

EDUCATION POLICY ANALYSIS ARCHIVES

A peer-reviewed scholarly journal
Editor: Gene V Glass
College of Education
Arizona State University

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Volume 12 Number 72

December 24, 2004

ISSN 1068-2341

More than Teacher Directed or Child Initiated: Preschool Curriculum Type, Parent Involvement, and Children's Outcomes in the Child-Parent Centers

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Citation: Graue, E., Clements, M. A., Reynolds, A. J., & Niles, M. D. (2004, December 24). 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). Retrieved [date] from <http://epaa.asu.edu/epaa/v12n72/>.

Abstract

This study investigated the contributions of curriculum approach and parent involvement to the short- and long-term effects of preschool participation in the Title I Chicago Child-Parent Centers. Data came from the complete cohort of 989 low-income children (93% African American) in the Chicago Longitudinal Study, who attended preschool in the 20 Child-Parent Centers in 1983-1985 and kindergarten in 1985-1986. We found that implementation of an instructional approach rated high by Head Teachers in teacher-directed and child-initiated activities was most consistently associated with children's outcomes, including school readiness at kindergarten entry, reading achievement in third and eighth grades, and avoidance of grade retention. Parent involvement in school activities, as rated by teachers and by parents, was independently associated with child outcomes from school readiness at kindergarten entry to eighth grade reading achievement and grade retention above and beyond the influence of curriculum approach. Findings indicate that instructional approaches that

blend a teacher-directed focus with child-initiated activities and parental school involvement are origins of the long-term effects of participation in the Child-Parent Centers.

Few people would argue about the value of high quality experiences for our youngest children. Over the years, academics, policymakers, and the public have searched for a perfect package that would not only support the growth and development of children, but would, at the same time, solve the ills that plague society. But there is serious contention about the nature of quality. In ongoing debates about what is best for children, we argue about home vs. child care, child initiated vs. teacher directed, play vs. academic content, public vs. private funding, care vs. education, ready children vs. ready schools, social vs. cognitive. Because the stakes and our hopes are so high, we continue to seek the one best way to promote their growth. In this paper, we will add to the direction of this argument. We examine the outcomes of several alterable elements of early childhood programming in an attempt to understand how curriculum and parent involvement affect children's school readiness, early achievement, and later experiences. Following a brief exploration of the literatures on preschool curriculum comparisons and parent involvement, we examine, using data from the Chicago Longitudinal Study, three major questions:

- (1) In what ways can early childhood curricula be described that captures key features in promoting development?
- (2) Using these descriptions, what outcomes can we attribute for a large group of low-income children who attended the Chicago Child-Parent Centers?
- (3) Does parent involvement in school in this Title I preschool program influence children's outcomes independent of curriculum context?

Literature Review

The question of what early childhood curriculum should look like has been debated for as long as people have thought about planned activity for children. In this project we were interested in arguments about curricular efficacy, so we focus on scholarship that has attempted to compare different curricular practices in terms of concurrent descriptions of teacher and student activity and subsequent outcomes and experiences. While there are many ways this literature might be described (Goffin, 1994; Golbeck, 2001; Stipek, 1991), we explore two eras in this scholarship that take slightly different approaches to the problem of program type and related outcomes. The first era spans the 1970's and 80's and focuses primarily on comparisons of specific curriculum designs implemented in model programs serving small groups of children. The second era, in the 1990's, compared more generic programming contrasting degrees of teacher structure and content focus.

Program Specific Comparisons

In the 1970's scholarship on curriculum focused on comparisons of specific curricular designs, with much work coming out of the investments in early education made

during the *War on Poverty*. A horse-race approach was typically taken, with different designs pitted against each other, without the comparison of a control group. Because of this, assertions about program efficacy are relative to the nature of the comparison. Some patterns can be discerned however. Most comparisons contrasted programs that varied in the degree to which the curriculum was initiated by the teacher or the child. Rather than being ends of a continuum, it is more useful to consider them as two dimensions that operate simultaneously in curriculum practice, recognizing the joint action of participants. First suggested by Schweinhart & Weikart (1988), we use this typology to describe the contrasts presented in this literature.

The starkest contrast is between programming that is teacher directed/child responsive versus programming that is child initiated/teacher responsive. In teacher directed programs, content is identified and sequenced by the teacher. Behavioral analysis provides the target and sequence for the content, which is transmitted from teacher to child through structured scripted lessons. *Direct instruction* or DISTAR is the probably the best exemplar of this approach. In contrast, curriculum can be initiated by the child, who works through environments provided by the teacher. In this approach, careful general planning is done by teachers but it is assumed that play and child choice of activity are the most developmental media for learning because they enact child developmental level and interest. Supported by a foundation of Freudian and Piagetian theory, child initiated programs are often described as *traditional* or *nursery school* approaches.

