Independent Evaluation of the Midwest CPC Expansion Project: Final Report

December 31, 2016

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MIDWEST CPC PreK-3rd EXPANSION

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1. Introduction

In 2011, the Human Capital Research Collaborative (HCRC) at the University of Minnesota, a partnership of the university's Humphrey School of Public Affairs and the Institute of Child Development, received a 5-year, $15 million Investing in Innovation (i3) Validation Grant from the U.S. Department of Education's Office of Innovation and Improvement. The i3 grant program was for the expansion of innovative interventions that have a demonstrated record of improving the academic outcomes of high-need students. The grant funds supported the Midwest Child-Parent Center (CPC) Expansion project, the goal of which was to increase the number of schools and districts implementing the CPC preschool-through-third grade program model. First implemented in Chicago in 1967, the CPC model has a long history of offering innovative, targeted approaches to school reform including a comprehensive system of educational and family support services during the preschool through third grade years for young children in low-income neighborhoods. The CPC model promotes school readiness, early school achievement, and parent involvement, with the ultimate objective of improving long-term outcomes such as educational achievement, career success, and adult well-being.

With i3 grant support, the HCRC used findings from the developing CPC evidence base to improve on and update key components of the CPC program model and expand its implementation in persistently low-performing schools in five school districts in Illinois and Minnesota.[1] These CPC sites represented a wide geographic area, encompassing urban, suburban, and rural areas. The specific objectives of the grant were to improve short-term outcomes in school readiness at kindergarten entry and to improve school achievement and social-emotional outcomes in first and second grade among CPC participants. Expected longer-term outcomes, which could not be assessed during the 5-year, i3 grant period, include improved achievement in reading and mathematics in third grade, improved high school graduation rates, and decreased need for later special education services. Given the CPC model's emphasis on comprehensive family support, greater parental involvement in their children's education and gains in parents' own education and employment trajectories were also expected short- and long-term outcomes, respectively.

This report presents the results of an evaluation of the Midwest CPC Expansion project. The i3 grant requirements stipulated that the grantees generate additional evidence of the funded

[1] The school districts were Chicago Public Schools, Saint Paul Public Schools, Unit 65 in Evanston, IL, Unit 5 in Normal, IL, and Virginia School District, MN.

program's effectiveness and the contexts in which it was most effective. Grant recipients must thus use a portion of their budgets to fund an independent evaluation. HCRC subcontracted with SRI International (SRI) to evaluate the implementation and impact of the Midwest CPC Expansion project using a quasi-experimental longitudinal study design to examine outcomes at kindergarten entry and at the end of second grade.

The Midwest CPC Expansion project and evaluation began in 2012, with the identification of 26 participating CPC schools and 24 matched comparison schools. Children could participate in up to 2 years of CPC preschool starting at age 3 or 4. Children began participating in preschool in fall 2012, and initial outcomes were assessed when the participating children entered kindergarten in fall 2013 for the 1-year preschool cohort and in fall 2014 for the 2-year preschool cohort. SRI researchers collected data again at the end of second grade for those children (from the 1-year preschool cohort) who were in second grade during the 2015–16 school year. The 5-year grant funding ended in December 2016.

This report has four main sections. This first section provides (1) an overview of the i3 grant competition and the i3 priorities addressed by the Midwest CPC Expansion project, (2) a description of the development of the original CPC program model and the evidence base supporting its efficacy, and (3) a brief literature review of the components and requirements of the Midwest CPC Expansion project. The second and third sections describe the implementation and impact studies, both requirements of the i3 grant program. The last section discusses the findings, implications, and limitations of the implementation and impact studies.

Investing in Innovation (i3) Grant Program

The i3 Fund was established under section 14007 of the American Recovery and Reinvestment Act of 2009. It provided competitive funding for local education agencies or nonprofit organizations collaborating with one or more local education agencies to expand practices that had demonstrated evidence of a positive impact in reducing achievement gaps and improving student outcomes in academic achievement and growth, high school completion, and college enrollment and completion.

The i3 grant competition offered three types of awards: development grants, validation grants, and scale-up grants. Development grants supported programs with promise or a strong theory that could be further developed and taken to scale. Validation grants—one of which funded this project—supported programs with moderate evidence of effectiveness that could be scaled up

regionally or statewide. Scale-up grants supported programs with a strong evidence base that could be scaled up nationally.

To leverage the i3 funds, the U.S. Department of Education required that applicants secure in-kind or matching funds from the private sector. The required match was a percentage of the total grant award, and the amount varied by the type of award. Development grants required a 5% match, validation grants required a 10% match, and scale-up grants require a 15% match. For the Midwest CPC Expansion project (which was funded at $15 million), several private foundations and organizations collectively contributed $1.5 million in matching funds to meet this requirement, and school districts and other partners contributed an additional $1.8 million.

Each year of the competition, the i3 grant program established a set of absolute priorities and competitive preference priorities to guide the selection of grant awards, and applicants must choose at least one absolute priority to address. The Midwest CPC Expansion project chose three absolute priorities and two competitive preference priorities.

- *Absolute Priority 4: Innovations that Turn Around Low-Performing Schools.* The Midwest CPC Expansion project was an evidence-based, targeted approach integrating a comprehensive set of supports to strengthen achievement among students in high-poverty neighborhoods.
- *Absolute Priority 1: Innovations that Improve Effectiveness of Teachers and Principals.* The project provided teachers and principals with training to enhance their skills in supporting high-need children through increased use of evidence-based curricula, aligned curricula across grades, and strategies to create classroom environments conducive to parent involvement and parent-teacher communication.
- *Absolute Priority 3: Innovations that Complement High Standards and High-Quality Assessments.* The Midwest CPC Expansion project aimed to accelerate children's knowledge and skills in reading and math with the expectation that children would be more likely to exceed proficiency standards on third-grade assessments. It also promoted the use and integration of high-quality assessments into classroom practice to monitor individual children's academic progress.
- *Competitive Preference Priority 6: Innovations for Improving Early Learning Outcomes.* The Midwest CPC Expansion intervention begins with high-quality preschool experiences with the expectation that children participating in CPC preschool sites would enter kindergarten

with higher levels of readiness in language, literacy, math, and social development than children not attending CPC preschool. Some CPC sites provided up to 2 years of preschool beginning at age 3 in which children attended small classes taught by certified teachers.

- *Competitive Preference Priority 9: Improving Productivity*. The CPC model of comprehensive and intensive services has been shown to reduce costs in remedial education and services to address problem behaviors over the course of students' school careers and into adulthood.

Overview of the Child-Parent Center (CPC) Program and Its Evidence Base

The Midwest CPC Expansion project evolved from the Child-Parent Center (CPC) program, a publicly funded early childhood intervention first implemented in 1967 in four of the highest poverty schools in Chicago (Reynolds, 1997, 2000). The intervention promoted young children's school success through language enrichment and intensive, mandatory parent involvement within a system of comprehensive support services for children and their families. The CPC program is one of the longest running federally funded early childhood programs (second only to Head Start) and the first preschool program to be funded by Title 1 of the Elementary and Secondary Education Act of 1965. Beginning in 1978, the state of Illinois expanded the CPC program to include intervention in the early elementary school grades using Title I funding, thus making CPC the first federally funded program to offer comprehensive programming to support children's development from age 3 through the transition to kindergarten and into third grade.

The ongoing Chicago Longitudinal Study (CLS) is a large, quasi-experimental research study designed to assess the short- and long-term outcomes of participation in the CPC model. Specifically, in the CLS, researchers collected data on the school readiness and academic outcomes of a non-randomized cohort of CPC participants who attended CPC model sites in the 1980s. The CLS principal investigator, Arthur Reynolds, and his colleagues have tracked approximately 90% of CLS participants into adulthood and have published numerous articles that present findings about educational and adult outcomes at various points in time (e.g., Reynolds, 1994, 2000; Reynolds & Robertson, 2003; Reynolds, Temple, Ou, Arteaga, & White, 2011).

For the earliest CLS studies, researchers examined CPC participants' school readiness at kindergarten entry, as well as participants' reading and mathematics achievement on the Iowa Tests of Basic Skills (ITBS) (Hieronymus, Lindquist, & Hoover, 1980), rates of grade retention and special education placements, life-skills competence, and teacher-rated school adjustment

at various times through eighth grade (e. g. Reynolds, 1994, 1995, 1997, 2000; Reynolds, Mavrogenes, Bezruczko, & Hagemann, 1996; Reynolds & Robertson, 2003; Reynolds & Temple, 1998; Reynolds, Temple, & Ou, 2003). Later CLS studies followed the sample into adolescence and early adulthood, assessing outcomes using school administrative data on academic performance; interview and survey data from teachers, parents, and youth on participants' academic, social, and psychological development; and records from the juvenile and adult criminal justice systems (Reynolds, 1997; Reynolds, Temple, Robertson, & Mann, 2001). Studies have further examined the economic benefits of the CPC model in terms of long-term cost savings associated with the positive outcomes achieved by CLS participants in adolescence and adulthood (Reynolds & Temple, 2008; Reynolds, Temple, Robertson, & Mann, 2002; Reynolds, Temple, White, Ou, & Robertson, 2011; Temple & Reynolds, 2007).

The original CLS intervention group comprised 989 children who resided in Title I-funded school neighborhoods in Chicago (Reynolds & Ou, 2011). According to Reynolds and colleagues, nearly half (41%) of the residents in these neighborhoods lived in poverty in 1989, when the original CPC cohort had completed the intervention (Reynolds, 1997, 2000). The sample also reflected the racial and ethnic makeup of the local area, with 93% of participants identified as African American and 7% Latino/a. Children in the CLS cohort graduated from kindergarten in 1986 (Reynolds, 1994).

An initial CLS comparison group comprised 389 children in Chicago who did not live in a neighborhood supported by a CPC (Reynolds, 1997). These children completed an all-day kindergarten program in 1986 at one of six randomly selected schools participating in an intervention for high-risk students in elementary schools in Chicago with populations that were largely African American children. The comparison group matched the study sample on age, gender, eligibility for public assistance including free lunch, and neighborhood and family poverty (Reynolds, 1997).

Because children in the CLS entered and exited the CPC program at different ages and for different reasons, the duration of CPC participation varied between 1 and 6 years (i.e., the full intervention could last from age 3 to second or third grade, depending on the school). Across several studies Reynolds and his colleagues have compared the outcomes of various groups of CLS participants, including those having (a) *any* CPC experience (i.e., between preschool and third grade), (b) any CPC *preschool* experience (i.e., either 1 or 2 years), (c) 1 year versus 2 years of CPC *preschool* experience, (d) CPC experience in both preschool and kindergarten, (e)

CPC experience in kindergarten through third grade (i.e., with no CPC preschool experience), (f) the full CPC intervention (i.e., from preschool through third grade), and (g) CPC intervention from preschool through second grade.

The composition of the comparison group described in the different follow-up studies also differed across the studies. For example, a small minority of children in the original comparison group (15%) had attended Head Start (Reynolds & Robertson, 2003), and these children were excluded from some analyses of CPC outcomes (e.g., Reynolds, 1995). In addition, some CLS studies included in the comparison group students who participated in CPC programs in kindergarten but not in preschool (Reynolds et al., 2007; Reynolds et al., 2001). Published studies from the CLS discuss the equivalence of the various non-randomized treatment and comparison groups on key demographic variables and provide explanations of sample sizes and attrition over time. Many of the analyses of the CLS cohort also included several covariates, documented by the studies' authors, which also differed somewhat across studies.

The following are key findings from various CLS studies that are relevant to the Midwest CPC Expansion project:

- Nearly half of children (44%) attending a CPC for 1 year were considered ready for kindergarten compared with 28% of children who had no preschool (A. Reynolds, personal communication, February 25, 2015). Children having 2 years of CPC preschool outperformed those with only 1 year of CPC preschool in cognitive readiness, word analysis, and mathematics skills at kindergarten entry; however, there was no advantage of 2 years over 1 year of CPC preschool in reading and math achievement into the elementary school years (Reynolds, 1995).
- Children who received CPC intervention in preschool outperformed children with no CPC preschool experience in reading and math throughout the elementary school years, with the exception of third grade (Reynolds, 1995). Preschool CPC experience also was associated with higher educational attainment in early adulthood (Reynolds, Magnuson, & Ou, 2006).
- Children who received the full CPC intervention (i.e., preschool through third grade) outperformed students with no CPC experience in reading and math by the end of third grade and at 1-year and 2-year follow-up assessments, or fourth and fifth grades, respectively (Reynolds, 1994).

- Children receiving CPC intervention in preschool experienced less grade retention throughout the elementary school years than those having no CPC preschool experience (Reynolds, 1995). Likewise, students who received the full CPC intervention (preschool through third grade) were less likely than those having no CPC experience to have repeated a grade by third, fourth, and fifth grade (Reynolds, 1994).
- Children having 1 or 2 years of CPC preschool experience were less likely than those having no CPC preschool experience to have received special education throughout the elementary school years. Furthermore, children having 2 years of CPC preschool were less likely than children having 1 year to have received special education by fifth grade (Reynolds, 1995).
- Teachers rated first and fifth grade children who had received 1 or 2 years of CPC preschool intervention as having better school adjustment than children having no CPC preschool intervention (Reynolds, 1995).
- Teachers rated third grade students who had received the full CPC intervention as having better school adjustment than students with no CPC experience, but by fifth grade this difference was non-significant (Reynolds, 1994).
- In eighth grade, CLS participants who had received CPC preschool intervention demonstrated significantly greater life-skills competence than those having no CPC preschool experience. Likewise, participants having any CPC exposure (between preschool and third grade) demonstrated more life-skills competence than those having no CPC experience (Reynolds, 1997).

These and other findings from the CLS provided evidence for the CPC model as an effective approach to promoting academic achievement and positive educational outcomes among young children from high-poverty backgrounds in the 1980s. However, given HCRC's opportunity to enhance and update the original CPC model to meet contemporary contexts and needs, advances in the evidence base about high-quality preschool programming, and changes in the availability of publicly funded preschool programs across the United States, an independent evaluation of the Midwest CPC Expansion project implementation was warranted.

Background and Context of the Midwest CPC Expansion Project

The Midwest CPC Expansion project was developed based on the CLS and its findings and took into account the contemporary context and needs of U.S. children and families. HCRC and SRI researchers expanded and improved key components of the official CPC model and

evaluation design guided by the large and growing research literature about the effectiveness of high-quality preschool in supporting school readiness of young children, the specific features of quality preschool programming that are associated with positive child outcomes, and the developing evidence-base for prekindergarten to third grade approaches. The manual provided to participating school districts in the first year of the Midwest CPC Expansion project is presented in Appendix A and it details the key components and the underlying requirements used to guide CPC implementation.

Reviewed here is the evidence base supporting each of the intervention components of the Midwest CPC Expansion model, their implementation requirements, and the rationale for their influence on child outcomes, including both the broad outcome of school readiness as well as specific skills in literacy, math, executive functions, and social-emotional development. We begin with a description of the current context of preschool programs in the United States, particularly for children from low-income and culturally diverse backgrounds and the persistent school preparation and achievement gaps between children living in poverty and their more affluent peers.

CURRENT CONTEXT: ACCESS TO PUBLIC PRESCHOOL

The accessibility and quality of publicly funded preschool across the country have changed significantly from the first implementation of CPC to its current adaptation in the Midwest CPC Expansion project. Participation in early care and education (ECE) programs (private or public) has increased dramatically among preschool-aged children: From 1968 to 2000, enrollment of 3-year-olds rose from 8% to 39% and that of 4-year-olds rose from 23% to 65% (Bainbridge, Meyers, Tanaka, & Waldfogel, 2005). The availability of publicly funded preschool also expanded between 1960 and 2012, shrinking the access gap for low-income children, young children of color, and children living in rural and urban areas (Bainbridge et al., 2005; Burgess, Chien, Morrissey, & Swenson, 2014). The use of federal and state funds to provide preschool has increased since 1980, with the CPC model setting the example by using Title 1 funds for public preschool in school-based settings (U.S. Department of Education, 2015). According to the National Institute for Early Education Research (NIEER), which compiles data about state-funded preschool programs, recent total state funding for preschool in 2015 was $6.2 billion (Barnett et al., 2016). Close to 1.4 million children attended preschool programs that were state funded in 2015, with 5% of 3-year-olds and 29% of 4-year-olds enrolled in state-funded preschool across the nation. Overall, the combined enrollment of children in public preschool

(Head Start and state-funded preschool) is 16% for 3-year-olds and 41% for 4-year-olds (Barnett et al., 2016).

Despite this expansion of publicly funded preschool, children from the highest risk populations are not yet adequately served. Children from low-income families are still less likely to attend preschool than their peers from more affluent families (Burgess et al., 2014), and the gaps between their school readiness skills are significant. In fact, recent data from a large national longitudinal study indicate that this achievement gap is actually increasing (Isaacs, 2012; Wasik & Snell, 2015). Latino/a children— the fastest growing demographic group— face increased risk for high poverty and factors associated with poor academic achievement (e.g., low parent education levels) (Child Trends, 2014, 2015; Garcia & Jensen, 2009; Hernandez, 2006; Laosa & Ainsworth, 2007; National Task Force on Early Childhood Education for Hispanics, 2007). Although Latinos/as experienced gains in preschool enrollment between 2007 and 2012, their preschool attendance and school readiness skills at kindergarten are lower than those of other demographic groups. Recent data indicate that approximately 52% of Latino/a children are enrolled in a center-based preschool program, whereas enrollment rates are 63% for White children and 65% for African American children. The Midwest CPC Expansion project sought to expand availability of a high-quality early childhood intervention model in additional schools across Chicago Public Schools and introduce the model in four new school districts in Illinois and Minnesota effectively reaching new populations of children and their families, including English learners and children from different cultural backgrounds (e.g., new immigrant populations, Latinos/as), who may face elevated risk for poor achievement outcomes.

EVIDENCE SUPPORTING THE MIDWEST CPC EXPANSION PROJECT COMPONENTS

As access to public preschool has increased, so has our knowledge about what characteristics of preschool and classroom quality yield the best outcomes for children across a wide range of skills and achievement domains, including literacy and language, math, social skills, behavior control and self-regulation, and approaches to learning (e.g., attention, task persistence). Early childhood researchers have identified a range of skills and abilities that are predictive of later school achievement, specifically, that school-entry math, language, literacy, and attention skills are the strongest predictors of later achievement (Duncan et al., 2007). Early learning experiences, including preschool attendance, can help young children from low-income households build the skills necessary to effectively close the achievement gap seen at kindergarten entry (Reynolds, Rolnick, Englund, & Temple, 2010). In general, it is the higher quality preschool programs, intentionally delivered by experienced, responsive, and supportive

providers and teachers, that lead to greater improvement in language, literacy, mathematics, and social-emotional development for children, improve academic and social outcomes over the course of children's school careers, and provide financial and societal benefits (McLanahan, Currie, Haskins, Rouse, & Sawhill, 2016; Pianta, Barnett, Burchinal, & Thornburg, 2009; Pianta, Cox, & Snow, 2007).

Defining preschool quality has been the focus of the last several decades of research on early childhood education (Zaslow, Martinez-Beck, Tout, & Halle, 2011). This research includes attempts to define and examine the relationship between quality components and both immediate and lasting impacts to establish benchmarks and thresholds for components of quality (Burchinal, Zaslow, & Tarullo, 2016; Pianta et al., 2009). Below we summarize the extent to which the preschool components of the Midwest CPC Expansion model are supported by evidence. In addition, we review the evidence for the adapted preschool to third grade (P-3) components of the Midwest CPC Expansion project.

MIDWEST CPC EXPANSION INTERVENTION COMPONENTS

In this section, we describe each of the CPC components implemented in the Midwest CPC Expansion project (Exhibit 1.1) and the evidence base that supports each component as an indicator of program quality that is hypothesized to contribute to positive child outcomes.

Exhibit 1.1. CPC Components

CPC components	Key requirements of the CPC Program

Effective learning experiences	• Small class size & low child-teacher ratio
	  · Preschool classes limited to 17 children
	  · K-3 classes limited to 25 children
	  · Minimum two teaching staff per classroom
	• Qualified teachers defined as:
	  · Head teachers and classroom teachers certified with a BA or higher
	  · Assistant teacher: Associate degree, 60 credit hours, or a Child Development Associate credential
	• Balance of teacher-directed/child-initiated activities and high instructional quality
	• Teachers use an endorsed instructional plan, evidence-based curriculum, and assessment/monitoring
	• Optional: field trips and full-day program

Aligned curriculum	• Alignment plan that describes aligning curriculum across the P-3 grade continuum and enhancing communication across grade levels • Involvement of head teacher, parent-resource teacher (PRT), and principal
Continuity and stability	• Optional: collocation/close proximity • Joint activities between and across P-3 grades to be planned • Establish a program continuity plan
Collaborative leadership team	• Head teachers, PRT, and school-community representative (SCR) in collaboration with principals establish a structure of communication, planning, and joint activities between classes across grades (preschool and K, K and 1st, 1st and 2nd, and 2nd and 3rd grade) setting the culture and climate of the program/school • Head teacher is the community face of the program, leads staff meetings and shared planning times, and local organizations are routed to the head teacher for information • Meetings occur across team and among similar positions
Parent involvement and engagement	• Parents sign a CPC school-home agreement at the start of the school year • Designated SCR/PRT staff • Designated parent resource room dedicated to parent and family activities (preschool) • Minimum: school provides at least two activities per month for parents, and parents commit to 2.5 hours per week in both site and home involvement • Endorsed guidelines that include a needs assessment, plan, and menu-based calendar of activities, and is integrated into parent-teacher conferences
Professional development (PD)	• Leadership teams and teachers participate in orientation • Head teacher reviews PD module content and constructs strategies for classroom application • Individual teachers and staff meet quarterly with school facilitators to review ways to support their instruction in the classroom and with other teachers • Teachers and staff actively participate in online PD modules with facilitators and take part in online activities and opportunities to share experiences with other teachers.

Source: Program Manual for 2012–13 (Human Capital Research Collaborative, 2012, pp. 6-7) and communication between the evaluation and implementation teams about how to define and operationalize the components and requirements. See Appendix A-1 for the Program Manual for 2012–13.

CPC component: Effective learning experiences, P-3

This component aims to "ensure mastery in language and literacy, math, science, and social-emotional development throughout early childhood" (Human Capital Research Collaborative, 2012, p. 3) through effective learning experiences from preschool to third grade, starting with up to 2 years in small classes taught by certified teachers in preschool. This component requires that the program support structural features of quality (e.g., class size, teacher-child ratios, and teacher educational levels) as well as process features of quality (e.g., teacher-child interactions with regard to instructional quality or emotional support) to promote effective learning experiences for participating children (Early et al., 2006; LoCasale-Crouch, Konold, et al., 2007; Pianta et al., 2005; Zaslow et al., 2011). Class size, teacher-child ratios, and teacher qualifications all contribute to CPC's component of effective learning experiences, along with intensity of instruction and balance of child- and teacher-directed activities (Human Capital Research Collaborative, 2012). Although these aspects are all widely researched components of preschool quality, there is a lack of consensus about their precise definitions and demonstrated impacts on child outcomes. Similarly, exactly how specific aspects of the interactions and instruction (e.g., emotional support, classroom organization, and instructional support) come together to influence child outcomes in different domains (e.g., cognitive, social) is still the subject of debate and empirical investigation (Hamre, Pianta, Hatfield, & Jamil, 2014).

Small class size: The Midwest CPC Expansion manual limits class sizes to 17 children for preschool classes and 25 children for K-3 classes as part of the Effective Learning Experiences component (Human Capital Research Collaborative, 2012). Class size is generally considered important in ensuring a quality preschool environment (Barnett, Schulman, & Shore, 2004). For example, Finn, Gerber, Achilles, and Boyd-Zaharias (2001) examined the immediate and long-term effects of smaller preschool classes using data from the Tennessee Project STAR. Their findings indicated that smaller ECE classes can have a statistically significant positive effect on child outcomes lasting through second and third grade if the child was in small classes for at least 2 years before moving into full-size classes. Teachers in the STAR experiment spent less time on classroom management and responding to children's problematic behaviors and more time and effort on instruction and meaningful teacher-child engagement, which may contribute to improved outcomes (Barnett et al., 2004; Finn et al., 2001).

Theories on why smaller class sizes during early childhood have enduring positive effects include improved teacher-child interactions that provide children with better coping skills, increased child engagement, reduced time spent on managing challenging behaviors, increased

instruction time (Barnett et al., 2004; Finn et al., 2001), and reduced teacher turnover (Ballantine & Spade, 2015; Barnett et al., 2004). Teachers in smaller classes have more direct and frequent communication with children, which benefits cognitive development (National Institute of Child Health and Human Development Early Child Care Research Network, 2000). Research does not provide consensus on a precise number of children that constitutes an appropriately small class, but there is evidence for preschool and kindergarten class sizes of less than 20 being associated with better child outcomes (Pianta, Downer, & Hamre, 2016). Variation between programs and recommendations reflects the lack of consensus: CPC recommends no more than 17 (Human Capital Research Collaborative, 2015), whereas preschool quality benchmarks developed by NIEER[2] recommend a 20-child maximum for preschool classes (Barnett, Carolan, Fitzgerald, & Squires, 2011; Human Capital Research Collaborative, 2015; Sachs & Weiland, 2010), and the highly successful Boston Public Schools Prekindergarten Program allowed up to 22 (Sachs & Weiland, 2010).

Low teacher-child ratio: The CPC manual mandates no fewer than two staff per classroom, resulting in a teacher-child ratio of 2:17 in preschool classrooms and 2:25 in K-3 classrooms as part of the effective learning experiences component (Human Capital Research Collaborative, 2012). Teacher-child ratio is closely related to preschool class size and contributes to program quality by expanding the opportunities for personalized teacher-child interaction, enhancing positive teacher behaviors, and raising the quantity and quality of instruction (Barnett et al., 2004; Shim, Hestenes, & Cassidy, 2004). Researchers have recommended having two teachers per classroom to improve teacher practice, increase the variety of activities available for children, and encourage collaborative decision-making, which benefits children's learning and the classroom environment (Shim et al., 2004). Lower teacher-child ratios are also associated with lower rates of suspensions and expulsions in state preschool programs (Gilliam, 2005), perhaps by giving teachers the ability to structure the classroom environment in ways that are more conducive to positive child behavior and better teacher responsiveness. Some researchers suggest that teacher-child ratio is a contributing factor to quality preschool programs but may not have as strong an effect as other factors, such as teacher qualifications (Howes, 1997; Pianta et al., 2005); others, however, suggest that teacher-child ratio is among

[2] The NIEER benchmarks are research-based benchmarks for preschool quality components and NIEER releases annual reports about the quality of the 57 state-funded preschool programs in the U.S. states and territories. Meeting these standards is not meant to be a guarantee of quality, but the benchmarks can be used to determine whether a state program meets minimum quality standards (Barnett et al., 2016).

the most important structural factors for ensuring high-quality preschool (Phillips, Mekos, Scarr, McCartney, & Abbott-Shim, 2000). Recent data also document that children of color are more likely to attend preschool programs with high teacher-child ratios, which may undermine program quality and the teacher-child relationship (Rashid, 2009). As with class size, a consensus does not exist on precise teacher-child ratios needed to produce enduring positive effects on achievement, and existing programs and recommendations vary in their definition of an appropriate teacher-child ratio. The CPC program recommends two teachers per each class of 17 (Human Capital Research Collaborative, 2015). NIEER recommends a ratio of 10 children per teacher, based on practices in programs that have shown significant positive effects for disadvantaged children (Barnett et al., 2011). The Boston Public Schools Prekindergarten Program recommended two teachers for a preschool class of 22 children and one teacher and a part-time paraprofessional per class of 22 for kindergarten (Sachs & Weiland, 2010).

Qualified teachers: As part of the effective learning experiences component, CPC preschools require Head Teachers[3] and other classroom teachers have a bachelor's or higher certification and assistant teachers have an associate's degree, 60 credit hours, or a Child Development Associate Credential (Human Capital Research Collaborative, 2012). Early studies of a variety of ECE programs with a wide range of quality found teachers' education and training to be significantly related to classroom quality and classroom quality to be significantly related to child outcomes (Cost Quality and Child Outcomes Study Team, 1995). Research on the link between teacher qualifications and professional development and classroom quality in state-funded preschool programs is less clear (Barnett, 2004; Barnett et al., 2011; Barnett, Lamy, & Jung, 2005; Buysse & Hollingsworth, 2009; Early et al., 2005; Gormley & Phillips, 2003).

As early childhood programs have expanded over the past several decades, states and funding agencies have taken different approaches to establishing teacher qualification requirements. Some researchers have concluded that teachers with bachelor's degrees produce improved child outcomes (Barnett, 2002), whereas others have found mixed results (Early et al., 2005). In general, having more education, specialized training, and experience that includes early childhood education content seems to lead to better quality (Burchinal, Cryer, Clifford, & Howes, 2002; Snider & Fu, 1990), and produce teachers who demonstrate more sensitive, less harsh,

[3] The Head Teacher is a certified teacher with extensive experience in teaching and in providing comprehensive services who directs the CPC program in the site and is responsible for all aspects of planning, implementation and supervision. The Head Teacher works closely with the principal and assistant principal.

and more responsive interactions with children (Howes, 1997). Thus, requiring preschool teachers to have a bachelor's degree seems to be a necessary but not sufficient indicator of quality.

