

## Project Narrative

Midwest Expansion of the Child-Parent Center Education Program, Preschool to Third Grade

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### Absolute Priorities

This proposal addresses *Absolute Priority #4: Innovations that Turn Around Low-Performing Schools*. The Midwest Expansion of the Child-Parent Center (CPC) Education Program is a targeted approach to reform that integrates a comprehensive set of student supports to strengthen achievement (#4b2) and provides increased length and intensity of time to learn core content (#4b1). CPC will be expanded in persistently low-performing schools in Illinois, Wisconsin, and Minnesota LEA districts. In response to poor attendance, low achievement, and parent disengagement with schools, the program has been implemented in the highest poverty Chicago schools since 1967 and provides comprehensive education and family support services from preschool to third grade (Pk-3). The Chicago Public Schools was the first district to use ESEA Title I funds for preschool and to develop a coordinated system of Pk-3. By providing up to six years of continuous high-quality education focused on academic achievement, the CPC program---as found in recent longitudinal studies--can substantially improve school readiness, achievement and performance leading to higher rates of high school graduation and well-being.<sup>1</sup>

<sup>2</sup> The proposed validation project is a partnership of the University of Minnesota and 10 districts and nonprofits including the Chicago Public Schools, Milwaukee Public Schools, Saint Paul Public Schools, and SRI International (evaluator). It will be implemented in 33 schools serving nearly 9,000 students overall.

The project also addresses two other absolute priorities. For *Absolute Priority 1: Innovations that Improve Effectiveness of Teachers and Principals*, the CPC program provides training to teachers and principals to enhance their skills with high-need students. Teachers will increase their use of evidence-based curricula and curriculum alignment across grades. Additionally, teachers will develop strategies to create classroom environments conducive to high levels of parent involvement and effective parent-teacher communication.

Because a main goal of the program is to accelerate knowledge and skills in reading and math, children will be more likely to exceed proficiency standards on third grade assessments, addressing *Absolute Priority #3: Innovations that Complement High Standards and High-Quality Assessments*. The timing and length of services also align with the common core standards, which have been incorporated into learning standards by the project states. CPCs will integrate high-quality assessments into classroom practice to monitor academic progress.

### **Competitive Preference Priorities**

The project addresses two competitive priorities. The first is *Innovations for Improving Early Learning Outcomes* (#6). CPCs provide up to two years of high-quality preschool beginning at age 3 in which children attend small classes taught by certified teachers. Within a comprehensive system of services for children and parents directed by head teachers in collaboration with principals, children enter school at higher levels of readiness spanning language, literacy, math, and social development. Transition services in kindergarten and the primary grades help ensure that learning gains are strengthened and persist throughout schooling.

The second competitive priority is *Improving Productivity* (#9). CPC has been found to have high efficiency by reducing costs over the school-age years in remedial education and problem behaviors requiring service intervention. For an average cost per child of about \$5,000 above and beyond the typical services, savings through high school have been found to exceed costs by a factor of 6.<sup>1</sup> By providing comprehensive and intensive services to children and families throughout early childhood and strengthening continuity in learning, the CPCs will increase achievement thereby lead to more enduring effects on later success.

## **A. Need for the Project**

### *A.1. Magnitude of the Need to Implement the Project*

Because school underachievement originates early in life, the most cost-effective prevention strategies are often designed to promote school readiness and continuity in the transition to elementary school. Studies show that up to 50% of all children enter kindergarten not fully ready to succeed.<sup>3-5</sup> For high-need children, the rates are as high as 75%.<sup>4</sup> If not comprehensive and intensive, catch-up efforts are unlikely to be effective in improving achievement. Programs to improve school readiness and transition to school are necessary to ensure excellence over K-12 for children at risk of school failure. Improving early school experiences can also help prevent the drop-off in effects of preschool that have been observed for many children, especially those attending low quality elementary schools.<sup>6,7</sup>

As one of the most innovative targeted approaches to school reform, the CPC program provides a comprehensive system of education and family support services from preschool to third grade for high-need children in low-achieving schools. The goals of the program are to promote school readiness, parent involvement, and early school achievement that in turn will enhance longer-term effects on achievement, graduation and career success (see Appendix J1). The program's evidence on impacts suggests a high probability of success if expanded to other

settings. The primary goal of the project is to expand the program to a broader range of contexts including small to large urban districts, rural districts, and Head Start settings in the Midwest.

The need to improve children's early school achievement is great. According to the 2009 National Assessment of Educational Progress, and shown in Table 1, only a third of U. S. fourth graders were proficient in reading. Low income and minority children had rates of proficiency of 17% or lower (math results were similar).<sup>8</sup> Given the strong correlation between early school achievement and high school graduation,<sup>9</sup> improvement efforts should be directed to strengthening children's early achievement. Compared to children assessed as NAEP proficient in third grade reading, for example, those not proficient in third grade had a rate of school dropout that was six times higher; and eight times higher for low-income minority children.<sup>9</sup>

Not only are indicators of school readiness at kindergarten entry among the strongest predictors of third and fourth grade achievement test scores, but one half of the socioeconomic achievement gap by fourth grade is already present at kindergarten entry.<sup>10</sup>

Table 1. NAEP 2009 4<sup>th</sup> Grade Reading: Percent Proficient or Advanced

	National	Illinois	Minnesota	Wisconsin
All students	32	32	37	33
Black	15	11	12	9
Latino	16	16	13	16
Low-income	17	15	17	15

*Source.* National Assessment of Educational Progress, 2010 (Footnote #8).

As reported in recent studies,<sup>11-13</sup> participation in early education programs is an alterable predictor of school readiness and can narrow achievement gaps. Many other education and school-related experiences independently predict school readiness and early achievement for high-need children, including parent involvement practices, instructional quality and teaching practices, mobility, and small classes.<sup>14-17</sup> Increasing achievement and raising levels beyond current norms, however, requires a concerted effort of many programs and practices. Pk-3

programs provide a framework for organizing these practices thus producing a synergy of effects. The CPC program has a strong record for producing these positive effects.

#### *A.2. Exceptional Approach to Priorities*

A major advance in early childhood education is the integration and alignment of services from preschool through the early grades. This integration can not only improve children's school transition in kindergarten but enhance learning gains from preschool that will promote enduring effects on later school performance. Models of Pk-3 have been evaluated but only one, the CPC program, has strong evidence of large and enduring effects on school achievement, high school graduation, and well-being.<sup>18</sup>

As the first Title I funded preschool program of the ESEA Act of 1965, the CPC program was designed to promote children's school success through a unique blend of language enrichment and parent involvement within a system of support services. By addressing the explicit purpose of ESEA, that school districts "employ imaginative thinking and new approaches to meet the educational needs of poor children,"<sup>19</sup> the program expanded to Pk-3 operating within early learning centers located in elementary schools.

Although publicly funded preschool programs have grown dramatically and now serve 25% of all 3- and 4-year-olds, the magnitude and endurance of their impacts are rarely sufficient to close achievement gaps or raise performance to the national average and beyond. Evaluations of state-financed preschool programs show average effects of 0.25- 0.30 standard deviations (SD) at kindergarten entry that, while meaningful, tend to drop over time.<sup>20</sup> Recent national evaluations of Head Start also demonstrate that short-term effects often are not sustained.<sup>21</sup>

As shown in Table 2, three contributing factors to this weak pattern of impacts may be that most state and local preschools provide only one year of service at age 4, do not provide comprehensive and intensive services, and do not implement Pk-3 programs systematically. In

the nationally representative Early Childhood Longitudinal Study, for example, less than 10% received the Pk-3 elements commonly used in CPC (e.g., preschool and kindergarten in the same location, small classes, and intensive parent involvement).<sup>18</sup> By providing longer duration of high-quality education and family support services to high-need students, CPC expansion shows great potential for efficiency as indicated by the high estimated return per dollar invested.

Table 2. Attributes of Early Education: National Versus CPC

Attribute	National/Overall <sup>1</sup>	CPC <sup>2</sup>
Timing: PreK entry at age 3, %	14	50
Comprehensive services, %	11	100
Length: Provide Pk-3 services, %	<10	70
Efficiency: Return per dollar invested	Up to \$2-4	\$8-12

Sources: 1. NIEER (2010); Reynolds et al. (2010); Aos et al. (2004). 2. Reynolds et al. (2002, 2011)

### A.3. Importance and Magnitude of Effects Expected

CPC has been found to be one of the most effective and cost-effective educational programs. It is on several registries of effective programs (e.g., Promising Practices Network, Model Program Guide) and has earned many awards (e.g., National Title I Distinguished Schools Awards) for its success in promoting school achievement.

Although dozens of studies have been conducted with program cohorts from the 1970s to 2000s,<sup>22-25</sup> Table 3 summarizes the magnitude of effects for CPC preschool and Pk-3 (see Appendix H for additional studies). The outcomes are school readiness, grades 3 achievement, remedial education, and high school graduation. The evidence meets the minimum research requirement for a validation project of *one study demonstrating high internal validity and moderate external validity*.