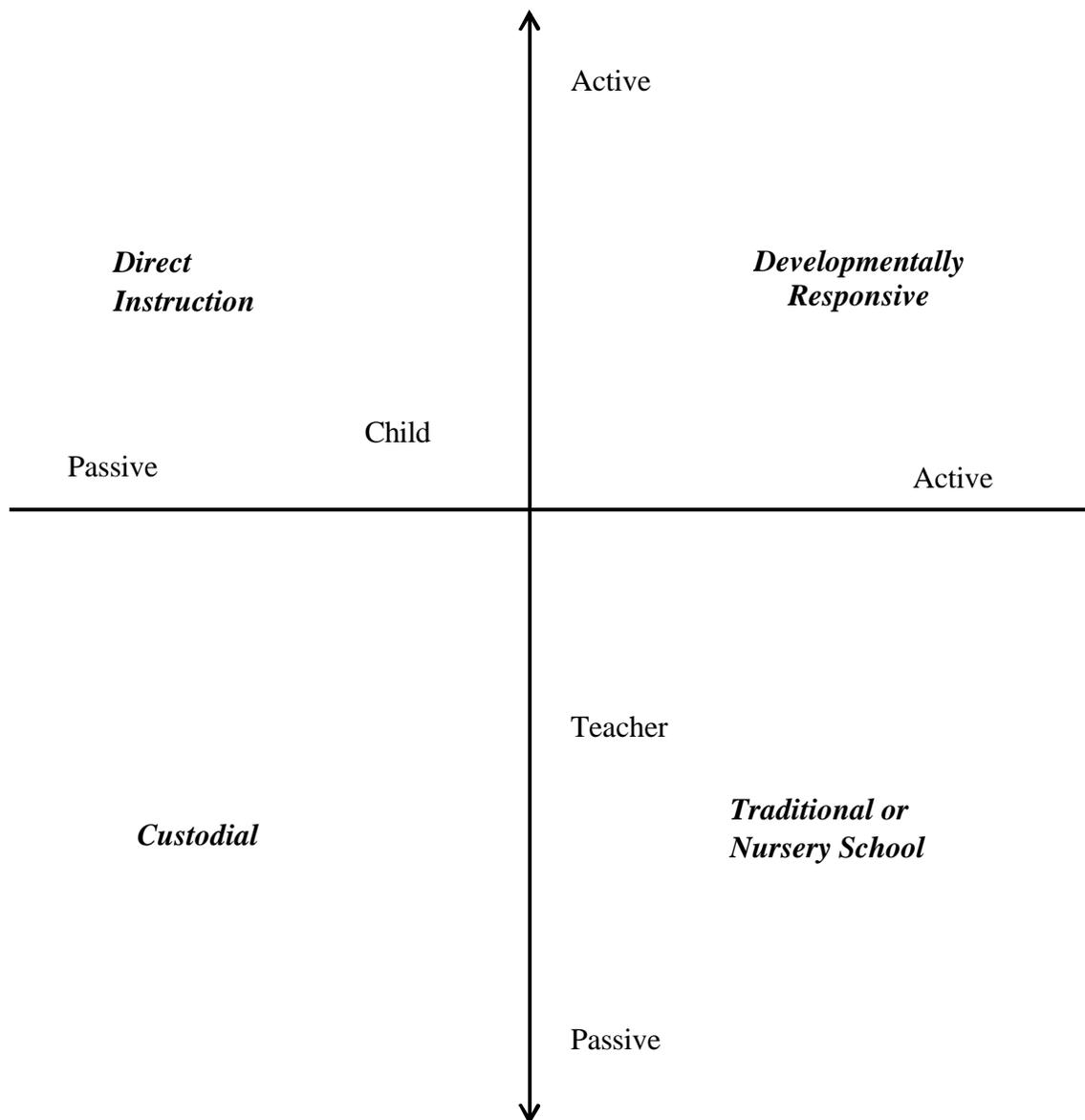
A third variant, *custodial* programs, are unplanned, unstructured and typically unresponsive for either teachers or children. This type of program is not considered in this paper as it is not a component of research on curriculum comparisons. A final type is the broadest and most complex, involving dialogic curriculum generation with both teachers and children initiating learning activities. In their most productive versions, these programs are planful and responsive, a kind of instructional conversation. Informed by neo-Piagetian and Vygotskian theories these programs might include High Scope, Montessori, certain types of constructivism. This two dimensional typology recognizes the joint actions of participants, with programs not being a pure enactment of either dimension but varying degrees of both. We represent our understandings of programs that have been examined in the first era of curriculum studies in Figure 1.

What do we know about the outcomes of these varied programs? One surprise for us was the relatively small number of studies of program effects. In our search of the literature involving comparisons of curricula, the first era was comprised of four separate comparisons, each contrasting different sets of programs with mostly low-income children. Student outcomes examined included cognitive status (through IQ, achievement tests, language processing), social emotional development, enrollment in special services or retention, crime and civic practice. Most projects had both short term and long-term measures of outcomes. Despite the varied nature of the programs, it appears that curricula with the most direct teaching (and specific content) produced larger cognitive gains early on in terms of IQ and achievement test performance (Dale & Cole, 1988; Karnes, Shwedel, & Williams, 1983; Karnes, Teska, & Hodgins, 1970; Miller & Dyer, 1975; Schweinhart, Weikart, & Larner, 1986). The advantage provided by programs like DISTAR or Karnes' Ameliorative program typically held in the early primary grades and then faded.

