). For Alaska Native/American Indian/Multiracial children, significant but negative associations were detected with caregivers' academic skills views and reading and math tests at Wave 4. Significant interaction effects were also found for Asian, Hispanic and African American children. The effects of congruence of parents' and caregivers' social skills views on math and reading scores at Wave 4 were significantly lower for Asian children (B = -6.51, t = -1.783, p = .075; B = -4.31, t = -1.712, p = .087), but when parents and caregivers

were congruent on academic skills, Asian children had 4.65 points higher results on math tests at Wave 4 ($t = 2.835$, $p = .005$). For more detailed results see Table 29.

CHAPTER 6

DISCUSSION AND CONCLUSION

This dissertation study examined parents and caregivers' early views of school readiness and their relationship to children's cognitive outcomes in preschool and kindergarten. More specifically, I sought to investigate whether congruence or agreement of parents' and caregivers' views is associated with children's scores on reading and math tests, and whether children's outcomes varied by degree of congruence between parents' and caregivers' views of school readiness. Finally, the study investigated whether race/ethnicity and SES moderated the relationship between parents' and caregivers' views, and children's reading and math scores.

The data used for this study were obtained from the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B), administered by the National Center for Education Statistics. The ECLS-B is a nationally representative longitudinal study of approximately 10,700 children born in 2001. American Indians, Alaska Natives, twins and low birth weight infants were oversampled. The ECLS-B data was collected in five successive waves from birth to kindergarten. The analyses of this study included only the preschool (Wave 3) and the kindergarten 2006 wave (Wave 4) data with approximately 4,500 children.

Discussion

Main Effects of Parents' and Caregivers' Views of School Readiness

Parents' and caregivers' school readiness views were measured using the 9-item School Readiness Instrument. The variables representing parents' and caregivers' school readiness views were created by summing up the scores for respective responses to individual items on the

measure. The hypotheses that parents' and caregivers' early views of school readiness were associated with children's cognitive outcomes in preschool and kindergarten were supported by data. Specifically, higher scores of parents' and caregivers' views were linked to better reading and math scores at both times. However, despite statistical significance, the effect sizes for these associations were not meaningful substantively. This issue of magnitude and substantive significance of findings will be discussed later.

Main Effects of Congruence on Child Outcomes

Factor analyses performed to examine the construct of school readiness, produced evidence of two underlying factors: The validated School Readiness Instrument is constituted of two subscales—Academic Skills subscale and Social Skills subscale. Congruence indices were estimated for all three measures—total score and 2 subscale scores. Overall, parent and caregiver responses were congruent. For example, on the School Readiness Scale, over a third of responses provided by pairs of parents and caregivers were highly congruent, falling within one category of response on the Likert scale.

However, the findings are inconclusive about the relationship between congruence and children's cognitive outcomes. There is insufficient evidence to validate the assumption that high congruence between parents' and caregivers' views is associated with higher scores on reading and math tests. When examined at the total scale level, there is no indication that congruence is related to child outcomes. When calculated separately for each subscale, congruence on the Social Skills subscale was negatively associated with children's reading scores at Wave 4. However, after entering interaction effects and moderators, the effects of congruence appeared inconclusive.

Moderating Effects of SES and Race/Ethnicity

The findings indicated SES had little or no effect on the relationship between children's cognitive outcomes and parents' and caregivers' congruence when congruence was calculated separately for academic and social subscales, or estimated as one composite. SES significantly moderated the effect of parents' and caregivers' views on children's math scores at Wave 4, and was somewhat marginally associated with children's math outcomes at Wave 3 and reading at Wave 4. However, for all interactions the effect size for the difference remained extremely small.

The interaction effects of race/ethnicity on the association between congruence and child outcomes are more evident. When the composite congruence was used, two significant interactions were found. Asian children and children who were Alaska Native/American Indian/Multiracial, whose parents' views were highly congruent with caregivers' views, had better math scores at Wave 3 and Wave 4, respectively. For Asian children, their race moderated the effects of congruence on child outcomes at Wave 4, resulting in a 4.49-point increase in math scores, $p < .05$. When social and academic subscales were estimated separately, race significantly moderated the effects of academic scale congruence on math scores at Wave 4 for Asian children ($B = 4.65$, $t = 2.835$, $p = .005$). The positive effects of race have been especially evident when moderating the associations between caregivers' views about importance of social skills and children's reading scores at Wave 4. It appears that when caregivers rated social skills as *Important*, African American, Hispanic, and Alaska Native/American Indian/Multiracial children were likely to yield significantly more positive cognitive outcomes in kindergarten. At the same time, when caregivers rated academic skills as *important*, cognitive outcomes for African American, Hispanic, Asian, and Alaska Native/American Indian/Multiracial children, particularly math scores in kindergarten, were likely to be negatively affected. No effects of