Most of the evidence is from the Chicago Longitudinal Study (CLS),<sup>26</sup> which follows a CPC cohort in 1983-1989 who were born in 1980. The entire group of 989 children (93% black; 7% Latino) in 20 centers is compared to 550 children of the same age who attended randomly selected schools participating in the usual early intervention (i.e., full-day kindergarten). Over

90% of the original sample has been followed successfully into adulthood with no evidence of selective attrition or bias. Estimates are adjusted for child and family background factors (e.g., SES, home environment, race/ethnicity, and program sites).

Table 3. Average Effects of CPC Participation From the Most Rigorous Studies (in Standard Deviations)

Component	School Readiness	Grade 3 reading	Remediation	Graduation
Preschool	0.62	0.30	-0.40	0.30
Pk-3	--	0.53	-0.31	0.25

*Note.* Coefficients > 0.20 are practically significant. Preschool averaged 1.5 years.

As shown in Table 3, the large effects of preschool on school readiness (cognitive composite scores on Iowa Tests of Basic Skills) remained significant throughout the schooling process to high school graduation.<sup>24, 27, 28</sup> Program participation was also linked to lower rates of later delinquency and crime (-0.30 SD) as well as school mobility (-0.35 SD).<sup>27, 29</sup> These are practically significant impacts. For school readiness, this is equivalent to a 25 percentage point improvement in proficiency and to an 11 point improvement over the comparison group in high school graduation (61% vs. 50%).<sup>30</sup> A 2001 CPC preschool cohort was found to exceed those in other publicly funded preschools by 1/3 SD in language proficiency at the end of the program.<sup>23</sup>

Pk-3 participation also showed a strong pattern of impacts on third grade reading test scores, six to eighth reading (0.43 SD), remedial education, arrests, and high school graduation.<sup>28, 31, 32</sup> Pk-3 also linked to lower rates of later school mobility (-0.48 SD).<sup>33</sup> For third grade achievement, this is equivalent to a 1/2 year gain. For example, at the end of program in third grade as compared to children who attended only preschool and kindergarten (n = 207), Pk-3 children having services up to second or third grade (n = 462) had significantly higher reading and math achievement (0.53 SD).<sup>31</sup> As shown in Appendix J1, the Pk-3 group had not only greater reading achievement growth than the comparison group, but substantially reduced the gap in performance with national norms. A similar pattern of positive effects was found for special education and grade retention.

Long-term Pk-3 findings for educational attainment and economic well-being have been recently reported in the journal *Science*.<sup>2</sup> Participants with for 4 to 6 years of CPC services (preschool to second or third grade; n = 516) had a rate of on-time high school graduation of 49% compared to 31% for those with fewer than four years of service (n = 870). This is an improvement of over 50%. As a consequence, the Pk-3 group had greater economic well-being, higher skilled jobs, and was less likely to be involved in the justice system. These findings accounted for potential differences in attrition and were unaffected by the comparison group characteristics. Along with other studies, this study provides the best evidence to date about the long-term educationally significant benefits of CPC.

*Cost-benefit analysis.* The size and significance of program effects are further supported by two cost-benefit analyses.<sup>1, 27</sup> Findings indicated that the economic return (assessed at ages 21 and 26) per dollar invested was 8-12 dollars for preschool, 2-4 dollars for school-age services, and 6- 9 dollars for Pk-3 relative to fewer years. These economic returns are among the highest of all education programs.<sup>1</sup> Roughly 60% of the benefits are public savings that were the result of reduced remedial education costs as well as increased tax revenues linked to graduation.

In support of moderate external validity, the study sample is large (n = 1,539), includes many sites and a range of school poverty (44% to 85%). There also is extensive evidence that the estimated effects of the program are similar by race and ethnicity, family structure and income, and school size. Suggestive of consistency by context, a formative test of the preschool program in Madison (WI) showed a similar pattern of results.<sup>34</sup> Nevertheless, children with a larger number of risk factors and who attended the highest poverty settings show the largest effects.<sup>28, 35</sup> By expanding CPC to districts outside of Chicago with diversity in ethnicity and student populations, the project will test the broader validity of the model.

## **B. Project Design**

The proposed project will assess the implementation and impact of the CPC program in 33 schools (6 LEAs) serving high-need children. Located in or close to elementary schools, the centers provide educational and family-support services between the ages of 3 and 9. The program emphasizes language development within a structured but diverse set of learning experiences as well as parent involvement in children's education. Given the strong level of evidence on impact, the validation of the program in 10 Chicago sites and 23 sites in three states (see Table 4) will provide critical knowledge about the generalizability of effects.

### *B.1.1. Project Goals*

The project has 6 major goals as follows:

Goal 1. Implement the CPC model with high levels of quality and following key elements and principles established by evidence of effectiveness.

Goal 2. Assess the quality of implementation of the preschool, kindergarten, and first to third grade components of the program by context and participant characteristics.

Goal 3. Evaluate the impact of the CPC program from preschool to third grade using a rigorous and multi-faceted quasi-experimental design (SRI International).

Goal 4. Assess the impact of the CPC program by child, family, and program characteristics.

Goal 5. Determine the cost-effectiveness of the program over preschool to third grade.

Goal 6. Implement a sustainability plan to facilitate program expansion in additional settings.

### *B.1.2. Program Strategies*

To achieve these goals, the comprehensive services of CPC will be implemented as a set of strategies that can promote strong and enduring effects on children's school readiness and achievement. Six key strategies define the CPC program to be implemented:

1. High-quality preschool for up to two years in small classes taught by certified teachers.

2. Curricula and instructional practices that emphasize language, literacy, and math skill skills within a structured activity-based approach.

3. Comprehensive family services led by the Parent Resource Teachers and School-Community Representatives that include parental involvement and resource mobilization.

4. A leadership team run by the Head Teacher in collaboration with the Principal.

5. Kindergarten and school-age continuity through co-located or close-by centers, small classes with teacher aides, and instructional coordination by school coordinators.

6. On-going professional development by school coordinators to support teachers and principals in implementing and aligning evidence-based curricula and instructional practices.

### *B.1.3. Key Objectives and Expansion Sites*

These strategies are consistent with the accumulated research (see program history, theory of change, and principles in Appendix J1).<sup>18, 24, 36</sup> On the basis of the program evidence summarized above and the project goals, the key objectives are that (1) the CPC program will be implemented with a high degree of fidelity and adherence to principles established by previous research, (2) preschool participation will substantially impact measures of school readiness, (3) Pk-3 participation will have sizable effects on second and third grade achievement, social competence, and reduce the need for remedial services, (4) the CPC program will show measurable cost savings that are suggestive of longer-term benefits, and (5) project partners will secure additional resources to maintain the program in current sites and expand to others.

Table 4 describes the LEA districts that will implement the program. Because the partners are strongly committed to implementing the full CPC program and have developed initiatives that will enhance sustainability, the project goals and objectives can be realistically achieved.

*Table 4: CPC Project Sites*

Site	Type	Project schools		Children served		CPC attributes	
		N	Poverty	Preschool	K-3	Age 3	Structure
Chicago	Large urban	15	75%	1450	3930	50%	Co-located
Evanston	Metro	4	57%	103	309	60%	Separate
Normal	Urban	1	50%	65	195	50%	Separate
Milwaukee	Large urban	6	76%	370	1110	30%	Co-located
Saint Paul	Large urban	6	66%	310	930	20%	Co-located
Virginia, MN	Rural	1	45%	54	162	25%	Both

*Note.* N of schools total = 33; N of students total = 2,352 (Preschool children followed over time). For K-3 components, a conservative estimate is that 6,636 additional children will be served as part of smaller classes and coordination. Virginia includes Arrowhead Head Start. The total number of children is 8,988.

All schools in the project receive Title I funds and most are in Absolute Priority 4 status. For example, the entire Milwaukee Public School district is in corrective action. The district size, context, and race and ethnic composition vary. The largest majorities of children in the target schools are black or Latino. The percentage of low-income students in target schools is similar to those in the research evidence from Chicago .

### *B.2. Costs Relative to Design and Significance of Project*

Because the partner districts have some elements of Pk-3, the CPC program will provide additional services and structural supports to implement an integrated and efficient system of education and family support services that is more easily replicable by other districts. By enhancing the quality, intensity, breadth, and continuity of services, the positive effects at kindergarten entry are expected to be maintained or strengthened at third grade and will promote enduring effects into high school.<sup>14, 15, 24</sup> The key program requirements are shown in Table 5.