Balance of teacher-directed/child-initiated activities and high instructional quality: CPC seeks to improve teacher-child interactions and instructional quality through a balance between teacher- and child-directed activities and measurement of instructional quality (Reynolds, Richardson, Hayakawa, Englund, & Ou, 2016; Graue, Clements, Reynolds, & Niles (2004; Human Capital Research Collaborative, 2012). In early childhood programs, the most proximal factor affecting children's development and learning is the quality of teacher-child interactions; for many early childhood researchers, it is hypothesized to be an essential, if not the most important, feature of program quality. Teachers need to know about early childhood development, about how to structure learning environments, and about how to observe and interact with young children in ways that encourage, support, and expand their learning. Much is known about the characteristics of teacher-child interactions that promote optimal childhood development—interactions that are warm and responsive, stimulating and fun, and that support and expand on children's interests (Pianta, 2006b; Ramey & Ramey, 2006). There is a debate in the early childhood field about the impact of child-initiated vs teacher-directed approaches to learning (Stipek, Feiler, Daniels, & Milburn, 1995). Research suggests a balance of the two approaches with child-initiated activities leading to improved social-emotional and executive function skills such as task persistence and teacher-directed approaches benefiting children's basic early literacy and math skills (Chien et al., 2010).

Evidence across many studies and types of preschool programs (e.g., state-funded preschool, Head Start, community-based child care) uniformly points to considerable variation in quality in the samples included in the studies. A recurring contemporary question is how well measures of quality actually predict child outcomes (Burchinal, Kainz, & Cai, 2011). A number of measures of quality, especially the Classroom Assessment Scoring System (CLASS) (Pianta, La Paro, & Hamre, 2004), have been used to show that teacher-child interactions and overall classroom quality affect child outcomes (Pianta, 2006b). Observations using the CLASS in state-funded preschools in six states showed that higher ratings of teachers' emotional responsiveness and instructional quality were associated with better child outcomes (Burchinal et al., 2008). However, overall ratings of instructional support were low (mean of 2.5 on a 7-point rating) while emotional support ratings were higher (mean of 5.2 on a 7-point rating) (Pianta et al., 2005), and CLASS ratings were not related to teacher-child ratios. These relatively low ratings on

instructional support have been found in a number of other preschool evaluation studies (Chien et al., 2010; Pianta et al., 2016). However, exactly how specific aspects of the interactions (e.g., emotional support, classroom organization, and instructional support) come together to influence child outcomes in different domains (e.g., cognitive, social) is still the subject of debate and empirical investigation (Hamre et al., 2014).

Instructional plan/curriculum. CPC requires that programs use one or more curricula and that the curricula be aligned with learning standards such as Head Start or Common Core;[4] address language, literacy, math, science, and social-emotional learning; provide alignment between preschool and third grade; and balance child-initiated and teacher-directed activities (Human Capital Research Collaborative, 2012). The selection and implementation of an evidence-based curriculum that guides instruction and includes opportunities for assessment of children's progress have been found to relate to classroom quality and child outcomes (Hyson, Copple, & Jones, 2006; Klein & Knitzer, 2006). The Head Start FACES study found that classes using *The Creative Curriculum* or *HighScope Curriculum* had higher classroom quality scores than programs that used other curricula (Zill et al., 2003). However, a more comprehensive study of curricula and child outcomes found considerable variability across settings, curricula, and outcome domains. Beginning in 2002, the Preschool Curriculum Evaluation Research (PCER) initiative began a large-scale evaluation of the effect of 15 curricula on several outcomes, including classroom quality and child outcomes. Participating classrooms were randomly assigned to intervention curricula or control curricula. Local curricula used in the participating schools and districts served as the control curricula which was defined as "teacher-developed, nonspecific curricula with a focus on basic school readiness" (Glazerman, 2008, p. 45). Findings showed no statistically significant impact on any of the child outcomes for 10 of the 15 intervention curricula at the end of preschool. One curriculum showed significant impacts on child outcomes at the end of kindergarten. Seven of the curricula showed significant effects on classroom quality, while eight of the curricula showed no significant impacts on classroom quality (Glazerman, 2008). One important caveat about interpreting the PCER study findings is that children in control classrooms were exposed to one or more different local curricula and thus, this study did not show results that compare the intervention curricula to classrooms with no curricula. In addition, an analysis of recent large-scale studies on preschool quality supports the importance of a quality curriculum but specifies that to achieve lasting positive social and

[4] Also see the description of the component of aligned curriculum described below.

cognitive outcomes, the curriculum must be domain specific, be sequential, have an appropriate scope, be aligned with children's natural development, and be paired with on-site coaching (Weiland, 2016b). Thus, there is limited evidence that a specific curriculum alone can achieve improved child outcomes which is one of the reasons that the CPC model does not specify a curriculum but instead promotes use of a curriculum or curricula to guide instruction and includes PD supports to implement effectively.

Finally, although the routine use of child progress monitoring tools or assessments is considered to be best practice (National Association for the Education of Young Children, 2005), few empirical studies have shown how progress monitoring predicts program quality or child outcomes.(Downs & Strand, 2006; Grisham-Brown, Hallam, & Brookshire, 2006).

Dosage (part day vs. full day, 1 year vs. 2 years, attendance): Although not a requirement, the CPC model encourages programs to identify ways to offer full-day preschool for 3- and 4-year-old children. There is some evidence that supports the efficacy of a full-day preschool program over a half-day preschool program. Walters (2014) found improvements in cognitive abilities of children who attended full-day programs compared to half-day programs. Research also demonstrates benefits for children who attend more than 1 year of preschool. Loeb, Bridges, Bassok, Fuller, and Rumberger (2007) found that entering an early education program between ages 2 and 3 led to more gains on reading and math measures compared to entering a program before or after that. Attendance is also crucial; children who attend fewer days of preschool have lower school readiness scores (Ehrlich et al., 2014). Furthermore, children who are chronically absent in preschool are five times more likely to be chronically absent in second grade and to have significantly lower reading scores (Ehrlich et al., 2014).

CPC components: Aligned curriculum, continuity and stability, and collaborative leadership

Although P-3 as an approach to early education is a growing area of interest, limited data are available on how these features of alignment, continuity, and collaboration impact school readiness and kindergarten entry outcomes. Further, there are few applied research studies describing how P-3 models are actually implemented in contemporary contexts. However, these three components have strong theoretical support as quality features that may increase the likelihood that the short-term gains found from children attending high-quality preschools are sustained into the early elementary school years and beyond. Indeed, many studies have found that the gains made in preschool are not sustained into the early elementary years, and this has

led to calls for the P-3 approach (Bogard & Takanishi, 2005; NAESP Foundation, 2011; Takanishi, 2011).

Aligned curriculum: One hypothesis for the lack of long-term outcomes has been that the maintenance of gains is not well supported when there is a lack of alignment into early elementary schools in curricula, pedagogical approaches, learning standards, assessments, professional development, parent engagement, and program leadership (Bogard & Takanishi, 2005; Kagan, 2012; Kauerz & Coffman, 2013). Thus, the CPC aligned curriculum component calls for a "sequence of evidence-based curricula and instructional practices that address multiple domains of child development within a balanced, activity-based approach" (Human Capital Research Collaborative, 2012, p. 3). This CPC component requires programs to use a quality curriculum that is aligned with external standards, is aligned from preschool to third grade, and is appropriate for the population of children throughout their early academic career.

Continuity and stability: The continuity and stability component calls for "prekindergarten to school-age continuity, through co-located or close-by centers, that incorporates comprehensive service delivery and stability for children and families" (Human Capital Research Collaborative, 2012, p. 3). This CPC component requires the integration of program structure, classroom instruction, and family services throughout the preschool learning experiences to improve outcomes. The model is based on a theoretical assumption that with these kinds of continuity children are more likely to achieve better outcomes that will be sustained over time into the early grades and beyond. Thus, this component addresses the fact that many studies of preschool programs have indicated that for at least some outcomes, effects fade over time (Barnett, 1995; Bowman, Donovan, & Burns, 2001; Lipsey, Farran, & Hofer, 2015). Some empirical support for the continuity component comes from a body of research about the importance of the transition into kindergarten for children's early school adjustment and success in the early grades (Hains, 2005; LoCasale-Crouch, Mashburn, Downer, & Pianta, 2007; Rimm-Kaufman, Pianta, & Cox, 2000). As the results of several previously mentioned longitudinal studies of CPC indicate, participation in P-3 programs may lead to greater and longer lasting effects on children's outcomes. P-3 programs are thought to be more successful because they are more intensive (i.e., longer in duration by definition) and promote more stable and predictive environments, which may offset less stable home and neighborhood environments. As one of very few P-3 interventions, the CPC model, when implemented in the 1980s, demonstrated significantly greater impacts on reading and mathematics skills for children participating in more rather than fewer years of the intervention (Reynolds, 1994; Reynolds & Temple, 1998).

Collaborative leadership team: The collaborative leadership component calls for "a leadership team run by the Head Teachers in collaboration with the Principal" (Human Capital Research Collaborative, 2012, p. 3). This team is meant to contribute to stability and comprehensive service delivery for children attending CPC and their families. The CPC program required sites to have a collaborative leadership team that included the Head Teacher, Parent Resource Teacher, and School-Community Representative as well as the principal. The team sets the culture and climate of the program at the school through regular communication and shared decision-making. The role of a Head Teacher as defined in the CPC model is critical to these collaborative efforts and serves as the face of the program to the larger community through outreach and building partnerships with local community providers. As described above, the Head Teachers, in collaboration with the principal and other instructional leaders at the school, are expected to support teachers in implementing and aligning evidence-based curricula and high-quality instructional practices on a daily basis.

Although there is no empirical research associating the collaborative leadership team component with child outcomes, as mentioned above, there is some theoretical support for the concept in the P-3 literature (Bogard & Takanishi, 2005; Kauerz & Coffman, 2013). This collaborative leadership component of the CPC model encourages program directors, PRTs, SCRs, and teachers in preschool settings to work together in a coordinated way to support children's developmental progression effectively. The leadership support, in theory, should ensure that progress made in preschool is sustained because of a vertical alignment in instructional practices, classroom structure and expectations about children's behavior, involvement of parents in children's education, and professional development for teachers.

CPC component: Parent involvement and engagement

The parent involvement and engagement component is defined as "Comprehensive services led by the Parent-Resource Teachers and School-Community Representatives that include multi-faceted activities, events, and opportunities to engage families" (Human Capital Research Collaborative, 2012, p. 3). This component aims to increase parent involvement and engagement in children's education throughout early childhood. This goal is to be accomplished by implementing comprehensive programming for parent involvement and working to strengthen school-family partnerships. This component also seeks to "Enhance educational attainment, career opportunities, and personal development for parents and family members" (Human Capital Research Collaborative, 2012, p. 2). Research affirms that family supports can increase families' self-sufficiency and economic and educational advancement, which are associated with

children's development and well-being (Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Evans, 2004; Gershoff, Aber, & Raver, 2003; Gershoff, Aber, Raver, & Lennon, 2007).

To these ends, the CPC Expansion sites are required to develop a written parent involvement plan and home-school agreement; keep a parent involvement calendar; conduct annual family needs assessments to determine family needs, interests, and time availability for in-school activities; and work to promote parental involvement in learning.[5] Parent resource teachers record and monitor parent involvement at their school using a parent involvement rating form that measures the degree of family participation (Human Capital Research Collaborative, 2016). CPC also promotes parent involvement through home visits and the use of parent involvement calendars and family participation portfolios, which reinforce the home-school connections that encourage parents to learn ways to support children's learning at home and in school. The parent involvement component is meant to be flexible and adaptive to meet parent and child needs.

Research has consistently shown that highly stimulating and responsive home environments predict children's optimal early development and subsequent school performance, attesting to the important role parents play in their children's learning and development (Bradley, Corwyn, Burchinal, McAdoo, & Coll, 2001; Bradley, Corwyn, McAdoo, & Coll, 2001). Involvement with their children's preschool program gives parents information and opportunities to support their children's learning and their own interaction with the school system. Research has established the link between family involvement in school and children's better academic and social outcomes, children's improved behavior and self-perception, and parents placing a higher value on education. For instance, children in elementary and secondary school whose families were active participants in their schooling showed improvements in social, academic, and behavioral outcomes (Albright, Weissberg, & Dusenbury, 2011; Gary & Witherspoon, 2011; Henderson, 2012; U.S. Department of Education & Southwest Educational Development Laboratory, 2013), including lower high school dropout rates (Barnard, 2004; Jeynes, 2005).

Many early childhood programs, including CPC and Head Start, have specific supports to engage parents and other family members in their children's preschool education as well as early learning activities at home. Recent evidence suggests that early childhood programs that

[5] Forms for documenting parent involvement including the Family Needs Assessment, Parent Home Involvement Checklist, Parent Involvement Plan, Parent Involvement Calendar, and School-Home Agreement can be found on the CPC website https://cpcp3.org/resource-library/.

provided parents with opportunities to practice parenting skills and that involved at least monthly home visits yielded impacts on children's early school readiness skills (Grindal et al., 2016). In addition, specific to the CPC Expansion project, findings from CLS data analysis found that children whose parents participated in more activities achieved higher reading performance, had lower grade retention rates at age 14, and spent fewer years in special education (Miedel & Reynolds, 2000).

CPC component: Professional development (PD)

This CPC professional development component calls for the integration of "online professional development and on-site follow-up support for classroom and program applications" (Human Capital Research Collaborative, 2012, p. 3) . CPC PD includes online modules, in-person PD, collaborative learning between teachers, individual goal-setting for teachers, and follow-up coaching throughout the year. The goals of the PD system are to ensure that educators implement the essential elements of high quality as intended and that teachers, administrators, and parent resource teachers feel supported in their work with children and families.

There is abundant empirical support for the value of strong, well-implemented PD as a feature of high-quality early education programs. A National Academy of Sciences volume was devoted to the recognition of the need for well-trained early childhood staff who receive ongoing PD (Allen & Kelly, 2015). There is a burgeoning literature on how best to support teachers in their ongoing learning of effective practices to provide young children with educationally rich experiences, including coaching and mentoring, professional learning communities, reflective practice consultation, and use of technology-based instruction (Elish-Piper & L'Allier, 2010; Zaslow, M., Tout, K., Halle, T., Whittaker, J. V., & Lavelle, B. , 2010; Howes & Pianta, 2011; Hyson & Whittaker, 2012; Hyson & Woods, 2014; Onchwari & Keengwe, 2008; Peterson, Taylor, Burnham, & Schock, 2009; Phillips, Austin, & Whitebook, 2016). Patterns across large-scale studies on preschool quality have identified ongoing expert coaching by a mentor as one of the strongest contributors to quality when paired with a high-quality curriculum (Weiland, 2016b). When combined with appropriate policies and program features such as class size and teacher-child ratio, PD aimed at improving teacher-child interaction quality can lead to improvements in school readiness (Mashburn et al., 2008). Because teacher and structural classroom characteristics are not necessarily associated with instructional quality, effective PD also requires a continuous and comprehensible focus on the process of instruction to improve instructional quality and language and literacy outcomes (Justice, Mashburn, Hamre, & Pianta,

2008). Continuing PD and classroom support for teachers helps ensure quality and morale of the ECE workforce, which in turn helps raise child outcomes. In recognition of the importance of ongoing PD, the NIEER recommends at least 15 hours per year of professional development for ECE teachers.[6]

SUMMARY OF EVIDENCE BASE FOR THE CPC MODEL

As this literature review indicates, there is empirical support for the hypothesis that implementation of the Midwest CPC Expansion Project's comprehensive early childhood education approach will lead to positive school readiness outcomes in a contemporary sample of preschool children. In the next section, we describe the implementation fidelity study and its findings.

[6] The CPC model did not specify the number of hours of PD for teaching staff.

2. Implementation Study

The Midwest CPC Expansion Project uses the developing evidence base of P-3 initiatives and approaches and expands and improves on key components of the original CPC program model. Specifically, as part of the i3 project, staff at University of Minnesota (UMN) and Human Capital Research Collaborative (HCRC) as well as several CPC staff in each of the districts, drafted a program manual that was revised and refined throughout the 5-year project. In addition, as part of the implementation study, described here, the intervention and evaluation teams worked together to clarify the requirements of each component and then operationalize what low, adequate, and high fidelity would look like in implementation. As described in the Introduction, the six components of the Midwest CPC Expansion intervention are the following:

(1) ***Effective learning experiences.*** P-3 program starting with up to 2 years in small classes taught by certified teachers in preschool

(2) ***Aligned curriculum.*** Curricula and instructional practices that emphasize language, literacy, and math skills within a structured activity-based approach aligned across the PK–3 continuum

(3) ***Continuity and stability.*** Kindergarten and first-to-third grade continuity through collocated or close-by preschool classrooms, a continuity plan, and instructional coordination

(4) ***Collaborative leadership team.*** Leadership team run by the Head Teacher in collaboration with the Principal, Parent Resource Teacher (PRT), and School-Community Representative (SCR)

(5) ***Parent involvement and engagement.*** Comprehensive family services led by Parent Resource Teachers and School-Community Representatives that promote parent involvement

(6) ***Professional development (PD).*** Ongoing PD by school facilitators to support teachers and principals in implementing and aligning evidence-based curricula and instructional practices

In this section, we describe how these six components of the intervention were operationalized; that is, we detail how we defined and measured the fidelity of implementation of each component. In addition to conducting a rigorous impact study, the i3 grant also required that project leaders identify early in the project what constitutes implementation fidelity of each component as well as what constitutes program fidelity (i.e., how many sites/schools need to be

implementing with fidelity for the project to expect positive outcomes). The primary questions addressed in the implementation study were: (1) Are the six Midwest CPC Expansion intervention components implemented with fidelity? (2) How much variation in implementation fidelity was there across schools? In addition, when possible, we collected similar data on the extent to which the components and requirements (e.g., low teacher-child ratios, qualified teachers) also were present in the comparison schools with the latter step especially critical for drawing conclusions on the impact of CPC compared with "business-as-usual" preschool classrooms in the same school district.

Measuring Fidelity of Implementation

Fidelity of implementation was measured at the school and program level for each of the components in the first 2 years of the evaluation.[7] Each component included one or more requirements that were assessed and scored, and the scores were summed to create a fidelity index for that component. Year 1 of implementation involved approximately 95 preschool classrooms and the associated 23 elementary schools and three sites that were not formally affiliated with an elementary school. Year 2 data collection occurred in approximately 91 kindergarten classrooms, and the associated 26 schools and describes implementation fidelity to the kindergarten components and requirements. Exhibit 2.1 shows the implementation requirements for each component for preschool and kindergarten. Implementation fidelity for preschool and kindergarten is similar except there are different requirements for teacher-child ratio and a different version of the classroom quality observation measure is used in kindergarten.

Missing data. If the evaluation team could not collect data from schools for any individual requirement, they marked the sites as not having met that requirement. We used this conservative measurement approach with the understanding that it may underestimate the level of fidelity of implementation by school or site and for the project overall depending on the

[7] Although the Midwest CPC Expansion Project is based on a model of implementation spanning preschool to third grade, the sites began serving preschool children in fall 2012, and these children reached the end of second grade in spring 2016 when the project ended. The i3 funding requirements specify that the evaluation team must document implementation fidelity for the first 2 years of multiyear projects. In this section, we describe in detail implementation in preschool (Year 1) and kindergarten (Year 2), those years for which SRI had established clear implementation fidelity standards. SRI researchers did not have clear guidance at the outset on what implementation fidelity should look like in first grade and second grade across the components. The intervention staff at UMN/HCRC provided implementation fidelity ratings for Year 3 (first grade), and these data are described briefly at the end of this section.

amount of missing data for each component. Where applicable, exhibits indicate the number of schools with missing data for a particular requirement.

Exhibit 2.1. Core Requirements of the Midwest CPC Expansion Project in Preschool and Kindergarten

Component	Preschool requirement	Kindergarten requirement
1. Effective learning experiences, P-3	Class size/ratio: (17/2 for preschool) Length (any full-day offered) Certified/licensed preschool teachers Field trip offered Endorsed instructional plan Evidence-based curriculum and curriculum liaison identified Assessment/monitoring Balance of teacher-directed/child-initiated activities (20/80 to 80/20) Classroom quality (CLASS PreK)	Class size/ratio: (25/2 for kindergarten) Same Same Same Same Same Same Same Classroom quality (CLASS K-3)
2. Aligned curriculum	Alignment plan that describes aligning curriculum across the P-3 continuum and enhancing communication across grade levels	Same
3. Continuity and stability	Distant vs. collocation/close proximity Program continuity plan Plan to promote continuity of preschool children to kindergarten at same school	N/A Same Same
4. Collaborative leadership team	Head Teacher, PRT, SCR and Principal Principal attends orientation	Same
5. Parent involvement and engagement	Home-school agreement Designated SCR/PRT staff Designated parent resource room (preschool) Needs assessment survey Parent involvement plan Menu-based calendar of activities 2 or more activities per month Plan offers activities across different types of parent involvement Parents are involved at least a total of 2.5 hours per week in both site and home involvement	Same
6. Professional development (PD)	Participation of leadership team in orientation/institutes Participation of teachers and other staff in orientation Head teacher reviews PD module content and constructs strategies for classroom application (for 3 of 4 modules) Online modules for teachers (4 in Year 1) Head Teacher conducts site visit Staff demonstrate high engagement with PD	Same[a]

Note. PRT = Parent Resource Teachers; SCR = School-Community Representative.

[a] The requirements for the program were the same in Year 2, but site-level data on these requirements were not available, so an alternate score was used. We provide more detail below, in the section titled "6 Professional Development."

Exhibit 2.2 shows the components, requirements, data sources, and thresholds for adequate fidelity, identified using the summary score across requirements. We measured fidelity for all 26[8] schools that participated in the Midwest CPC Expansion project. The evaluation team considered schools to be meeting fidelity on each component based on the summary scores across requirements. The evaluation team used several tools to measure fidelity. These measures are easy to use, document verifiable, low-inference requirements, and have face validity. Although the CPC implementation team collected some of the data, the independent evaluation team ultimately scored the schools on fidelity using the raw data collected across measures.

[8] In Year 1 there were 26 intervention sites: 16 in CPS, 6 in SPPS (which includes a community-based preschool site), two in Evanston (one community early learning center, one community-based preschool site), one in Normal, IL, and one in Virginia, MN. In Year 2, there were 26 intervention sites, 16 in CPS, 5 in SPPS, 4 in Evanston (all elementary schools), and one in Normal, IL. The Virginia, MN site dropped out before the second year of the study.

Exhibit 2.2. Measurement of Fidelity of Implementation for the Midwest Expansion of the CPC Program (School Level) for Year 1 (PreK)

Component	Requirement	Data source	Scale	Criterion for adequate fidelity
1. Effective learning experiences, P-3	Class size/ratio: (17/2 for preschool)	Teacher survey	0 vs 1	Low = 0–4
	Length (any full-day offered)	Teacher survey or district	0 vs 1	Adequate = 5–9
	Certified/licensed preschool teachers	Teacher survey	0 vs 1	
	Field trip offered	Teacher survey	0 vs 1	
	Endorsed instructional plan	Implementation tool[a]	0 vs 1	
	Evidence-based curriculum and curriculum liaison identified	Implementation tool[a]	0 vs 1	
	Assessment/monitoring	Implementation tool[a]	0 vs 1	
	Balance of teacher-directed/child-initiated activities (20/80 to 80/20)	Monthly activity form	0 vs 1	
	Classroom quality	CLASS/CLAC	0 vs 1	
2. Aligned curriculum	Alignment plan that describes aligning curriculum across the P-3 continuum and enhancing communication across grade levels	Implementation tool	0 vs 1	Low = 0 Adequate = 1
3. Continuity and stability	Distant vs. collocation/close proximity	Administrative information	0 vs 1	Low = 0–1
	Program continuity plan	Implementation tool[a]	0 vs 1	Adequate = 2–3
	Plan to promote continuity of preK children to kindergarten at same school	Implementation tool	0 vs 1	
4. Collaborative leadership team	Head Teacher, PRT, SCR with Principal	Implementation tool	0 vs 1	Low = 0
	Principal attends orientation	PD attendance rosters		Adequate = 1
5. Parent involvement and engagement	Home-school agreement	80% of families sign[b]	0 vs 1	Low = 0–4
	Designated SCR/PRT staff	Implementation tool	0 vs 1	Adequate = 5–9
	Designated parent resource room (preK)	Implementation tool	0 vs 1	
	Needs assessment survey	Implementation tool	0 vs 1	
	Parent involvement plan	Parent Involvement Plan	0 vs 1	
	Menu-based calendar of activities 2 or more activities per month	Calendar		
	Plan offers activities across different types of parent involvement	Implementation tool	0 vs 1	
	Parents involved at least 2.5 hours per week in both site and home involvement	Parent Involvement Rating Form (40%-70% = 1 and >70% =2)[c]	0 –2	
6. Professional development (PD)	Participation of leadership team in orientation/institutes	Attendance rosters	0 vs 1	Low = 0–3 Adequate = 4–6
	Participation of teachers and other staff in orientation	Attendance rosters[d]	0 vs 1	
	Head teacher reviews PD content and constructs strategies for classroom application (for 3 of 4 modules)	School facilitator records	0 vs 1	
	Online modules for teachers (4 in Year 1)	Attendance rosters (67% of teachers all 4 modules)	0 vs 1	
	Head Teacher conducts site visit	Attended at least 2 visits, scores range from 0 to 6.	0 vs 1	
	Staff demonstrate high engagement with PD	Index completed by facilitators for each visit, scores ranged from 0 to 3 (average > 2 = 1)	0 vs 1	

[a] In Years 1 and 2, these were collected using a principal survey rather than the implementation tool.

[b] In Year 1, these data were not available, and no schools received credit for this requirement. In Year 2, the data were available categorically, and schools received credit if they were categorized in "70%–100%" of agreements for kindergarten families signed.

[c] In Years 1 and 2, this was collected using a teacher survey rather than the parent involvement rating form.

[d] In Year 1, these data were not available, and no schools received credit for this requirement.

Below we provide more detail on each component, the individual requirements, and how we measured implementation fidelity.

1. Effective learning experiences, preschool to third grade

No single classroom model or curriculum is prescribed by the Midwest CPC Expansion program. Instead, the effective learning experiences component includes several requirements designed to promote children's school readiness and early achievement as well as social-emotional outcomes. Researchers collected data on the nine requirements for this component using four instruments: (1) a teacher survey administered each spring (requirements 1–5), (2) a principal survey administered each spring (requirements 6 and 7), (3) a teacher-completed monthly activity form (requirement 8), and (4) a combination of two classroom quality observation measures (requirement 9). The nine requirements were as follows.

(1) Preschool classrooms limited to 17 children and a minimum of two teaching staff; kindergarten classrooms limited to 25 children and a minimum of two teaching staff. All classrooms at a school had to meet this criterion to receive 1 point for class size/ratio.

(2) School may provide full-day preschool. Schools received 1 point if they offered any full-day preschool.[9]

(3) Classroom teachers are certified teachers with a bachelor's degree or higher, and all assistants have an associate degree, 60 credit hours, or a Child Development Associate Credential. All classrooms at a school had to meet this criterion to receive 1 point for certified/licensed teachers.

(4) School may provide field trips throughout the year. Schools received 1 point if any class provided a field trip.[10]

(5) School has an endorsed instructional plan (1 point). Information was collected using an item on a principal survey administered in the spring of each year. Schools were given one point if the principal reported that their school had a plan that was implemented adequately or well.

[9] Although not a requirement, the expectation is that the CPC model will have greater impacts if delivered for a full day.
[10] Although not a requirement, the expectation is that the CPC model will have greater impacts if children are exposed to enrichment activities such as field trips.

(6) Teachers use an evidence-based curriculum (1 point). CPC requires that curricula be aligned with learning standards such as Head Start or Common Core. During the first year all curricula were reviewed and approved by a member of the intervention team. However, for fidelity of implementation, the evaluation team reviewed responses on a teacher survey for which curriculum or curricula was used. Members of the evaluation team determined which curricula were evidence-based following the criteria used by the intervention team.

(7) Schools have a plan for assessing and monitoring children's progress either through the curriculum or other process. Information on assessment practices was collected using two items on a principal survey administered in the spring of each year. A school was given 1 point if the principal responded to both items with at least a 3 ("to a moderate extent") on a 4-point scale.

(8) Classes provide a balance of teacher-directed and child-initiated activities and effective learning experiences as evidenced by an independent observation of classroom quality. Schools were given 1 point if more than half the classrooms had between a 20/80 and 80/20 balance of teacher-directed and child-initiated activities.

(9) Classroom quality is high. Classroom quality was measured using the CLASS (Pianta et al., 2004), an observational measure of classroom quality for preschool or K-3 classrooms that yields three subscales—emotional support, instructional support, and classroom organization—with subscores ranging from 1 to 7. Observations were collected either as ongoing efforts in the district or by SRI-trained observers who had met reliability standards required by the CLASS developers. CLASS scores were averaged across classrooms for each school. Each school received 1 point if the average CLASS score was 3 or more on instructional support, 5 or more on emotional support, and 5 or more on classroom organization. This decision was based on a review of the literature and thresholds for quality in public preschool programs (Burchinal et al., 2011; Pianta, 2006a). A parallel tool called the Classroom Learning Activities Checklist (CLAC), developed by a team of researchers at University of Minnesota, also was used to assess quality in a subset of classrooms.[11] The CLAC observations were conducted and scored by members of the implementation team at the University of Minnesota.