There are several ways to explain this pattern. One would be that this approach generated the most cognitive development in the majority of children. This explanation would be premised on the idea that children living in poverty need highly structured, teacher

directed activities to be able to benefit from early intervention. In contrast, it could be asserted that the direct approaches had better

Figure 1. Relationship of Teacher to Child Activity in Curriculum Models



alignment between the content of instruction and the content of the measures. This explanation focuses less on learning and more on links between curriculum and testing instruments. For example, in the Illinois comparisons (Karnes et al., 1970) the experimental program was designed in relation to the conceptual framework of the ITPA, instruction used student results on initial testing with the ITPA and Frostig materials and then both measures

were used as outcomes. Although less explicit in the mapping of curriculum to measures, the DISTAR content was a good fit to the notions of reading readiness and math skills portrayed in many early learning tests.

Follow up studies traced these students' experiences later in schooling. IQ gains and differences in other cognitive outcomes among programs faded over time (Cole & Dale, 1991; Karnes et al., 1983; Miller & Bizzell, 1983; Schweinhart et al., 1986). In this work we begin to see a pattern of differential effects for certain subgroups. In both studies that included Montessori programs (Karnes et al., 1983; Miller & Bizzell, 1983), boys seemed to derive a boost from participation in their later school years. Examining a variety of measures of later school success, it appeared that a focus on child initiated activity with teacher support provided more enduring and broader effects, with children who participated in programs like Montessori, High/Scope, and Traditional programs experiencing less placement in special education, retention in grade, delinquency, and higher rates of graduation and engagement in civic activity. Taken together with the earlier studies we see a contrast in notions about the relations between academic and social competence and school success. The teacher directed programs are based on the assumption that social competence and success come out of academic development and competence while the child initiated programs work from a foundation valuing social and emotional development as a precursor to academic skills and school success (Miller, 1979), cited in (Golbeck, 2001).

General Program Contrasts

The second era of curriculum studies turned from model programs for children in poverty to community based programs serving a cross section of U.S. children. These contrasts are marked by their attempts to categorize field-based practice according to the degree of teacher direction and structure and to link these characterizations to both descriptions of child activity and later outcomes. As was the case with the programmatic comparisons, the sample of studies that form our knowledge base is surprisingly small. Seven distinct studies were identified that examined a range of behaviors and outcomes. The first set of studies attempted to describe the nature of child activity in various types of instruction. These studies found that children in highly structured or developmentally inappropriate contexts were engaged in more empty activities such as waiting, worksheets and TV (Hart et al., 1998) and they exhibited less prosocial behavior, aggression, and imaginative play (Huston-Stein, Friedrich-Cofer, & Susman, 1977). Differential effects were found for gender and economic subgroups, with low SES boys evidencing more stress in developmentally inappropriate programs, while there were no differences in stress in developmentally appropriate related to economic status (Hart et al., 1998). Teacher engagement in children's activity provided more interactive and prosocial learning among children than did teacher absent approaches (Smith & Connolly, 1986).

Researchers have also explored student outcomes related to general program experience. Several themes can be drawn from these studies. The first is conceptual coherence in curriculum. When curriculum is characterized on a one dimensional continuum of academic versus child initiated, eclectic approaches seem to depress student outcomes at the end of preschool (Marcon, 1992). Rather than getting the best of both, it appears that children might be getting a muddle that is less likely to leverage development. The second issue addresses developmental effects. The issue of what curriculum seems to be related to what age. Preschoolers in programs that did not focus on basic skills outperformed those that attended basic skills programs on reading/letters, number memory, grouping and verbal

fluency while the reverse was true of kindergartners (Stipek et al., 1998). Didactic programs appear to provide better support for learning letters or reading while child centered programs produce children with more stable motivation and self concept (Rescorla, Hyson, & Hirsh-Pasek, 1991; Stipek, Feiler, Daniels, & Milburn, 1995).

Taken together, the literature on curriculum effects provides a picture that requires a much more nuanced interpretation than might be thought. When asking what works, we need to examine issues of age, gender, and economic status. The value of didactic approaches focused on particular academic content is inseparable from issues of climate and child engagement. The two dimensional model of child initiated and teacher direction may provide the best fit for understanding potential outcomes.

Parent Involvement

In addition to curriculum models, we were interested in understanding the effects of parent involvement on development. Curiously, parent involvement, though a hallmark of early childhood programming, is little examined in relation to curriculum. Of the studies we reviewed on curriculum, only one made reference to a parent education component. Our review of parent involvement research is brief, focusing on key aspects of the multidimensional construct.

Parent involvement is a frequently used label for an array of activities that work to make stronger links between home and school. It has been described through a typology developed by Joyce Epstein and her colleagues which includes the following categories: parenting, communicating, supporting school, learning at home, decision making, and collaborating with community (Epstein, 1995). This diverse set of relationships and activities will be examined here for children in the early childhood years focusing primarily on reviews of major subject areas.

In 1992, White, Taylor, and Moss published a review of the parent involvement literature related to early intervention programs. In this review, they analyze the studies that were typically cited in previous reviews in terms of methodological rigor in conjunction with findings. This analysis called into question many of the assertions made about the efficacy of parental involvement in early intervention programs. Focusing primarily on studies of training parents as teachers of their own children, they found little evidence of effects when comparing intervention with programs that did not include parental involvement, regardless of the risk status that prompted placement in the intervention program. Authors pointed to low design quality in most studies, making it difficult to find effects (White, Taylor, & Moss, 1992). A recent review of parent involvement programs beyond the early childhood years (Mattingly, Prislin, McKenzie, Rodriguez, & Kayzar, 2002) was similarly skeptical, noting that evaluators typically had poor measures of outcomes, resulting in constrained ability to find positive outcomes.