In Chicago, several features of the evidence-based CPC program--including smaller classes from kindergarten to third grade, teacher aides, and school-community representatives--were discontinued several years ago as a result of budget cutbacks and will be reestablished by this grant in 10 sites (with Head Start funds) as well as expanded to five additional sites. Validation

Table 5. Key Requirements of CPC

Age	Max. child to staff	Family support	Curriculum	PD	Assessment
3	17 to 2	PRT, SCR	Evid.-based*	Coordinator	Continuous
4	17 to 2	PRT, SCR	EB	“ “	“ “
5 (K)	25 to 2	PRT, SCR	EB	“ “	“ “
6 (G1)	25 to 2	Coordinator	EB	“ “	“ “
7 (G2)	25 to 2	Coordinator	EB	“ “	“ “
8 (G3)	25 to 2	Coordinator	EB	“ “	“ “

*Note.* The Head Teacher runs the program at each site. Length of day for preschool is primarily half day; full-day in K. Full or half day preschool can be determined locally but will be offered at all sites.\*EB = evidence based. See Appendix J3 for evidence based curricula. Coordinator provides professional development (PD) and teacher support for instruction, curriculum alignment, and parent involvement. PRT = Parent Resource Teacher. SCR = School-community representative.

and further expansion in Chicago is not only an efficient use of resources, but enables comparisons in implementation and impact between older and newer sites of the full model. Moreover, the program will be implemented through third grade in all sites whereas in earlier years the majority of sites went to second grade. Analysis of this additional year will provide insight about optimal program length. Previous research found that participation to third grade relative to second grade was associated with stable improvements in reading achievement.<sup>24, 32</sup>

The estimated average cost per child to implement the full research-based CPC program in the districts, above and beyond current expenditures ranges from \$4,500 to \$7,000 over five years (\$1,200 to \$1,700 per year) with an average cost of \$5,300 per child (2011 dollars). With local matches across districts averaging 10%, the added cost to implement the CPC program from preschool to third grade is estimated at \$4,762 per child over five years.

Based on accumulated evidence of economic returns of the program as well as projected savings from similar programs that are scaled up,<sup>37-39</sup> the project is expected to recoup costs within five years if the quality of implementation is high.

### *B.3. Services Reflect Current Knowledge from Research and Effective Practice*

The implementation of CPC is closely tied to strong evidence of effective practice including: (a) high-quality preschool that is intensive and comprehensive in scope,<sup>40</sup> (b) multi-

faceted parent program designed to promote parenting skills and home support for learning, participation in school activities, GED courses, and mobilization of resources to promote health and career success,<sup>41</sup> (c) instructional emphasis on language development (e.g., literacy, comprehension) through diverse strategies guided by evidence from recent evaluations of curricula (Appendix J2),<sup>42-44</sup> and (d) a continuous system of supports (e.g., co-location, small classes, teacher support) that increase opportunity, intensity, and predictability in learning.<sup>45-47</sup>

Based on this evidence and feasibility, three refinements are made in the expansion. None of these compromise the essential elements identified in research. First, in sites that serve less than 80 preschool children, the head teacher position will be distributed across two sites. Although this will increase efficiency in implementation, the number of children per head teacher will match that found in the research evidence.

Second, although the comprehensiveness of the parent involvement component as directed by parent resource teachers and school-community representatives remains, the requirement of a parent resource room in each site is relaxed. Absent covered construction costs, space limitations in schools may prevent co-location of parent rooms in the centers. Because further expansion to other regions would face the same issue, the project will examine whether the frequency and quality of parent involvement is influenced by the presence of parent rooms.

Third, the professional development and teacher support model will be enhanced. Although the services of the school-age program remain the same, curriculum resource teachers in each site will be replaced by school coordinators from the Erickson Institute as part of an integrated professional development system of teacher support. Pk-3 school coordinators will implement a sequence of professional development activities and will provide on-going teacher and principal support throughout the project period. The process will be conducted in the first two years with preschool and kindergarten teachers and then extended upward through grades 1 to 3.

The four activities include (1) a “Foundations of CPC” Institute of six hours in length emphasizing alignment of curriculum, vertical grouping of students, family involvement, and formative assessment, (2) a sequence of four professional development “learning labs” will be conducted during the year and will be aligned with the evidenced-based curricula and child assessment systems in use at the sites, (3) individual in-class coaching for teachers will follow each learning lab to support and guide the application of teaching strategies and practices, and (4) cross-grade level collaboration to support alignment and child/family transitions.

#### *B.4. Estimated Costs of Proposed Project*

The total cost of the project over five years is \$18.3 million with \$15 million in federal funds requested (direct and indirect costs), \$1.5 million in required private matches, and \$1.8 million in contributions by the school districts and others partners.

The estimated average cost per child of \$4,762 is based on an estimate of providing the CPC program to students in the included schools. As discussed, this average was comprised of district-specific costs that varied according to labor costs and how many of the CPC ingredients already were in place. Assuming that the average cost remains the same when providing the program to additional districts, the scale up costs to serve 100,000 children is \$476.2 million, the costs to serve 250,000 children is \$1.19 billion, and the costs to serve 500,000 children is \$2.38 billion. These cost estimates assume that districts are able to acquire 10% in matching funds. Without these funds, the costs to serve 500,000 children would be \$2.66 billion. These estimates do not include the additional students who would receive CPC services through reduced class sizes and instructional supports during K-3. Accounting for these students would be significantly increase the number of children receiving services at the same estimated cost. In the detailed budget calculations of the project, the only expenditures needed to implement small class sizes were teacher compensation costs as the included schools were chosen because district leaders

indicated that they would have the space. The scale-up costs may be larger if schools need to construct new classrooms to provide the CPC model. One economic analysis estimated the facilities cost per student of reducing class sizes to be approximately \$780 per student.<sup>48</sup>

Assuming half of all students served will require new facilities, the one-time start-up cost for the students served by CPCs would be \$39 million for 100,000 students, \$97.5 million for 250,000 students, and \$195 million for 500,000 students. Given the evidence of CPC effectiveness, the public savings contributed by the program (assuming the scaled-up CPC program would continue to be targeted toward at-risk students) may exceed costs by a ratio of 7.

Given the availability of a variety of sources of funding, project costs could be reduced or leveraged more efficiently. The Chicago schools, for example, are using federal Head Start dollars to expand the CPC in additional sites. Normal Unit #5 schools are using state Preschool for All funding. Further expansion could also be developed. Block grants or school funding formula could also be tapped as well as potential federal and state dollars (early Race to the Top funding, state funded preschool). Moreover, because only 3% of federal Title I dollars go to preschool and less to Pk-3 programs, districts could access these dollars.

#### *B.5. Potential and Planning for Incorporation of Project into Ongoing Work*

The proposed project dovetails with many current and planned activities of the partners that will help lead to sustainability, as some of these district examples demonstrate. The Chicago school district currently serves over 30,000 children through Head Start and the state-funded Preschool for All block grant. In addition to the expansion to five additional sites, which will be funded in part by Head Start, the core CPC elements have the potential to be integrated across these programs as part of existing funding. The CPC program also provides a system of integrating preschool services with kindergarten and early school-age programs. In Milwaukee, for example, the program can be the mechanism to coordinate 4-year-old kindergarten programs

(funded primarily by the school funding formula), Head Start, and the state-funded class size reduction program that begins in kindergarten, and consequently, provide a strong transition process for children through the early grades.

In Saint Paul, the project will strengthen literacy plans that are now required of all Minnesota districts to document how every child will be at or above grade level by third grade. It will also provide a framework for teacher training and classroom assessments as is also the case in Chicago and Evanston-Skokie. Moreover, Saint Paul's adoption of a K-5 model of elementary schools (from K-6) creates opportunities for downward expansion to prekindergarten. CPC provides a ready-made approach for state investment in organizing Pk-3 elements. In Evanston, the project will expand resource supports for additional literacy coaches and parent involvement specialists across the district. By increasing the frequency and intensity of services, the CPC program can further address the district goal of improving achievement from preschool to third grade. This strategy can provide impetus to address the drop-off in achievement by third grade<sup>14</sup> that is found in publicly funded programs across the region and nationally.<sup>21</sup>

Finally, the commitment of the HCRC to Pk-3 education and research will benefit the goals of the project. The NIH-funded CLS study within HCRC investigates the effects of a mid 1980s CPC cohort. The proposed project will add needed information on the generalizability of impacts by cohorts and context. Continued contributions of resources and staff by the Federal Reserve of Minneapolis to HCRC will further strengthen the capacity of the project to meet its goals.