race/ethnicity on the relationship between parents' views and child outcomes were detected. Two possible explanations for these finding are offered. First, Alaskan Native/American Indian/Multiracial families may share some unique cultural views related to academic and social skills that White families do not have. Second, the existing instruments may lack the qualities necessary to accurately assess the views of school readiness in different subpopulations. Therefore, the School Readiness Instrument may not be detecting some important cultural dimensions of parents' and caregivers' school readiness views.

Statistical Versus Substantive Significance

In the current study, child's race/ethnicity, SES, age, and gender explained most of the variance in outcome variables. Parents' and caregivers' early views of school readiness and congruence of their views appear to provide little predictive power beyond that contributed by initial covariates. The findings reported in this section indicate that the associations between children's outcomes and parents' and caregivers' views and their congruence were all statistically significant at the .05 and .10 levels; however, their effect sizes remained extremely small.

Miller (2008) highlighted two aspects of significance that are important for research. The first one is statistical significance, which is determined using inferential statistics; while it is essential for hypothesis testing, it alone does not explain "the real-world meaning" of the findings of this study. Substantive significance (the second aspect), when applied to interpret the findings in the context of a specific study, may have different meanings depending on the research topic and discipline. Therefore, based on these considerations, the findings of the current study need to be interpreted with caution, with special attention given to research question, context, and study limitations.

Study Limitations

There are several limitations to note regarding this dissertation study. Perhaps the most serious limitation is the attempt to measure the sophisticated construct of school readiness using a simplistic approach. The School Readiness Instrument was designed in the 1990s by reviewing existing scales and compiling single items pertaining to school readiness. The initial instrument consisted of 15 items measuring school readiness. Earlier in this dissertation study, the School Readiness Instrument was assessed using parallel analysis, one of the most recognized methods for factor extraction. The results were indicative of 4 to 6 factors in the model, which serves as another proof of the complexity of the school readiness construct. Further factor analyses suggested a 9-item measure with two subscales—academic and social. This final 9-item School Readiness Instrument (α = .88 for parents' views and α = .86 for caregivers' views), and its subscales—Academic Skills subscale with 6 items (α = .87 for parents' views and α = .85 for caregivers' views), and the Social Skills subscale with 3 items (α = .75 for parents' views and α = .71 for caregivers' views)—appeared internally consistent. However, questions remain about the construct validity of the current instrument, and whether the instrument is an adequate measure for the multifaceted meaning of school readiness when used in diverse cultural contexts.

A second possible limitation of this study is social desirability bias in responses provided by parents and caregivers. The data were collected via face-to-face and phone interviews which are known to produce socially desirable responses (Tourangeau & Yan, 2007). Both parents and caregivers had reasons to view the interview questions about school readiness as sensitive, and, therefore, provide more socially desirable responses in order to avoid social disapproval. One indication of this is the limited variation in responses, with most parents' and caregivers' responses belonging to Likert scale categories *Very important* and *Essential*. Other limitations of

the study include the use of the centered composite variable of SES, which was slightly skewed (M = .09) due to baseline weighting; however, this methodology was not regarded as a problem by statisticians at the NCES (J. MacCarroll, personal communication, April 10, 2013,).

Implications for Practice, Research, and Policy

Implications for Future Research

This dissertation study offers several recommendations for future research. First, this study reaffirms the complexity of the construct of school readiness and demonstrates that measuring school readiness requires more than a simple measure. More research is needed to advance our understanding of what constitutes school readiness and design accurate measurement models. One important lesson from this study is that researchers must recognize that measurement tools originally designed several decades ago may not be appropriate in current economic, social, and cultural contexts. For this reason, and given the high availability of sophisticated statistical tools, it is essential that all existing instruments are put through detailed testing and validation processes to ensure that they meet rigorous research standards.