[11] The CLAC measure has shown strong reliability and predictive validity with internal consistency reliability estimates of .94 for PreK items and .93 for K items and overall CLAC classroom scores significantly predictive of children's math, oral language, and reading text benchmarks as measured by formative assessment tools (A. Candee, personal communication, December 14, 2016)

Specifically, the CLAC measures task orientation in children in the classroom, providing a global measure of the classroom activities and interactions that directly facilitate task orientation and active engagement. Classrooms received a score on task orientation of from 1 to 5. The scores across classrooms were averaged for each school. Schools with average scores of 3 or more were considered reaching adequate fidelity on this measure. For schools with both measures of classroom quality, scores had to meet the requirements on at least one of the two measures.

Schools were considered to be meeting fidelity on the effective learning experiences component if they had a score of 5 or greater across the nine requirements.

2. Aligned curriculum

The Midwest CPC Expansion program requires sites to implement an aligned curriculum. In the first year of implementation, the expectation was that schools would have a plan and rationale for aligning curricula across the P-3 continuum and enhancing communication across grade levels. Information about whether and the extent to which the school or site had a plan was collected during the site visits using the implementation tool. Sites were given 1 point if there was a plan in place and if staff from the University of Minnesota scored the quality of the plan as 3 or higher on a 5-point scale. A score of 1 was considered to be meeting fidelity on this component.

3. Continuity and stability

The Midwest CPC Expansion program requires sites to provide a stable school environment that promotes continuity of the P-3 components as well as continuity for children as they progress from preschool to kindergarten and beyond. During site visits, the implementation team members collected information about the extent to which the school or site had a P-3 program continuity plan and a plan to promote preschool children's continuity to kindergarten using the implementation rating tool. Schools received 1 point if a plan was in place to ensure program continuity (P-3) and received 1 point if a plan was in place to promote preschool children's continuity to kindergarten. Additionally, an optional aspect of the component was having the preschool classes collocated or in close proximity to the elementary school, and this was documented through administrative data and the site visits. Schools received 1 point for having the preschool classrooms collocated or in close proximity. Across the three requirements, schools were considered to be meeting fidelity on this component if they had a score of 2 or 3.

4. Collaborative leadership team

The Midwest CPC Expansion program requires sites to have a collaborative leadership team comprised of the Head Teacher, Parent Resource Teacher (PRT), School-Community Representative (SCR), and Principal. The team is expected to set the culture and climate of the program at the school through regular communication and shared decision-making. The Head Teacher plays a critical role in these collaborative efforts and also is the face of the program to the larger community through outreach and building partnerships with local community providers. During site visits, implementation team members collected information about the extent to which the school or site had a collaborative leadership team using the implementation tool. Sites were given 1 point if the team was in place (Head Teacher, PRC, SCR, Principal), if the quality of the team was scored 3 or higher on a 5-point scale on the implementation tool, and if the Principal attended the orientation. A score of 1 was considered to be meeting fidelity on this component.

5. Parent involvement and engagement

Comprehensive family services led by PRTs and SCRs that promote parent involvement and engagement are critical components of the Midwest CPC Expansion program. This CPC program component requires staff at participating sites to ask parents to sign a home-school agreement, establish a written parent involvement plan, maintain a parent involvement calendar, conduct a needs assessment, and promote parents' involvement in their children's learning at home and in school. Schools received 1 point for each of requirements 1–7 and up to 2 points for requirement 8 below.

(1) Most of the parents of preschool children (80%) signed the home-school agreement.

(2) An SCR/PRT is assigned to the school.

(3) There is a designated parent resource room.

(4) A needs assessment was completed.

(5) A parent involvement plan was developed.

(6) There is a menu-based calendar of activities offering at least two activities per month for parents.

(7) The plan offers activities across different types of parent involvement.

(8) There is substantial parent involvement. To measure parent involvement at the school, teachers were asked to estimate the percentage of families participating in different types of activities and how frequently parents were participating. These estimations were averaged across teachers at each school. Schools received a score of 1 if 40-70% of parents on average participated 2.5 hours per week or more, and a score of 2 if more than 70% participated 2.5+ hours weekly.

The evaluation team considered schools to be meeting fidelity if they had a score of 5 or higher across the eight requirements.

6. Professional development

The Midwest CPC Expansion program's PD system includes orientations for leadership teams, teachers, and other staff; four online professional development modules during the first year; and site visits by school PD facilitators to provide Head Teachers with support and coaching. The evaluation team assessed fidelity of these implementation requirements using attendance rosters, school facilitator records, and school facilitators' ratings of participant engagement in the PD (Exhibit 2.2).

In Year 1, the evaluation team had access to data on most of these school-level requirements to determine fidelity with the exception of data on the extent to which teachers and other staff participated in orientation. In Year 2, however, information on these 6 requirements was not collected systematically at the school level; thus, the evaluation team used a single alternative score to identify whether the school met the requirements. During site visits, the implementation team collected information about the extent to which the school or site engaged in appropriate PD activities using the implementation tool, and they used that information to assign sites a score from 1 to 5. Sites that received a score of 3 or greater on this 5-point scale were determined to have met the PD requirement in Year 2.

Year 1 Findings: Preschool

This section presents the summary results of the Midwest CPC Expansion project's analysis of implementation fidelity for preschool classrooms in Year 1. Exhibit 2.3 summarizes fidelity by component and requirements for the schools. Exhibit 2.4 summarizes the extent to which the project met fidelity given the a priori threshold for implementation fidelity. Below is a summary of the key findings about implementation fidelity for schools/sites (Exhibit 2.4).

- ***Effective learning experiences.*** Most schools (23 of 26, 88%) met the fidelity threshold for this component (five of nine requirements). Two requirements that were less likely for schools to meet were class size/ratio (with only 13 of 24 or 54% of schools meeting the requirement) and offering at least one full-day preschool class (14 of 26 or 54% of schools).
- ***Aligned curriculum.*** Nearly all schools (24 of 25, 96%) met fidelity for aligned curriculum (one requirement). One school did not meet fidelity, and another had dropped out of the study before the rating could be assigned. In districts with multiple schools, the percentage of schools meeting fidelity ranged from 50% to 100%.
- ***Continuity and stability.*** The majority of schools (20 of 26, 77%) met the fidelity threshold for this component (two of three requirements). In districts with multiple schools, the percentage of schools meeting fidelity ranged from 0 to 100%. For the six schools that did not meet fidelity, four were missing data for one of the three requirements.
- ***Collaborative leadership team.*** The majority of schools (21 of 25, 84%) met the fidelity threshold for this component (one requirement). In districts with multiple schools, the percentage of schools meeting fidelity ranged from 50% to 100%. One school had dropped out of the study before the rating could be assigned.
- ***Parent involvement and engagement.*** Nearly all schools (25 of 26, 96%) met the fidelity threshold for this component (five of eight requirements). In districts with multiple schools, the percentage of schools meeting fidelity ranged from 50% to 100%. All schools were missing data for one of the eight requirements (percentage of students with a signed home-school agreement) and did not receive credit for meeting the requirement. The requirement that was next least likely to be met was having at least 40% of parents participating 2.5 hours or more per week (5 of 19 schools met this requirement).[12]

[12] One district was not comfortable with their teachers estimating parent involvement and instructed them not to respond to these items on the teacher survey. Thus, no schools in that district received credit for this requirement.

- ***Professional development.*** Over half of the schools (14 of 26, 54%) met the fidelity threshold for this component (four of six requirements). In districts with multiple schools, the percentage of schools meeting fidelity ranged from 0 to 100%. All schools were missing data for one of the six requirements (at least 67% of teachers attended the CPC orientation). Schools that did not meet the fidelity threshold were missing data for more requirements (mostly two or three) than schools that passed (mostly one requirement). The requirement that was least likely to be met was engagement during site visits (12 of 26 schools met this requirement).

Exhibit 2.3. Schools Implementing CPC Requirements with Fidelity in Year 1 (Preschool), by Component (N = 26)

Component	Requirement	Schools with data *N*	Schools meeting requirement *N*	Meeting requirement %	Schools missing data *N*
1. Effective learning experiences	Teacher-child ratio: (17:2 for preschool)	24	13	54%	2
	Length (half day or full day) (1 point if full day)	26	14	54%	0
	Certified/licensed preschool teachers	24	24	100%	2
	Field trip	24	20	83%	2
	Endorsed instructional plan (yes/no)	17	15	88%	9
	Evidence-based curriculum and curriculum liaison identified (yes/no)	24	24	100%	2
	Assessment/monitoring	17	14	82%	9
	Balance of teacher-directed/child-initiated activities (20/80 to 80/20)	24	24	100%	2
	Classroom quality: CLASS (average scores meet subscale thresholds) or CLAC ≥ 3 = 1 point	26	26	100%	0
2. Aligned curriculum	Alignment plan that describes aligning curriculum across the preK-to-3rd grade continuum and enhancing communication across grade levels	25	24	96%	1
3. Continuity and stability	Distant vs collocation/close proximity	26	19	73%	0
	Program continuity plan (see component 2)	17	10	59%	9
	Plan to promote preschool children's continuity to kindergarten	26	26	100%	0
4. Collaborative leadership team	Head Teacher, PRT, SCR and Principal	25	21	84%	1

Note. Percentages were calculated on the basis of the number of schools *with data on that requirement* rather than the total number of schools.

Exhibit 2.3. Schools Implementing CPC Requirements with Fidelity in Year 1 (PK), by Component (concluded)

Component	Requirement	Schools with data *N*	Schools meeting requirement *N*	Meeting requirement %	Schools missing data *N*
5. Parent involvement and engagement	Home-school agreement	0	0	0%	26
	Designated SCR/PRT staff	26	26	100%	0
	Designated parent resource room (preK)	26	22	85%	0
	Needs assessment survey	26	26	100%	0
	Parent involvement plan	26	25	96%	0
	Menu-based calendar of activities with at least 2 activities per month for parents	26	26	100%	0
	Plan offers activities across different types of parent involvement	26	26	100%	0
	Parents are involved at least a total of 2.5 hours per week in both site and home involvement	19	5	26%	2
6. Professional development (PD)	Participation of leadership team in orientation/institutes	18	18	100%	8
	Participation of teachers and other staff in orientation	0	0	0%	26
	Head Teacher reviews PD module content and constructs strategies for classroom application (for 3 of 4 modules)	26	26	100%	0
	Online modules (4 across first year) for teachers	15	12	80%	11
	Head Teacher conducts site visit	26	25	96%	0
	Staff demonstrate high engagement with PD	26	12	46%	0

Note. Percentages were calculated out of the number of schools *with data on that requirement* rather than the total number of schools.

In Exhibit 2.4, we summarize the key implementation fidelity findings for Year 1 of the project overall. The goal was to have 60% of schools meet the fidelity threshold for each of the components. In general, in Year 1, the project met this goal for five of the six components: effective learning experiences, aligned curriculum, continuity and stability, collaborative leadership team, and parent involvement and engagement. The goal was not met for the professional development component. However, a notable amount of data was missing for several requirements in the PD component; one requirement was missing for all schools, and two other requirements were missing for all schools in a certain district so that those schools did not meet four of six the requirements necessary to pass fidelity on this component. For the schools in that district, all met at least two of the three requirements for which there were data.

Exhibit 2.4. Schools Meeting CPC Component and Project-wide Implementation Fidelity in Year 1 (Preschool)

Component	Requirements *N*	Criteria for implementation fidelity at school level	Schools with data *N*	Schools meeting fidelity criteria *N, %*	Implemented with fidelity?
1. Effective learning experiences, PK -3	9	Met at least 5 of 9 requirements	26	23, 88%	Yes
2. Aligned curriculum	1	Met requirement	25	24, 96%	Yes
3. Continuity and stability	3	Met at least 2 of 3 requirements	26	20, 77%	Yes
4. Collaborative leadership team	1	Met requirement	25	21, 84%	Yes
5. Parent involvement and engagement	8	Met at least 5 of 8 requirements	26	25, 96%	Yes
6. Professional development (PD)	6	Met at least 4 of 6 requirements	26	14, 54%	No

The evaluation team attempted to collect similar implementation data from the comparison schools for any of the Midwest CPC Expansion program requirements. Information on class size and teacher-child ratios was available for the comparison classrooms, but comparison schools could not readily provide other data (e.g., parent involvement and professional development data).

Exhibit 2.5 shows the percentage of schools that met the 12 Midwest CPC Expansion program requirements within three components for which data were available for both CPC and comparison schools. In general, CPC schools fared better than comparison schools on four

requirements (offering a full-day option, offering field trips, classroom quality as defined in this study, and frequency of parent involvement), were the same or nearly the same (i.e., a difference of less than 10%) on seven requirements, and were worse on the requirement that preschools be collocated with elementary schools.[13]

[13] Because the CPC program was expanded to other districts that may not have been able to accommodate the collocation requirement, the intervention sites were not able to meet this requirement in all sites whereas all but one of the comparison sites/schools had preschool located within the elementary school.

Exhibit 2.5. CPC and Comparison Schools Meeting CPC Program Requirements in Year 1 (Preschool)

Component	Requirement	CPC schools with data *N*	CPC schools met requirement *N*, %	Comparisons schools with data *N*	Comparison schools met requirement *N*, %
1. Effective learning experiences	Teacher-child ratio (17:2 in preschool)	24	13, 54%	18	9, 50%
	Full-day offered	26	14, 54%	23	3, 13%
	Certified/licensed preschool teachers	24	24, 100%	16	16, 100%
	Field trip offered	24	20, 83%	18	6, 33%
	Endorsed instructional plan	17	15, 88%	12	10, 83%
	Evidence-based curriculum	24	24, 100%	18	18, 100%
	Assessment/monitoring	17	14, 82%	12	9, 75%
	Balance of teacher-directed/child-initiated activities	24	24, 100%	5	5, 100%
	Classroom quality	26	26, 100%	16	9, 56%
3. Continuity and stability	Collocated preschool with elementary	26	19, 73%	23	22, 96%
	Has program continuity plan	15	10, 59%	11	7, 64%
5. Parent involvement and engagement	Parents involved 2.5 hours per week or more	19	5, 26%	13	0, 0%

Note. Percentages were calculated on the basis of the number of schools *with data on that requirement* rather than the total number of schools.

Exhibit 2.6 shows the average scores for the CLASS and CLAC classroom quality measures overall and by CPC and comparison groups. The majority of both CPC and comparison schools with CLASS or CLAC data met the criteria of fidelity, and the differences between CPC and comparison groups in the average scores on each measure were not statistically significant.

Exhibit 2.6. Average Classroom Quality Ratings for CPC and Comparison Schools in Year 1 (Preschool)

	CLASS *N*	CLASS: Emotional support (0–7)	CLASS: Classroom organization (0–7)	CLASS: Instructional support (0–7)	CLAC *N*	CLAC score (0–5)
CPC	66	6.24	6.05	3.31	65	4.28[a]
Comparison	19	6.13	5.96	3.01	7	3.48

Note. CLASS = Classroom Assessment and Scoring System; CLAC = Classroom Learning Activities Checklist. Approximately 70% of teachers at CPC sites (66 of 95) and 54% of teachers at comparison sites (19 of 35) were observed using CLASS, and 68% and 20%, respectively were observed with the CLAC observation tool.

[a] The difference in CLAC scores approached significance with $p = .06$.

Year 2 Findings: Kindergarten

This section presents the summary results of the analysis of implementation fidelity data for Year 2 in the kindergarten classrooms participating in the Midwest CPC Expansion project. Exhibit 2.7 summarizes the fidelity by component and requirement for the schools, and Exhibit 2.8 summarizes the extent to which the project met fidelity given the a priori threshold for implementation fidelity. Below, we summarize the key findings for schools/sites.

- ***Effective learning experiences.*** All schools (26 of 26, 100%) met the fidelity threshold for this component (five of nine requirements). The requirement that was least likely to be met was the teacher-child ratio (25:2) with only 14 of 26 (or 54%) of schools meeting this requirement.
- ***Aligned curriculum.*** Nearly all schools (25 of 26, 96%) met fidelity for aligned curriculum (one requirement). In districts with multiple schools, the percentage of schools meeting fidelity ranged from 94% to 100%.
- ***Continuity and stability.*** The majority of schools (22, 85%) met the fidelity threshold for this component (two of three requirements). In districts with multiple schools, the percentage of schools meeting fidelity ranged from 0% to 100%.
- ***Collaborative leadership team.*** The majority of schools (23, 88%) met the fidelity threshold for this component (one requirement). In districts with multiple schools, the percentage of schools meeting fidelity ranged from 81% to 100%.
- ***Parent involvement and engagement.*** All schools (26, 100%) met the fidelity threshold for this component (five of eight requirements). The requirement that was least likely to be met was having at least 40% of parents participating 2.5 hours or more per week (5 of 25 schools with data met this requirement).
- ***Professional development.*** All schools (26, 100%) met the fidelity threshold for this component based on data available for this year (i.e., based on implementation team rating).

Exhibit 2.7. Schools Implementing CPC Requirements with Fidelity in Year 2 (K), by Component (N = 26)

Component	Requirement	Schools with data *N*	Schools meeting requirement *N*	Meeting requirement %	Schools missing data *N*
1. Effective learning experiences	Teacher-child ratio: (25:2 for kindergarten)	26	14	54%	0
	Length (half day or full day)	26	26	100%	0
	Certified/licensed preschool teachers	26	26	100%	0
	Field trip	26	23	88%	0
	Endorsed instructional plan	21	20	95%	5
	Evidence-based curriculum and curriculum liaison identified	26	26	100%	0
	Assessment/monitoring	21	17	81%	5
	Balance of teacher-directed/child-initiated activities	25	25	100%	1
	Classroom quality	26	26	100%	0
2. Aligned curriculum	Alignment plan that describes aligning curriculum across the P-3 continuum and enhancing communication across grade levels	26	25	96%	0
3. Continuity and stability	Distant vs. collocation/close proximity	26	19	73%	0
	Program continuity plan	21	14	67%	5
	Plan to promote preschool children's continuity to kindergarten	26	26	100%	0
4. Collaborative leadership team	Head Teacher, PRT, SCR and Principal	26	23	88%	0

Note. Percentages were calculated on the basis of the number of schools *with data on that requirement* rather than the total number of schools.

Exhibit 2.7. Schools Implementing CPC Requirements with Fidelity in Year 2 (K), by Component (N = 26) (concluded)

Component	Requirement	Schools with data *N*	Schools meeting requirement *N*	Meeting requirement %	Schools with missing data *N*
5. Parent involvement and engagement	Home-school agreement	20	16	80%	6
	Designated SCR/PRT staff	26	25	96%	0
	Designated parent resource room (preschool)	26	24	92%	0
	Needs assessment survey	26	26	100%	0
	Parent involvement plan	26	26	100%	0
	Menu-based calendar of activities with at least 2 activities per month for parents	26	26	100%	0
	Plan offers activities across different types of parent involvement	26	26	100%	0
	Parents are involved at least a total of 2.5 hours per week in both site and home involvement	20	5	25%	6
6. Professional development (PD)	Overall rating for professional development (0–5 scale)	26	26	100%	0

Note. Percentages were calculated on the basis of the number of schools *with data on that requirement* rather than the total number of schools.

In Exhibit 2.8, we summarize the key implementation fidelity findings for the project overall in Year 2. The overall goal was to have 60% of schools meet the fidelity threshold for each component. This goal was met for all six components in Year 2.

Exhibit 2.8. Schools Meeting CPC Component Project-wide Implementation Fidelity in Year 2 (K) (N = 26)

Component	Requirements *N*	Criteria for implementation fidelity at school level	Total number of schools *N*	Schools meeting fidelity criteria *N*, %	Implemented with fidelity?
1. Effective learning experiences, preK to 3rd grade	9	Met at least 5 of 9 requirements	26	26, 100%	Yes
2. Aligned curriculum	1	Met requirement	26	25, 96%	Yes
3. Continuity and stability	3	Met at least 2 of 3 requirements	26	22, 85%	Yes
4. Collaborative leadership team	1	Met requirement	26	23, 88%	Yes
5. Parent involvement and engagement	8	Met at least 5 of 8 requirements	26	26, 100%	Yes
6. Professional development (PD)	6	Met at least 4 of 6 requirements	26	26, 100%	Yes

As in Year 1, the evaluation team attempted to collect similar implementation data on the comparison schools for any of the CPC program requirements for which data were available. For example, information on class size and teacher-child ratios was available for the comparison classrooms, but other data were not readily available (e.g., parent involvement, professional development).

Exhibit 2.9 shows the percentages of schools that met the 11 CPC program requirements across three components for which data were available for both CPC and comparison schools. In Year 2, CPC schools fared better than comparison schools on six requirements (teacher-child ratio, endorsed instructional plan, assessment/monitoring, classroom quality, program continuity, and frequency of parent involvement), were the same or nearly the same on four requirements (i.e., a difference of less than 10%), and were worse on one requirement (collocation of preschool with elementary).

Exhibit 2.9. CPC and Comparison Schools Meeting CPC Program Requirements in Year 2 (K)

Component	Requirement	CPC schools with data *N*	CPC schools met requirement *N*, %	Comparison schools with data *N*	Comparison schools met requirement *N*, %
1. Effective learning experiences, preK to 3rd grade	Teacher-child ratio	26	14, 54%	22	1, 5%
	Full-day offered	26	26, 100%	22	22, 100%
	Certified/licensed preschool teachers	26	26, 100%	22	22, 100%
	Field trip offered	26	23, 88%	22	20, 91%
	Endorsed instructional plan	21	20, 95%	15	11, 73%
	Evidence-based curriculum	26	26, 100%	22	22, 100%
	Assessment/monitoring	21	17, 81%	15	8, 53%
	Classroom quality	26	26, 100%	22	14, 64%
3. Continuity and stability	Collocated preschool with elementary	26	19, 73%	23	21, 91%
	Has program continuity plan	18	14, 78%	23	6, 26%
5. Parent involvement and engagement	Parents involved 2.5 hours per week or more	20	5, 25%	15	0, 0%

Note. Percentages were calculated on the basis of the number of schools *with data on that requirement* rather than the total number of schools.

Exhibit 2.10 shows the average scores for the CLASS and CLAC classroom quality measures overall and by CPC and comparison schools. The majority of both CPC and comparison schools with CLASS or CLAC data met the definition of fidelity. However, there was a statistically significant difference in the average scores on the CLAC, with CPC schools having higher quality scores ($p < .001$). On the other hand, the group differences on the three CLASS domains were not significantly different.

Exhibit 2.10. Average Classroom Quality Ratings for CPC and Comparison Schools in Year 2 (K)

	CLASS *N*	CLASS: Emotional support (0–7)	CLASS: Classroom organization (0–7)	CLASS: Instructional support (0–7)	CLAC *N*	CLAC score (0–5)
CPC	34	5.30	5.30	2.47	67	4.53*
Comparison	20	5.19	4.97	2.25	25	4.01

Note. CLASS = Classroom Assessment and Scoring System; CLAC = Classroom Learning Activities Checklist. Approximately 37% of teachers at CPC sites (34 of 91) and 34% of teachers at comparison sites (20 of 59) were observed using the CLASS, and 74% and 42%, respectively had CLAC observations completed.

*Significant at $p < .001$.

First and Second Grade Implementation

The Midwest CPC Expansion project is a P-3 model, and high-quality implementation is expected through third grade. Because the i3 project was funded for 4 school years (2012–13, 2013–14, 2014–15, and 2015–16), the schools were able to implement only the preschool through second-grade components during the project period for the i3 grant. The children who began participating as preschoolers in 2012–13 had reached second grade in 2015–16. SRI's independent evaluation included a priori implementation fidelity criteria for only Years 1 and 2 (preschool and kindergarten, respectively). However, the CPC program implementation team at the University of Minnesota continued to collect data on implementation in first and second grade. In the next two sections, data collected by the CPC program implementation team during site visits and from administrative data from school and district personnel are presented.

YEAR 3 FINDINGS: FIRST GRADE

In Year 3, a subset of the implementation requirements was collected by the implementation team at the University of Minnesota. They assigned sites a score of 1-5 on several

requirements[14] within the same six core components described above. The implementation team assigned greater weights to certain requirements they felt were more important within that core component (e.g., the CLASS or CLAC score received a weight of 3, compared with first grade teacher-student ratio, which received a weight of 2). Using these data and weighting scheme, the evaluation team at SRI calculated a single score for each core component for each school. If the score was at least a 3 on the 5-point scale, the school received credit for implementing that component with fidelity.

In general, the 26 elementary schools were implementing all six components with fidelity in Year 3 (first grade) with between 77% and 100% of sites meeting fidelity on each component.

- ***Effective learning experiences.*** Most schools (21 of 26, 81%) met the alternative fidelity threshold for this component developed by the intervention team.
- ***Aligned curriculum.*** Nearly all schools (25 of 26, 96%) met fidelity for aligned curriculum.
- ***Continuity and stability.*** All schools (26, 100%) met the fidelity threshold for this component.
- ***Collaborative leadership team.*** The majority of schools (24, 92%) met the fidelity threshold for this component.
- ***Parent involvement and engagement.*** The majority of schools (24, 92%) met the fidelity threshold for this component.
- ***Professional development.*** Most schools (20, 77%) met the fidelity threshold for this component based on data available for this year.

YEAR 4 FINDINGS: SECOND GRADE

Data from Year 4 (2015-16 school year) for implementation of the Midwest CPC Expansion intervention in second grade classrooms was still being analyzed by staff at the University of Minnesota and was not available as of December 2016.

[14] Some of these requirements are the same or similar to those described earlier (e.g., the core component for effective learning experiences has a requirement about classroom quality as measured by the CLASS or CLAC); others are different (e.g., that core component also has a requirement about the percent of time an aide is present in the classroom).

Implementation Study Summary

Overall, the Midwest CPC Expansion components were implemented with fidelity in preschool and kindergarten for the first 2 years of the project. We were unable to document the PD component in the second year of the project due to missing data. The comparison sites also implemented several of the requirements as part of preschool and kindergarten classroom business as usual, making the distinction between the two conditions similar for some components with the exception of full-day preschool, field trips, classroom quality, and parent involvement in preschool and teacher-child ratio, instructional plan, assessment/monitoring, classroom quality, program continuity plan, and parent involvement in kindergarten classrooms. Implications for these implementation study findings are discussed in the final section of the report. The next section describes the impact study that examined impacts of the Midwest CPC Expansion intervention on child outcomes at kindergarten entry and second grade.

3. Impact Study

This section describes the study the SRI evaluation team conducted to meet the i3 requirement for an independent evaluation using a rigorous quasi-experimental design to assess the impacts of the Midwest CPC Expansion intervention on student outcomes. The SRI team examined effects of CPC preschool on improving children's academic, social, and behavior outcomes at kindergarten entry. We had planned to assess outcomes additionally in the spring of second grade, but due to various factors, including particularly high attrition, we did not collect direct assessment of children's academic achievement in second grade.[15] The i3 National Evaluation team approved the confirmatory and exploratory contrasts identified a priori in the analysis plan. Here, we describe the design, sample, measures, analytic strategies, and findings from the impact study. We also present findings from exploratory analyses conducted to further examine effects of the CPC model by district and implementation variation.

Evaluation Design and Methodology

The SRI evaluation team designed a quasi-experimental study to evaluate the impacts of the CPC intervention on children's outcomes. The design was based on the extensive evidence base documented in the Chicago Longitudinal Study (CLS) and illustrated in Arthur Reynold's pathways model of hypothesized relationships between CPC program participation and child outcomes (Exhibit 3.1).

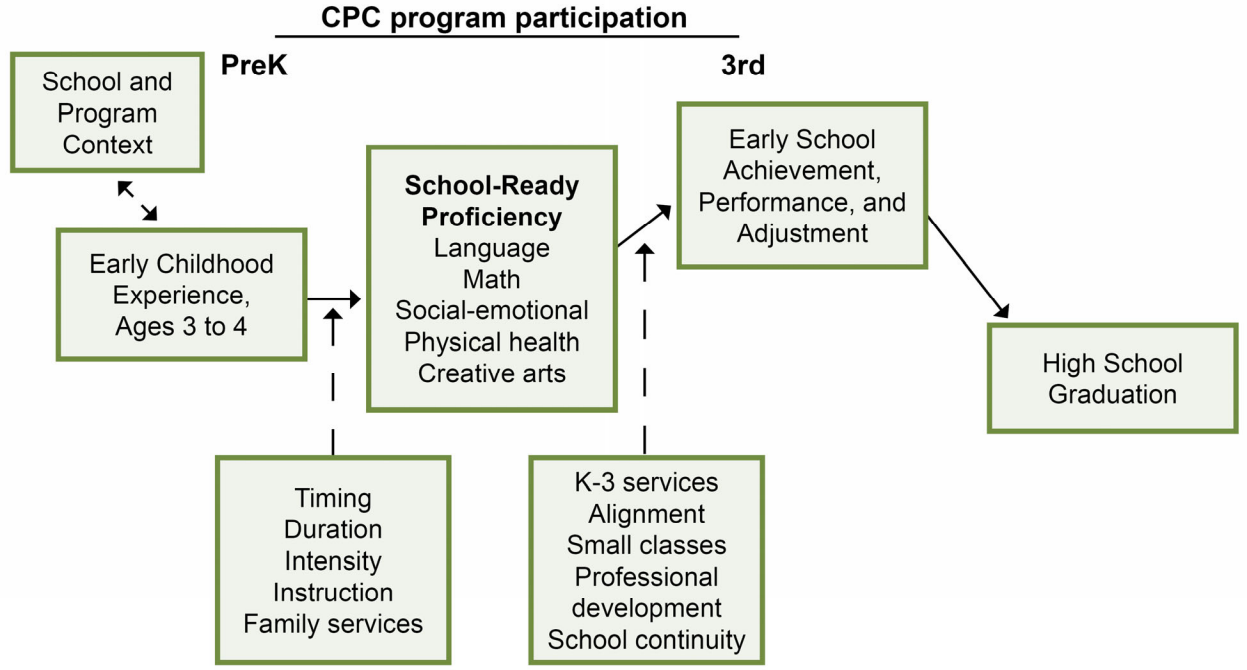
SRI's impact study was designed to answer the following questions:

- Do children in the CPC intervention schools attain greater gains in school readiness skills (i.e., early literacy, mathematics, executive functioning, behavior and social skills) at kindergarten entry than children in the comparison schools?