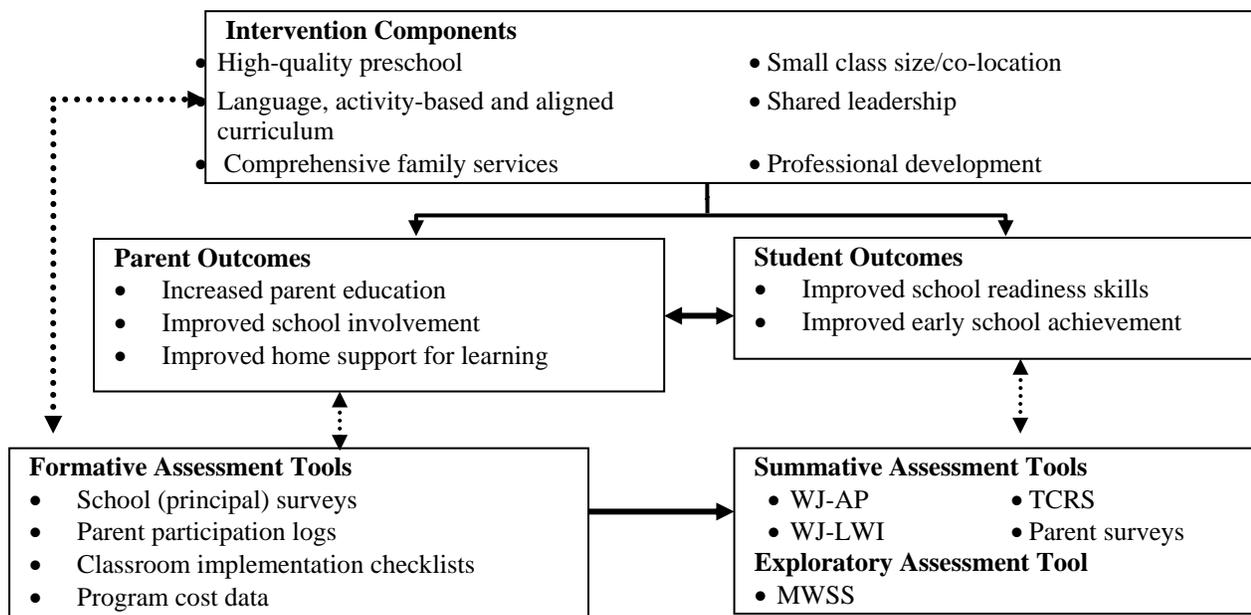
### **C. Project Evaluation Design**

#### *C1. Design Quality*

SRI International will conduct an independent summative and formative evaluation of the CPC expansion (project goals 3 and 4). A quasi-experimental longitudinal design will be implemented with over 1,800 children and families in 66 schools, using propensity score

matching to create comparable intervention (I) and comparison (C) schools. Data collection will include measures of family demographic characteristics, parent and student outcomes, and fidelity of implementation. We propose to conduct a cost effectiveness study that will involve collecting and comparing estimates of program costs to school outcomes. Findings on outcomes and implementation, and feedback on progress toward intended outcomes will be shared through annual reports and regular project briefings. Figure 1 shows the evaluation logic model.

Figure 1. Logic Model for Evaluation



*Evaluation questions.* SRI will address three major impact research questions: (1) Do students in the intervention group make greater gains in school readiness skills and early school achievement (early literacy, reading, mathematics, social skills and behavior) compared to students in the comparison group? (2) Do parents of students in the intervention group show greater involvement in their children's school, more frequent parenting practices that support early learning, and greater increases in education level and employment compared with parents of students in the comparison group? (3) Do outcomes vary as a function of child, family and

program characteristics? Using a quasi-experimental design, SRI will collect pre- and post-test data of student-, parent-, and school-level outcomes in both the intervention (I) and matched-comparison (C) schools. Schools will be matched using propensity score matching on student demographics (e.g., percentage of students on free or reduced-price lunch status, minority status/ethnicity, English learner status, and standardized test scores) and school/neighborhood characteristics (e.g., poverty, mobility).<sup>49</sup> As shown in Table 2 above, the counterfactual condition will consist of schools providing less intensive and less comprehensive Pk-3 programming. For example, less than 10% of children receive elements similar to CPC.

In addition to the impact study, the evaluation will answer two exploratory questions: (1) Do students in the intervention group who participate in 2 years of preschool (start at age 3) show greater improvements in school readiness skills compared with children in the intervention group who participate in one year of preschool (age 4)? and (2) Do students in the intervention group who participate in either 1 or 2 years of preschool (PreK) (age 3 or 4) show greater gains in school readiness compared with children who participate starting at kindergarten?

Finally, the evaluation will use outcome and cost data to answer: Do the estimated benefits of the improvements in educational outcomes associated with the CPC program exceed the additional costs of the program compared to the programs offered in the comparison sites?

*Sample and timing of outcome assessments.* Table 6 shows the number of students in intervention (I) and comparison (C) schools and timing of assessments. The I group and matched C group will consist of 66 schools total (33 in each group). The schools will be in 6 locations including Chicago, IL (30), Evanston, IL (8), Milwaukee, WI (12), Saint Paul, MN (12), Normal, IL (2), and Virginia, MN (2). To assess students' academic and social skills growth between PreK and 2<sup>nd</sup> grade, SRI will collect baseline data about children's literacy, math, and social skills in fall 2012 at age 4 (see all measures described below) for the study sample in both I and

C schools. These same assessments will be repeated for all I and C group study children at kindergarten entry, and at the end of 2<sup>nd</sup> grade.

Table 6. Sample and Measures for Impact Study

<b>Year of Study</b>		<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
	Jan-Dec	2012	2013	2014	2015	2016
<b>Construct</b>	<b>Measure</b>	<b>Fall – P4</b>	<b>Fall – K entry</b>			<b>Spring - End of 2nd</b>
Early literacy	WJ-LWI	66/2,040*	66/1,836			
Reading	WJ-Passage Comprehension					66/1,652
Math	WJ-AP	66/2,040	66/1,836			66/1,652
School readiness	MWSS	66/2040	66/1,836			
Social skills/problem behaviors	TCRS	66/2,040	66/1,836			66/1,652
Parent involvement and school participation	Parent Survey	66/2,040	66/1,836			66/1,652

\* Indicates number of schools and children for intervention and comparison groups (33 I and 33 C schools, with approximately 30 children per school, with an estimated 10% attrition per year).

An important question is whether 2 years of preschool has a larger effect on children's school readiness and early achievement than 1 year. However, very few comparison schools offer preK for children at age 3, and thus there is not an appropriate matched comparison group for these children. Therefore, we propose to conduct an exploratory study to begin to answer this question that involves following a cohort of children who begin the CPC program when they are 3-years old, using only those I schools (i.e., in Chicago, Normal, and Evanston) which will have at least half of their population starting at age 3. To conduct this exploratory study, SRI will ask P3 teachers to complete the Minnesota Work Sampling System (MWSS) beginning in year 2 for a sample of children who start PreK(3) in fall 2013 (Table 7). The following year PreK(4) teachers will be asked to complete the MWSS on this same sample as well as a sample of children who begin the CPC program in fall 2014. Finally, in the third year of the exploratory study, K teachers will be asked to complete the MWSS on the samples of children who began in PreK(3) and PreK(4), as well as on a sample of children who began at the CPC program in K.

This within-group design will allow us to conduct exploratory analyses of the effect of 1 vs. 2 years of CPC preK and will add to the evidence established by previous QED studies of CPC.

Table 7. Sample for Exploratory Study in Intervention Schools

Wave	2013-14	2014-15	2015-16
PreK(3) Entry	400	360	320
PreK(4) Entry	-	400	360
K Entry			400
Total	400	760	1080

Note: Assumes 10% attrition a year.

*Student outcome measures.* To assess students' school readiness skills and school achievement (Table 6), direct child assessments with standardized tests will be used: the Woodcock-Johnson-III Applied Problems (WJ-AP), Letter-Word Identification (WJ-LWI), and Passage Comprehension (WJ-Passage Comprehension - end of 2<sup>nd</sup> grade only) subtests.<sup>50</sup> Social skills and problem behaviors will be rated by teachers using the well validated Teacher-Child Rating Scale (TCRS), a 32-item checklist which includes subscales for Peer Social Skills, Behavior Control, Assertiveness, and Task Orientation.<sup>51</sup> In addition, another well-validated teacher-report school readiness measure, the Minnesota Work Sampling System Kindergarten Entry Developmental Checklist (MWSS) will also be completed for all children in all I schools at entry into preK(3), entry into preK(4), entry into kindergarten, end of kindergarten, and the end of first grade.<sup>4</sup> The 32-item MWSS rating scale provides proficiency scores in 5 school readiness domains: Language and Literacy; Mathematical Thinking; Personal and Social Development; Physical Development and Health; and The Arts, as well as an overall proficiency score. Domain items will be aligned and equated by age to enable longitudinal analysis.<sup>52, 53</sup> Data on children's placement in special education and grade retention also will be collected.

Beyond the i3 grant period (in 2017), the project team will be able to obtain school achievement test scores from the end of 3<sup>rd</sup> grade (reading and math) for children who began the

CPC program in PreK(4), because children's student identification numbers will be used to track them throughout the study. It also will be possible to track school achievement scores at a school-wide level for all 66 schools to show changes over time and to make comparisons between I versus C schools in years just after the grant ends.

*Parent outcome measures.* A phone interview will be conducted with study sample parents at baseline at the beginning of the preK school year and at the end of 2<sup>nd</sup> grade. The interview will include items about family demographic characteristics including education and income levels, parent-reported participation in school activities, and home supports for learning. Parents also will be mailed and asked to complete a survey in spring 2014 with items similar to the phone interview to gather information on parent involvement and obtain updated contact information. Teachers also will complete logs about parent participation in school activities annually for both I and C group families (described below).