Second, the study findings indicate the significant associations between parents' and caregivers' views about school readiness and children's cognitive outcomes. Although there is some evidence that individual beliefs, values, and attitudes may affect parenting and teaching practices, which, in turn, influence the skills and competencies adults nurture in children (Alexander, Entwisle, & Horsey, 1997; Axinn, Barber, & Thornton, 1999; Bates et al., 1994; Charlesworth et al., 2006; Olsen & Bruner, 1996; Stipek et al., 1992), caution should be exercised before assuming causality. There are questions remain about how and when parents' and caregivers' views of school readiness are shaped, how important and accurate these views

are, and how these views are influenced by race/ethnicity, child's special needs, household poverty, parental education, and other factors. Further, while this dissertation study examined the congruence of parents' and caregivers' views on school readiness and the effects of congruence on children's early cognitive outcomes, the mechanisms of their reciprocal influence and their interplay with contextual factors, and how the congruence and its strength affect children over time, are not entirely clear.

This study suggests the need to more closely examine the effects of parents' and caregivers' school readiness views on child outcomes for specific subgroups. In the current study, the Asian and Alaska Native/American Indian/Multiracial children showed greater variability in the outcome, demonstrating more sensitivity to differences. In-depth studies to further refine the current measurement model by race/ethnicity and by caregivers' status (e.g., relative caregiver versus preschool teacher) are needed. Studying social and cultural factors is important for understanding the dynamics of parent and caregiver behaviors and practices and their impact on child outcomes.

School readiness continues to be an important topic for educational policy and practice for the foreseeable future. To better assist policymakers and practitioners in their goal to help young children and families achieve school success, it is essential to continue expanding and improving this body of research. Future studies will benefit from using supplementary data from multiple sources (e.g., home and school observations, informal contacts with parents and caregivers). Studies need to better identify and examine unique cultural values and beliefs about school readiness among parents, caregivers, and early childhood professionals to offer deeper insights about serving diverse groups. Further longitudinal initiatives need to be launched to continue providing valuable research data on the impact of school readiness efforts on the

trajectory of child development. Finally, researchers must recognize the value and need for accurate interpretation of school readiness data to facilitate informed decisions to better serve children.

Implications for Practice

The concept of school readiness includes much more than children themselves and their academic skills. Health, nutrition, social and emotional development, parents, and communities, as well as schools and teachers, are integral parts of children's school success (NEGP, 1997). The key role of schools and early childhood professionals in getting children ready was also acknowledged by the National Association for the Education of Young Children (NAEYC), the world's largest organization working on behalf of young children. In its position statement (1995), NAEYC declared that schools and teachers must be ready to help children learn and are responsible for providing necessary services to help children reach their fullest potential.

The findings of the current study support NAYEC's statements about the central role of parents, caregivers, and educators in early development and endorse the NAEYC position on recognizing and accepting children's individual differences (1995). Furthermore, the study offers additional insights and implications for practitioners related to developing and maintaining successful partnerships with parents of young children. First, it is critical that parents and caregivers from diverse backgrounds recognize and accept school readiness as an important prerequisite for children's success in school and later life. Practitioners should be aware that some families, including economically disadvantaged and/or minority families, may lack sufficient knowledge about the meaning and value of school readiness. Tailored training and information sessions to discuss school expectations and ways to get children ready for school,

and to share resources and experiences, will help facilitate working relations among families, communities, and early childhood professionals.

This study also brings focus to the cultural context of child development discussed by many scholars. One of the most prominent sociocultural theories of learning, developed by Russian psychologist Vygotsky, suggests that child learning results from interactions with more knowledgeable persons using cultural tools such as language (Woolfolk, 1998). The findings of this dissertation study support Vygotsky's beliefs about the effects of culture on child's cognitive outcomes. Given that familiarity with social and cultural contexts may serve as a valuable asset in practitioners' work, it is important for professionals to know about the school readiness beliefs, expectations, and experiences of the families with whom they work. Having a deeper understanding of the cultural aspects of preparing children for school success substantially improves the ability of professionals to recognize diverse manifestations of school readiness and to coordinate their efforts with families when helping young children navigate in different cultures. Research evidence confirms the critical importance of having early childhood professionals from diverse backgrounds and/or bilingual abilities for serving cultural minorities (Buysse, Castro, West, & Skinner, 2004).

Finally, in addition to supplementing their practices with valuable knowledge of diverse cultures and their experiences, this study calls upon practitioners to reevaluate current models of collaboration with families of young children. The finding that for certain races and cultures, congruence of views among parents and caregivers has greater influence on children's school success suggests promising options for further exploration. It is possible that parent-teacher collaboration models in which the parties, rather than being congruent, complement each other in their efforts to promote school readiness may have positive effects for some cultural groups.