[15] As of April 4, 2016, the principal investigator of the i3 Midwest CPC Expansion project, Arthur Reynolds, decided to discontinue direct assessments in the spring of second grade. Dr. Reynolds reviewed available attrition data provided by the four remaining school districts and determined that attrition was too high to provide a representative sample of children. The SRI evaluation team continued to collect online teacher ratings using the Teacher-Child Rating Scale 2.1 for those participating children who were in second grade to answer questions about impact on students' social skills and behavior.

- Do children in the CPC intervention schools attain greater gains in early school achievement (i.e., reading comprehension, mathematics, executive functioning, behavior and social skills) at the end of second grade than children in the comparison schools?[16]
- Do subgroups of children (e.g., children who had 2 years of preschool, children who participated in full-day preschool) benefit more from the CPC intervention than their peers?

Exhibit 3.1. Hypothesized Pathways of CPC Program Participation on Short- and Long-Term Child Outcomes



Source: Human Capital Research Collaborative (2012, p. 2). See also Appendix A.

The extensive CLS literature points to CPC's significant impacts on school readiness and later impacts on students' academic achievement in third grade and beyond. Thus, we viewed the evaluation questions related to school readiness, literacy, and mathematics at kindergarten entry as confirmatory contrasts (or expected outcomes) and the evaluation questions related to executive functions, social skills, and behavior as exploratory contrasts (or potential outcomes). It is important to note that because children only reached second grade by the end of the grant funding period, the evaluation team used the end of second grade proficiency as a proxy for third grade achievement outcomes. We specified executive functions, social skills, and behavior

[16] The reading comprehension, mathematics, and executive functioning outcomes were not collected. See above.

as exploratory outcomes in second grade. The hypothesized pathways shown in Exhibit 3.1 suggest that it is reasonable to expect positive outcomes for participants across this wide range of skills and abilities.

As described, the Midwest CPC Expansion project used the developing evidence supporting P-3 initiatives and expanded and improved on components of the original CPC intervention model. Arthur Reynolds and his team at HCRC viewed the CPC model as a school-wide reform model intended to be implemented across grades (vertical alignment from preschool to third grade) and across content and supports (horizontal alignment of curricula, assessments, professional development, parent involvement, etc.). Impacts are expected for children at kindergarten entry as well as through third grade and beyond, as shown in analyses of the original CPC model (Reynolds, 1994, 1995, 1997, 2000; Reynolds et al., 1996; Reynolds & Robertson, 2003; Reynolds & Temple, 1998; Reynolds et al., 2003). Although measuring long-term outcomes were beyond the scope of this grant, it is expected that short-term outcomes set the foundation for long-term outcomes such as improved third grade reading and math achievement, higher high school graduation rates, and less need for special education services. In addition, we hypothesized that the school-wide P-3 approach coupled with a focus on providing comprehensive family services and outreach will lead to better outcomes on school readiness than providing preschool alone.[17] In some of the CLS subsample studies, children in the comparison group did not receive any formal preschool because of limited access and availability. Thus, we purposely designed a study that would meet rigorous standards, enable us to control for baseline skills and abilities in children in both the intervention and comparison groups, and would examine the added benefit of CPC over business-as-usual preschool experiences more widely available in the contemporary context in five school districts in the Midwest.

[17] These parent/family components are also believed to lead to more parent involvement in their children's education, greater involvement and support of learning in the home, and gains in parents' own education and employment trajectories. However, we were not able to examine impacts on these parent outcomes in the i3 evaluation. Note that Arthur Reynolds received a National Institute of Child Health and Human Development grant in September 2016, "Longitudinal Effects of Extended Early Childhood Intervention," to begin a longitudinal study of the Midwest CPC Expansion project participants.

QUASI-EXPERIMENTAL DESIGN AND PROPENSITY SCORE MATCHING

Using a quasi-experimental longitudinal study design,[18] SRI assessed the impact of CPC on improving school readiness skills at kindergarten entry (in fall 2013 for the children who began preschool as 4-year-olds and in fall 2014 for those who began preschool as 3-year-olds[19]). We also assessed students' social-emotional outcomes at the end of second grade for the subset of children who had reached second grade by the time the 5-year grant ended (spring 2016).

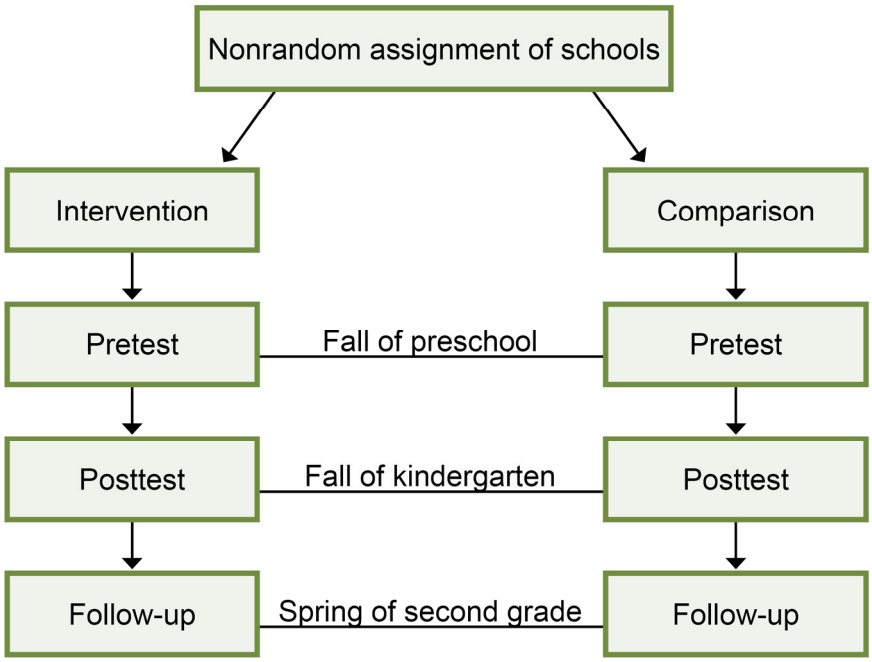
Between January and July 2012, the implementation team and school district supervisors jointly selected the intervention schools based on which schools they believed could implement the CPC intervention model and had administrative support to continue the project over 5 years. Then the evaluation team used propensity score analysis (Stuart, 2010) to find comparison schools that matched the intervention schools on key student body demographics and third-grade achievement test scores in reading. First, we stratified by school district: Chicago Public Schools (CPS); Unit 65 in Evanston, Illinois; and Saint Paul Public Schools.[20] Second, propensity score matching models were analyzed separately in each of three locations. We calculated a propensity score (logit) of being an intervention school based on school-level pretest variables, such as percentage of students in different racial/ethnic categories, percentage of English learners, percentage of students eligible for free or reduced-price lunch, and percentage of third-grade students reading at grade-level. We next selected a comparison school that was the closest match for each of the intervention schools on the propensity score using nearest neighbor matching (See Exhibit 3.2).

[18] We obtained approval from SRI's Institutional Review Board (IRB) and the University of Minnesota IRB, as well as from CPS's Research Review Board, Saint Paul Public Schools Research Committee, Unit 5 in Normal, IL, Unit 65 in Evanston, IL, and Virginia, MN, school districts.

[19] For the confirmatory contrasts, we treated all children in the sample who had data at pretest and posttest as the intent-to-treat sample. However, we also explored whether the impact of CPC varied by child, family, and school characteristics, including whether effects were greater for children who attended CPC preschool for 2 years compared with children who attended CPC preschool for 1 year. For the latter analyses, only one school district provided the 2-year option (CPS), so the analyses were limited to that district in the exploratory analysis.

[20] The Unit 5 school district in Illinois did not have a comparison site because the preschool program was essentially the same (i.e., CPC) throughout the small district, with the same curriculum and program structure including parent supports. The Virginia, MN, school district had only one other preschool program in the area; thus, it was selected to be the comparison site.

Exhibit 3.2. Quasi-experimental Design of the Midwest CPC Expansion Intervention Project



SAMPLE OF SCHOOLS

The final sample of schools in the evaluation study consisted of 27 CPC elementary schools and 24 comparison elementary schools.[21] Exhibit 3.3 shows the aggregated demographic and school academic performance characteristics at baseline for the intervention and comparison schools. We often use *schools* and *sites* interchangeably, but for the most part the CPC expansion model was implemented in school-based settings with preschool classrooms in or near the elementary school classrooms in the school district. There were a few exceptions where the preschool classroom was in a community setting that fed into an identified intervention elementary school. One school district with four intervention elementary schools had only two comparison elementary schools, and one school district did not have a comparison

[21] The final sample of 27 sites is different for the impact study because we counted elementary schools for the purpose of creating a matched sample of schools in a comparison group (16 in CPS, 4 in Evanston, 5 in SPPS, 1 in Normal, IL, and 1 in Virginia, MN). Two schools in CPS that were asked to participate—one as an intervention and one as a comparison site—did not participate. The intervention site administrators decided they were not ready to implement the CPC components. The comparison site was unresponsive to the evaluation team and the district administrator, so it was dropped from the study. One school district (Virginia, MN) decided to stop implementing the CPC model after the preschool year because it was required to recompete for its Head Start grant and could not implement the CPC model simultaneously. The kindergarten teachers in Virginia completed the teacher-report measures in the fall of kindergarten, but no direct assessments were collected.

preschool site. For the impact analyses in Exhibits 3.13 through 3.18, students were nested in the schools or sites where they were enrolled for preschool, with intervention students nested in 26 CPC sites for preschool and comparison students nested in 23 sites for a total of 49 sites. However, the total number of sites drops to 47 because no direct assessments were collected for students in the two schools in Virginia.

Overall, the propensity scoring matching process resulted in a set of comparison schools that were similar to CPC schools on the baseline demographic and school performance variables. That is, all the differences shown in Exhibit 3.3 were less than .25 standard deviation difference between the two groups of schools across the entire sample, indicating the two groups were similar at baseline. However, when we examined the differences between CPC schools and comparison schools for each district, we found that two of the four districts (Unit 65 in Evanston and Saint Paul Public Schools) had comparison schools that were significantly different from the CPC schools on some school characteristics. For example, when examining the differences between the comparison and intervention schools in Saint Paul Public Schools, the percentage of third-grade students reading at grade level on state-administered reading achievement tests in the comparison schools was significantly higher than in the CPC schools (50% vs. 33%, $p < .05$). Similarly, Evanston's intervention and comparison schools, when examined within the district separately, were not well matched on many of these school-level characteristics. This within-district mismatch is a typical limitation in the analysis when using the school as the unit of intervention in school districts with a small number of schools. In the analytical approach section below, we included school characteristics variables in our multilevel model to account for potential school characteristics differences when examining the impact of CPC on child outcomes.

Exhibit 3.3. Baseline Demographic and School Performance Indicators of Intervention and Comparison Schools, Overall

Indicator	Overall Intervention % (*n* = 26)	Overall Comparison % (*n* = 23)
Minority	91.62	91.41
African American	56.43	57.10
Latino/a	21.52	23.81
Free or reduced-price lunch	84.50	87.86
English learner	20.29	20.10
Mobility	17.95	21.17
Proficient in reading in third grade	55.44	55.74
Proficient in math in third grade	67.63	66.02

Note. This exhibit does not include the two sites in Virginia, MN.

Source: Administrative data publicly available at the time schools were matched.

SAMPLE OF CHILDREN

The independent evaluation team had a sampling goal to recruit approximately 50 children at each of the intended 28 CPC intervention sites and 28 comparison sites, with an expectation of 10% attrition in each group overall in each year. Thus, our proposed sample size was 2,800 (1,400 intervention and 1,400 comparison children).

Approximately 3,500 children were enrolled in preschool in fall 2012 across the participating schools (Exhibit 3.4). Of those, 2,663 children or 75% of the total enrolled consented to participate in the study. Children were included if they were at least 2.5 years old by September 1, 2012, or by the time they were assessed and were enrolled in the study schools and participating classrooms. Parents in all participating classrooms were asked to provide signed consent for their children to participate in the study, and all consented children were eligible to participate in assessments.

Although we were able to obtain consent for a large number of children, intervention sites served a much larger number of children overall than comparison sites, especially in CPS (where CPC sites served three times as many children). Further, nearly 85% of parents of children enrolled in the intervention sites consented, but only 56% of children enrolled in the comparison sites consented. Despite these sample size differences, we believe we recruited a sample of children that was representative of those enrolled in preschool for the 2012–13 school year. In the results section, we describe the characteristics of those children who remained in the study at posttest and follow-up and their similarities and differences with all children participating in the study at baseline.

Exhibit 3.4. Enrollment and Consent Rate, Overall and by Condition and District

Sample	Total enrolled	Total consented	Total consent rate (%)	Intervention – enrolled	Intervention – consented	Consent rate (%)	Comparison - enrolled	Comparison - consented	Consent rate (%)
Overall	3,548	2,663	75%	2,340	1,986	85%	1,208	677	56%
Chicago Public Schools	2,527	2,036	81%	1,694	1,536	91%	833	500	60%
Saint Paul Public Schools	496	316	64%	296	208	70%	200	108	54%
Unit 65 (Evanston)	351	152	43%	212	119	56%	139	33	24%
Unit 5 (Normal)	85	71	84%	85	71	84%	–	–	–
Virginia, MN	89	88	99%	53	52	98%	36	36	100%

Note. Enrollment numbers obtained from administrative data provided to University of Minnesota by the districts.

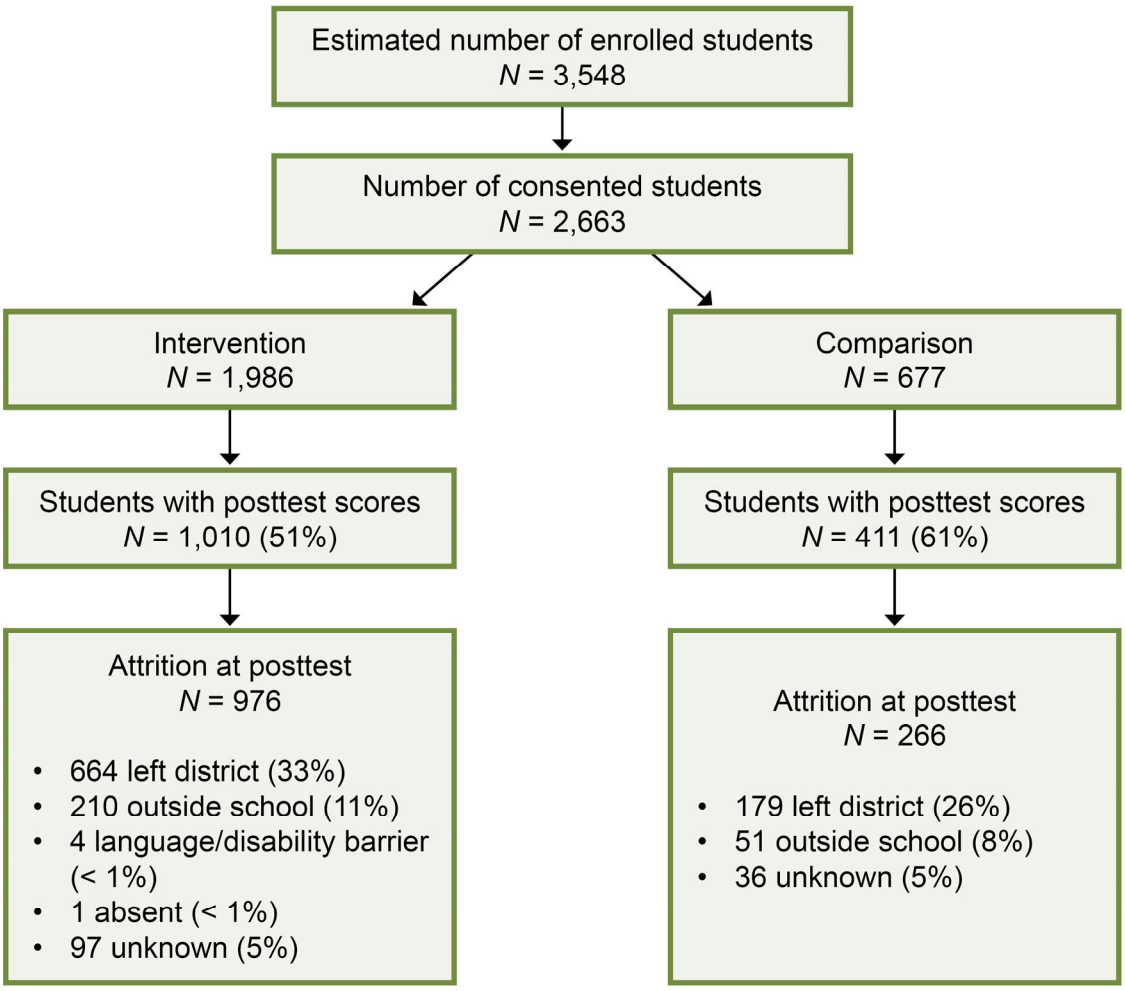
All children whose parents provided written consent were included in the sample, including children identified as having a disability or an IFSP/IEP.[22] Children were not assessed at a particular data collection interval if they were unable to complete the assessment in English or Spanish or were not present on the days the assessment team visited the school.[23] For children whose parents identified a home language other than English, the classroom teacher identified which of these children should be assessed in Spanish, and a bilingual assessor conducted the assessment using the Spanish version of the instrument. Children were not assessed if the teacher advised that testing would not be appropriate.

Due primarily to student mobility issues, the evaluation team assessed only 50% to 60% of all participating children at kindergarten entry (Exhibits 3.5 and 3.6). Nearly one third of the children had left the district by the time they entered kindergarten, and another 10% of the children enrolled in kindergarten classrooms across several hundred schools that were not participating in the CPC study as either an intervention or comparison site (referred to in Exhibits 3.5 and 3.6 as an *outside school*).

As children relocated or transferred to a new school, the evaluation team attempted to obtain the teacher-reported measures (described below) from the teacher. For children enrolled outside the participating schools, we also attempted to collect direct assessments. This was a significant challenge, however, because many children previously enrolled in CPC preschools, especially in the CPS district, attended kindergarten in non-CPC schools. This high attrition rate from the original sample of schools was a primary reason that the second-grade direct assessment outcomes were also not collected. The attrition also has implications for how many children received the P–3 CPC intervention as planned.

[22] IFSP is an Individual Family Service Plan and IEP is an Individual Education Program for children receiving early intervention or special education services.
[23] These exclusions resulted in some students having direct assessment data for some years but not others.

Exhibit 3.5. Sample of Participating Children and Attrition for Impact Study Direct Assessments at Kindergarten Entry [24]

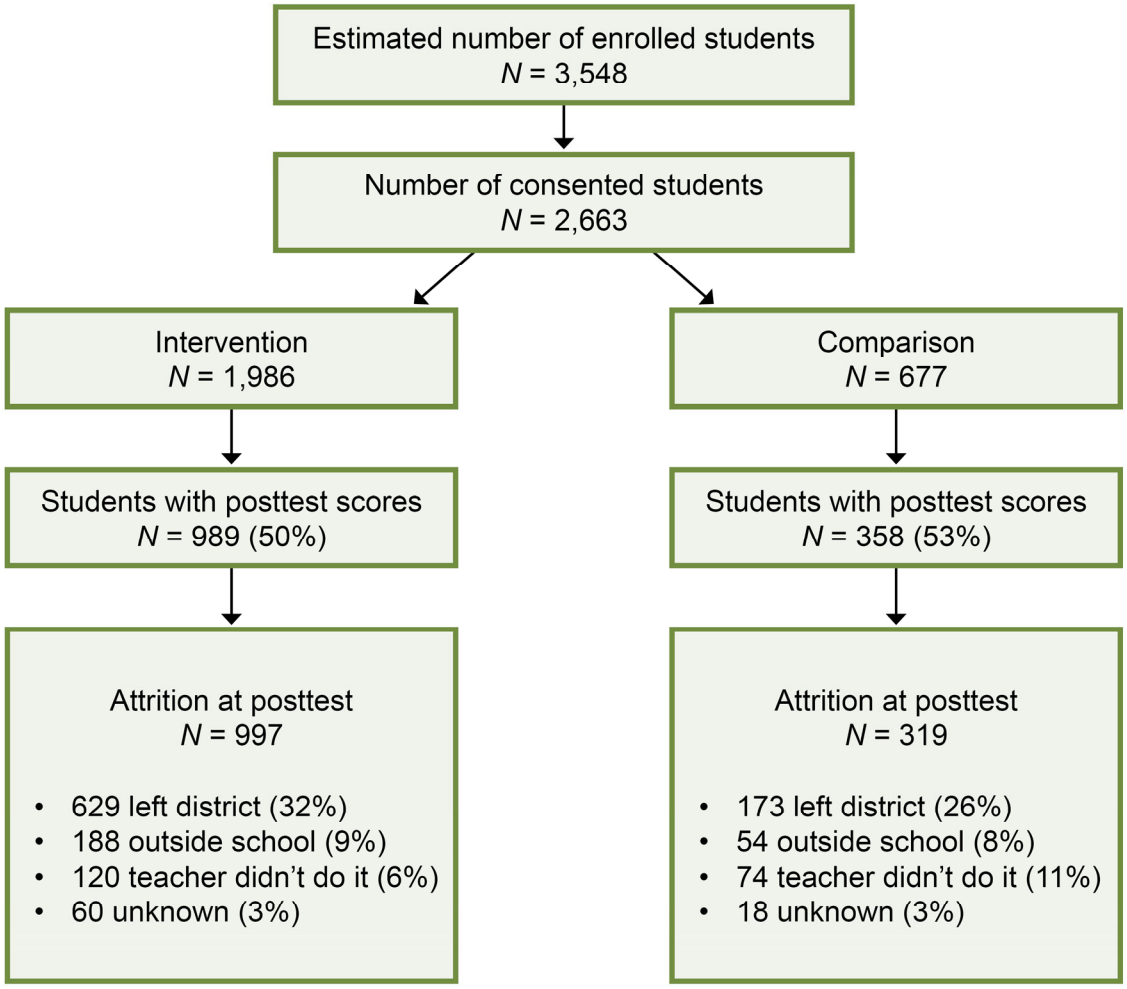


Note. The evaluation team tried to collect assessment data on all children even if they left the participating schools, but we were unable to reach all the children because they were enrolled for kindergarten at too many schools.

[24] A small percentage of consented children in the intervention group (*n* = 119 or 4%) did not have pretest assessments for various reasons including language or disability barriers, late consent, or chronic absences or unable to locate the child. A slightly larger percentage of consented children in the comparison group (*n* = 47 or 7%) did not have pretest assessments. The children identified as "left district" at posttest include children who the district staff could not locate.

Attrition also made collecting the teacher-report measures difficult because of the wide distribution of children in kindergarten at schools across the district.

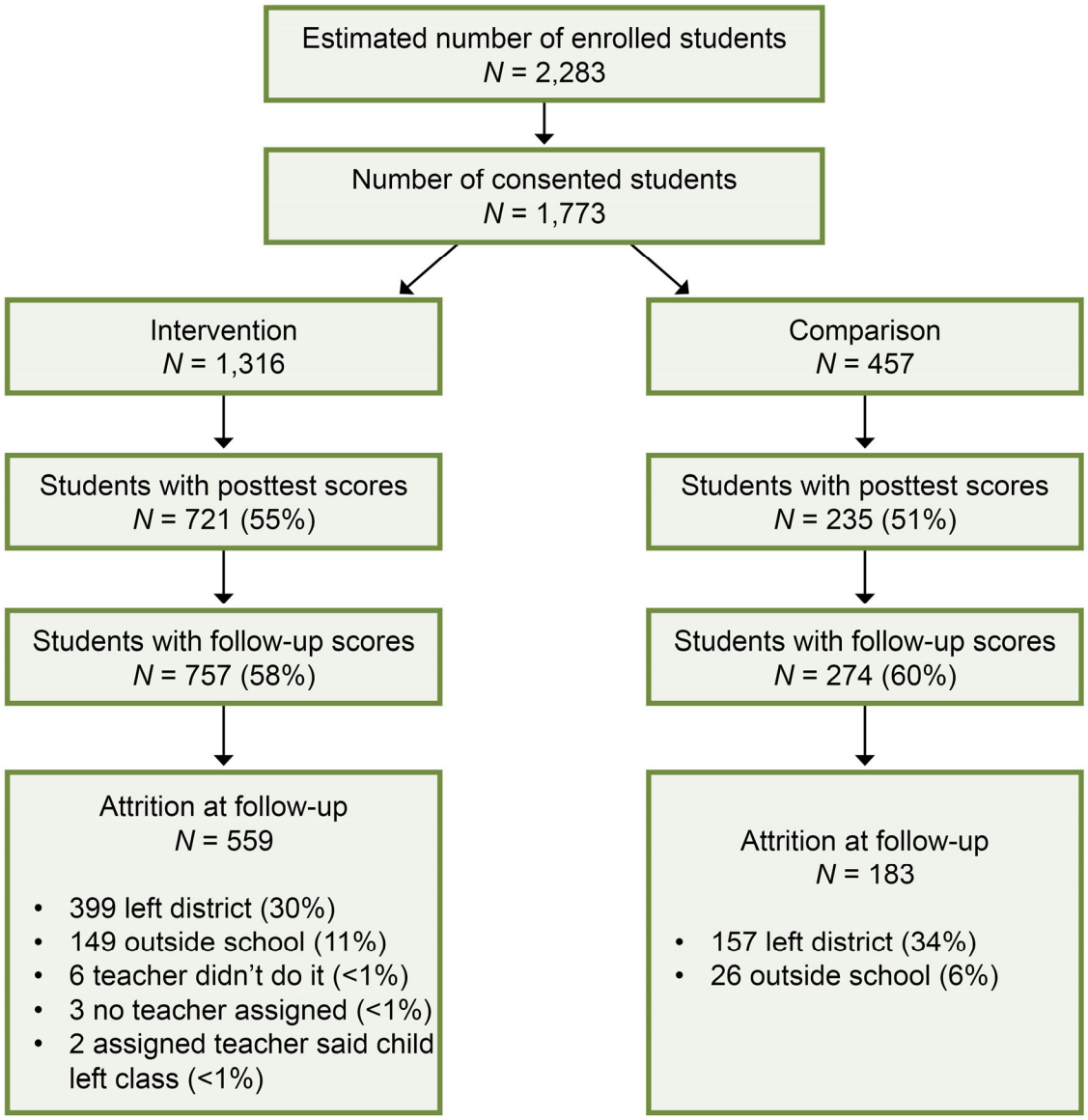
Exhibit 3.6. Sample of Participating Children and Attrition for Impact Study Teacher-Report Measures at Kindergarten Entry



Note. The evaluation team tried to collect assessment data on all children even if they left the participating schools, but we were unable to reach all the children because they were enrolled for kindergarten at too many schools.

The research team collected data on the participating children for 4 years, in fall of the second year of preschool (if applicable), fall of kindergarten, fall of first grade, and spring of second grade (if applicable). Only children who were 4 years old in fall 2012 had reached the end of second grade by spring 2016; exhibit 3.7 shows attrition for this cohort, demonstrating that we were able to collect teacher ratings in the spring of second grade for approximately 60% of children who began the study at age 4. However, it would have been difficult to collect direct assessment data on children in so many different elementary schools throughout the district.

Exhibit 3.7. Sample of Participating Children and Attrition for Impact Study Teacher-Report Measures at Second Grade for One-year Preschool Cohort Children Only



Note. It is possible for children who were missing posttest scores to have received follow-up scores at follow-up.

The sample was balanced across conditions on gender, age, and English learner status, with very little missing data at pretest (Exhibit 3.8). About one fourth to one third of both the intervention and comparison groups were identified as Latino/a. Children in the comparison group were more likely to be White and children in the intervention group were more likely to be African American. Children in the intervention condition were more likely to be identified with a disability during preschool than children in the comparison condition. However, when we examined the baseline equivalence of those children who ended up in our intent-to-treat (ITT)

analytical sample, the two groups were quite similar with no statistically significant differences on any characteristic (See Exhibit 3.11).