*Cost-effectiveness study measures.* To evaluate whether the estimated benefits of the improvements in educational outcomes associated with the CPC program exceed the additional costs of the program compared to the programs offered in the comparison school sites, we propose to collect cost data on an annual basis. The cost-effectiveness analysis requires estimates of program costs. Some cost data will be obtained directly from school district budgets with additional cost information to be imputed for costs not available in district budgets (such as the costs of classroom space and value of parents' time). For this analysis, we will calculate the economic benefits associated with reduced special education placement and grade retention.

## *C2. Implementation Assessment*

To monitor the quality of implementation of the 6 CPC components, provide feedback to implementers, and examine how implementation of specific program components lead to changes in outcomes, SRI will work closely with University of Minnesota staff to collect

implementation data. Consistent with current approaches,<sup>54</sup> multiple sources of data will be used and will focus on fidelity, dosage, and intensity. SRI will conduct annual principal surveys that collect data about the implementation of the 6 intervention components at all schools (including similar activities in comparison group schools). SRI also will collect parent participation logs from teachers to record level of parent participation in school activities for parents of students in the study sample. The parent interview will provide similar information.

In addition, a classroom checklist will be developed to assess the extent to which both intervention and comparison school teachers are implementing language- and activity-based curriculum and instructional practices that are rich in literacy, language, and early math concepts. The degree of curricular alignment across grades also will be assessed. Data collection tools used in previous CPC program evaluations<sup>24, 26, 43</sup> to monitor implementation in instruction, parent involvement, and dosage levels will be adapted for use in this study and, where needed, new tools will be developed to capture fidelity of other program components.

Finally, variation in implementation by program, social context, and participant characteristics will be explored. This includes differences by urbanicity (i.e., large urban versus others), school poverty, co-location of services and the presence of parent resource rooms, duration of implementation history (within Chicago), and child characteristics such as risk level and language minority status. Descriptive profiles of the association between variation in implementation by state, district, and school and child outcomes will be tested.

### *C. 3. Analysis and Assessment of Key Elements to Replication*

#### *C.3.1. Power analysis*

The power analysis for the impact study described above is based on having 33 intervention and 33 comparison schools in the study, with 30 students per school at baseline in fall 2012 and accounts for 10% student attrition annually. We based the attrition estimate on available

information from conducting recent similar longitudinal studies in Illinois and Minnesota as well as extensive experience in conducting other longitudinal studies in early childhood. Given the 66 schools for the study, even if some schools drop out of the study, there will be sufficient power to detect changes at the expected levels. To reduce bias and increase power when data are missing at random, we will impute both dependent and independent variables using imputation by chained equations.<sup>55, 56</sup> Missing data will be imputed separately for each outcome and for the CPC and control groups within each outcome to indicate the strength of the impact.

SRI conducted a power analysis showing the minimum detectable effect (MDE) for HLM analysis.<sup>57</sup> Using conservative assumptions that pretests and other baseline covariates can reduce variance at the student and school level by 50% or using reductions of 78% and 56%.<sup>58</sup> for student outcomes, the MDE is from 0.19 to 0.26. Given prior CPC studies,<sup>24, 27, 31</sup> we expect effect sizes of 0.30 and 0.60. SRI will report both Hedges'  $g$  and HLM-adjusted effect sizes.<sup>59</sup>

### C.3.2. Data analysis

The magnitude of the intervention effects on student outcomes will be tested using Hierarchical Linear Modeling (HLM), adjusting for important covariates (e.g., pretest scores, demographic characteristics). HLM adjusts standard errors to account for the dependence among teachers within schools and among students within classrooms, thus avoiding overestimation of statistical significance of the effect size.<sup>60</sup> For student outcomes, SRI will examine the overall effect and examine whether specific child or family characteristics predict greater gains.

1. *Intent to Treat (ITT) analysis of CPC effect on student outcomes.* Two-level HLM models will be conducted to analyze the one-year effect of CPC and four-year effect of CPC. Level 1 is student level and level 2 is the school level.

$Y_{is}^{posttest} = \beta_0 + \beta_1 Y_{is}^{pretest} + \beta_2 CPC + \beta_3 COV_{is} + r_{is} + \mu_{0s}$ , where  $i$  present student,  $s$  presents schools;  $Y_{is}^{posttest}$  is either the K-entry score or end of 2<sup>nd</sup> grade score,  $Y_{is}^{pretest}$  is the

baseline test score,  $CPC=1$  for treatment schools and 0 for comparison schools,  $COV_{is}$  is student or school level covariates.  $r_{is}$  and  $\mu_{0s}$  are individual and school random effects.

2. *ITT analysis of CPC effect on parent outcomes.* A similar two-level HLM comparing parent outcomes measured at the end of the 2<sup>nd</sup> grade between I and C will be performed, controlling for parent outcomes at baseline and other family and child demographic variables.

3. *Treatment-on-the-treated (TOT) analysis and link to implementation measures to student outcomes.* The TOT analysis to examine the effect of CPC for students who received treatment will use Bloom's adjustment to estimate the TOT effect using the following formula.  $TOT = \frac{ITT}{E(T|CPC=1)}$ , where  $E(T|CPC = 1)$  is the proportion of students in CPC schools receive it for the full 1 year or 4 years.<sup>61</sup> For implementation and fidelity measures, we will use instrumental variables models in which a random assignment variable is an instrument for implementation and fidelity of CPC.<sup>62</sup> In addition, researchers will apply the same HLM using implementation factors extracted from survey, parent participation log, and other tools to predict each student outcome and parent outcome in equation (1) and (2).

4. *Subgroup and moderation analysis.* Moderation analysis will provide information on whether the CPC has a differential effect for certain subgroups of students. In addition to ELL and LD students, we will test reasonably sized subgroups defined by other student characteristics (such as gender, ethnicity, age/grade levels, family income, context, length of participation) to determine whether such subgroups each benefit from CPC. To conduct moderation analyses, HLM regressions will be modified by adding the moderators as covariates and as grand-mean centered interactions with the treatment indicators. The coefficients of the interaction term will be tested using Wald's test to for moderation effects.

5. *Mediation analysis.* We hypothesize that parent outcomes (improved school involvement and improved home support for learning) may mediate the effects of CPC . We will follow four steps to test mediation effects to determine if the independent variables affects change in a mediator variable that in turn affects change in a dependent variable.<sup>63</sup> The logic model and previous findings on mechanisms of change<sup>29, 64</sup> will help strengthen inferences from these analyses. Other mediators linked to cognitive advantage and school support also will be investigated as part of the program theory (see Appendix J1 for additional information).

6. *Cost effectiveness analysis (CEA).* The cost-effectiveness analysis will be conducted in two ways. First, the improved scores on assessments associated with participation in the CPC program will be compared to the additional costs of the program. This comparison shows how much it costs to achieve a particular improvement in scores. Second, monetizable outcomes, such as the reduced need for school remediation through special education placement and grade retention, will be compared to the additional costs of the CPC program to obtain the benefit-cost ratio associated with the CPC program. We will estimate the total cost, total costs per school, net costs, and net costs per school of the CPC program.<sup>65, 66</sup> The costs include increased educational expenditures (beyond those for regular instruction) to offer the program as well as the opportunity cost of parents' time. Furthermore, research suggests that improved test scores translate into greater likelihood of high school completion and higher lifetime earnings. Measurable Pk-3 impacts on 3<sup>rd</sup> and or 4<sup>th</sup> grade test scores will be translated into lifetime earnings gains and compared to the initial cost of the intervention.

#### *C.4. Evaluation Resources*

As a leading nonprofit research organization, SRI International has a long tradition of work with school districts and project partners. The SRI evaluation team has extensive experience with early childhood research and lead major evaluation projects in several states including Illinois,

Minnesota, and Florida. They will collaborate closely with the University of Minnesota team to manage the project, monitor a detailed workplan, adhere to a timeline and schedule for all project activities, monitor the project budget, and prepare project reports and other dissemination reports and articles. SRI has developed successful project management procedures that help assure high-quality products delivered on time and within budget. SRI's quality assurance process derives from extensive experience in managing complex collaborative work plans that necessitate close working relationships with our partners.

To meet timeline of project tasks, we will follow a detailed work plan that lays out all the tasks needed to accomplish the project objectives, with the associated timeline, and we will have weekly conference calls with University of Minnesota staff to review progress and problem solve together about upcoming issues in project implementation and its evaluation. Evaluation staff will prepare annual reports and semi-annual progress reports to submit to the University of Minnesota. SRI also work with the partners to share findings to a range of audiences and report outlets. Control of labor and other expenditures on projects is supported by SRI's Project Status Reporting system, which provides weekly itemized reports of time and resource allocations. Information on all work completed will be available on SRI's website for project review.