Reviews of home visiting programs in early intervention with families living in poverty, Olds and Kitzman (1993) found that home visiting programs were most effective with families at greater risk, when they were embedded in comprehensive services and when visits were frequent and conducted by nurses. Perhaps in response of critiques related to methodological quality, research reported in the 90's has found more consistent patterns of positive effects. Training parents of preschoolers to work with their children at home have been found to have positive results (Henderson & Mapp, 2002), with longer and more intense participation providing greater gains in later school measures of success, regardless of family configuration or income.

Taken together, the literatures on early childhood curriculum and parent involvement indicate that despite widespread support for early childhood programming, particular types of programming and parental involvement, we have limited empirical evidence to make policy decisions. The focus of this paper is to provide such evidence using data from a large cohort of children in the Chicago Longitudinal Study who attended the Child-Parent Center preschool program. While previous reports in the study have indicated that program participation is associated with significantly higher levels of school performance and enhanced social competence over the school-age years (Reynolds, 1995, 2000; Reynolds et al., 2001), the contributions of curriculum and parent involvement to the short- and long-term impact of program participation have not been investigated. In addition to the large amount of data collected on study children and their families, information on curriculum and parent involvement in school is available from participation in this large-scale, federally funded early educational intervention. Extensive longitudinal data on educational context and child outcomes are rare in studies of large-scale programs. Our study addresses these issues by investigating the contributions of curriculum and parent involvement to children's school and social adjustment throughout the school-age years, including school readiness, early and later school achievement, need for remedial education services, delinquency, and high school completion.

Methods

Sample and Intervention

The study sample included the 989 children in the Chicago Longitudinal Study (CLS, 1999) who attended the Chicago Child-Parent Centers (CPC) at age 3 or 4 in 20 sites. As a complete CPC cohort who attended preschool in 1984-85 and kindergarten in 1985-86, study children (93% of whom are African American) resided in low-income families and grew up in the highest poverty neighborhoods in Chicago. Because the focus was on children in the preschool program, the remaining 550 children in the CLS were excluded. They constituted the nonCPC comparison group. For a complete description of the original study sample of 1,539 children, see Reynolds (1999, 2000).

Table 1 displays the child and family characteristics of the study sample. The CPC preschool group was about evenly split between boys and girls. Among socioeconomic characteristics, over 90% were eligible for the subsidized school lunch program. About one-half resided in single-parent families and in families in which parents were not employed full- or part-time. About half the sample participated in CPC preschool for two years beginning at age 3, 60% attended full-day kindergarten programs in the centers, and 69% attended the CPC school-age program for at least one year. Given our focus on curriculum and parent involvement, levels of program participation were used as covariates in the analysis.

The CPC program is an early educational intervention providing comprehensive educational and family services to children between the ages of 3 to 9 (preschool to third grade) and their families living in poverty. The program practices and structure are based on the assumptions that development is optimized in rich, stable learning environments and when parents are involved in the process of learning. Four components comprise the program: early intervention, parent involvement, a structured language/basic skills learning approach, and program continuity between preschool and elementary school. Participation

in the elementary school-age component is not investigated in this study, but is included as a covariate in estimating the effects of instructional and family-support behavior.

Table 1
Descriptive Statistics for CPC Preschool Participants in the
Chicago Longitudinal Study

Child/family attribute	Preschool group (<i>n</i> = 989)
Female child, %	51.5
Black child, %	92.9
High school poverty (> 59%), % *	76.5
Risk index (0-6), mean (<i>SD</i>)	3.7 (1.4)
Child eligible for subsidized meals, % *	92.3
Parent(s) not employed full-or part-time, % *	53.2
Parent(s) completed high school, % *	66.7
Single-parent status, % *	48.6
Number of siblings, mean *	2.4
Parent(s) < age 20 years at child's birth, %	23.5
Two years of preschool, %	53.9
School-age program, %	69.2
Full day of kindergarten, %	59.7

* Included in the risk index.

Located in the poorest neighborhoods in Chicago, the centers serve 100 to 150 three- to five-year-olds in separate facilities or in wings of neighborhood schools. Each center is directed by a Head Teacher and two coordinators, the Parent-Resource Teacher and the School-Community Representative. The Parent-Resource Teacher implements the family-support component. The School-Community Representative provides outreach services to families including resource mobilization, home visitation, and enrollment of children. On-going staff development and health and nutrition services also are provided, including health screening, speech therapy, and nursing and meal services (see Reynolds, 2000; Sullivan, 1971).

Although similar to Head Start, there is a critical difference: CPC's have historically provided up to 6 years of intervention services for children from ages 3-9, whereas Head Start is a preschool program. This provides the opportunity for a school-stable environment (minimal school transfers) during preschool and the early primary years. As a Title I program, the CPCs also have emphasized the development of children's literacy skills. Unlike many community- based programs, including Head Start, all teachers in the CPCs have at least bachelors' degrees with certification in early childhood. Staff compensation is relatively high. These features contribute to high levels of stability among staff. The eligibility criteria for the program are (1) residence in a high-poverty school area eligible for federal Title I funding, (2) demonstration of educational need due to poverty and associated factors as assessed by a screening interview, and (3) parents agree to participate. Over 80% of children from the neighborhoods of the CPCs attended the preschool program.