Exhibit 3.8. Child Demographic Characteristics For Consented Student Sample, Overall Percentage or Mean, by Condition

Demographic variable	Overall *N*	Overall % or Mean	Intervention *N*	Intervention % or Mean	Comparison *N*	Comparison % or Mean
Gender						
Male	1,302	49%	967	49%	335	49%
Female	1,360	51%	1,018	51%	342	51%
Missing	1	0.04%	1	0.05%	0	0.00%
Mean age (months) at baseline	2,657	49.66 (6.53)	1,982	49.61 (6.55)	675	49.81 (6.47)
Missing	6	0.22%	4	0.20%	2	0.30%
English learner						
Yes	850	32%	623	31%	227	34%
No	1,795	67%	1,347	68%	448	66%
Missing	18	0.68%	16	0.81%	2	0.30%
Race/ethnicity						
Latino/a	709	27%	545	27%	164	24%
White	170	6%	109	5%	61	9%
Black or African American	1,309	49%	1,053	53%	256	38%
Asian/Pacific Islander	128	5%	92	5%	36	5%
Other	91	3%	73	4%	18	3%
Missing	256	10%	114	6%	142	21%
IEP status						
Yes	203	7.62%	170	9%	33	5%
No	2,154	80.89%	1,643	83%	511	75%
Missing	306	11.49%	173	9%	133	20%

Note. Most data came from the parent-report survey completed when the children were in preschool and/or administrative data obtained from the respective school districts on children with consent to participate. Gender and date of birth were from administrative data. Race/ethnicity was from the parent survey and if missing was filled in with available administrative data. English learner status came from four sources: the language of assessment, parent survey, consent form, and administrative data. IEP status came from administrative data for the first preschool year (2012–13) and if missing was taken from teacher-report information on the teacher ratings.

Substantially more data were missing for the family characteristics variables, either because parents did not complete the survey and/or declined to answer the survey questions (Exhibit 3.9). Still, the two groups were very similar on percentage of single parent households

and unemployed households as well as maternal education level and mean number of types of public assistance received. However, children in the intervention group were more likely to come from low-income households, defined as less than or equal to 185% of the federal poverty level.

Exhibit 3.9. Family Demographic Characteristics For Consented Student Sample, Overall and by Condition

Demographic variable	Overall *N*	Overall %	Intervention *N*	Intervention %	Comparison *N*	Comparison %
Low income						
Yes	2,122	80%	1,682	85%	440	65%
No	185	7%	126	6%	59	9%
Missing	356	13%	178	9%	178	26%
Maternal education level						
Less than high school	494	19%	359	18%	135	20%
High school diploma	608	23%	454	23%	154	23%
Some college	640	24%	507	26%	133	20%
BA/BS	178	7%	125	6%	53	8%
Graduate or professional degree	67	3%	44	2%	23	3%
Missing	676	25%	497	25%	179	26%
Single parent household						
Yes	823	31%	619	31%	204	30%
No	1,222	46%	923	46%	299	44%
Missing	618	23%	444	22%	174	26%
Household employment status						
Unemployed/not working	536	20%	415	20%	121	18%
Employed part time	327	12%	243	12%	84	12%
Employed full time	1,150	43%	857	43%	293	43%
Missing	650	24%	471	24%	179	26%
Mean number of types of public assistance received	2,022	2.92 (1.80)	1,526	2.93 (1.80)	496	2.89 (1.82)
Missing	641	24%	460	23%	181	27%

Note. Most data came from parent-report survey completed when the children were in preschool and/or administrative data obtained from the respective school districts on children with consent to participate. Low-income status was from the parent survey and if missing was filled in with available administrative data. Mother's highest education level was only available from the parent survey.

CHILD OUTCOME MEASURES

The evaluation team assessed children's academic abilities using a combination of direct assessment and teacher-reported assessment measures at three time points (Exhibit 3.10). Below, we describe the measures used and present summary information about how we collected and scored the outcome measures.

Exhibit 3.10. Child Outcome Measures and Timing of Data Collection

Construct	Measure	Preschool (pretest)	Kindergarten (posttest)	Second grade (follow-up)
School readiness skills	MWSS	X	X	N/A
Early literacy	WJ LWI	X	X	N/A
Reading	WJ Reading	N/A	N/A	Not collected as planned
Math	WJ AP	X	X	Not collected as planned
Executive Functioning	DCCS	X	X	Not collected as planned
Social skills/ attention/problem behaviors	T-CRS	X	X	X

Note. Children who attended one year of preschool were approximately 4 years old at pretest. Children who attended 2 years of preschool were approximately 3 years old at pretest. Kindergarten entry was in fall 2013 for 1-year preschool children and fall 2014 for 2-year preschool children. MWSS = Minnesota Work Sampling System; WJ LWI = Woodcock-Johnson III Letter Word Identification subtest; WJ AP = Woodcock-Johnson III Applied Problems subtest; WJ Reading = Woodcock-Johnson III Passage Comprehension subtest; DCCS = Dimensional Change Card Sort task; T-CRS = Teacher-Child Rating Scale 2.1.

Direct assessments were administered to all participating children at pretest (fall 2012) and posttest (or kindergarten either in fall 2013 or fall 2014). Pretest measures were collected between September and December 2012, and posttest measures were collected between October and December in the year that children started kindergarten (either 2013 or 2014). Children were assessed as early as the end of September and as late as the end of November/beginning of December at pretest. Assessors were unaware of children's experimental condition (blind) at the time of assessment. Teacher-reported measures were collected via an online system and individual password-protected links were sent to teachers by email.

Direct child assessments

The independent evaluation team hired and trained experienced local assessment staff to conduct three direct assessments of children's early math, literacy, and executive functioning

abilities: the Woodcock-Johnson III Applied Problems (WJ AP) subtest (Woodcock, McGrew, & Mather, 2001), the Woodcock-Johnson III Letter-Word Identification subtest (WJ LWI), and the Dimensional Change Card Sort (DCCS) task, respectively. The team of assessors, which had substantial experience conducting assessments of young children in early childhood settings, had previously been trained to conduct WJ AP and WJ LWI.

Early math and literacy skills

Woodcock-Johnson III tests are individually administered norm-referenced tests with items increasing in difficulty across the test. The WJ AP subtest is a 60-item test that measures skills in analyzing and solving practical math problems. The assessor verbally presents items involving counting, telling time or temperature, and problem solving. Testing is discontinued after six consecutive errors. The score is the number of correct items. The WJ LWI 76-item subtest measures children's ability to identify printed upper and lower case letters, as well as words in isolation. The WJ LWI tests decoding (the ability to identify the letters and sounds in printed words) and pronunciation specifically. Testing is discontinued after six consecutive errors. The score is the number of correct items. For both the subtests, we transformed the raw scores into W scores using the developer's software and then used the W scores in our analyses.[25]

The Woodcock-Johnson achievement tests are highly reliable for children ages 2 to 6 years with reliability coefficients ranging from .97 to .99 on WJ LWI and .88 to .94 for WJ AP. For children ages 7 to 10, reliability coefficients range from .91 to .93 on WJ AP.[26] One-year test-retest reliability for WJ AP is .90 for children ages 2 to 7 years and .92 for children ages 8 to 18 and for WJ LWI is .96 across both age groups.

The WJ III shows evidence of criterion predictive validity (McGrew & Woodcock, 2001) yielding correlations in the .70 range on a range of well-known cognitive and achievement measures (McGrew & Woodcock, 2001). This measure also shows evidence of concurrent validity. Among

[25] The WJ W score is the foundational metric of all other types of WJ scores (e.g., standard scores, percentile ranks, relative proficiency indexes). It is an equal-interval scale and is useful to measure an individual's progress over time, for example, from pretest to posttest. Raw scores of children who took *Batería III Woodcock-Muñoz* (Spanish version of Woodcock-Johnson III) were transferred to ability level (W scores) using the Batería III Compuscore and Profile Program (Schrank & Woodcock, 2005). Raw scores of children who took WJ III English were also transferred to W scores. Batería III W scores can be directly compared with WJ III English W scores when both instruments were administered (Schrank et al., 2005).

[26] We had planned to collect assessments at the end of second grade using the WJ AP and Passage Comprehension subtests, but that data collection was discontinued.

preschool children 3 to 5 years old, WJ III AP scores have been correlated with 12 early numeracy assessment tasks that measure skills and concepts identified as fundamental to early mathematics development; correlations ranged from .35 to .70; (Purpura & Lonigan, 2015).

Additionally, five large-scale early care and education research studies (Head Start Family and Child Experiences Survey, [FACES]; Preschool Curriculum Evaluation Research [PCER]; North Carolina Prekindergarten [NC-PK]; National Center for Early Development and Learning [NCEDL]; and The Head Start Impact Study [HSIS]) all used the WJ AP subtest and the LWI subtest, and internal consistency coefficients in these studies ranged from .92 to .94 (Burchinal, Xue, et al., 2016).

Children who were identified as English learners and required testing in Spanish were administered the WJ AP subtest (*Problemas aplicados*) of the *Batería III Woodcock-Muñoz*, which is the Spanish adaptation of the Woodcock-Johnson III (Woodcock, Munoz-Sandoval, McGrew, & Mather, 2005). Internal alpha reliability estimates ranged from .91 to .95 for Spanish-speaking children ages 4 to 9 years (Schrank et al., 2005).

Executive function skills

Executive functioning or one domain of it—cognitive flexibility—was directly assessed using the Dimensional Change Card Sort task (Carlson, 2005; HealthMeasures, 2016; Zelazo, 2006). This task is an easily administered and widely used measure of executive functioning across the life span. The standard version of the task has two phases. In the pre-switch phase, children are shown two target cards (e.g., a blue rabbit and a red boat) and asked to sort test cards according to one dimension (e.g., color). During the post-switch phase, children are shown the test cards but asked to sort by another dimension (e.g., shape). In the standard version of the assessment, a child needs to correctly sort at least five out of six of the pre- and post-switch trials to pass the task. If the child passes the post-switch phase, he/she proceeds to the border phase, which uses the same cards as the first two phases and is composed of 12 trials. In this phase, a new rule is introduced: If the child sees a border on the target card, cards are sorted along one dimension (e.g., If there is a border, sort by color); if there is no border on the target card, cards are sorted on a different dimension (e.g., If there is no border, sort by shape). To pass this task, a child must correctly sort nine or more cards out of the 12 trials. Data from the border phase can be treated as categorical or continuous.

The present study used the scoring rules outlined in Zelazo (2006). A score of 0 is assigned if children fail the pre-switch phase of the standard version; a score of 1 is assigned if they pass

the pre-switch phase of the standard version but fail the post-switch phase; a score of 2 is assigned if they pass both the pre- and post-switch phases of the standard version but fail the border version; and a score of 3 is assigned if they pass both phases of the standard version and pass the border version.

The standard version provides an index of development of executive functioning during the preschool years. According to Zelazo (2006), a majority of healthy 3-year-old children (between 36 and 47 months) fail the post-switch phase, while a majority of 4- and 5-year-old children pass this phase. Additionally, most 4-year-old children fail the border phase, as do approximately half of all 5-year-olds. The DCCS task is correlated with children's performance on other measures of executive functioning (Hongwanishkul, Happaney, Lee, & Zelazo, 2005). Preliminary analysis showed strong reliability (test-retest = .92) and construct validity (Bauer & Zelazo, 2013). For example, children's DCCS task performance correlated with WPPSI-III Block Design (r = .69) and with PPVT-IV (r = .79). Since the start of the Midwest CPC Expansion study, additional research has supported the use of the DCCS as a reliable measure of children's skills, including test-retest reliability between .48 (Meador, Turner, Lipsey, & Farran, 2013) and .92 (Zelazo et al., 2013). Because the DCCS task shows less discriminant validity in very young children, the developers have continued to modify it so it can be used with a wider age range of children. The revised version is available only on digital devices, however, and not as a paper/pencil version (S. Carlson, personal communication, February 15, 2016).[27]

Teacher ratings

School readiness

School readiness skills were measured using the Minnesota Work Sampling System (MWSS), an abbreviated version of the Work Sampling System©, 4th edition (WSS), an authentic performance-based measure. The MWSS covers five domains: Personal and Social Development, Mathematical Thinking, Language and Literacy, the Arts, and Physical Development and Health (Meisels, Dichtelmiller, Jablon, Dorfman, & Marsden, 2001). The teacher-report checklist is a criterion-referenced, 32-item checklist completed by teachers who have observed children for approximately 6 weeks. During the observation period, teachers record student performance for each of the indicators through observation of meaningful tasks

[27] Children who were identified as English learners and required testing in Spanish were administered a translated version of the DCCS task. This version has not been tested for reliability and validity in a Spanish-speaking population.

and the collection of the child's work in preschool or kindergarten. Upon collection of evidence to support scores, teachers rate each student's performance on the checklist using a modified mastery scale: Not Yet, In Process, or Proficient. Ratings are determined using criteria set forth in the tool and are based on developmental guidelines and national standards. Before receiving the MWSS checklist to complete for their students, teachers were sent a training document that included (1) links to four online modules about the MWSS, (2) tips for effective observations, and (3) a rubric describing what a child at each of the three developmental rating categories might look like for each item.

In one validation study seeking to ensure alignment between the school readiness assessment and learning standards, the MWSS showed moderate alignment with the Minnesota Early Childhood Indicators of Progress (ECIP), the state's early learning standards; the tool aligned with an unduplicated 43% of the total 98 ECIP indicators. Confirmatory factor analysis from that study illustrated a good model fit (RMSEA = .06) and good internal consistency results of .88 or higher on each domain. Results also showed that children who scored higher on the MWSS were more likely to meet more early learning standards (Cox, Rodriguez, & Edwards, 2016).

At least one report prepared for the Minnesota Department of Education that had adapted and modified the WSS for use in a kindergarten school readiness study showed that the measure has predictive validity, with children scoring 75% proficient on the MWSS more likely to be reading at grade level in third grade (partial correlation controlling for child/family background = .14) as well as overall internal consistency of .98 based on 32 items (Reynolds, Englund, et al., 2011). We added six items from the WSS bank – three items to the math domain and three items for a newly added Science domain. This modified scale consisting of 38 items also has an internal consistency of 0.98.

Social-emotional adjustment

Teachers rated social skills and behavior control using the Teacher-Child Rating Scale-version 2 (T-CRS:2.1), a widely used 32-item checklist assessing four domains of a child's social-emotional adjustment. The four primary empirically derived scales are Peer Social Skills, Behavior Control, Assertiveness, and Task Orientation (Hightower & Perkins, 2010). Each subscale contains eight items, four measuring positive behaviors, and four measuring negative behaviors. The T-CRS is a normed measure with strong psychometric support including internal consistency alpha reliability estimates between .87 to .94 and test-retest reliability correlations

ranging from .66 to .80, depending on the scale. It is appropriate for children ages 3 to 9, so it represents the age span targeted by the CPC study from preschool to second grade.

Research on the T-CRS indicates adequate validity as a measure of children's social-emotional adjustment. Results of the measures' confirmatory factor analysis (GFI and CFI = .98, AGFI, NFI, and NNFI = .97) support the four subscales and indicate strong construct validity (Hightower & Perkins, 2010, p.5). The measure was found to be highly correlated with similar assessments measuring the same constructs (e.g., Child Behavior Checklist-Teacher Report Form), indicating excellent concurrent validity (*r*s ranging from -.36 to .89, showing both convergent validity for scales intended to measure the same constructs and discriminant validity for scales intended to measure different constructs) (Hightower & Perkins, 2010, p.24). When testing the discriminatory power of the measure (criterion-related validity), scores of *at-risk* and *random* groups of children were compared. The two groups differed significantly, with the random sample scoring higher ($p < .05$) on all scales (Hightower & Perkins, 2010, p.26). The measure also shows high predictive validity with school performance as to whether a child was flagged as at risk or referred for services. The discriminate analysis showed that group membership (at risk, random) could be predicted based on T-CRS 2.1 scale scores (Hightower & Perkins, 2010, p.27).

Although the T-CRS is appropriate for use with children ages 3 to 9, it is typically used as a screener for children in elementary school. All the reliability and validity data cited above pertain to a normative sample of children in kindergarten through eighth grade. This is one of the main limitations of the T-CRS. For the pretest assessment when the study children were beginning preschool, we used the norms provided in the manual for preschool-age children. The limitation to this approach is that the norms are not based on a nationally representative group of children. At posttest and follow-up (fall of kindergarten and spring of second grade, respectively), we used the norms provided in the manual for children in kindergarten through sixth grade.

ANALYSIS AND FINDINGS

Given that the children and teachers in this study were nested within schools, the magnitude of the intervention effects on children was tested using multi-level analysis, also referred to as hierarchical linear modeling (HLM) (Raudenbush & Bryk, 2002). HLM adjusts standard errors to account for the dependence among students within schools, thus avoiding overestimation of statistical significance of the effect size. We conducted a series of multilevel analyses to examine the effect of the intervention on children's outcomes, adjusting for important covariates

(e.g., pretest scores and demographic characteristics). Before conducting the impact analyses, we tested for baseline equivalence for all ITT samples as described in the findings section.

Baseline balance testing

What Works Clearinghouse (WWC) guidelines recommend that baseline equivalence of the analytic sample[28] be demonstrated on observed characteristics defined for quasi-experimental studies in a topic area, which is in this case students' school readiness skills and early school achievement in math and literacy (What Works Clearinghouse, 2014). Given the longitudinal quasi-experimental design, we decided to test the difference in pretest scores (i.e., WJ AP W scores and LWI W scores at preschool entry) between intervention and comparison students in the analytic sample (students who have both pretest and posttest scores). Baseline equivalence analysis results are shown in Exhibits 3.11 and 3.12. The HLM to test for baseline equivalence had the same nesting structure as the model used for the impact analysis, with students nested within schools. In addition, we presented the absolute effect size (ES) difference between the CPC group and comparison group means at baseline as recommended by WWC. HLM results did not indicate any significant baseline difference in pretest scores between CPC and the comparison condition. The absolute ES [column "ES" in Exhibit 3.11] on the pretest scores does not exceed .25 of a standard deviation. Therefore, this quasi-experimental design established baseline equivalence between the intervention and comparison groups.

[28] WWC defines the analytic sample as the students, schools, or classrooms that remain at the end of the study when the outcomes are assessed (What Works Clearinghouse, 2014, p. 15).

Exhibit 3.11. Baseline Equivalence for Intervention and Comparison Children for Demographic Characteristics

Variable	Intervention		Comparison		*β*	*SE*	*p*
Demographic characteristics	*M* (*SD*)	*N*	*M* (*SD*)	*N*			
Male	0.48 (0.50)	791	0.49 (0.50)	273	-0.04	0.14	0.7909
Age (months) as of Sep 2012	50.44 (6.08)	791	49.84 (6.55)	271	0.55	0.86	0.5204
Low income	0.94 (0.23)	733	0.86 (0.35)	211	0.44	0.47	0.3693
Latino/a	0.30 (0.26)	762	0.32 (0.47)	227	-0.29	0.63	0.6487
White (not Latino/a)	0.07 (0.26)	762	0.12 (0.32)	227	-0.24	0.64	0.7107
Black (not Latino/a)	0.52 (0.50)	762	0.47 (0.50)	227	-0.18	0.65	0.7874
Asian/Pacific Islander (not Latino/a)	0.07 (0.25)	762	0.07 (0.26)	227	-0.21	0.97	0.8276
Other race/ethnicity	0.04 (0.20)	762	0.02 (0.15)	227	0.51	0.64	0.4256
Speak only English at home	0.63 (0.48)	790	0.65 (0.48)	273	-0.46	0.60	0.4452
Mother's education	2.29 (0.99)	621	2.32 (1.15)	210	0.13	0.16	0.4195
IEP status	0.08 (0.27)	781	0.05 (0.21)	273	0.34	0.45	0.4459
Single parent	0.38 (0.49)	641	0.41 (0.49)	211	-0.16	0.28	0.5763
Employment status	2.28 (0.88)	629	2.37 (0.84)	210	-0.07	0.12	0.5661
Public assistance	2.90 (1.80)	633	2.85 (1.81)	208	-0.05	0.27	0.8488

Note. See Exhibits 3.8 and 3.9 for sources for these variables.

Exhibit 3.12. Baseline Equivalence for Intervention and Comparison Children for Pretest Assessment Scores

Variable	Intervention		Comparison		*β*	*SE*	*p*	*ES*
Pretest Scores	*M* (*SD*)	N	*M* (*SD*)	N				
School readiness (MWSS) total score	45.52 (17.63)	836	46.85 (15.36)	288	-3.39	2.68	0.2061	-0.08
School readiness (MWSS) 75% of points	0.30 (0.50)	836	0.30 (0.40)	288	-0.07	0.50	0.8822	0
WJ AP standard score	99.23 (12.72)	964	97.90 (22.85)	388	-0.98	1.26	0.4369	0.08
WJ LWI standard score	100.21 (13.08)	964	98.37 (11.76)	388	1.38	1.12	0.2169	0.14
WJ AP W score	391.59 (25.04)	964	388.31 (46.33)	388	-1.35	2.46	0.5824	0.10
WJ LWI W score	329.01 (28.22)	964	325.30 (26.13)	388	2.77	2.50	0.2675	0.14
DCCS	1.22 (0.63)	972	1.20 (0.64)	389	0.03	0.06	0.5875	0
T-CRS assertiveness	56.46 (25.25)	791	58.66 (23.94)	273	-2.47	2.63	0.3471	-0.09
T-CRS peer social skills	54.69 (23.31)	824	56.88 (23.38)	285	-2.67	3.28	0.4156	-0.09
T-CRS behavior control	49.38 (25.55)	817	55.47 (24.02)	276	-4.29	3.27	0.1905	-0.24
T-CRS task orientation	56.51 (23.68)	829	61.00 (21.12)	286	-4.84	2.49	0.0518	-0.20

Note. Standard deviations for continuous variables are in parentheses. The demographic variable descriptive analysis used the smallest analytic sample (children with both pretest and posttest) across all outcomes – T-CRS assertiveness analytic sample. MWSS = Minnesota Work Sampling System; WJ LWI = Woodcock-Johnson III Letter Word Identification subtest; WJ AP = Woodcock-Johnson III Applied Problems subtest; DCCS = Dimensional Change Card Sort task; T-CRS = Teacher-Child Rating Scale 2.1. ES = baseline differences measured in effect size unit.

Intent-to-treat analysis (ITT) of CPC effect on child outcomes

ITT is the average effect of the treatment based on the initial treatment assignment regardless how many participants actually received the treatment. The ITT impact estimate is the expected effect of CPC when it was implemented in the real world, with less than perfect teacher implementation and student dosage. Two-level HLM was performed to take into account children nested in schools. Dependent variables were the child direct assessments or teacher-reported assessments listed in Exhibits 3.10 and 3.13. Independent variables included a constant, a pretest score on the same outcome measure, demographic characteristics, and treatment indicator.

See Appendix B for the contrast table.[29] Two-level HLM models were conducted to analyze the one-year effect of CPC and four-year effect of CPC (using only the T-CRS teacher rating outcomes). Level 1 is student level and level 2 is the school level.

$Y_{is}^{posttest} = \beta_0 + \beta_1 Pretest + \beta_2 CPC + \beta_3 COV_{is} + \gamma_{is} + \mu_{os}$, where *i* is the student; *s* is schools; $Y_{is}^{posttest}$ is either the K-entry score (to examine the 1-year effect of CPC) or end-of-second grade score (to examine the 4-year effect of CPC); $Pretest$ is the baseline test score; *CPC* = 1 for intervention schools and 0 for comparison schools; COV_{is} is child-, school-, or district-level covariates. γ_{is} and μ_{os} are individual and school random effects.

Covariates included in this study were derived from the extensive literature on predictors and correlates of children's school readiness and academic achievement (Ayoub et al., 2009; Hair, Halle, Terry-Humen, Lavelle, & Calkins, 2006; Sameroff, Seifer, Baldwin, & Baldwin, 1993; Zhai, Brooks-Gunn, & Waldfogel, 2011). Specifically, we included the following **child-level covariates** in the two-level ITT HLM because previous studies have shown that these background characteristics are related to school readiness and achievement: gender, age at pretest, low-income status, ethnicity [Latino/a, White (not Latino/a), Black (not Latino/a), Asian/Pacific Islander (not Latino/a)], mother's education, language spoken at home, special education placement in preschool, single parent family status, parent employment status, use of public assistance, and child pretest scores (fall 2012).

We also added **district- and school-level covariates** to our models to account for differences across districts and schools (Raudenbush & Bryk, 1986). Specifically, we added dummy variables for the districts and the following school-level baseline variables: percentage of minority students, percentage of English learners, percentage of students eligible for free or reduced-price lunch, and percentage of third-grade students exceeding proficiency level on the state reading achievement test.[30] Interaction terms were added for the last models. For example, we included a three-term interaction among condition, child-level pretest scores, and

[29] The i3 office culls the results from all grantees into a report that synthesizes the quality of study designs and their findings. Thus, each independent evaluator is asked to identify a priori confirmatory contrasts that will be reported for the national evaluation report. Other outcomes and analyses are considered exploratory.

[30] To identify comparison schools and conduct propensity score matching, we used data that were available before fall 2012, when pretest scores were to be collected. For CPS, we used achievement test scores and race/ethnicity data from school year (SY) 2010–11 and other demographic data from SY 2011–12. For SPPS, we used achievement test scores from SY 2010–11 and demographic data from SY 2011–12. For District 65 in Evanston, all data used in the matching were from SY 2011–12.

district dummy codes to examine whether the intervention works better in one district or another while controlling for pretest scores (Model F, described below).

Using covariates can increase the precision of estimates of the CPC intervention. However, poorly chosen covariates decrease the degrees of freedom available to estimate the effect of the intervention and thus reduce the power available to detect it (Bailar & Mosteller, 1992; Bloom, Hayes, & Black, 2007). The high correlation among covariates, i.e., multicollinearity, can seriously distort the interpretation of a model. To avoid multicollinearity, we used a correlation matrix, the variance inflation factor, and a condition index to identify multicollinearity among school- and child-level covariates. No multicollinearity was detected, and a parsimonious number of covariates were chosen for inclusion in the final models.

To explore the impact of the CPC intervention on child outcomes, we developed six models to account for the potential contributions of child, family, school, and district factors.

- **Model A** is the simplest model and controls for children's pretest scores and age at pretest only.
- **Model B** controls for the variables in Model A plus other child and family characteristics known to influence children's school readiness, early achievement, and social-emotional outcomes.
- **Model C** adds school-level characteristics to Model B to examine whether some of the differences we were seeing between schools at pretest might influence child outcomes controlling for pretest scores and child and family characteristics.
- **Model D** adds a district dummy variable to Model C to examine whether the district as a whole might influence outcomes considering geographic differences, such as CPS being very urban and Evanston and Normal being considered suburban.
- **Models E and F** test for any expected interactions between child, family, school, and district variables. Specifically, in Model E we tested the interaction between child pretest scores, treatment condition, and district to observe the extent to which child outcomes vary as a function of differences in child pretest scores between the treatment conditions across school districts. In Model F, we tested for the presence of Model E's three-way interaction while also accounting for child and family covariates.

- **Model G** is the same as Model C except that all the missing covariates were imputed using SAS PROC MI. Pretest scores and outcomes were not imputed. We reported the results from Model G to Abt Associates.

Confirmatory findings

The evaluation team ran confirmatory contrasts for three measures: MWSS, LWI, and AP and exploratory contrasts for two measures: DCCS and T-CRS 2.1 subscales. The academic outcomes are considered confirmatory outcomes based on the literature described above and evidence base. Because the primary goal of the Midwest CPC Expansion project was to have impacts on academic outcomes, we considered the social-emotional outcomes and executive function skills as exploratory. Exhibit 3.13 shows the mean and standard deviations of outcome scores for all the measures for children in the two conditions.

Exhibit 3.13. Outcome Scores for Intervention and Comparison Children, at Kindergarten Entry

Variable	Intervention		Comparison	
Outcomes	*M* (*SD*)	*N*	*M* (*SD*)	*N*
School readiness (MWSS) total score	52.10 (18.37)	836	54.50 (16.09)	288
School readiness (MWSS) 75% of the points	0.40 (0.50)	836	0.50 (0.50)	288
WJ AP standard score	96.74 (11.40)	964	96.64 (11.26)	388
WJ LWI standard score	104.66 (14.30)	964	101.86 (11.49)	388
WJ AP W score	419.15 (17.68)	964	418.11 (17.32)	388
WJ LWI W score	376.83 (33.49)	964	369.34 (25.60)	388
DCCS	1.74 (0.56)	972	1.72 (0.57)	389
T-CRS assertiveness	55.83 (25.70)	791	57.44 (27.53)	273
T-CRS peer social skills	55.21 (23.88)	824	59.83 (25.05)	285
T-CRS behavior control	48.78 (25.11)	817	52.55 (28.00)	276
T-CRS task orientation	55.32 (25.62)	829	59.58 (26.88)	286

Note. Descriptive analysis uses the sample of children with both pretest and posttest on each outcome. MWSS = Minnesota Work Sampling System; WJ LWI = Woodcock-Johnson III Letter Word Identification subtest; WJ AP = Woodcock-Johnson III Applied Problems subtest; DCCS = Dimensional Change Card Sort task; T-CRS = Teacher-Child Rating Scale 2.1

In general, this study found no significant differences between CPC and comparison on any outcomes at kindergarten entry for any of the HLM models on either the confirmatory or exploratory contrasts.