#### **D. Quality of Management Plan and Personnel**

##### *D.1. Adequacy of Management Plan to Achieve Objectives*

The project will be overseen by the Steering Committee (SC) at the University of Minnesota. The SC will be co-chaired by Arthur Reynolds and Art Rolnick of the Human Capital Research Collaborative (HCRC) and will include at least one representative from each of the school districts and official partners. The SC will meet quarterly to review the progress on the grant activities with a special focus on monitoring the implementation of the program at each site and addressing barriers and challenges that may occur. Dissemination and sustainability

activities also will be monitored. SRI International, the evaluator for the project, will provide progress reports on data collection, implementation, and on-going findings. Table 8 shows the timeline of key project activities (see Appendix J3 for a list of SC members and advisory group).

Created in 2006, HCRC is a partnership of the University and the Federal Reserve Bank of Minneapolis dedicated to research and outreach on the development, implementation, and evaluation of cost-effective programs and policies for children and youth. The College of Education and Human Development and Humphrey School of Public Affairs jointly administer this interdisciplinary center. HCRC has received over \$10 million in grants and contracts, including on-going projects with the Minnesota Department of Education and Head Start (see Appendix J4) and has published a volume on effective interventions in the first decade of life.<sup>14</sup> The experience of the University of Minnesota and the HCRC in working with schools to increase achievement and graduation rates is described in detail in Appendix C. This includes collaborations with the Chicago Public Schools that has documented the impact of the CPC program in increasing achievement, and examples from other programs (e.g., Check & Connect and Early Risers).

The day-to-day management of the project will be the responsibility of the management team including the Project Director, Co-Director, Manager, and Coordinator of Implementation. The individuals and their roles are described in the following section.

The management team will meet biweekly and will provide input and guidance to three teams that are responsible for the implementation, evaluation, and dissemination of the project. The other three teams are LEA Program Implementers, Evaluators, and Scale-Up and Disseminators. The entire team meets in June for overall planning and presentations.

The LEA program implementers include the program sites from the three states and will supervise the program implementation and provide ongoing support to the school districts. The

Table 8. Project Timeline of Activities

Academic Year	2011-2012		2012-2013				2013-2014				2014-2015				2015-2016				2016-2017				
Grade	Planning		PK				K				1 <sup>st</sup> grade				2 <sup>nd</sup> grade				3 <sup>rd</sup> grade				
Seasons	S	S	F	W	S	S	F	W	S	S	F	W	S	S	F	W	S	S	F	W	S	S	
Investing in Innovation Fund Grant Period	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>Project Management</b>																							
•Meets biweekly to assess progress on implementation (PM)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
•Meets for overall planning and presentations (PM/SC/ ET/ SD)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
•Identify enrollment for new school year (PM / LEA)	X				X				X				X				X						
•Sites hire staff and order key instructional materials	X				X				X				X				X						
•Meets with sites to verify implementation plans (PM)	X				X				X				X				X						
•Plans for enrollment for Fall (PM)	X				X				X				X				X						
•Cost data collected and verified						X				X				X					X				
•Plan first grade implementation as well as hire staff									X	X													
•Cooperate with technical assistance provided by Dept.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
•Participate in, coordinate, or facilitate (as appropriate) communities of practice with other i3 grantees			X		X		X		X		X		X		X		X		X				
<b>Implementation</b>																							
•Foundations of CPC training		X	X			X	X			X	X			X	X			X	X				
•Learning labs professional development activities and in-class coaching (approx.. once per quarter)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
•Preschool program begins implementation			X	X																			
•Staff to reduce class sizes hired for year 2					X	X																	
•Kindergarten program begins implementation							X	X															
•Organize schools for implementation							X	X															
•First grade implementation begins											X	X											
•Second grade implementation begins															X	X							
•Third grade implementation begins																			X	X			
•Implementation report						X				X				X					X				
•Sites fund implementation from Jan to June 2017																					X	X	
<b>Evaluation</b>																							
•Data collection of baseline characteristics		X																					
•Data collection of individual assessments			X				X										X						
•Implementation data collected			X	X			X	X			X	X			X	X			X	X			
•Baseline data collection and school readiness assessments			X	X																			
•Collect administrative data from districts	X	X			X				X				X				X					X	
•District and state achievement tests administered																					X		
<b>Scale Up</b>																							
•Convene state and regional meetings on model scale up				X				X				X			X						X		
•Disseminate findings and meet with school principals		X				X				X			X			X					X		
<b>Sustainability</b>																							
•Develop and refine sustainability plan for added funding		X				X				X					X						X	X	X
•Incorporate program elements into existing practice			X			X			X			X			X			X			X	X	
•School district contributions in percent (average)			10			10			10			10			10					10			

PM: Project management Team; SC: Steering Committee; LEA: Program Implementers; ET: Evaluation Team; SD: Scale-Up and Dissemination Team.

evaluation team is led by SRI international. The scale-up and sustainability team includes Illinois State University and Erikson Institute in collaboration with HCRC. They will seek alternative funding sources to ensure dissemination and sustainability of the program.

*D.2. Qualifications of Directors and Key Staff*

The project Director (PI) is Arthur J. Reynolds, Co-Director of HCRC, Director of the CLS, and Professor of Child Development at the University of Minnesota. As CLS director, Dr. Reynolds has managed, over a span of two decades, one of the largest longitudinal studies of the effects of early childhood programs. Through a partnership with Chicago schools and many government agencies, the project has amassed a rich array of program evidence for over 1,500 CPC graduates. In addition to being a leading scholar in Pk-3, Dr. Reynolds has also collaborated with many districts and educational institutions in developing, implementing, and analyzing educational programs from preschool to high school. He will oversee all aspects of the project including planning and implementation, coordination with districts and partners, and dissemination and sustainability (See Appendix F for resumes of all Project-related staff).

The project Co-Director (Co-investigator) is Art Rolnick, Co-Director of HCRC and Senior Fellow, Humphrey School of Public Affairs. As an economist and leading early childhood scholar, Dr. Rolnick brings a wealth of research and management expertise in early childhood policy and economic development. For over 4 decades, Dr. Rolnick served as Director of Research and Senior Vice-President of the Federal Reserve Bank of Minneapolis. He is heavily involved with communities and governments in dissemination of early childhood research. Dr. Rolnick will oversee grant expenditures, manage project personnel, and conduct dissemination research to increase program sustainability.

The coordinator of research and dissemination (Co-investigator) is Judy Temple, Professor of Public Affairs and HCRC at the University of Minnesota. Dr. Temple will oversee technical

assistance to the school districts and serve as a liaison to SRI in the cost effectiveness analysis.

Dr. Temple is a leading economist of education, specializing in cost-benefit analysis.

The coordinator of implementation (Co-investigator) is Barbara Bowman, Chief Officer of Early Childhood Programs, Chicago Public Schools and Harris Professor of Child Development at the Erickson Institute. As one of the premier scholars and educators in early childhood education, Dr. Bowman will coordinate implementation in Chicago and monitor and provide consultation to the management team on curricula, professional development, and assessment.

A project manager will be hired to provide day-to-day oversight of project activities and will coordinate the alignment of work among the implementation, evaluation, and scale-up and sustainability teams. Working with the district coordinators, the manager will also help ensure faithful implementation of the program. A Research Fellow also will be hired to provide technical assistance to the project team, the districts, and the independent evaluator.

*Illinois State University and Erikson Institute*

Lisa Hood (M. A.) is coordinator of scale-up work in Illinois and the Midwest. Ms. Hood is the project director for the Leadership to Integrate the Learning Continuum (LINC) initiative. This project brings together stakeholders from the early childhood and K-12 education systems to study the policies and practices of creating a seamless P-12 education system. She brings research and program evaluation experience at all levels of the school system.

Erika Hunt (Ph.D.) is coordinator of sustainability of the program and outreach. Dr. Hunt serves as the project director for the Illinois State Action for Education Leadership Project (IL-SAELP). She brings experience in state policy as a staff member for former Governor Jim Edgar and at two state agencies in Illinois. She serves on the Governor's P-20 Council.

Christine Maxwell (Ph.D.), coordinator of professional development, will design modules for professional development and direct teacher support. Dr. Maxwell is the Director of the New

Schools Project at the Erickson Institute, a professional development partnership initiative with Chicago Public Schools to advance the quality of Pk-3 education. As a leading expert in teacher training, Dr. Maxwell's work focuses on expanding inclusive practices in early childhood and has developed many partnerships, including with the Milwaukee Public Schools.

*Evaluator SRI International (Independent Evaluator)*

Erika Gaylor, Ph.D., Early Childhood Researcher, will serve as the Evaluation Principal Investigator. Dr. Gaylor has extensive experience as a researcher in both clinical- and community-based settings. Her expertise conducting qualitative and quantitative research includes designing longitudinal research projects. Gaylor has directed the evaluations of the Illinois Statewide Birth to Five Block Grant Program and the Scholarship Program in Saint Paul.