Further elaboration and experiments in this direction are needed. Practitioners are strongly encouraged to continue their search for effective partnership models that benefit all young children regardless of their ability levels, cultural and linguistic backgrounds, and SES.

Implications for Policy

The study has several implications for policies to promote school readiness. First, it highlights the importance of strengthening ongoing dialogue between policymakers on one side, and parents, practitioners, and researchers on the other. Maximizing the effectiveness of this dialogue will require effort on both sides of the table. Policymakers need to make themselves aware of the most up-to-date developments in the field, including critical issues related to school readiness initiatives, community resources, and family experiences. To enable this awareness, parents, practitioners, and researchers must provide accessible, useful, and meaningful data in a format that can be used to inform future policies (Saluja, Scott-Little, & Clifford, 2000).

Next, the persistence of the achievement gap, despite the long history of state and federal policies and programs on school readiness, suggests the need to maximize policy impact, possibly through a thorough reexamination of the effectiveness of policy initiatives and subsequent improvement of the ability to measure their implementation and success. This critical need for rigorous evaluation tools to investigate the impact of policy initiatives on children and families is closely linked to the issue of school readiness assessment strategies. The study findings indicate a compelling need for more accurate school readiness assessment techniques, a cornerstone to assessing the impact of policy on system improvement and on outcomes for parents and children. The data collected may be used to guide policy priorities in long range strategic planning to help the families and caregivers in promoting school readiness of young children.

In essence, the ultimate goal of every educational program and policy is to create positive and lasting outcomes for all parents and children. As such, school readiness policies must aim at building successful partnerships with families and communities to foster children's success. By examining the effects of congruence of school readiness views between parents and caregivers on child outcomes, the study contributes more depth to the perspectives of collaboration among school readiness stakeholders, and highlights the integral role of parents, other significant adults and home culture for early development.

Conclusion

Growing market competition and increasingly high standards for the global workforce have placed a greater emphasis on school readiness, a complex construct with multiple dimensions. The challenges facing school readiness are well known: defining and measuring school readiness, determining the best ways to promote school readiness, and designing and implementing programs and policies to help children succeed in school (Ackerman, & Barnett, 2005). Still, after decades of experimenting with a long list of local, state, and federal programs and policies, school readiness has yet to be understood and achieved. It is clear that addressing the multiple challenges of increasing school readiness will require coordinated efforts by researchers, policymakers, and practitioners. This dissertation study strives to contribute to the body of readiness research by offering new insights into factors associated with improving child outcomes.

Although the importance of families, communities, schools, and teachers in children's early education and development has been long recognized (NAEYC, 1995; NEGP, 1997), few research efforts have been made to study parents' and caregivers' views of school readiness, their congruence, and how they relate to children's cognitive outcomes. This dissertation study

examined parents' and caregivers' understanding of school readiness, the congruence of their views, and their relationship to early childhood outcomes in preschool and kindergarten using the ECLS-B longitudinal data. This study found small but significant indications that the way parents and caregivers view school readiness has an important association with child early reading and math scores. Further, it suggested that children from certain ethnic groups, specifically Asian and Alaska Native/American Indian/Multiracial children, may have significantly different outcomes compared to White children raised in similar contexts.

This dissertation study advances the existing research on school readiness in several ways. First of all, this study is the first of its kind to measure congruence between parents' and caregivers' views of school readiness using multiple innovative approaches for measuring congruence. Next, the study validated and revised the School Readiness Instrument initially developed for use in the National Household Education Survey (West et al., 1990) and consequently used for the ECLS-B. It is interesting to note that more significant associations between school readiness views and child outcome variables were found when using the separate subscales of the School Readiness Instrument, not the entire instrument. Third, the study offers more insights into the complexity of the meaning of school readiness for early and special education, and social work professionals working in diverse cultural contexts.