School readiness

We did not find any significant differences favoring the CPC intervention group on the school readiness outcome at kindergarten entry. All children's teacher-rated school readiness skills increased from baseline (Exhibit 3.12) to kindergarten entry (Exhibit 3.13). In addition, we examined the differences between CPC and comparison on the percentage of children who were rated proficient or not based on whether they received 75% of the points on the MWSS measure, a cut-off used in previous studies (Reynolds, et al., 2011). Again, we found no differences between the two groups at kindergarten entry.

Exhibit 3.14. Results for Intent-to-Treat Impact Analysis for MWSS Total Scores, Kindergarten Entry

Models	Estimated impact	*SE*	*df*	*T* value	*p*	Students *N*	Schools *N*	Effect size (Hedge's *g*)	Improvement Index
Model A	1.3	2.4	1,071	0.6	0.5838	1,122	49	0.07	3
Model B	1.3	2.4	795	0.5	0.5865	855	49	0.07	3
Model C	2.1	2.5	772	0.8	0.3997	834	49	0.12	5
Model D	2.2	2.6	769	0.8	0.3986	834	49	0.12	5
Model E	1.7	2.4	1068	0.7	0.4869	1,122	49	0.10	4
Model F	1.3	2.5	781	0.5	0.5884	845	49	0.07	3
Model G	1.4	2.3	1002	0.6	0.5263	1,124	49	0.08	3

Note. Two-level HLM was used where children were nested in schools. For the effect size and improvement index values, a positive number favors the intervention group and a negative number favors the comparison group. Effect size measures the change (measured in standard deviations) in an average student's outcome that can be expected if the student is exposed to the intervention. The improvement index is an alternative presentation of the effect size, reflecting the change in an average student's percentile rank that can be expected if the student is exposed to the intervention. The improvement Index is a way to translate the effect size into a meaningful metric in educational research. What Works Clearinghouse (2008) recommends translating the effect size into "improvement in percentile rank," which is supposed to indicate the expected change in percentile rank for the median comparison student if that student had received the CPC intervention. Estimated impact and standard errors are the coefficient and standard errors associated with intervention variable from the two-level HLM model (children nested in school model). Effect size = Estimated impact/pooled standard deviations of the intervention and comparison group.

Model A = HLM impact models controlling for pretest scores and age at pretest.

Model B = HLM impact model controlling for pretest, age at pretest, gender, family income, race and ethnicity, mother's education, single parent family status, family employment, and public assistance status.

Model C = HLM impact model controlling for pretest, age at pretest, gender, family income, race and ethnicity, mother's education, single parent family status, family employment, public assistance status, and school characteristics (percent minority, percent ELL, percent free of reduced lunch and percent proficient in reading).

Model D = HLM impact model controlling for pretest, age at pretest, gender, family income, race and ethnicity, mother's education, single parent family status, family employment, public assistance status, school characteristics (percent minority, percent ELL, percent free of reduced lunch and percent proficient in reading), and district dummy variables.

Model E = HLM impact model controlling for pretest, age at pretest, school characteristics (percent minority, percent ELL, percent free of reduced lunch and percent proficient in reading), district dummy variables, interaction terms of pretest scores and district dummy variables, and interaction terms of intervention variable and district dummy variables.

Model F = HLM impact model controlling for pretest, age at pretest, gender, family income, race and ethnicity, mother's education, single parent family status, family employment, public assistance status, school characteristics (percent minority, percent ELL,

percent free of reduced lunch and percent proficient in reading), district dummy variables, and interaction terms of intervention and district dummy variables.

Model G = HLM impact model controlling for pretest, age at pretest, gender, family income, race and ethnicity, mother's education, single parent family status, family employment, public assistance status, and school characteristics (percent minority, percent ELL, percent free of reduced lunch and percent proficient in reading). All the missing covariates were imputed using multiple imputation techniques. Pretest scores and outcomes were not imputed.

All the predictors except the intervention indicator variable were grand-mean centered in the HLM. A variable is grand-mean centered by subtracting the sample mean from each case's score on that variable. This transformation does not do anything to change the relationship between child outcomes and the predictor variables. However, it makes the intercept of the multilevel model more interpretable, which is the estimated mean of the control group after controlling for all covariates.

Early math skills

We did not find any significant differences favoring the CPC intervention group on the applied problems subtest at kindergarten entry (Exhibit 3.15). All children's W scores increased over time on this measure (comparing Exhibit 3.12 and 3.13). The standard scores did show that children were performing in the average range of the measure at posttest (data shown in Exhibits 3.13).

Exhibit 3.15. Results for Intent-to-Treat Impact Analysis for WJ Applied Problems W Scores, Kindergarten Entry

Models	Estimated impact	*SE*	*df*	*T* value	*p*	Students *N*	Schools *N*	Effect size (Hedge's *g*)	Improvement index
Model A	-0.5	1.4	1,303	-0.4	0.7113	1,352	47	-0.03	-1
Model B	0.3	1.3	957	0.2	0.8354	1015	47	0.02	1
Model C	0.2	1.3	953	0.1	0.9005	1015	47	0.01	0
Model D	0.3	1.4	950	0.2	0.8475	1015	47	0.02	1
Model E	-0.5	1.4	1,302	-0.4	0.7119	1,352	47	-0.03	-1
Model F	0.2	1.4	864	0.2	0.8833	924	47	0.01	0
Model G	0.03	1.28	1,290	0.02	0.9813	1,352	47	0.00	0

Note. See note on Exhibit 3.14 regarding the HLM tests, effect sizes, and improvement index.

Early literacy skills

We did not find any significant differences favoring the CPC intervention group on the LWI subtest at kindergarten entry (Exhibit 3.16). All children demonstrated increases over time on this measure. Children in the intervention group gained more on this measure, but it was not statistically significant.

Exhibit 3.16. Results for Intent-to-Treat Impact Analysis for WJ Letter-Word Identification W Scores, Kindergarten Entry

Models	Estimated impact	*SE*	*df*	*T* value	*p*	Students *N*	Schools *N*	Effect size (Hedge's *g*)	Improvement index
Model A	3.7	2.9	1,303	1.3	0.2025	1,352	47	0.12	5
Model B	4.32	3.2	958	1.4	0.1773	1016	47	0.14	5
Model C	4.5	3.0	954	1.5	0.1368	1016	47	0.14	6
Model D	4.5	3.3	951	1.4	0.1689	1016	47	0.14	6
Model E	3.8	2.9	1,302	1.3	0.1974	1,352	47	0.12	5
Model F	5.8	3.4	865	1.7	0.0855	925	47	0.19	7
Model G	4.5	2.7	1,290	1.7	0.1005	1,352	47	0.14	6

Note. See note on Exhibit 3.14 regarding the HLM tests, effect sizes, and improvement index.

Exploratory findings

Below, we describe the exploratory outcomes regarding social skills, behavior problems, and executive functions as measured by the DCCS task and the teacher-reported T-CRS 2.1. Although these had not been assessed at kindergarten entry in the earlier CLS-CPC analyses, there was an expectation that high-quality preschool may support these nonacademic skills.

Executive functioning

We did not find any significant differences favoring the CPC intervention group on the DCCS task at kindergarten entry (Exhibit 3.17). There were small gains in both groups on this measure.

Exhibit 3.17. Results for Intent-to-Treat Impact Analysis for DCCS Scores, Kindergarten Entry

Models	Estimated impact	*SE*	*df*	*T* value	*p*	Students *N*	Schools *N*	Effect size (Hedge's *g*)	Improvement index
Model A	0.001	0.1	1,312	0.0	0.9846	1,361	48	0.002	0
Model B	0.020	0.1	961	0.5	0.6412	1,019	48	0.030	1
Model C	0.020	0.1	957	0.4	0.7255	1,019	46	0.030	1
Model D	-0.002	0.1	954	0.0	0.9680	1,019	46	-0.003	0
Model E	-0.001	0.1	1,311	0.0	0.9879	1,361	48	-0.003	0
Model F	0.050	0.1	867	1.0	0.3202	927	48	0.080	3

Note. See note on Exhibit 3.14 regarding the HLM tests, effect sizes, and improvement index.

Social and emotional outcomes

We did not find any significant differences favoring the CPC intervention group on any of the T-CRS 2.1 subscales at kindergarten entry (Exhibit 3.18). We also explored whether there was an impact on social and emotional outcomes at the end of second grade and did not find any differences between the intervention and comparison children on the T-CRS 2.1 subscales (data not shown), although there was a high level of attrition at second grade as shown in Exhibit 3.7.

Exhibit 3.18. Results for Intent-to-Treat Impact Analysis for T-CRS Scores, Kindergarten Entry

Models	Estimated impact	*SE*	*df*	*T* value	*p*	Students *N*	Schools *N*	Effect size (Hedge's *g*)	Improvement index
Task Orientation									
Model A	-1.9	2.6	1,062	-0.7	0.4622	1,113	48	-0.07	-3
Model B	-3.2	2.5	791	-1.3	0.1986	851	48	-0.12	-5
Model C	-2.7	2.5	768	-1.1	0.2819	830	46	-0.10	-4
Model D	-3.0	2.8	765	-1.1	0.2700	830	46	-0.12	-5
Model E	-1.9	2.4	1,059	-0.8	0.4228	1,113	48	-0.07	-3
Model F	-3.8	2.5	777	-1.5	0.1370	841	48	-0.15	-6
Behavior Control									
Model A	-1.7	2.9	1,040	-0.6	0.5604	1,091	48	-0.07	-3
Model B	-1.8	3.0	775	-0.6	0.5573	835	48	-0.07	-3
Model C	-1.0	3.1	752	-0.3	0.7363	814	46	-0.04	-2
Model D	-2.6	3.2	749	-0.8	0.4175	814	46	-0.11	-4
Model E	-1.4	2.9	1,037	-0.5	0.6204	1,091	48	-0.06	-2
Model F	-2.0	3.3	761	-0.6	0.5521	825	48	-0.08	-3
Assertiveness									
Model A	0.1	3.0	1,011	0.0	0.9663	1,062	48	0.005	0
Model B	0.9	3.1	748	0.3	0.7792	808	48	0.030	1
Model C	1.7	3.0	725	0.6	0.5740	787	46	0.060	3
Model D	2.2	3.2	722	0.7	0.4845	787	46	0.090	3
Model E	0.1	2.9	1,008	0.0	0.9841	1,062	48	0.002	0
Model F	0.5	3.1	735	0.1	0.8774	799	48	0.02	1
Peer Social Skills									
Model A	-3.6	2.9	1,056	-1.3	0.2067	1,107	48	-0.15	-6
Model B	-3.3	3.1	785	-1.1	0.2810	845	48	-0.14	-5
Model C	-2.6	3.0	762	-0.9	0.3760	824	46	-0.11	-4
Model D	-3.3	3.2	759	-1.1	0.2920	824	46	-0.14	-5
Model E	-3.9	2.7	1,053	-1.5	0.1450	1,107	48	-0.16	-6
Model F	-3.6	3.0	772	-1.2	0.2236	836	48	-0.15	-6

Note. See note on Exhibit 3.14 regarding the HLM tests, effect sizes, and improvement index.

To understand why we found so few significant effects on child outcomes, we conducted exploratory analyses to determine whether some subgroups benefited more than others. First, we examined the impact of CPC for each district separately. In these analyses, we found a trend for a positive impact of the intervention on child outcomes but only for CPS and Evanston and only for WJ LWI and MWSS, respectively. That is, children participating in the CPS CPC intervention group had higher scores than the comparison group on the literacy measure at kindergarten entry, but it was only a trend ($p < .10$). Children who participated in the CPC intervention group in Evanston had significantly higher scores than the comparison group on the MWSS school readiness measure ($p < .05$).

Second, we conducted analyses with the CPS sample only to explore whether dosage affected the outcomes. Approximately 34% of children in the intervention group ($n = 670$) and 32% of children in the comparison group ($n = 220$) began preschool as three-year olds and thus received two years of preschool. We found a significant positive impact on literacy (as measured by the WJ LWI subtest) for children who began the preschool as three-year olds (compared with children who began the comparison preschool as three year olds) ($p < .05$). We found a similar positive impact for the two-year CPC preschool cohort on the T-CRS assertiveness subscale ($p < .10$).

We then examined whether children who participated in full-day preschool performed better at kindergarten entry than children who attended part-day preschool in CPS.[31] Approximately 18% of intervention children were enrolled in a full-day preschool classroom in year 1 but only 6% of children in the comparison group were. We did not find any significant differences favoring intervention children compared with comparison children in full-day preschool classrooms. We also conducted exploratory analyses within the intervention group only to determine whether full-day CPC yields a significant advantage to part-day to replicate findings published by Reynolds and his colleagues (Reynolds, et al., 2014). However, we found no differences on outcomes between full-day CPC compared to part-day CPC.

We have conducted analyses to better understand attrition patterns and how they impact the results. Overall, children were more likely to drop out from pretest to posttest if they were in the intervention group, were younger at pretest, were non-Hispanic, and had mothers with higher

[31] Only CPS had variation on dosage, where approximately half the sites offered a full-day classroom for preschool. In Evanston and SPPS, one site offered a full-day preschool option. The Normal, IL, site did not offer a full-day preschool classroom.

education levels. There was also variation in attrition across the 5 school districts. As outlined in the impact analysis plan submitted and approved by the i3 office, we conducted additional exploratory analyses that weight for the inverse probability of attrition to help compensate for this differential attrition (Weuve et al., 2012). We first developed models of the probability of having outcome data – i.e., remaining in the study at posttest – from 1) child-level background characteristics only, 2) child and school level characteristics, and 3) child-, school-characteristics and district indicator variables. We then used these probabilities to compute analytical weights that are in inverse proportion to the probability of having posttest data. Observations with characteristics associated with a lower probability of having posttest data, e.g., non-Hispanic students, were assigned larger weights, thereby "compensating" for the underrepresentation of these types of observations in the posttest data. We then applied the weights to our ITT impact analyses. The results of these analyses did not show a significant positive impact of the intervention on any child outcomes.

Related to attrition, we also conducted analyses where we impute covariates only (Model G in Exhibit 3.14 to 3.18), covariates and pretest scores only (not presented in this report due to space limitation), and then covariates, pretest and posttest scores (not presented in this report due to space limitation) to examine how the missing data impact the results. We found that treatment impact estimates are consistent across different models. The results did not change depending on whether missing data were imputed.

Finally, we did conduct exploratory analyses on the T-CRS outcomes at the end of second grade for those students who had reached second grade by the end of the grant period (i.e., one-year preschool cohort), were still enrolled in the district, and teachers completed the ratings for consented children. For those children, we did not find any significant impacts of CPC intervention on teachers' ratings of social skills and behavior control at the end of second grade.

4. Discussion

In this report, we have described the design and findings of an important contemporary evaluation of one of the most extensively studied early childhood intervention programs, the Child-Parent Center (CPC), which was revised and expanded in 2012 by an Investing in Innovation (i3) Validation Grant from the U.S. Department of Education's Office of Innovation and Improvement. The i3 grant program was for the expansion of innovative interventions that have a demonstrated record of improving the academic outcomes of high-need students. Implementation of this new project, the Midwest Child-Parent Center (CPC) Expansion project, was led by the Human Capital Research Collaborative (HCRC) at the University of Minnesota, a partnership of the university's Humphrey School of Public Affairs and the Institute of Child Development. As part of the grant requirements, SRI International designed and conducted an independent evaluation of the implementation and the impact of this preschool to third grade intervention that was conducted in persistently low-performing schools in five school districts in Illinois and Minnesota.

As described in the Introduction section, first implemented in Chicago in 1967, the CPC model has a long history of offering innovative, targeted approaches to school reform including a comprehensive system of educational and family support services during the preschool through third grade years for young children in low-income neighborhoods. The CPC model promotes school readiness, early school achievement, and parent involvement, with the ultimate objective of improving long-term outcomes such as educational achievement, career success, and adult well-being. The current project and evaluation covered preschool to second grade only due to the length of the grant funding. The CPC model has been used continuously in the Chicago Public Schools (CPS), and along with the Abecedarian project and the Perry Preschool Project has been used extensively to advocate for policies and funding for early childhood education based on studies showing short- and long-term improvements in school readiness skills and later school achievement as well as long-term cost savings (Belfield, Nores, Barnett, & Schweinhart, 2006; Karoly et al., 1998; Reynolds, 2000; Reynolds, Temple, White, et al., 2011; Schweinhart et al., 2005).

Since the original CPC model was implemented in the 1980s and 1990s, there have been many changes in access to preschool programs for young children living in poverty and research about preschool program quality and impacts of preschool programs on young children's learning and school readiness skills and long-term academic achievement. In particular, we

have witnessed an expansion of state preschool programming across the country, policy initiatives aimed at improving quality of preschool programs as well as providing comprehensive services, expansion of Head Start programs, support for preschool to third grade initiatives at the state and local levels, and other efforts to require certain quality features in community child care programs (e.g., development and implementation of quality rating systems). These efforts have been summarized in many important books in the field published over the past decade (Burchinal, Zaslow, et al., 2016; Kagan & Kauerz, 2012; McLanahan et al., 2016; Pianta et al., 2007; Pianta, Barnett, Burchinal & Thornburg, 2009; Pianta & Howes, 2009; Reynolds et al., 2010; Zaslow et al., 2011). As described earlier, the Midwest Child-Parent Center (CPC) Expansion project builds on earlier CPC findings and expands and updates the CPC's comprehensive early childhood education intervention approach for a contemporary context. The evaluation study described in this report adds to that body of research about how best to implement a high-quality P-3 early childhood intervention to achieve positive child outcomes.

Summary of Implementation Findings

In the implementation study, we examined fidelity to the six core components of the Midwest CPC Program model and corresponding requirements in years 1 and 2 of the project, which represent preschool and kindergarten implementation respectively. We then examined the extent to which some of the CPC intervention components existed in the comparison sites in each year. In particular, we focused on characteristics of preschool and kindergarten classrooms or programs that have been identified as being indicators of quality (e.g., CLASS observation scores, class size/ratio) and/or to be associated with child outcomes (e.g., parent involvement).

Fidelity of implementation was measured at the school and program level for each of the core components in the first 2 years of the project. In year 1, the majority of schools implemented 5 of the 6 components with fidelity but only 54% of schools implemented the professional development (PD) component with fidelity. Measuring PD in the first year was a challenge and was plagued by a notable amount of missing data for several requirements. Thus, scores on this component may not reflect how well the PD was implemented in schools participating in the intervention. In year 2, the majority of schools implemented all six components to fidelity; however, more of the requirements, especially in the PD component, relied on ratings completed by the implementation team during site visits. Thus, the criteria for fidelity for this component were different in kindergarten. Schools that did not meet the implementation fidelity threshold for some of the core components tended to miss the threshold cut point because of

missing data on one or more of the requirements. Overall, the findings demonstrate that most CPC schools were able to implement the CPC model with good fidelity in both years 1 and 2.

Fewer schools were able to meet some of the individual requirements in each of the components. Most notably, only 54% of schools in year 1 and year 2 met the requirement to have low teacher-child ratios in all classrooms (2:17 for preschool and 2:25 for kindergarten). Only one-fourth of schools met the parent involvement requirement in year 1 (preschool) and one-fifth met the parent involvement in year 2 (kindergarten). Also in year 1, less than half of the schools met the staff engagement with PD requirement which was arbitrarily set at 2 on a three-point rating completed by the school PD facilitator.

The evaluation team attempted to collect similar implementation data from the comparison schools for each of the program requirements. For example, information on class size and teacher-child ratios was available for the comparison classrooms, but comparison preschools could not readily provide other data (e.g., parent involvement and professional development data). In year 1, data were available for 12 Midwest CPC Expansion program requirements across three components for both CPC and comparison schools. Overall, CPC schools were more likely than comparison schools to offer a full-day preschool option and field trips, had higher classroom quality as defined in this study using CLASS and CLAC data, and had more frequent parent involvement (as reported by teachers). However, CPC and comparison schools were quite similar on seven of these 12 requirements (teacher-child ratio, teacher qualifications, endorsed instructional plan, evidence-based curriculum, assessment/monitoring, balance of teacher-directed/child-initiated activities, and program continuity plan). Finally, a larger percentage of comparison schools implemented the optional collation/close proximity but due to implementation challenges not all intervention schools were able to collocate the preschool classroom in or near the school. These findings are not too surprising and many of the requirements are structural characteristics required of most publicly funded preschool programs, such as those implemented in the participating school districts.

In year 2 (kindergarten), data were available for 11 CPC program requirements across three components for both CPC and comparison schools. Overall, CPC schools were more likely to implement the following requirements compared with comparison schools: teacher-child ratio (2:25), endorsed instructional plan, assessment/monitoring, high instructional quality (as defined in this study using CLASS and CLAC data), program continuity plan, and frequent parent

involvement. Again, CPC and comparison schools were similar on 4 of the 11 requirements: full-day kindergarten, teacher qualifications, field trips, and evidence-based curriculum.

These fidelity data for CPC versus comparison classrooms for both preschool and kindergarten implementation indicate that the comparison schools were implementing many of the same features. The program quality findings using the CLASS measure are especially important in showing similarities in classroom quality for CPC and comparison group children. That is, for both the preschool and kindergarten classrooms, the average CLASS scores of the CPC and comparison schools were very similar for all three quality areas measured. For the preschool classrooms, for Emotional Support, the average scores for CPC versus comparison schools were 6.24 and 6.13, and for Classroom Organization, they were 6.05 and 5.96, respectively, scores that are also typically found in many other contemporary preschool studies (Burchinal, Zaslow, et al., 2016; Early et al., 2006). For the kindergarten classrooms, for Emotional Support, the average scores for CPC versus comparison schools were 5.30 and 5.19, and for Classroom Organization, they were 5.30 and 4.97, respectively, scores that are also typically found in other studies. Perhaps most important, however, for the preschool classrooms, the average Instructional Support scores of 3.31 and 3.01 for CPC and comparison school also are similar and a little higher than what is typically found in other contemporary studies of preschool programs. For the kindergarten classrooms, the average Instructional Support scores of 2.47 and 2.43 for CPC and comparison schools are similar and a little lower to what is typically found in other contemporary studies. Overall, these finding show similar program quality results for the two groups on a reliable and valid measure used in many preschool evaluation studies. We conclude therefore that children in both groups received similar doses of critical components of high-quality preschool and kindergarten (e.g., small classroom size, teachers with a bachelor's degree, evidence-based curriculum) as well as an adequate dose of instructional and emotional support as measured by independent classroom observations. However, these data may point to a lower than needed dose of content-specific instructional support as recently identified in a meta-analysis (Burchinal, Zaslow, et al., 2016). For example, the Boston Public Schools Prekindergarten Program found CLASS instructional support scores of 4.3 and also found significant impacts on child outcomes (Weiland, Ulvestad, Sachs, & Yoshikawa, 2013).

What we were not able to measure in the comparison classrooms with the same degree of precision and detail were features like professional development, parent involvement resources and staff, and continuity and alignment. Although these quality components may be important

and may be occurring to some extent in the comparison classrooms, not having more complete data about them this is a limitation in the current study.

Summary of Impact Findings

The SRI evaluation team designed an independent quasi-experimental study to evaluate the impacts of the CPC intervention on children's outcomes. The impact study addressed questions about whether children in the CPC intervention schools attain greater gains in school readiness skills (i.e., early literacy, mathematics, executive functioning, behavior and social skills) at kindergarten entry and at the end of second grade than children in the comparison schools. It also examined whether the effects of the CPC intervention vary as a function of child, family, and school characteristics. Because the extensive CLS literature points to CPC's significant impacts on school readiness and later impacts on students' academic achievement in third grade and beyond, we viewed the evaluation questions related to school readiness, literacy, and mathematics at kindergarten entry as confirmatory contrasts (or expected outcomes) and the evaluation questions related to executive functions, social skills, and behavior as exploratory contrasts (or potential outcomes). Further, because students only reached second grade by the end of the grant funding period, the evaluation team used second grade outcomes as a proxy for third grade proficiency outcomes. We specified reading comprehension and skills in mathematics as confirmatory outcomes at second grade and executive functions, social skills, and behavior as exploratory outcomes in second grade. Although we had planned to assess these confirmatory outcomes in the spring of second grade, it was decided by the project director that high attrition in both the intervention and comparison groups in second grade limited the representativeness of the sample and thus did not warrant additional resources to collect direct assessment data.

The developers of the revised and improved CPC P-3 model view the CPC model as a school-wide reform model intended to be implemented across grades (vertical alignment from preschool to third grade) and across content and supports (horizontal alignment of curricula, assessments, professional development, parent involvement, etc.). It is hypothesized that the school-wide P-3 approach coupled with a focus on providing comprehensive family services and outreach will lead to better outcomes on school readiness than providing preschool alone. Thus, we purposely designed a study that would meet rigorous standards, enable us to control for baseline skills and abilities in children in both the intervention and comparison groups, and would examine the added benefit of CPC over business-as-usual preschool experiences more widely available in the contemporary context.

Intervention schools were matched to comparison schools within the district using propensity score matching techniques. The final impact sample included 27 CPC schools and 24 comparison schools. Overall, the propensity scoring matching process resulted in a set of comparison schools that were similar to CPC schools on the baseline variables. That is, we saw no differences that represented a greater than .25 standard deviation difference between the two groups of schools across the entire sample. However, two of the four districts (Unit 65 in Evanston and Saint Paul Public Schools) had comparison schools that showed significant differences on some of these variables used in the analyses as covariates. This within-district mismatch is a typical limitation in the analysis when using the school as the unit of intervention in school districts with a small number of schools.

Approximately 3,500 children were enrolled in preschool in fall 2012 across the participating schools and 75% of the total enrolled consented to participate in the study. Despite sample size and consent rate differences, we believe we recruited a sample of children that was representative of those enrolled in preschool for the 2012–13 school year in both the intervention and comparison schools. Both our descriptive analyses of the total number of children consented at baseline shows equivalence as well as our intent-to-treat (ITT) analytical sample.

Attrition was high for consented children who were assessed at kindergarten entry. Due primarily to mobility issues, the evaluation team assessed only 50% to 60% of all participating children at kindergarten entry. Nearly one-third of the children had left the district by the time they entered kindergarten, and another 10% of the children enrolled in kindergarten classrooms across over one hundred schools that were not participating in the CPC study as either an intervention or comparison site. As children relocated or transferred to a new school, the evaluation team attempted to attain the teacher-reported measures. For children enrolled outside the participating schools, we also attempted to collect direct assessments. This was a significant challenge, however, because many children previously enrolled in CPC preschools, especially in the CPS district, attended kindergarten in non-CPC schools. This high attrition rate from the original sample of schools was a primary reason that the second-grade direct assessment outcomes were not collected. The attrition also has implications for how many children received the P–3 CPC intervention as planned. The research team collected data on the participating children for 4 years, in fall of the second year of preschool (if applicable), fall of kindergarten, fall of first grade, and spring of second grade (if applicable). Only children who were 4 years old in fall 2012 had reached the end of second grade by spring 2016. The

evaluation team was able to collect teacher ratings in the spring of second grade for approximately 60% of children who began the study as four-year-olds. However, it would have been difficult to collect direct assessment data on children in so many different elementary schools throughout the districts.

In all six of the two-level HLM analyses performed to take into account children nested in schools, with the child direct assessments or teacher-reported assessments as the dependent variables, the results showed that there were no significant differences between the CPC and comparison groups on any of the outcomes. Although analyses of the teacher-rated MWSS assessment of school readiness did not show any significant positive impacts for intervention children, average scores for both groups increased from pretest to posttest. In addition, we examined the percentage of children who were rated proficient or not based on whether they received 75% of the points on the measure, a cut-off used in previous studies (Reynolds, Englund, et al., 2011). Again, we found no differences between the two groups at kindergarten entry. For early math skills, we did not find any significant differences favoring the CPC intervention group on applied problems subtest. All children's W scores increased over time on this measure. The standard scores showed that children were performing in the average range of the measure. For early literacy skills, as measured by the LWI subtest, we did not find any significant differences favoring the CPC intervention group on the LWI subtest. However, our models tended to show a trend for children in the intervention group to have higher scores on this measure than children in the comparison group. This finding was further explored by restricting the sample to the largest school district only and there we did find a trend for children in the intervention group to outperform children in the comparison group, controlling for several child and family demographic characteristics and children's pretest scores. We also found that children who began the CPC preschool as three year olds had better literacy scores at kindergarten entry than children in the comparison group who began preschool as three year olds. On the executive functioning measure, we did not find any significant differences favoring the CPC intervention group on the DCCS task. There were small gains in both groups on this measure. Nor did we find any significant differences favoring the CPC intervention group on any of the T-CRS 2.1 subscales measuring social-emotional skills.

All children demonstrated increases over time from preschool to kindergarten on all direct assessment measures and some teacher-report measures (i.e., MWSS). The trend for literacy is interesting because it is supported by the long history in the district and the CPC program of focused instruction on language and literacy to promote both short- and long-term outcomes in

language, literacy, and reading. At the end of second grade, we were only able to collect and analyze the teacher-report data for the four subscales measuring social-emotional adjustment: task orientation, behavior control, assertiveness, and peer social skills. Again, we found no significant differences for the subgroup of children who participated in one-year of CPC preschool compared with children who participated in one-year of non-CPC preschool in the same district.