Donna Spiker, Ph.D., Early Childhood Program Manager, will serve as Senior Evaluation Consultant. Dr. Spiker has over 30 years of experience designing and conducting research on the effects of early education. She has expertise on the development and assessment of programs to promote learning. Her expertise includes longitudinal studies and randomized and quasi-experimental designs. Donna has been co-leading early childhood projects in the Midwest.

Shari Golan, Ph.D., Associate Director of SRI's Center for Education and Human Services, will serve as Senior Evaluation Consultant. Dr. Golan has more than 20 years of experience helping improve education, social, and health programs and policies for young children and their families. Her expertise includes working with policymakers, funders, and program leaders to identify strategies to achieve outcomes and ways to collect high-quality data to monitor progress.

Xin Wei, Ph.D., Statistician, will provide statistical support and lead the quantitative data analysis of the evaluation. Dr. Wei has extensive experience in statistical modeling, experimental designs, and psychometrics. She currently directs the quantitative analysis of two Investing in

Innovation (i3) grants. Dr. Wei has numerous peer-reviewed journal articles demonstrating her expertise in using hierarchical modeling, propensity scoring methods, and mediation.

### *D.3. Capacity to Bring Project to Scale*

The project partners will use the following three approaches for program sustainability.

*Building into existing infrastructure.* The project will build core components of the program into existing infrastructure. The Center for the Study of Education Policy (CSEP) at Illinois State University will provide resources for enhancing sustainability. The Erikson Institute's (EI) professional development modules also provide a framework for expansion to other districts. In collaboration with EI and HCRC, CSEP will contribute the following:

- 1) Develop communication materials, including the development of an interactive website and a CPC toolkit that will cost out and package key elements of CPC in an easy to understand format for districts and the state to aide with replication
- 2) Provide technical support to districts and states based on emerging results of the i3 CPC validation study, national Pk-3 research and local practices, and staff's own research on effective practices with aligning early learning and K-12 schools
- 3) Convene a Regional CPC Advisory Committee made up of key professional organizations and policy representatives from states to build capacity for replication, to identify state and district supports, and to address barriers impacting sustainability.
- 4) Facilitate communication between district partners and CPC advisory committee members, including hosting quarterly webinars, facilitating a listserv to share resources and research, and hosting a final symposium that will share data and lessons learned through the project, including the CPC toolkit.

Among the LEAs, the Chicago Public Schools will continue to financially support the five new CPC programs after the end of the grant period and will identify additional schools for the program. The other districts plan to continue to their commitment and determine the most efficient approach to increasing resources.

Illinois Governor Quinn and Minnesota Governor Dayton (Appendix G) have pledged their support for sustainability and collaboration as have Superintendents of Education in all three states. Additional school districts have also expressed interest (e.g., Battle Creek, MI; Seattle, WA; Appendix C shows Battle Creek). The Foundation for Child Development has committed to supporting the project. The Kellogg Foundation and the McKnight Foundation also plan to provide support. The Federal Reserve Bank of Minneapolis already provides significant staff time and in-kind contributions to HCRC projects, including this project.

*Supporting creative financing.* The partners will also work with LEAs and state agencies to find short and long-term financing options for CPC. LEAs are contributing time and cost to the program expansion and it is anticipated this will continue. In collaboration with the project partners, LEAs will develop plans to finance subsequent cohorts beyond this project. Options for short-term and long-term financing include having LEAs apply for competitive *School Improvement Grants* from their state agencies, re-allocating existing Title I funds, or assisting LEAs in applying to local private foundations. Longer term financing options include tax credits to businesses that support CPC schools, tax credits to families, private scholarships/vouchers, or passing legislation to include preK-3 in a state funding formula.

*Obtaining broad support.* The final approach to sustainability means gathering support from key stakeholders in early childhood and K-12 systems. Through the work of the Regional CPC Advisory Committee, outreach will be made to statewide and national organizations to garner support and align the CPC initiative to key priorities. A most notable example is the work

of the National Association of Elementary School Principals (NAESP), who recently released a report on the need to align standards and practices from preschool to third grade. As executive director of the Minnesota NAESP, Fred Storti will work with the CPC Advisory Committee to disseminate knowledge and convene meetings with school principals about adopting the model. He will also assist with outreach to affiliates in other states. The project will also enlist the support of national and state affiliates for the National Education Association, the National Federation of Teachers, the Parent Teachers Association, the business community (e.g., Chamber of Commerce), and early childhood organizations (e.g., Ounce of Prevention, Head Start). In collaboration with the management team, CSEP will focus not only on communicating results to stakeholders but working with these organizations to align evidence-based practices of the CPC model with initiatives of these organizations.

## References

1. Reynolds, A. J., Temple, J. A., White, B. A., Ou, S., & Robertson, D. L. (2011). Age 26 cost-benefit analysis of the Child-Parent Center education program. *Child Development*, 82(1), 379-404.
2. Reynolds, A. J., Temple, J.A., Ou, S., Arteaga, I, and White, B. A. B. (2011, July 15). School-based early childhood education and age-28 well-being: Effects by timing, dosage, and subgroups. *Science*, 333, 360-364. Supporting material:  
<http://www.sciencemag.org/content/suppl/2011/06/08/science.1203618.DC1/1203618.Reynolds.SOM.revision1.pdf>
3. State of Vermont, Agency Human Services. (2010). Vermont's Statewide Report on Kindergarten Readiness 2009-2010. Retrieved from  
<http://humanservices.vermont.gov/publications/school-readiness-report/>.
4. Reynolds, A.J., Englund, M.M., Hayakawa, C., Hendricks, M., Ou, S., Smerillo, N., & Warner-Richter, C. (2011). *Assessing the validity of the Minnesota school readiness indicators*. Saint Paul, Minnesota: Minnesota Department of Education.
5. De La Rocha, O., Mintzer, C., Mastrianna, A. (2005, June 1). Performance outcomes measurement system quarterly report. Retrieved from  
[www.occhildrenandfamilies.org/WorkArea/DownloadAsset.aspx?id=144](http://www.occhildrenandfamilies.org/WorkArea/DownloadAsset.aspx?id=144).
6. Takanishi, R., & Kauerz, K. (2008). PK inclusion: Getting serious about a P-16 education system. *Phi Delta Kappan*, 89(7), 480-487.
7. Reynolds, A. J. (2003). The added value of continuing early intervention into the primary grades. In A. J. Reynolds, M. C. Wang, & H. J. Walberg (Eds.), *Early childhood programs for a new century*. Washington, DC: Child Welfare League of America Press.

8. National Assessment of Educational Progress. (2010). *The nation's report card: Fourth-grade reading, 2009*. Washington, DC: National Center for Educational Statistics, U. S. Department of Education.
9. Hernandez, D. (2011, April). *Double jeopardy: How third-grade reading skills and poverty influence high school graduation*. New York: Annie E. Casey Foundation.
10. Rathburn, A. & West, J. (2004). *From kindergarten through third grade: Children's beginning school experiences*. U.S. Government Printing Office: National Center for Educational Statistics.
11. Camilli, G., Vargas, S., Ryan, S., & Barnett, W. S. (2010). Meta-analysis of the effects of early education interventions on cognitive and social development. *Teachers College Record*. 112, 579-620.
12. Zigler, E., Gilliam, W., & Jones, S. (2006). *The case for universal preschool education*. New York: Cambridge University Press.
13. Temple, J. A. & Reynolds, A. J. (2007). Benefits and costs of investments in preschool education: Evidence from the Child-Parent Centers and related programs. *Economics of Education Review*, 26 (1), 126-144.
14. Reynolds, A. J., Rolnick, A. J., Englund, M. M., & Temple, J. A. (Eds.). (2010). *Childhood programs and practices in the first decade of life: A human capital integration*. New York: Cambridge University Press.
15. Ramey, S. L., Ramey, C. T., & Lanzi, R. G. (2004). The transition to school: Building on preschool foundations and preparing for lifelong learning. In E. Zigler & S. J. Styfco (Eds.), *The Head Start debates* (pp 397-413). Baltimore, MD: Paul H. Brookes Publishing Co.

16. Fan, X., & Chen, M. (2001). Parental Involvement and students' academic achievement: A meta-analysis. *Educational Psychology Review*, 13, 1-22.
17. Temple, J. A. & Reynolds, A. J. (1999). School mobility and achievement: Longitudinal findings from an urban cohort. *Journal of School Psychology*, 37, 355-377.
18. Reynolds, A. J., Magnuson, K. & Ou, S. (2010). PK-3 programs and practices: A review of research. *Children and Youth Services Review*, 32, 1121-1131.
19. U. S. Senate. (1967). *Elementary and Secondary Education Act of 1965* (Report no. 146, pp. 1446-1461). Washington, DC: Author.
20. Karoly, L. A., Kilburn, M. R., Cannon, J. S. (2005). *Early childhood interventions: proven results, future promise*. Santa Monica, CA: RAND.
21. U. S. Department of Health and Human Services (DHHS). (2010). *Head Start impact study: Final report*. Washington, DC: Administration for Children and Families.
22. Chicago Public Schools. (1998). *Child-Parent Center Program: Application to the National Title I Distinguished Schools Program*. Chicago: Author.
23. Reynolds, A. J. (2002). *Chicago's preschool programs: Do they promote children's school success? Executive summary II*. Chicago: Chicago Board of Education.
24. Reynolds, A.J. (2000). *Success in early intervention: The Chicago Child-Parent Centers*. Lincoln, NE: University of Nebraska Press.
25. Fuerst, J. S., & Fuerst, D. (1993). Chicago experience with an early childhood program: The special case of the Child-Parent Center Program. *Urban Education*, 28, 69-96.
26. Chicago Longitudinal Study. (2005). *Chicago Longitudinal Study: User's guide* (Vol. 7). Minneapolis, MN: University of Minnesota.