Nonparticipation is likely to be due to family conflicts with work schedules, participation in alternative programs, and lack of available space.

The program model is displayed in Figure 2. The CPC curriculum can be described as an amalgam of standardization and local control, academic and social-emotional development. The core curriculum philosophy emphasized the acquisition of basic skills and knowledge in literacy and mathematics through relatively structured but diverse learning experiences that ranged from whole class, small group, centers, individual work, and fieldtrips. Affective learning was embedded in academic content. This core was shared across centers but adapted to reflect local needs. Suggested instructional activities were provided (Chicago Board of Education, 1988) and were supplemented with other literacy materials, such as Houghton Mifflin, DISTAR and Peabody Learning Kits. The child to staff ratio is limited to 17 to 2 in preschool and 25 to 2 in kindergarten, although parent volunteers reduce these numbers further. After full-day or part-day kindergarten, continuing services are provided in the affiliated schools under the direction of the curriculum parent-resource teacher. The centers make considerable efforts to involve parents in the education of their children, requiring at least one-half day per week of parent involvement in the program. The parent component includes participating in parent room activities, reinforcing learning at home, volunteering in the classroom, attending school events and field trips, participating in vocational and educational training, and receiving home visits from the school-community representative (Reynolds & Robertson, 2003). A unique feature of the CPC is the parent resource room, which is physically located in the center adjacent to the classrooms (Reynolds, 2000). The full-time parent-resource teacher organizes the parent room in order to implement parent educational activities, initiate interactions among parents, and foster parent-child interactions (Reynolds, 2000).

Explanatory Measures

Instructional approach. A first step in our analysis was to develop a system to describe the relevant variation in the approaches taken in the Child-Parent Centers. Head teachers at the time of program participation completed a short retrospective survey in 1995 about the curriculum and organizational structure of the preschool and kindergarten program for the years 1983-1986 (Reynolds, 2000). Ratings by a long-time evaluator of the Child-Parent Centers (and a founder of the Chicago Longitudinal Study) were used if head teachers or staff could not be located for these years.

Teachers rated the extent to which the centers emphasized basic skills, small- or large-group activities, formal reading instruction, learning centers, fieldtrips, and child- and teacher-directed activities. The teaching philosophy of the center and specific instructional materials in use also were reported through open-ended questions. Table 2 presents a summary of the responses related to these dimensions of instruction.