Taken together, in the impact study, we found no statistically significant differences at kindergarten entry on any the child outcomes for measures of school readiness, early math skills, and early literacy skills (confirmatory analyses) nor on executive functioning skills or social and emotional skills (exploratory analyses). Both groups showed increases over time on the measures and average scores were within a normative range for kindergarten entry. These results are similar to other contemporary studies showing that children in both treated and comparison groups show improvements in early literacy and math skills (Gormley, Gayer, Phillips, & Dawson, 2005; Puma et al., 2012; Weiland, 2016a; Weiland & Yoshikawa, 2013; Reynolds et al, 2014; Reynolds, Richardson, Hayakawa, Englund, & Ou, 2016).

In summary, compared to the original Chicago CPC model implemented throughout the 1980s and 1990s, children in the comparison group in this study attended preschool programs in the same school districts as the CPC schools. These comparison schools had many of the same characteristics and features of quality including data from measures of overall quality such as the CLASS showing that the two groups of classrooms were very similar. Studying this CPC model in a contemporary context meant that the counterfactual was made up of schools with preschool classrooms such that the comparison group children were receiving an intervention quite similar to that received by CPC children. Given these similar overall program quality results for the two groups, it is not surprising then that in the impact study we did not find any statistically significant difference between the two groups on any of the child outcome measures.

Implications and Limitations of the Findings

The purpose of the Investing in Innovation grant was to evaluate the CPC preschool to third grade model. The hypothesis being tested is that investing in a comprehensive model such as the CPC P-3 should result in better outcomes for children when compared with business as usual preschool programs where children do not get the benefit of P-3. Given the time period of the i3 grant and other factors related to attrition, we were only able to assess a range of child

outcomes at kindergarten entry and a limited set of teacher-reported social outcomes at the end of second grade. As such, this study did not really test the full intended P-3 model nor were any long-term academic outcomes assessed.[32] For some components of the CPC model such as parent involvement, we did not have sufficient data for both groups to adequately test whether that aspect of the model was implemented more fully in the intervention schools than the comparison schools. Given the short time period of the i3 grant, we also did not follow children long enough to examine the aligned curriculum and stability and continuity core components nor the unique ways that other components operate throughout the early elementary years. There is almost no literature on P-3 approaches, perhaps because they require rather expensive longitudinal studies. Thus, there are virtually no rigorously designed impact studies of these approaches although some researchers are examining aspects of P-3 in case studies, typically focused on increasing literacy and reading and sometimes social-emotional skills (U.S. Department of Education, 2016).

The importance of testing the full CPC model from preschool to third grade under contemporary conditions is important for several reasons. First, the long-term school achievement outcomes found in the earlier CLS and their associated cost savings are strong and meaningful outcomes and have been used to advocate for expanding preschool programs across the country. Second, researchers and policymakers have been concerned about addressing what is referred to as fade-out, that is, positive outcomes for children attending preschool programs that are not sustained over the early elementary years (either due to growth that is slowed or comparison group children catching up over time or both) (e.g., Lipsey et al., 2015; Claessens, Engel & Curran, 2014). As a P-3 model, the CPC model has been put forth as a solution to the problem of fade out of preschool program effects by the time children reach third grade because it seeks to extend and maintain many high-quality program components throughout the early elementary years (Reynolds et al., 2006). For this reason, it is essential that this and other P-3 models be subjected to rigorous empirical investigation. And third, the original CPC population was largely

[32] We had planned to assess outcomes additionally in the spring of second grade per our research question, but due to various factors, including particularly high attrition, we did not collect direct assessment of children's academic achievement in second grade. As of April 4, 2016, the principal investigator of the i3 Midwest CPC Expansion project decided to discontinue direct assessments in the spring of second grade. He and his team reviewed available attrition data provided by the four remaining school districts and determined that attrition was too high to provide a representative sample of children. The SRI evaluation team continued to collect online teacher ratings using the Teacher-Child Rating Scale 2.1 for those participating children who were in second grade to answer questions about impact on students' social skills and behavior.

African-American, with only 7% being Latino/a, while Latinos/as are currently the fastest growing population. One could hypothesize that a P-3 model seems to be especially well suited to this group for supporting their acquisition of two languages over the early years if the model supports well-implemented evidence-based programs. However, there are limited data about the impacts of any P-3 model for this population.

As with many contemporary evaluations of preschool programs, the comparison group in this study was made up of children who attended other preschool classrooms in the same district as the intervention children. As described earlier, we found that the implementation data shows that the comparison schools have many quality features that are similar to the core components in the CPC model. It is simply quite difficult to recruit for a rigorous study a well-matched comparison sample of preschool children who have no participation or experience with any preschool or child care program with nearly 50% of low-income preschool children attending some sort of public preschool. Furthermore, the study design used schools as the unit of analysis because the CPC model is an intervention defined as a P-3 school-wide model implemented at the school level. As such, if the evaluation team had selected a comparison sample of children who did not participate in a preschool program, the evaluation would not have been an evaluation of the CPC model. The counterfactual for this CPC model needed to be a comparison with another preschool program to test the added benefit of the CPC P-3 model; an assumption of the CPC model is that it is a comprehensive school-wide approach implemented from preschool to third grade and it is hypothesized that it is the full model that will produce positive short- and long term child outcomes. However, in this evaluation, we were unable to test the full model. Furthermore, the implementation data suggest that the comparison group schools may not have been sufficiently lower or different in quality to lead to superior performance of the CPC group children on the outcome measures.

Other kinds of research designs can get around this comparison sampling issue. For instance, two recent evaluations of contemporary preschool programs implemented in urban school districts used regression discontinuity designs, one for the Boston Public Schools preschool program (Weiland, 2016a; Weiland & Yoshikawa, 2013) and Tulsa Universal Preschool program (Gormley, Gayer, Phillips, & Dawson, 2004). In an RDD study, a birthday cutoff is used to create two groups of children as an alternative to random assignment and in the analysis, the differences in their scores on outcome measures can provide an unbiased estimate of the effects of the preschool program. In both of these studies, the researchers found positive impacts on multiple school readiness domains including cognitive and social outcomes.

Furthermore, in both cases, the programs had many high-quality features like those in the CPC model. For instance, the Boston Public Schools Prekindergarten program featured consistent use of evidence-based curricula focused on mathematics, language, and literacy (i.e., Building Blocks mathematics curriculum and the Opening the World of Learning (OWL) literacy and learning curriculum), an ongoing district-developed coaching and professional development system for practitioners, and teachers with the same qualification requirements and pay as K-12 teachers (Weiland & Yoshikawa, 2013). Likewise, in the Tulsa Universal Preschool program, all teachers are required to have a bachelor's degree and an early childhood certificate, group size maximums are 20 with a required ratio of 10 students per teacher, teachers use evidence-based curricula and have professional development that emphasizes instructional quality by using CLASS data to monitor the PD (Gormley et al., 2005). These studies also illustrate the fact that many of the quality features of the CPC model are also features of many other contemporary preschool programs. In addition, these and other recent studies also show that programs need to implement high-quality instructional practices in math and literacy and language in order to achieve positive school readiness outcomes for children (Clements & Sarama, 2016; Snow & Matthews, 2016).

It is important to note that a RDD study does not work for evaluating long-term outcomes from P-3 interventions because by definition the comparison group receives the intervention. However, future studies of the CPC model might need to explore the use of different types of comparison groups. When comparison schools and children are selected within the same school district as the intervention sample, there is likely to be too much similarity in quality features of the intervention and comparison schools and classrooms. We think the implementation findings also suggest that research designs in which program quality features can be systematically manipulated and compared are needed. As other researchers have recently suggested (Burchinal, Zaslow, et al., 2016; Pianta et al., 2016; Pianta et al., 2009; Weiland, 2016a), an important question for the early childhood field remains: what features or combination of features of high-quality preschool produce the best child outcomes?

Similar to findings from many other preschool evaluation studies, the CLASS Instructional Support scores are relatively low and similar for both the CPC and comparison group classrooms. We need future research to show whether or not improving Instructional Support as measured by the CLASS to much higher levels will actually lead to higher scores on the kinds of child outcome measures used in this study. And if not, we need to ask whether we are measuring the right things with the most precise measures. Equally important, we need new

research about the best ways to actually improve instruction and sustain it in preschool programs implemented to scale such as state-funded preschool and Head Start programs that serve the majority of at-risk children from low-income families.

One of the most important findings of this study is how difficult it can be to implement a P-3 model in a district because for P-3 approaches to achieve long-term outcomes children need to stay in the intervention for more than one year. In the Midwest CPC Expansion project, we found very high attrition of children following preschool participation. As mentioned above, nearly one-third of the children had left the district by the time they entered kindergarten, and another 10% of the children enrolled in kindergarten classrooms across several hundred schools that were not participating in the CPC study as either an intervention or comparison site. This level of attrition was not a problem for the impact evaluation with regard to the analyses because baseline equivalence comparisons of children in our intent-to-treat (ITT) analytical sample demonstrated that the two groups were quite similar. However, because the CPC model requires stability and continuity from preschool to third grade, families who move after the child attends a CPC preschool to a neighborhood with a non-CPC elementary school will not be participating in the full extended CPC model. In a large district such as Chicago Public Schools, we have many children who attended a CPC preschool but then did not attend a CPC elementary school once they enter kindergarten. This kind of high mobility is a problem for a P-3 model that depends on stability and continuity across grades. A possible solution for this kind of mobility would be to implement the model across the entire district and then mobility at least within the district would not affect receipt of the entire extended CPC model.[33]

Another limitation of this study is that the child outcome measures are limited. For instance, many studies of preschool find positive impacts on print-related and sound-related skills like letter-word identification and rhyming, which are easier constrained skills rather than impacts on more complex unconstrained language and knowledge skills that are better predictors of later skilled reading and school achievement, language skills such as vocabulary or knowledge skills such as in science or other knowledge-based content (Shanahan & Lonigan, 2013; Snow & Matthews, 2016). We did find a trend in one of the models tested that intervention children outperformed comparison on letter-word identification scores, but it is also important to point out that both groups of children improved on this measure of a constrained early literacy skill.

[33] It would be good to test whether for those children who received multiple years of the CPC model where the components are well-implemented in a school. To that end, Arthur Reynolds will continue to follow participants of this study with a NICHD grant received in September 2016.

Because we did not measure more complex unconstrained skills we do not know if the CPC children had better outcomes on those kinds of measures that are more prognostic of later reading and academic skills. The CPC developers explored impacts on children's formative assessments collected by the districts and examined parent involvement and attendance, resulting in some positive impacts on child outcomes (Arteaga, et al., 2014; Reynolds, et al., 2016; Reynolds, et al., 2014). The analyses may have used different samples to explore within district impacts not using the same samples described in this report.

Another limitation of the study is that we had no empirical validation of the way we measured and scored fidelity of implementation. That is, each implementation component was operationalized by measuring each individual requirement and creating a summary score and then setting a criterion for fidelity for each of the six components. This approach does not take into account the fact that some features of implementation quality may be more important than others for producing positive child outcomes. For example, we were not able to measure how the PD components supported preschool and kindergarten teachers, and this may be an especially important quality feature based on recent literature which has identified ongoing expert coaching by a mentor as one of the strongest contributors to quality when paired with a high-quality curriculum (Weiland, 2016b).

We also want to note some context about the school sample. Although district was not part of the sample identification and selection process for the QED, the CPC Expansion Project was implemented in 5 districts, including Chicago Public Schools, Saint Paul Public Schools, Unit 65 in Evanston, IL, Unit 5 in Normal, IL, and Virginia School District, MN. One school district (Virginia, MN) decided to stop implementing the CPC model midway through the preschool year because it was required to re-compete for its Head Start grant and could not implement the CPC model simultaneously. The kindergarten teachers in Virginia completed the teacher-report measures in the fall of kindergarten, but no direct assessments were collected. Because our impact study intended to use the intent-to-treat (ITT) approach, we included any data collected in our analyses. Note, as described in more detail above, it was not possible to identify well-matched schools in 3 of the 4 school districts even though overall the matching process identified a comparable sample of schools and children.

Finally, this was a multiyear study in that it followed two cohorts of children (1 with one year of preschool and 1 with two years of preschool) over four years. As important context, we think it is important to share that during the first year of program implementation, two major events

occurred in CPS that impacted roll-out of the program and continuing the alignment important for P-3. First, there was a teacher strike for nine days in Fall 2012 that was a disruptive presence in all schools, both leading up to it and immediately after. This changed a smooth process of training and implementation in the summer and early fall to work stoppage and lost school days. Second, and far more consequential, was the decision of the Chicago Board of Education in Spring 2013 to close, consolidate, or reconstitute 50 elementary schools. This was the largest number of school closings in city history. This was nearly a year-long process of identifying schools early in the year as candidates for closing and then following a step-by-step process of further consideration, community forums, and hearings, until the final decisions were made. The majority of CPC schools (i.e., 10 of 16) were impacted by this process compared to just a few comparison schools (2 of 16). A significant amount of time by the program and school teams was expended to maintain as strong as possible implementation and keep leadership teams, teachers, and students from moving to other schools or out of the district the following year. These events likely impacted implementation and attrition in a variety of ways which in turn may have affected the impact findings.

In conclusion, this evaluation contributes important new information about the revised and updated CPC model (referred to here as the Midwest CPC Expansion project), but does not go far enough in shedding light on the theoretical benefits of the CPC model as a contemporary alternative to other preschool programs currently implemented across the country. While preschool programs and funding have been increasing in recent decades, with many young children receiving the extra support needed to prepare them to be successful when they enter kindergarten, at a policy level, the early childhood field has a tension between efforts to improve access and to improve program quality. To attain the promise of early education programs, including preschool alone as well as P-3 models, the field has an urgent need to find the most cost-effective models to close the school preparation and achievement gaps that persist and for which solutions continue to be elusive. Comprehensive P-3 models such as the CPC model offers to fill that need, but the results of this evaluation do not provide unequivocal support for its unique quality or benefits.

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Appendix A: 2012 Midwest CPC Expansion Project Guidelines

MIDWEST CPC

PreK-3rd

EXPANSION

2012

Midwest Child-Parent Center Expansion

Guidelines Executive Summary

HCRC Human Capital Research Collaborative

Human Capital Research Collaborative

University of Minnesota
301 19th Ave South
Minneapolis, MN 55455
www.humancapitalrc.org

Child-Parent Center Program, Prekindergarten to Third Grade

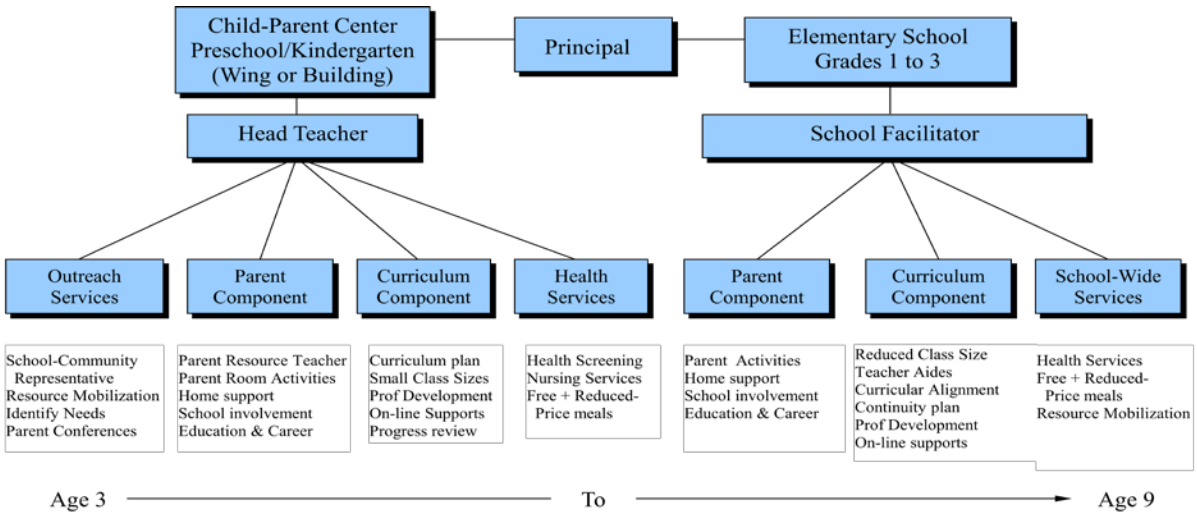
The Child-Parent Center (CPC) Program is a center-based early childhood model that provides comprehensive educational and family support services to children residing primarily in low-income neighborhoods from preschool to third grade. Established by the Chicago Public School District in 1967, CPC has demonstrated for over four decades that it is one of the nation's most effective educational reform strategies.

Each CPC is run by a Head Teacher (HT) or Director and includes a parent resource room directed by the Parent Resource Teacher (PRT), outreach activities organized by the School-Community Representative (SCR), and health services coordinated with the elementary school. The HT works under the leadership of the Principal of the affiliated elementary school.

After an intensive language- and activity-based prekindergarten at ages 3 or 4, the kindergarten and school-age component in the elementary school provides reduced class sizes, teacher aides for each class, continued parent involvement activities, and enriched classroom environments for strengthening language and literacy, math, science, and socio-emotional skills. Curriculum alignment and performance monitoring also are key elements, and they are integrated within the professional development system of school facilitators and on-line supports.

The organization of CPC services from prekindergarten to third grade is shown in Figure 1.

Figure 1. Child-Parent Centers, Prek to 3rd grade



A. CPC Goals

The program has five major goals that will be assessed in the expansion. These goals are consistent with the historical record of the program to strengthen schools and communities.

1. Promote readiness for kindergarten in language and literacy, math, science, and socio-emotional learning.

2. Increase proficiency and excellence in early school achievement, including reading, math, and science.

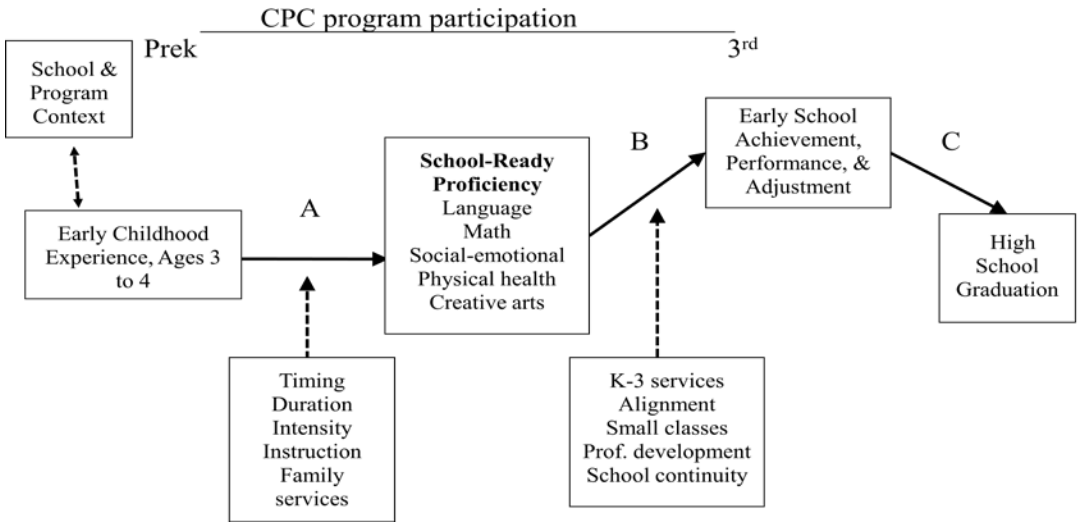
3. Enhance social adjustment and psychological development in the early grades, including socio-emotional learning, school commitment, and self control.

4. Increase parent involvement and engagement in children's education throughout early childhood.

5. Enhance educational attainment, career opportunities, and the personal development for parents and family members.

The process by which CPC participation promotes school achievement and success is shown in Figure 2.

Figure 2. Key Paths of Success in CPC PK-3 Program



B. Core Program Elements

In the Midwest expansion of CPC that begins in the fall 2012, all centers and sites will implement six core elements of the program:

1. ***Effective learning experiences, PreK to 3rd grade***: Ensure mastery in language and literacy, math, science, and socio-emotional development throughout early childhood.
2. ***Aligned curriculum***: Organize a sequence of evidence-based curricula and instructional practices that address multiple domains of child development within a balanced, activity-based approach.
3. ***Parent involvement and engagement***: Comprehensive services led by the Parent Resource Teachers and School-Community Representatives that include multi-faceted activities and opportunities to engage families.
4. ***Collaborative leadership team***: A leadership team run by the Head Teacher in collaboration with the Principal.
5. ***Continuity and stability***: Prekindergarten to school-age continuity through co-located or close-by centers that incorporates comprehensive service delivery and stability for children and families.
6. ***Professional development system***: Integrate on-line professional development and on-site follow-up support for classroom and program applications.

C. CPC History

The program was designed as a response to three major problems facing Chicago's west side neighborhoods of North Lawndale and West Garfield Park in the mid 1960s: low rates of school attendance, family disengagement with schools, and low student achievement. For example, only 8% of sixth graders in area schools were at or above the national average in reading achievement.

Based in part on responses to a survey of neighborhood residents, Dr. Lorraine Sullivan, District 8 Superintendent for Chicago's west side schools and CPC founder, believed that the best solution was to design an early childhood program with parents as partners in children's education. The Child-Parent Education Centers were established in May 1967 in four sites serving the most disadvantaged areas of the city. Expansion began soon after.

By approving the establishment of CPCs in 1967, the Chicago Public School District was the first in the nation to allocate Title I funds (from the Elementary and Secondary Education Act of 1965) to preschool. CPC is the second oldest federally funded early childhood program (after Head Start), and the first federally funded comprehensive Pk-3 program.

The original goal of the program (an "ESEA Title I, Model Project") was to "reach the child and parent early, develop language skills and self-confidence, and to demonstrate that these children, if given a chance, can meet successfully all the demands of today's technological, urban society."

Dr. Sullivan described the CPC philosophy as promoting a nurturing learning climate: "In a success-oriented environment in which young children can see themselves as important, they are 'turned on' for learning. Attitudes toward themselves and others, interest in learning, increased activity, conversation, and enthusiasm are all evidences of

the change. Parents are increasingly aware of the role of the home in preparing children for school and have renewed hope that education will develop the full potential of their children" (p. 70)

D. Rationale for CPC as a Prekindergarten to Third Grade Approach

Early childhood programs from birth to age 5 that are high in quality have demonstrated positive effects in promoting school readiness and achievement. However, the size of the initial effects of most routinely implemented programs indicates that they are insufficient by themselves to substantially increase excellence in achievement or reduce the achievement gap by third grade.

Although CPC has a distinguished history, expansion of the program to other settings is a major need. It is consistent with the reform goal of scaling up the most effective Pk-3 models. Participation in CPC Pk-3 is expected to promote enduring impacts on achievement for three major reasons: (1) A longer duration of participation will produce larger and more enduring changes in school achievement and performance; (2) the program encourages stability and predictability in learning environments; and (3) it is implemented during the transition to school, a critical phase of development whereby continuing services can accelerate learning and lessen the possibility of drop-off effects.

E. CPC Leadership Team

The CPC leadership team includes the Head Teacher (HT), Parent Resource Teacher (PRT), and School-Community Representative (SCR). Working with the Principal and Assistant Principal, the HT is a certified teacher who directs the CPC program in the site and is responsible for all aspects of planning, implementation and supervision. HT has extensive experience in teaching and in providing comprehensive services.

PRT is a full-time professional that is a certified teacher (or in some cases a social worker). This teacher directs the parent program and staffs the parent resource room in the center. Working collaboratively with the SCR, the PRT also establishes partnerships with community agencies to strengthen parenting, health, education, and social service and employment opportunities.

SCR is a paraprofessional who works under the PRT to implement the parent program in the center. As a half-time staff member, the SCR has extensive knowledge of the local community and services agencies. Typical activities include enrolling families, providing resource referrals to parents, conducting home visits, and meeting informally with parents and other staff.

Specialist staff may include nurses, speech therapists, school psychologists and ESL and special education teachers and aides. School nurses conduct health screenings, test for vision and hearing, and provide referrals. Referrals are made for nutrition, physical exams, and mental health. Links with community agencies and clinics also are provided. Children typically receive free- and reduced-price breakfast and lunches in the program.

F. Eligibility

Children enter the program at age 3 or 4 and their eligibility is based primarily on the level of risk, family or neighborhood poverty. Residence in a Title I neighborhood is the key criterion for participation in Chicago's CPCs. Full-day services in prekindergarten and kindergarten are at the discretion of the district and/or school. The schools will ensure continued participation in the program through third grade.

G. Implementation

The CPC program helps children develop skills in reading, math, and communication through a broad spectrum of learning experiences in the classroom, family support services, and community-based activities and programming. Although the program does not require specific curricula, those used must have a strong emphasis on the development of literacy, oral language skills, phonemic awareness, numeracy skills, science-based inquiry, and socio-emotional learning through diverse activity-based strategies (e.g., whole-class, individualized, field trips). This approach also helps ensure the achievement of high standards in student performance. The partner districts will implement an aligned Pk-3 curriculum model. Research on the CPCs shows that successful integration of teacher-directed and child-initiated strategies link to greater effects on achievement and long-term child well-being.

In collaboration with Head Teachers, Parent Resource Teachers will develop multi-faceted parent programs at each center to promote involvement and engagement in children's learning at home and in school, and for parents' own benefit. A menu-based parent involvement plan will be developed at each center to address six areas: (1) child development and parenting, (2) health, safety, and nutrition, (3) school involvement, (4) language, math, & science, (5) field experiences and community resources, and (6) education, career, and personal development. A parent involvement calendar will be maintained for each child and shared with family members. Effective communication between parents and teachers is fundamental to the success of the program.

Because of the establishment of a continuous system of comprehensive services that is responsive to children's needs, the CPC Pk-3 program enhances school stability, consistency, and satisfaction with education necessary for children' long-term school success.

Head teachers will establish an efficient structure of communication, meetings, and activities with the leadership team, principals, and other school staff during the year. The i3 management team at the University of Minnesota and district administrators will coordinate cross-site meetings and events. As part of the professional development system, the Erikson Institute provides coaching to classroom teachers throughout the year with quarterly progress meetings.

H. Evidence of Effects and Investing in Innovation Project

Since its inception, the CPC program has consistently demonstrated that it is one of the most effective education programs in the nation. Based primarily on the findings of the Chicago Longitudinal Study, which tracks impacts for a mid 1980s Prek cohort, there is strong evidence of the positive effects of CPC. They include large effects on school readiness at kindergarten entry, school achievement up to third grade as well as longer-term effects on reading and math achievement, impacts on reductions in need for school

remedial services, educational attainment including high school graduation and college attendance, delinquency and arrest, and positive adult well-being. The program also has been found to return 4 to 11 dollars in economic benefits per dollar invested in the program.

In the CPC expansion, a five-year longitudinal evaluation of the implementation and impact of the program for the fall 2012 Prek cohort will be conducted by SRI International in collaboration with the University of Minnesota and project partners. The data collection methods include direct assessments and teacher ratings of child performance, parent and teacher surveys, principal surveys, classroom observations, and assessments of children in comparison schools not implementing the CPC program.

The six major goals of the Investing in Innovation Project on the CPC expansion are:

1. Implement the CPC program with high levels of quality and fidelity.
2. Assess the quality of implementation of the Prek, K, and 1st to 3rd grade components.
3. Evaluate the impact of CPC from Prek to 3rd grade using a rigorous design.
4. Assess the impact of CPC overall and by child, family, and program characteristics.
5. Determine the initial cost-effectiveness of the CPC program.
6. Implement a sustainability plan to facilitate program expansion in additional settings.

I. Key Requirements of the CPC Program

The following are the key requirements of the CPC program implemented in collaboration with districts and centers by core element.

Effective Learning Experiences, Prek to 3rd grade

1. Prekindergarten classes are limited to 17 children and have a minimum of 2 teaching staff.
2. Kindergarten and Grade 1-3 classes are limited to 25 children and have a minimum of 2 staff.
3. Head Teachers and classroom teachers are certified teachers with a bachelor's degree (or higher). All assistants have an associate's degree, 60 credit hours, or a CDA.
4. Teachers document the organization and implementation of instructional practices each week in accordance with the effectiveness elements.
5. Teachers meet with parents over the year (fall, winter, spring) to review children's progress and discuss parent program opportunities with the PRT.

Aligned Curriculum

1. Implement an endorsed curriculum plan from Prek to 3rd grade that is aligned to standards, domains of learning, assessments, and learning activities.
2. Provide a rationale for the curriculum plan including supplemental materials.
3. Collaborate with the PRT to ensure that opportunities to engage families in student learning are available.
4. Provide meaningful professional development and ongoing coaching and feedback for teachers, aides, and other staff members that will facilitate high-quality instructional practices.

Parent Involvement and Engagement

1. Parents sign a CPC school-home agreement at the start of the school year.
2. Sites maintain a file of school-home agreements for all families.
3. Establish a written parent involvement plan designed to balance home, school, and community participation.
4. Maintain a parent involvement calendar for all families during the year.
5. Conduct parent/teacher conferences over the year (fall, winter, spring) to review progress in the parent program.
6. The Parent Resource Teacher will establish a parent advisory group for the center.
7. A resource room dedicated to parent and family activities is available.
8. Provide opportunities for participation in evenings and alternatives times of day.