27. Reynolds, A. J., Temple, J. A., Roberson, D. L., & Mann, E. A. (2002). Age 21 cost-benefit analysis of the Title I Chicago Child-Parent Centers. *Educational Evaluation and Policy Analysis*, 24(4), 267-303.
28. Reynolds, A. J., Temple, J. A., Roberson, D. L., & Mann, E. A. (2001). Long-term effects of an early childhood intervention on educational achievement and juvenile arrest: A 15-year follow-up of low-income children in public schools. *Journal of the American Medical Association*, 285, 2339-2346.
29. Reynolds, A. J., Ou, S., & Topitzes, J. (2004). Paths of effects of early childhood intervention on educational attainment and juvenile arrest: A confirmatory analysis of the Chicago Child-Parent Centers. *Child Development*, 75, 1299-1328.
30. Ou, S. & Reynolds, A. J. (2006). [Early childhood intervention and educational attainment: Age 22 findings from the Chicago Longitudinal Study](#). *Journal of Education for Students Placed at Risk*, 11, 175-198.
31. Reynolds, A. J. (1994). Effects of a preschool plus follow-on intervention for children at risk. *Developmental Psychology*, 30, 787-804.
32. Reynolds, A. J., & Temple, J. A. (1998). Extended early childhood intervention and school achievement: Age 13 findings from the Chicago Longitudinal Study. *Child Development*, 69, 231-246.
33. Reynolds, A. J., Chen, C., & Herbers, J. (2009, June 29). *School mobility and educational success: A research synthesis and evidence on prevention*. Paper presented at the Workshop on the Impact of Mobility and Change on the Lives of Young Children, Schools, and Neighborhoods. National Research Council. Washington, DC: National Research Council.

34. Reynolds, A. J., & Graue, B. (2004). *Four-year-old kindergarten pilot program evaluation, 2003-2004*. Madison, WI: Madison Metropolitan School District, Waisman Center, and Dane County Parent Council.
35. Reynolds, A. J. Temple, J. A., Ou, S., Robertson, D. L., Mersky, J. P., Topitzes, J. W. & Niles, M. D. (2007). Effects of a School-Based, Early Childhood Intervention on Adult Health and Well Being: A 19-Year Follow Up of Low-Income Families. *Archives of Pediatrics & Adolescent Medicine, 161*(8), 730-739.
36. Nation, M. et al. (2003). What works in prevention: Principles of effective prevention programs. *American Psychologist, 58*, 449-456.
37. Lynch, R. G. (2007). *Enriching children, enriching the nation: Public investment in high-quality prekindergarten*. Washington, DC: Economic Policy Institute.
38. Karoly, L., & Bigelow, J. H. (2005). *The economics of investing in universal preschool education in California*. Santa Monica, CA: RAND.
39. Aos, S., Lieb, R., Mayfield, J., Miller, M., & Pennucci, A. (2004). *Benefits and costs of prevention and early intervention programs for youth*. Olympia, WA: Washington State Institute for Public Policy.
40. National Institute of Early Education Research. (2010). *Preschool yearbook: 2009-2010*. New Brunswick, NJ: Author.
41. Reynolds, A. J. & Temple, J. A. (2008). Cost-effective early childhood development programs from preschool to third grade. *Annual Review of Clinical Psychology, 4*, 109-139.
42. Stipek, D. (2004). Teaching practices in kindergarten and first grade: Different strokes for different folks. *Early Childhood Research Quarterly, 19*, 548-568.

43. Graue, E. Clements, M. A., Reynolds, A. J. & Niles, M. D. (2004). More than teacher directed or child initiated: Preschool curriculum type, parent involvement, and children's outcomes in the Child-Parent Centers. *Education Policy Analysis Archives*, 12 (72).
44. Preschool Curriculum Evaluation Research Consortium. (2008). *Effects of preschool curriculum programs on school readiness*. (NCER 2008-2009). Washington, DC: U. S. Department of Education, National Center for Education Research.
45. Finn, J. P. & Achilles, C. M. (1999). Tennessee's class size study: Findings, implications and misconceptions. *Educational Evaluation and Policy Analysis*, 20, 95-113.
46. Ehrenberg, R. G., Brewer, D. J., Gamoran, A., & Willms, J. D. (2001). Class size and student achievement. *Psychological Science in the Public Interest*, 2, 1-30.
47. Schweinhart, L. J. & Wallgren, C. R. (1993). Effects of a Follow Through program on achievement. *Journal of Research in Childhood Education*, 8, 43-56.
48. Harris, D. (2009) Toward policy benchmarks for interpreting effect sizes: combining effects with costs," *Evaluation and Educational Policy Analysis*, 31, 3-29.
49. Stuart, E. A. (2010). Matching methods for causal inference: A review and look forward. *Statistical Science*, 25(1), 1-21.
50. Woodcock, R. W., McGrew, K. S., & Mather, N. (2001). *Woodcock-Johnson III*. Itasca, IL: Riverside Publishing.
51. Hightower, A. D., Work, W. C., Cowen, E.L., Lotyczewski, B.S., Spinell, A.P., Guare, J.C., & Rohrbeck, C.A. (1986). The Teacher-Child Rating Scale: A brief objective measure of elementary children's school problem behaviors and competencies. *School Psychology Review*, 15, 393-409.
52. Meisels, S. J., Jablon, J. R., Marsden, D. B., Dichtelmiller, M. L., Dorfman, A. B. (2001). *The Work Sampling System* (4<sup>th</sup> ed.). New York: Pearson Early Learning.

53. Gallant, D. J. (2009). Predictive validity evidence for an assessment program based on the Work Sampling System in mathematics and language and literacy. *Early Childhood Research Quarterly, 24*, 133-141.
54. Durlak, J. A., & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology, 41*, 327-350.
55. Royston, P. (2005). Multiple imputation of missing values: Update of ICE. *Stata Journal, 5*(4), 527–536.
56. Allison, P. D. (2001). *Missing data*. (Sage University Papers Series on Quantitative Applications in the Social Sciences, series no. 07-136), Thousand Oaks, CA: Sage.
57. Schochet, P. Z. (2008). *Technical methods report: Guidelines for multiple testing in impact evaluations (NCEE 2008-4018)*. Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from the National Center for Education Evaluation:  
<http://ncee.ed.gov>
58. Hedges, L.V. & Hedberg, E.C. (2007). Intraclass correlation values for planning group-randomized trials in education. *Educational Evaluation and Policy Analysis, 29*, 60-87.
59. What Works Clearinghouse (2008). *What Works Clearinghouse procedures and standards handbook* (Version 2.0). Retrieved from  
[http://ies.ed.gov/ncee/wwc/pdf/wwc\\_procedures\\_v2\\_standards\\_handbook.pdf](http://ies.ed.gov/ncee/wwc/pdf/wwc_procedures_v2_standards_handbook.pdf)
60. Bloom, H. S., Hayes, L. R., & Black, A. R. (2007). Using covariates to improve precision for studies that randomize schools to evaluate educational interventions. *Educational Evaluation and Policy Analysis, 29*(1), 30–59.

61. Gennetian, L. A., Morris, P. A., Bos, J., & Bloom, H. (2005). Constructing instrumental variables from experimental data to explore how treatments produce effects. In H. Bloom (Ed.), *Learning more from social experiments: Evolving analytic approaches*. New York: Russell Sage Foundation.
62. Rouse, M., & Krueger, A. (2004). Putting computerized instruction to the test: A randomized evaluation of a “scientifically-based” reading program. *Economics of Education Review*, 23(4), 323-338.
63. MacKinnon, D. P. (2008). *Introduction to statistical mediation analysis*. Hillsdale, NJ: Erlbaum.
64. Ou, S. (2005). Pathways of effects of an early intervention program on educational attainment: Findings from the Chicago Longitudinal Study. *Journal of Applied Developmental Psychology*, 26, 578-611.
65. Levin, H. M., & McEwan, P. J. (2001). *Cost-effectiveness analysis: Methods and applications*. Thousand Oaks, CA: Sage.
66. Blonigen, B., A., et al. (2008). Applications of economic analysis to school-wide positive behavior support (SWPBS) programs. *Journal of Positive Behavioral Interventions*, 10, 5-19.