Figure 2. Child-Parent Center Program

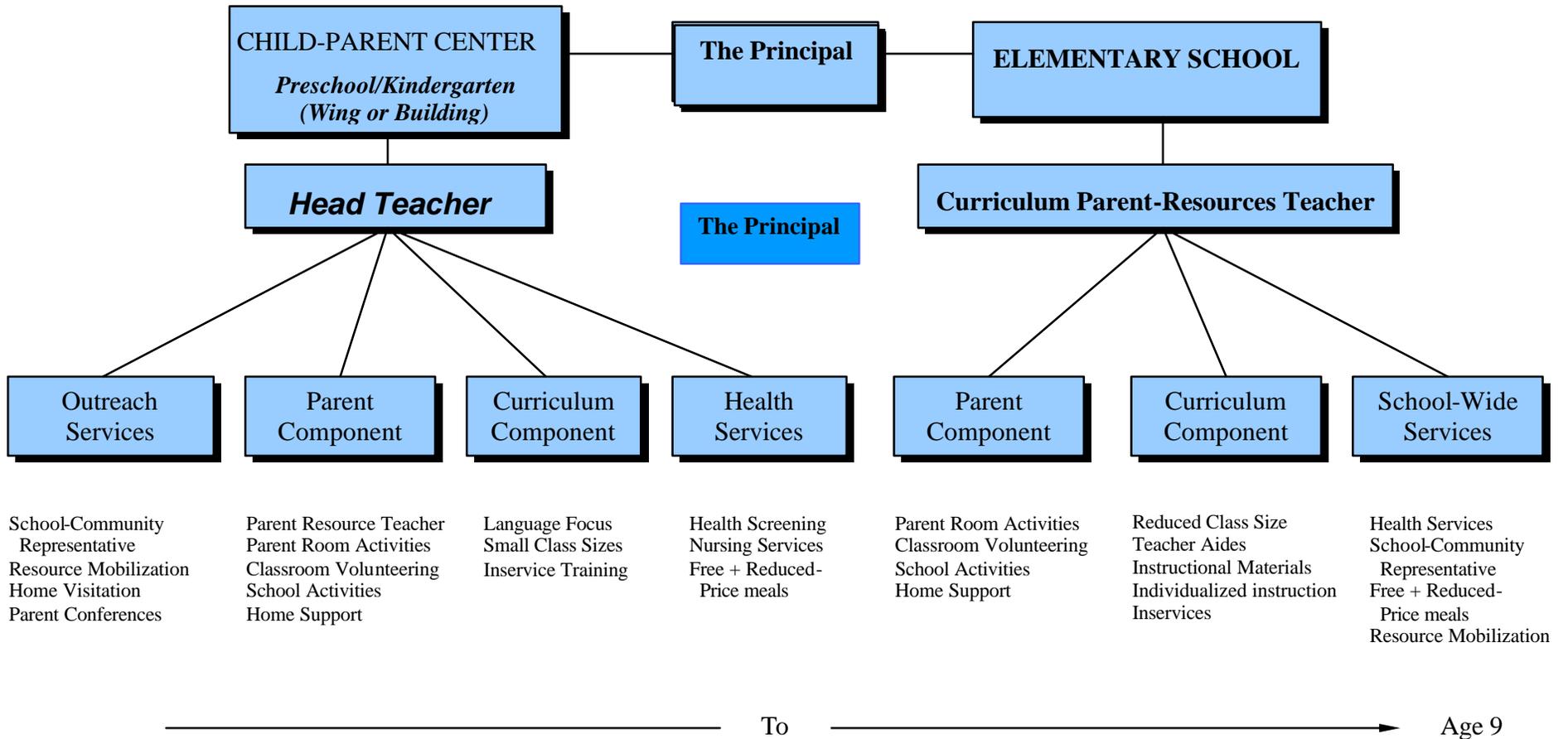


Table 2
Head Teacher Descriptions of Frequency of
Activities in the Child-Parent Centers (N = 20)

How often did your curriculum contain the following?	Minimal/ never	Sometimes/ occasionally	Often/always
Formal reading instruction	35%	20%	45%
Emphasis on basic skills	4%	30%	65%
Small group activities	—	30%	70%
Large group activities	—	20%	80%
Field trips	—	15%	85%
Child-initiated activities	20%	55%	25%
Teacher-initiated activities	—	15%	85%
Learning centers	20%	25%	55%

From these data, each Child-Parent Center was classified as relatively high or low on two dimensions of preschool instruction: teacher-directed instructional activities and child-initiated instructional activities. Centers rated high on teacher-directed (HT) activities used direct instruction materials that emphasized phonics and pencil-and-paper activities. The most frequently mentioned commercial instructional programs were Houghton Mifflin, Ginn, and Sullivan. Centers low in teacher-directed activities used activity-based approaches or materials emphasizing using language in context (e.g., Peabody Language Development Kits, activity-based science). HT classrooms were most likely to have large-group activities, emphasize basic skills, and implement formal reading instruction.

Use of a child-initiated approach was based on ratings of the extent to which centers utilized child-focused instructional approaches including (1) field trips, (2) learning centers, and (3) child-initiated activities. Centers were rated as having a high emphasis on child-initiated activities (HC) if each of the three approaches was used “often”. Remaining centers were rated as relatively low on child-initiated activities.

Using ratings on these two dimensions, children in the centers were assigned to one of four instructional groups: (1) high teacher-directed instruction and high child-initiated instruction (HT + HC; n = 387), (2) high teacher-directed instruction and low child-initiated instruction (HT + LC; n=63), (3) low teacher-directed instruction and high child-initiated instruction (LT + HC; n=362), and (4) low teacher-directed instruction and low child-initiated instruction (LT + LC; n=177).

Inter-rater reliability, based on three raters, for assignment into teacher-directed and child-initiated instructional approaches was .75. Notably, the standard for classification into these groups is relative and not absolute. Children in HT + LC, for example, did have opportunities for exploratory learning but it was less frequent than for children in centers

rated high in child-initiated activities. The classification was based largely on retrospective reports. To minimize reporting bias, we relied most heavily on the teaching philosophy and specific instructional materials used in the centers in determining the classifications. This information was more easily verifiable.

Parental involvement in school. Parent involvement was measured by ratings of parent participation in school by children's first grade teachers. Each child was assigned the average rating (Min. = 1 [poor/not at all; Max [excellent/much] = 5) for their CPC preschool site as rated by classroom teachers. Site-level average ratings ranged from 1 to 3.5, with 3 indicating an average level of participation. The use of aggregated ratings served two purposes. First, the measure is parallel to instructional approach, representing a school level characteristic. Second, aggregating parent involvement at the level of the center reduces the possibility of selection bias in family-level reports of involvement that may be confounded with child outcomes.

Teacher ratings of parent involvement have demonstrated adequate levels of construct validity as determined by factor analysis and measurement reliability (alphas > .90), and have been shown to mediate the effects of program participation on a variety of child and family outcomes (Reynolds, 2000; Reynolds et al., 1996). They also are a key component of the theory of the program (Sullivan, 1971). Our use of a first grade measure is supported by findings that parent involvement in school is relatively stable from preschool to the early school grades. This measure also was based on largest amount of data from the study as teachers provided ratings for over 80% of study sample. Nevertheless, alternative measures rated by parents were investigated.

Covariates

CPC Program Participation. Three measures of CPC participation were used as covariates to estimate the contributions of instructional approach and parent involvement. Their inclusion accounted for the possibility that instructional approach is confounded with early childhood program experience. All were obtained and verified from school records.

Preschool. This dichotomous indicator measured whether children enrolled in the CPC program for two years beginning at age 3 or for one year at age 4. For both years, a half-day program was offered.

Kindergarten. To take into account kindergarten experiences, children attending full-day kindergarten programs in the centers were coded 1 and those attending half-day programs were coded 0.

School-age. Children who attended the CPC school-age program for one or more years from first to third grade were coded 1. Those who did not attend the school-age program were coded 0. Unlike the preschool and kindergarten program, the school-age program is located in the elementary school building and is open to any child in the attendance area regardless of educational need.

Sex of child. Girls were coded 1 and boys were coded 0 as obtained from school records.