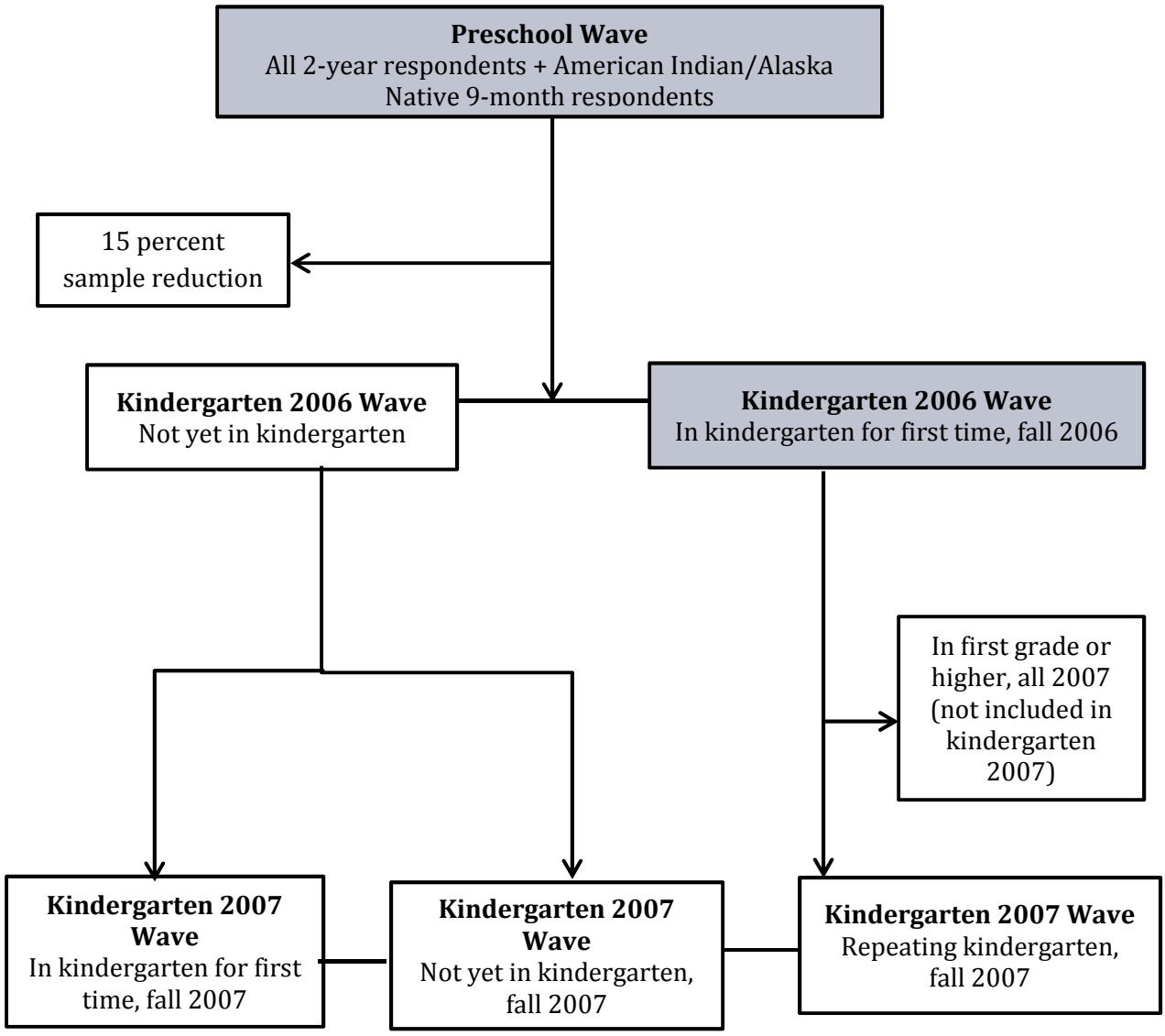
Overall, the findings support the notion that parents and caregivers play a critical role in children's early development. Hypothetically, when parents and caregivers place higher value on school readiness, their decisions are more likely to be guided by these views, providing children with better opportunities for development. As such, children whose parents and caregivers highly value school readiness and are in high congruence, are likely to benefit most and have better cognitive outcomes. However, given the magnitude of the study findings and their conflicting

nature, the question about the associations between congruence of views and child outcomes remains inconclusive.

This study clearly demonstrates that simplistic attempts to measure school readiness views are not working. They indicate the need for more refined instruments to enable researchers more accurately measure multiple dimensions of school readiness. Finally, the study also cautions that the understanding of school readiness may vary vastly among parents, community members, early childhood professionals, and researchers. Given the different patterns in child outcomes among various ethnic/cultural groups, it is recommended that future research focus on cultural aspects and perceptions of school readiness. The suggestions from this research study need to be considered when designing and implementing educational policies and programs to help children, their families, and communities to achieve better outcomes.

Appendix A

Figure 6. Flow of Participants in the ECLS-B, preschool through kindergarten



Adapted from the U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), preschool (2005–06), kindergarten 2006 (2006–07), and kindergarten 2007 (2007–08) data collections.

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