Collaborative Leadership Team

1. The program leadership team in each site includes the Head Teacher (or Director), Parent Resource Teacher, and School-Community Representative.
2. Under the direction of the Head Teacher, the site leadership team meets regularly, and all members of the team of the same job position at neighboring CPCs also meet regularly.
3. The leadership team is responsible for ensuring that other school staff have adequate resources, including time for preparation and collaboration, to effectively meet the goals of the other CPC elements.
4. The Head Teacher will establish partnerships with community providers to strengthen service delivery and enlist local universities in training opportunities.

Continuity and Stability

1. Head Teachers in collaboration with Principals will establish a structure of communication, planning, and joint activities between classes across grades (PreK and K, K and 1st, 1st and 2nd, and 2nd and 3rd grade).
2. Establish a plan to promote program continuity from Prek to 3rd .
3. To promote continuity of services, class sizes are limited to 25 children in kindergarten through third grade with teacher aides for each class.
4. Establish that the preschool cohort is assured continued enrollment in the program through third grade in the same school where they began participation.

Professional Development System

1. Individual teachers and staff will meet quarterly with school facilitators to review ways to support their instruction in the classroom and with other teachers.
2. Teachers and staff actively participate in professional development modules with facilitators and take part in on-line activities and opportunities to share experiences with other teachers.
3. All leadership team members participate in professional development workshops during the year.
4. Ensure that training modules are implemented jointly across grades such as for Prek and K teachers, K and 1st grade teachers, and so on.

In the next section, the definitions, goals, and requirements of each program element are described further.

i3 CPC Elements and Requirements

Effective Learning Experiences, Prek-3rd Grade

Definition	Teaching and classroom practices provide continuous and intensive opportunities and experiences for engaged learning through diverse instruction focused on the development of language and literacy, math, science, and socio-emotional skills. Nine elements define effective learning experiences necessary for high impact beginning in Prek and continuing to third grade: • Small Class Sizes And Low Child:Teacher Ratios • Qualified Teachers • Balanced Curriculum • Family Engagement • Intensity Of Instruction • Classroom Climate • Teacher-Child Interactions • Professional Development • Accountability System
Goals	• Provide a well-planned, well-implemented Prek experience that will set the stage for a child's early elementary years. • Implement effective kindergarten and school-age services to enhance children's academic and social skills necessary for sustained effects. • Implement the effectiveness elements with consistency over time. • Increase proficiency and excellence in all domains of child development.
Requirements	• Prekindergarten classes are limited to 17 children and have a minimum of 2 teaching staff (< 9 children for each staff) • Kindergarten and Grades 1 to 3 classes are limited to 25 children and have a minimum of 2 teaching staff (< 13 children for each staff) • Head Teachers and classroom teachers are early childhood certified teachers (or equivalent) in possession of a Bachelor's degree. All assistants have an associate's degree, 60 credit hours, or a CDA. • Teachers document the organization and implementation of instructional activities each week in accordance with the effectiveness elements. • Teachers meet with parents over the year (fall, winter, spring) to review children's progress and discuss parent program opportunities.

i3 CPC Elements and Requirements

Aligned Curriculum

Definition	An organized sequencing of evidence-based curricula and instructional practices from PreK – 3rd that address multiple domains of child development within a balanced, activity-based approach.
Goals	• Provide consistent and developmentally appropriate instructional practices throughout the early learning years. • Provide clear understanding to teachers, parents, and others of how to support learning in multiple domains at each stage of development. • Assess and monitor children's progress throughout the year. • Ease transition from one grade level to another.
Requirements	• Implement an endorsed curriculum plan that is: o Aligned to standards (Head Start, Common Core, etc.) o Addresses language-literacy, math, science, and socio-emotional learning o Supported by on-going assessment of child progress o Aligned from PreK-3rd o Balances child-initiated and teacher-directed activities. • Provide a rationale for the curriculum plan. The rationale should include: o Why you have selected this curriculum for the student population in your schools o The use of supplemental materials o The extent to which it is evidence-based. • Collaborate with PRT to ensure that there are opportunities to engage families in student learning. • Provide professional development and ongoing coaching and feedback for teachers, aides, and other staff members that will facilitate high-quality instructional practices.

i3 CPC Elements and Requirements

Parent Involvement and Engagement

Definition	Comprehensive services led by the Parent Resource Teachers and School-Community Representatives that include multi-faceted activities, events, and opportunities to engage parents, family members, and mobilize community resources.
Goals	• Implement a comprehensive, menu-based parent program to strengthen the school-family partnership. • Increase parent involvement and engagement in children's education throughout early childhood. • Enhance educational attainment, career opportunities, and personal development for parents and family members.
Requirements	**Involvement** • Parents sign a **school-home agreement** at the start of the school year agreeing to participate in the program for at least **2.5 hours** per week. • Sites maintain a file of home-school agreements for all families • Establish a written parent involvement plan designed to balance home, school, and community participation as well as opportunities for educational, career, and personal development. • Maintain an parent involvement calendar for all families during the year • Conduct parent/teacher conferences over the year (fall, winter, spring) to review progress in the parent program. • PRT will establish a parent advisory group for the center. **Parent Resource Room** a. **A resource room dedicated** to parent and family activities is available. This room will include resources to facilitate use (e.g., computer with internet, microwave, library with children's books). b. Provide opportunities for participation in evenings and alternative times of day. **Engaging Diverse Populations** Parent involvement and engagement may be defined differently for low-income and diverse populations. Strategies must be **sensitive** to these issues and provide **different options** for families of all backgrounds. Involvement by other family members also is emphasized.

i3 CPC Elements and Requirements

Collaborative Leadership Team

Definition	A leadership team run by the Head Teacher in collaboration with the Principal.
Goals	• Promote shared visions among members of the leadership team to establish and structure the climate of the school and to promote more cohesive instructional practices. • Share responsibilities and resources across staff to create effective and efficient distribution of leadership roles. • Foster communication among the leadership team as well as other school staff.
Requirements	• The program leadership team in each site includes the Head Teacher or Director, Parent Resource Teacher, and School-Community Representative. • Under the direction of the Head Teacher, leadership teams meet regularly within the school, and all members of the team of the same job position at neighboring CPCs also meet regularly. • The leadership team is responsible for making sure that other school staff have adequate resources, including time for preparation and collaboration to effectively meet the goals of the other CPC elements. • The Head Teacher will establish partnerships with community providers to strengthen service delivery and enlist local universities in training opportunities.

i3 CPC Elements and Requirements

Continuity and Stability

Definition	Prekindergarten to school-age continuity through co-located or close-by centers that incorporates comprehensive service delivery and stability for children and families.
Goals	• Provide a stable school environment and fosters an environment that allows students to take full advantage of the CPC Pk-3 program. • Reduce the potential drop-off in the effects of prekindergarten that have been observed for many programs. • Maintain a high percentage of entering prekindergarten children that continues to the kindergarten and school-age components.
Requirements	• Head Teachers in collaboration with the principal will establish a structure of communication, planning, and joint activities between classes across grades (Prek and K, K and 1st grade, 1st and 2nd, and 2nd and 3rd grade). • Establish a plan to promote program continuity from Prek to 3rd. • Class sizes are limited to 25 children in kindergarten through third grade with teacher aides for each class. • Establish that the preschool cohort is assured continued enrollment in the program through third grade in the same school where they began participation.

i3 CPC Elements and Requirements

Professional Development System

Definition	The CPC professional development cycle integrates on-line professional development and on-site follow-up support for classroom and program applications.
Goals	• Advance the quality and alignment of Prek-3rd grade teaching within each CPC site; • Promote the capacity of each site's leadership team in advancing the CPC model; and • Help build a Prek-3rd CPC professional learning community within and across sites.
Requirements	• Individual teachers and staff will meet quarterly with school facilitators to review ways to support their instruction and practices in the classroom and with other teachers. • Teachers and staff actively participate in professional development modules with facilitators and take part in on-line activities and opportunities to share experiences with other teachers. • All leadership team members participate in professional development workshops during the year. • Ensure that training modules are implemented jointly across grades, such as for Prek and K teachers, K and 1st grade teachers and so on.

Instructions for Parent Involvement Monthly Calendar

As Parent Involvement is a critical element in the Child-Parent Center program, we would like to ensure that parents have every possible opportunity to get involved – regardless of their circumstance. This means that 1) **different types** of parent involvement activities and events must be offered and 2) activities and events must be offered at **different times of the day**.

Also, recognizing that parent involvement and engagement in activities at the school may be a new and different expectation, we encourage specialized events such as Real Men Read (i.e. fathers and grandfathers come in to the school to read to children) or Grandparents' day.

The calendar should be a useful tool for the families – at one glance, parents should be able to identify events they would be interested in attending.

When appropriate, please list the time when an event or activity is occurring.
Particularly highlight any workshops or events occurring for parents of families of high importance (for example, workshops on how to open a savings account).

The Parent Involvement Monthly Calendar is to be completed by the Parent Resource Teacher and *approved* by the Principal **before the 1st of the month**. These monthly calendars will be sent home with the children on the 1st of every month.

Parent Involvement and Engagement Events and Activities Calendar

Head Teacher/Parent Resource Teacher:_____

August 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		Read to your child everyday.	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Principal's Signature:_____ Date:_____

Instructions for Parent Involvement Summary Calendar

The Child-Parent Center model expects parents to participate in numerous forms of parent involvement activities and events. Research indicates that different types of parent involvement impact children in different ways. Therefore, we encourage Parent Resource Teachers to offer a variety of parent involvement activities.

The Parent Involvement Summary Calendar is to be completed by the Parent Resource Teacher at the **end of each month** to summarize the variety of parent involvement activities and events that were offered through the CPC parent involvement and engagement program at your center.

There are 6 types of parent involvement and engagement that will be offered through the Parent Resource Teacher:

1. Child Development and Parenting: Attending workshops offered through the Parent Resource Room on parenting techniques/strategies and child development (for example, socio-emotional development). Receipt of home visiting to discuss child development and parenting strategies also falls under this category.
2. Health, Safety, and Nutrition: Health screening, nutrition education, and cooking with your child are all examples of this category of parent involvement. Parents can also attend cooking events in the Parent Resource Room and learn about healthy, inexpensive recipes they can cook with their children.
3. School Involvement: Participation in activities in the Parent Resource Room or children's classrooms. Also, attending assemblies and various events held at school. Teacher conferences are also considered as school involvement.
4. Language, Math, and Science: Reading with your child at home, singing songs, and playing counting or math games at home.
5. Field Experience and Community Resources: Going on field trips or participating in community events.
6. Career, Education, and Personal Development: Parents taking GED classes, vocational classes, and degree classes. .Also pursuing employment opportunities and acquiring further skills and training (e.g. career training, attending job fairs).

At the end of each month, please complete the Summary Calendar and identify how many times each type of parent involvement activity opportunity was provided to families through the Parent Resource Teacher for that month. Please use the definitions listed above as a guide to identify parent involvement activities and events under the appropriate category of parent involvement.

Name of Center:_____ Parent Name:_____ Child's Name_____

CPC Parent Involvement & Engagement Summary Calendar 2012-2013

	August	September	October	November	December	January	February	March	April	May	June
A. Child Dev. & Parenting Attend workshop Meet with parents Home visit											
B. Health, Safety, and Nutrition Health screening Nutrition ed Cook with child Examination											
C. School Involvement Volunteer in class Attend event Teacher confer. Assist teacher											
D. Language, Math, & Science Read with/to child Go to library Math games											
E. Field Experience & Com. Res. Go on field trip Clinic visit Community partic											
F. Career, Education, & Personal Devel. GED class Vocational class Degree class Job Fair Career training Home arts project											

Instructions for Home-School Agreement

The Home-School agreement is a contract between the parents and the school. It is a critical tool that provides a starting ground for the Head Teacher to discuss with parents the myriad of opportunities available through our high-quality Prek-3 program.

It is imperative that parents have an opportunity to personally come in contact with the Head Teacher and not only understand but commit to the CPC expectations. This is a wonderful opportunity for the Head Teacher to share with the family the uniqueness of CPC program and emphasize the great support offered through the CPC.

Head teachers can use this time to discuss what makes the CPC program high-quality: small class sizes, teacher student ratio, curriculum, PreK-3rd alignment, and abundant parent resources. In addition to explaining what is offered through the program, Head Teachers should highlight the importance of parent involvement and our weekly expectations of the parents. It is crucial that parents understand that parent involvement and engagement is *not an option* but an *expectation* in the CPC program.

It is our expectation that all enrolled families have signed and had face-to-face contact with the Head Teacher by the **end of the first week of school.**

The Home-School Agreement is NOT to be sent home with the child to be signed by the parent at home.

Insert your logo here

Child-Parent Center at <your site name>
<Site Address>
<Site Phone Number – the best one for family members to call>
<Site website, if available>

Child-Parent Center School-Home Agreement

Parent's/Guardian's Name _____

Child's Name_____

Child's Birthdate (DD/MM/YY)_____

The Center's Agreement
We agree to:

I. Give this child the best education possible in this center.
2. Do everything possible to provide the child with a happy, successful learning experience.
3. Keep the parent informed of the child's progress and development in the center.
4. Welcome visits by the parents to the center.
5. Provide a meaningful and varied parent program.

The Parents' Agreement

1. I (or my designee) agree to bring my child to school every day. Children must report at_____a.m. to receive breakfast. Afternoon classes begin at_____p.m.
2. I (or my designee) agree to pick up my child from school or the bus stop each day on time. Children are dismissed from school at_____a.m. or _____ p.m.
3. I agree to participate in the parent program ***at least*** 2.5 hours per week and participate in a ***combination*** of both school events (e.g., field trips, workshops in the Parent Resource Room, meetings with the Head Teacher/Parent Resource Teacher/Classroom Teacher, classroom participation) and home parent involvement (e.g. reading to child, cooking with child, playing educational games with child).
4. I understand that through enhancing *my own education*, *skills, and job training,* I will support my child's educational success.
5. I agree to read all notes and to fill in any forms from the center and have them sent back to the center promptly.
6. I agree to have all physicals and inoculations completed in a timely manner.
7. I agree to do everything possible to cooperate with the center to assist our child's growth and development.

WE AGREE TO WORK TOGETHER

_____ _____ _____
Principal's/Director's Signature **Parent's Signature** **Date**

This document is an agreement between the school and the parent to work together in helping the child achieve maximum education growth.

MIDWEST CPC PreK-3rd EXPANSION

Weekly Activity Summary Worksheet

Your Name: _____ Your Title: _____ Classroom #_____ Date Completed:_____

School Name: _____ "# of Sessions Children Attend This Week: _____ Length of School Day: _____

Purpose of Tool: For teachers to individually reflect and/or collaboratively reflect with their colleagues and Head Teacher, about allocation of time in their classrooms.

Directions: At the end of each week, the classroom teacher completes the worksheet, noting the number of minutes spent on each activity. Submit the form to your Head Teacher or Director. The Head Teacher will retain a hard copy for each classroom for every week of the school year (ex: a separate binder for each classroom's worksheets.)

ACTIVITY	**CIRCLE AVERAGE WEEKLY MINUTES**				
1. LANGUAGE/LITERACY					
COMPREHENSION (Understanding and vocabulary)	10	20	30	40	50+
PRINT CONVENTIONS (direction, authorship, punctuation)	10	20	30	40	50+
ORAL AND WRITTEN EXPRESSION (drawing, dictation, dramatization)	10	20	30	40	50+
PHONEMICS, PHONICS (Letter sounds, word sound separation)	10	20	30	40	50+
EXPLICIT ALPHABET INSTRUCTION (letter identification, letter formation, letter tracing, name writing)	10	20	30	40	50+
ALPHABET GAMES (Lotto, part of play activity)	10	20	30	40	50+
***2.* MATH**					
EXPLICIT MATH INSTRUCTION (number names, order, counting up, down, graphing, estimation, operations	10	20	30	40	50+
MATH GAMES (Puzzles, chutes and ladders, blocks)	10	20	30	40	50+
3. SCIENCE (Observation/describing, explanations)	10	20	30	40	50+
4. PLANNED CONVERSATION WITH TEACHERS OR OTHER CHILDREN (Planned group discussions, social information, play)	10	20	30	40	50+
5. GROSS and FINE MOTOR ACTIVITY (Teacher led**)**	10	20	30	40	50+
6. ART (Free drawing, pasting cutting)	10	20	30	40	50+
7. FREE PLAY (Unstructured choice time with teacher involvement	10	20	30	40	50+

Note: If you teach more than one prekindergarten cohort per week, please turn the sheet over and fill out the form for your additional section.

MIDWEST CPC PreK-3rd EXPANSION

Weekly Activity Summary Worksheet

Your Name: _____ Your Title: _____ Classroom #_____ Date Completed:_____

School Name: _____ "# of Sessions Children Attend This Week: _____ Length of School Day: _____

Purpose of Tool: For teachers to individually reflect and/or collaboratively reflect with their colleagues and Head Teacher, about allocation of time in their classrooms.

Directions: At the end of each week, the classroom teacher completes the worksheet, noting the number of minutes spent on each activity. Submit the form to your Head Teacher or Director. The Head Teacher will retain a hard copy for each classroom for every week of the school year (ex: a separate binder for each classroom's worksheets.)

ACTIVITY **CIRCLE AVERAGE WEEKLY MINUTES**

1. LANGUAGE/LITERACY					
COMPREHENSION (Understanding and vocabulary)	10	20	30	40	50+
PRINT CONVENTIONS (direction, authorship, punctuation)	10	20	30	40	50+
ORAL AND WRITTEN EXPRESSION (drawing, dictation, dramatization)	10	20	30	40	50+
PHONEMICS, PHONICS (Letter sounds, word sound separation)	10	20	30	40	50+
EXPLICIT ALPHABET INSTRUCTION (letter identification, letter formation, letter tracing, name writing)	10	20	30	40	50+
ALPHABET GAMES (Lotto, part of play activity)	10	20	30	40	50+
2. **MATH**					
EXPLICIT MATH INSTRUCTION (number names, order, counting up, down, graphing, estimation, operations	10	20	30	40	50+
MATH GAMES (Puzzles, chutes and ladders, blocks)	10	20	30	40	50+
3. SCIENCE (Observation/describing, explanations)	10	20	30	40	50+
4. PLANNED CONVERSATION WITH TEACHERS OR OTHER CHILDREN (Planned group discussions, social information, play)	10	20	30	40	50+
5. GROSS and FINE MOTOR ACTIVITY (Teacher led**)**	10	20	30	40	50+
6. ART (Free drawing, pasting cutting)	10	20	30	40	50+
7. FREE PLAY (Unstructured choice time with teacher involvement	10	20	30	40	50+

Appendix B: Data submitted to Abt Associates as part of the grant reporting requirements

B-1. Confirmatory and Exploratory Contrasts for CPC Outcomes

Contrast ID #[a]	Contrast Name [Expected Reporting Date]	Design	Treatment Group			Comparison Group	Outcome				Baseline		
			[Condition] Description	Age/grade during intervention	Exposure	[Condition] Description	Domain	Measure [Scale]	Unit of Observation	Timing of Measurement	Measure [Scale]	Unit of Observation	Timing of Measurement
C1	MWSS: Kindergarten entry posttest	QED with matched schools	full sample of pre-K students, treatment	Intervention runs from pre-K thru grade 3. This study goes thru end of grade 2.	At least one year	full sample of pre-K students, comparison	School Readiness	Minnesota Work Sampling System (MWSS): Kindergarten entry posttest	Student	Fall 2013, at entry to K or Fall 2014 for two-year cohort	MWSS: pretest	Student	Fall 2012, at entry to preschool
C2	WJ III Applied Problems subtest: Kindergarten entry posttest	QED with matched schools	full sample of pre-K students, treatment	Intervention runs from pre-K thru grade 3. This study goes thru end of grade 2.	At least one year	full sample of pre-K students, comparison	Math achievement	Woodcock-Johnson III (WJ III) Applied Problems subtest: Kindergarten entry posttest	Student	Fall 2013, at entry to K or Fall 2014 for two-year cohort	WJ III Applied Problems: pretest	Student	Fall 2012, at entry to preschool
C3	WJ III Letter-Word Identification subtest: Kindergarten entry posttest	QED with matched schools	full sample of pre-K students, treatment	Intervention runs from pre-K thru grade 3. This study goes thru end of grade 2.	At least one year	full sample of pre-K students, comparison	Alphabetics	WJ III Letter-Word Identification subtest: Kindergarten entry posttest	Student	Fall 2013, at entry to K or Fall 2014 for two-year cohort	WJ III Letter-Word Identification subtest: pretest	Student	Fall 2012, at entry to preschool

Contrast ID #[a]	Contrast Name [Expected Reporting Date]	Design	Treatment Group			Comparison Group	Outcome				Baseline		
			[Condition] Description	Age/grade during intervention	Exposure	[Condition] Description	Domain	Measure [Scale]	Unit of Observation	Timing of Measurement	Measure [Scale]	Unit of Observation	Timing of Measurement
E1-Chicago Public Schools	WJ III Letter-Word Identification subtest: Kindergarten entry posttest	QED with matched schools	Sample of pre-K students in Chicago Public Schools, treatment	Intervention runs from pre-K thru grade 3. This study goes thru end of grade 2.	At least one year	Sample of pre-K students in Chicago Public Schools, comparison	Alphabetics	WJ III Letter-Word Identification subtest: Kindergarten entry posttest	Student	Fall 2013, at entry to K or Fall 2014 for two-year cohort	WJ III Letter-Word Identification subtest: pretest	Student	Fall 2012, at entry to preschool
E2-Chicago Public Schools 2 year exposure	WJ III Letter-Word Identification subtest: Kindergarten entry posttest	QED with matched schools	Sample of pre-K students in Chicago Public Schools who received intervention for two years, treatment	Intervention runs from pre-K thru grade 3. This study goes thru end of grade 2.	2 years	Sample of pre-K students in Chicago Public Schools, comparison	Alphabetics	WJ III Letter-Word Identification subtest: Kindergarten entry posttest	Student	Fall 2014, at entry to K	WJ III Letter-Word Identification subtest: pretest	Student	Fall 2012, at entry to preschool

NOTE: In this table, contrasts that are confirmatory have "C-" prefixes. Exploratory contrasts have "E-" prefixes.

B-2. Impact Estimates Submitted to Abt for Grant Reporting Requirements

Contrast ID #	Contrast Name (Optional)	Post-test Measure Name	Treatment Group N of Clusters	Treatment Group N of Students	Comparison Group N of Clusters	Comparison Group N of Students	Unadjusted Treatment Group SD	Unadjusted Comparison Group SD	Standard Deviation Source (Code)	Comparison Group Mean (Optional)	Impact Estimate	Standardized Effect Size (Optional)	Impact Standard Error	p-value	Code for Impact Model Description	Degrees of Freedom	Source of Data (Optional)	Level of Inference (Optional)
C1	MWSS: Kindergarten entry posttest	Minnesota Work Sampling System (MWSS): Kindergarten entry posttest	26	836	23	288	18.4	16.1	A	54.5	1.4	0.08	2.3	0.5263	A	1002		
C2	WJ III Applied Problems subtest: Kindergarten entry posttest	Woodcock-Johnson III (WJ III) Applied Problems subtest: Kindergarten entry posttest	25	964	22	388	17.7	17.3	A	418.1	0.03	0.00	1.28	0.9813	A	1290		
C3	WJ III Letter-Word Identification subtest: Kindergarten entry posttest	WJ III Letter-Word Identification subtest: Kindergarten entry posttest	25	964	22	388	33.5	25.6	A	369.3	4.5	0.14	2.7	0.1005	A	1290		
E1-Chicago Public School	WJ III Letter-Word Identification subtest: Kindergarten entry posttest	WJ III Letter-Word Identification subtest: Kindergarten entry posttest	16	584	16	232	35.5	25.7	A	369.7	7.6	0.23	4.0	0.0674	A	768		
E2-Chicago Public Schools 2 year exposure	WJ III Letter-Word Identification subtest: Kindergarten entry posttest	WJ III Letter-Word Identification subtest: Kindergarten entry posttest	16	195	16	88	39.6	25.2	A	373.2	17.2	0.48	6.7	0.0147	A	236		

Note. HLM impact models control for pretest, age at pretest, gender, race and ethnicity, mother's education, single parent family status, family employment, public assistance status, and school characteristics (percent minority, percent ELL, percent free of reduced lunch and percent proficient in reading).

B-3. Baseline Equivalence of Students

Contrast ID #	Contrast Name (Optional)	Pre-test Measure Name	Treatment Group N	Comparison Group N	Unadjusted Treatment Group SD	Unadjusted Comparison Group SD	Standard Deviation Source (Code)	Comparison Group Mean (Optional)	Treatment – Comparison Difference	Standardized T-C Difference (Optional)	Pre-test shown in this row was used as a control in the impact model for this contrast ? (Y/N)	Code for T-C Difference Calculation	Source of Data (Optional)
C1	MWSS: Kindergarten entry posttest	Minnesota Work Sampling System (MWSS)	836	288	17.6	15.4	A	46.8	-1.3	-0.08	Y	B	
C2	WJ III Applied Problems subtest: Kindergarten entry posttest	Woodcock-Johnson III (WJ III) Applied Problems subtest	964	388	25.0	46.3	A	388.3	3.3	0.10	Y	B	
C3	WJ III Letter-Word Identification subtest: Kindergarten entry posttest	WJ III Letter-Word Identification subtest	964	388	28.2	26.1	A	325.3	3.7	0.14	Y	B	

B-4. Description of Key Components of Intervention

Planned Intervention Activity: All ***key components*** measured across years of implementation	**List of Key Indicators For Each Key Component**
Effective learning experiences, PreK to 3rd grade	- Class size/ratio: (17/2 for preschool) - Length (HD or FD) (1 point if full-day) - Certified/licensed preschool teachers - Field trip - Endorsed instructional plan (yes/no) - Evidence-based curriculum and curriculum liaison identified (yes/no) - Assessment/monitoring - Balance of teacher-directed/child-initiated activities (20/80 to 80/20) - Classroom quality: CLASS (average scores meet subscale thresholds) or CLAC ≥ 3 = 1 point
Aligned curriculum	- Alignment plan that describes aligning curriculum across the PreK to 3rd grade continuum and enhancing communication across grade levels
Continuity and stability	- Distant vs co-location/close proximity - Establish a program continuity plan (see 2nd component) - Establish plan to promote preschool children's continuity to kindergarten
Parent involvement and engagement	- Home-school agreement - Designated SCR/PRT staff - Designated parent resource room (PreK) - Conduct needs assessment survey - Develop parent involvement plan - Maintain menu-based calendar of activities with at least 2 activities per month for parents - Plan offers activities across different types of parent involvement - Parents are involved at least a total of 2.5 hours per week in both site and home involvement
Professional Development (PD) System	- Participation of leadership team in orientation/institutes (August 2012) - Participation of teachers and other staff in orientation (August 2012) - Head Teacher reviewing PD module content and constructing strategies for classroom application (for 3 of 4 modules) - Online modules (4 across first year) for teachers - Participation in site visit by Head Teacher (number of completed visits, ranging from 0 to 6) - Engagement (averaged across visits, scores ranged from 1 to 3 with high scores reflecting more engagement)
Collaborative leadership team	- Head Teacher, PRT, SCR with Principal - Principal attends orientation

B-5. Fidelity of Implementation of Intervention by Year

Findings from Evaluator Study of Implementation: IMPLEMENTATION YEAR 1 (2012-13)							
Intervention Components: Copy from list above	Implementation measure (total number of measurable indicators representing each component	Sample Size at the Sample Level (# of schools, districts, etc)	Representativeness of sample: Measured on All (A), Some (S), or None (N) of the units representing the intervention group in the impact analyses[b]	Component Level Threshold for Fidelity of Implementation for the Unit that is the Basis for the Sample-Level	Evaluator's Criteria for "Implemented with Fidelity" at Sample Level	Component Level Fidelity Score for the Entire Sample	Implemented with Fidelity? (Yes, No, N/A)
Planned Intervention Activities [i.e., key components]							
Effective learning experiences, PreK to 3rd grade	9	26	A	5	60%	100%	Yes
Aligned curriculum	1	25	S	1	60%	96%	Yes
Continuity and stability	3	26	A	2	60%	77%	Yes
Parent involvement and engagement	8	26	A	5	60%	96%	Yes
Professional Development (PD) System	6	26	A	4	60%	54%	No
Collaborative leadership team	1	25	S	1	60%	84%	Yes
Findings from Evaluator Study of Implementation: IMPLEMENTATION YEAR 2 (2013-14)							
Intervention Components: Copy from list above	Implementation measure (total number of measurable indicators representing each component	Sample Size at the Sample Level (# of schools, districts, etc)	Representativeness of sample: Measured on All (A), Some (S), or None (N) of the units representing the intervention group in the impact analyses[b]	Component Level Threshold for Fidelity of Implementation for the Unit that is the Basis for the Sample-Level	Evaluator's Criteria for "Implemented with Fidelity" at Sample Level	Component Level Fidelity Score for the Entire Sample	Implemented with Fidelity? (Yes, No, N/A)
Planned Intervention Activities [i.e., key components]							
Effective learning experiences, PreK to 3rd grade	9	26	A	5	60%	26 (100%)	Yes
Aligned curriculum	1	26	A	1	60%	25 (96%)	Yes
Continuity and stability	3	26	A	2	60%	22 (85%)	Yes
Parent involvement and engagement	8	26	A	5	60%	26 (100%)	Yes
Professional Development (PD) System	6	26	A	4	60%	26 (100%)	Yes
Collaborative leadership team	1	26	A	1	60%	23 (88%)	Yes