Race/ethnicity of child. African American children were coded 1 and Hispanic children were coded 0.

Family risk index. This multiple risk index measures socioeconomic disadvantage and was included in the model as a covariate. The index provides a cumulative summary of the co-occurrence or a "pile-up" of risk factors that are frequently associated with child and family functioning (Bendersky & Lewis, 1994; Rutter, 1987). The risk indicators were selected based on their well-known associations with child and family well-being (Bendersky & Lewis, 1994). It was the sum of six dichotomously-coded risk factors measured from family surveys or school records from preschool to age 8 as follows: (a) parent did not

complete high school, (b) eligibility for a fully subsidized lunch defined as a family income at or below 130% of the federal poverty line, (c) residence in a school neighborhood in which 60% or more of children are in low-income families, (d) residence in a single-parent family, (e) parent not employed full- or part-time, and (f) four or more children in family. Cases with missing data were assigned values based on their overall risk level.

Outcome Measures

Cognitive composite at kindergarten entry (School readiness). Readiness skills at the start of kindergarten in early reading and mathematics were measured by the early primary battery of the Iowa Tests of Basic Skills (ITBS, Level 5 Form 7; Hieronymus, Lindquist, & Hoover, 1980) in October 1985. Group administered over one week, the test measures a broad array of readiness skills in picture format including listening, word analysis, vocabulary, and mathematics. Internal consistency reliability was .94. This coefficient reflects the large number of items in the test, but it is impressive given the age of the children tested. Cognitive skills at kindergarten entry are a major focus of nearly all preschool programs for children at risk and research has confirmed predictive validity of measures like the ITBS on later achievement (Reynolds, 1989; Reynolds et al., 1996). Scores were reported in developmental standard scores on this and subsequent ITBS results. An advantage of this metric is its equal-interval scale points.

Kindergarten achievement. Kindergarten achievement in key academic areas were measured by end-of-kindergarten scores on the group-administered word analysis and mathematics subtests (Early Primary Battery, Form 7 level 5) of the Iowa Tests of Basic Skills (ITBS). The test was administered orally by staff other than the classroom teacher. The word analysis subtest contained 35 items assessing prereading skills, including letter-sound recognition and rhyming.

Examples for word analysis are as follows:

- (1) Move your marker under the box with the kite (word recognition);
- (2) Fill in the oval under the M (choices are W N R M) (letter identification) and;
- (3) From pictures of a lock, a foot, and a book, students are asked to “fill in the oval under the one that rhymes with look” (rhyming, similarities).

The mathematics subtest included 33 items measuring numbering, classification, and quantification. Examples for mathematics are as follows:

- (1) Fill in the oval under the 3 (choices are 3 8 9) (number identification)
- (2) Fill in the oval under the circle (among 3 choices) (identification of shapes)
- (3) From the picture, move your marker under the one showing 9 o'clock

The reliabilities of the word analysis (KR-20 coeff. = .87) and mathematics (KR-20 coeff. = .82) subtest are the highest of the ITBS measures at this age.

Third-grade reading achievement. ITBS reading comprehension scores were measured in the spring of 1989 (Form 7, Level 8 or 9; Hieronymus, Lindquist, & Hoover, 1990). This subtest included 44 multiple-choice items on recognizing facts, making inferences, and developing generalizations from textual material. The internal consistency reliability is .91. We analyzed a recoded indicator, performance at or above national norms in third-grade reading achievement. This dichotomous measure was coded 1 for children scoring at or above the national average of 108 and 0 for those below this score.

Eighth-grade reading achievement. School achievement prior to high school entry was assessed using subtest scores on the reading comprehension (58 items) section of the Iowa Test of Basic Skills (ITBS, Level 13 or 14) administered in the spring of 1994 in the Chicago public schools. The internal consistency reliability of .93 is among the highest of all achievement tests. The national average for eighth graders was 166, which is a grade equivalent of 8.8. We also tested a recoded measure, performance at or above national

norms in reading achievement. This dichotomous measure was coded 1 for children scoring at or above the national average for eighth graders of 166 and 0 for those below this cutoff.

Incidence of grade retention. Incidence of grade retention was dichotomized and defined as whether children repeated a grade from kindergarten through the eighth grade (age 15 years) because of failure to meet minimum levels of performance. Any incidence of grade retention was coded 1, otherwise 0. Once in high school, students are no longer formally retained in grade. Data were based upon school administrative records.

Incidence of special education placement. Special education placement was a dichotomous variable measuring whether or not children received any special education services from ages 6 to 18 years (grades 1-12). Any incidence of special education placement was coded 1, otherwise 0. Most children receiving special education services participated in the regular school program. The most frequent categories of placement (based in part on federal definitions) were specific learning disability, behavioral disorder, and speech and language impairments. Data came from school administrative records.

High school completion. High school completion measured whether youth completed their secondary education with an official diploma or were awarded a General Education Development (GED) certificate by age 22 (May 2002). If they completed high school or GED, they were coded as 1, all others, 0. This measure was extracted from administrative records in all schools youth attended and were supplemented by interviews with family members.

Juvenile delinquency. Juvenile delinquency was measured by official Cook county court reports of petitions filed between ages 10 and 18 (1990 through 1998). Any incidence of arrest was coded 1. Youth with no arrest history were coded 0. To be included in the analysis, youth had to reside in the Chicago area at age 10 or older.

Results

We present results in three major sections corresponding to the study questions. The first question is about describing the curricula implemented in the centers and how this is linked with ratings of parent involvement. The two other questions are explanatory in which the relations between curriculum approach and parent involvement, and short- and longer-term child outcomes are investigated. Alternative analyses are presented to test the robustness of findings across different models or measures.

Description of Preschool Curricula in the Child-Parent Centers

To address the first research question, we describe children's experiences in the CPC program along the dimensions of curriculum and parent involvement. We also report intercorrelations among these dimensions, program characteristics and kindergarten outcomes.

As shown in Table 2, a wide variety of educational activities were used in the centers. Over 80% of Head Teachers indicated that field trips and teacher-initiated activities were used "often" or "always." Both small-group activities, including learning centers as well as large-group activities, such as a basic-skills, phonics emphasis also were prominent. These activities are indicative of the two-dimensional curriculum structure displayed in Figure 1.

Table 3
Distribution of Children by Instructional Group and Parental Involvement

	High child- initiated activities	Low child- initiated activities	Total
<hr/>			
Instructional group			
High teacher-directed (% of total sample, $n = 989$)	387 (39.1)	63 (6.4)	450 (45.5)
Low teacher-directed (% of total sample, $n = 989$)	363 (36.7)	176 (17.8)	539 (54.5)
<hr/>			
Parental involvement			
Low parental involvement (% of total sample, $n = 989$)	191 (19.3)	98 (5.9)	289 (25.2)
Medium parental involvement (% of total sample, $n = 989$)	252 (25.5)	63 (6.4)	315 (31.9)
High parental involvement (% of total sample, $n = 989$)	307 (31.0)	78 (7.9)	385 (38.9)
<hr/>			

Table 3 shows the distribution of children by instructional group and level of parent involvement. Overall, 76% of CPC children attended centers rated high in child-initiated activities (e.g., learning centers, small group activities), and 46% attended centers rated high in teacher-directed activities (e.g., large-group activities, basic skills emphasis), which was measured independently of child-initiated instruction. Among the four curriculum groups, the largest percentage of children (39.1%) attended centers emphasizing high levels of teacher-directed and child-initiated instructional strategies (HT + HC). 37% of children were in centers characterized as high in child-initiated activities and low in teacher-directed activities (LT + HC). The smallest percentages of children were in centers with relatively low teacher-directed and low child-initiated activities (18%; LT + LC) and with high teacher-directed but low child-initiated activities (6%; HT + LC).

Ratings of parent involvement in school by classroom teachers also are shown in Table 3. Overall, 70% of children attended centers with medium to high levels of parent involvement in school as rated by teachers. More than half of these children (38.5% vs 31.5%) had relatively high levels of parent involvement, defined as ratings of 3.5 or higher on a scale from 1 to 5. 29% of the total sample had ratings of parent involvement in the low range, defined as less than 2.5 on the aggregated scale.

Parent involvement was rated higher at centers that emphasized child initiated instruction. As shown in Table 3, 41% (307 / 750) of children attended centers rated high in child-initiated activities and in parent involvement, whereas 33% of children in centers with lower child-initiated activities had high levels of parent involvement. Moreover, three quarters of children attending centers high in child initiated activities had medium or high levels of parent involvement compared to 59% for children attending centers low in child initiated activities.

Intercorrelations among instructional approach, program participation, and kindergarten outcomes are found in Table 4. Low to moderate negative intercorrelations were found for most instructional group variables. Parent involvement was higher in centers that implemented low levels of teacher direct activities and high levels of child initiated activities (LT + HC; $r = .41$). This may reflect the greater opportunities for parent involvement in child-initiated classrooms, such as reading to children in small groups and going on field trips. Membership in the other instructional groups was associated with lower levels of parent involvement.

School readiness was significantly and positively associated ($r = .175$) with a high teacher directed and high child initiated instructional emphasis (HT + HC) and negatively associated with a high teacher directed and low child initiated emphasis (HT + LC, $r = -.089$). Having two years of preschool as compared to one year was significantly related to greater school readiness, word analysis scores, and math achievement. Children attending full day kindergarten had significantly higher word analysis scores. Participation in full-day kindergarten and CPC follow-on services were included primarily as control variables in the analyses.

Table 4
Intercorrelations of Instructional Indicators, Program Factors, and
Kindergarten Outcomes (N = 989)

Measure	2	3	4	5	6	7	8	9	10
1- HT + HC	-.209 **	-.611 **	-.115 **	.033	.209 **	-.201	.175 **	.055	-.057
2- HT + LC	—	-.199 **	-.149 **	.050	-.319 **	-.014	-.089 *	.038	.077 *
3- LT + HC	—	—	.414 **	-.042	-.164 **	.054	-.012	-.038	.091 **
4- Parent involve. 5-2 years of pre-K, %	—	—	—	.067 *	-.080 *	.162 **	.107 **	.131 **	-.003
6-Full-day K, % 7-CPC follow-on, %	—	—	—	—	—	-.073 *	-.051	.107 *	-.010
8-School readiness 9-Word analysis	—	—	—	—	—	—	.069	.093 **	.088 **
10-Math achiev.	—	—	—	—	—	—	—	.572 **	.636 **
	—	—	—	—	—	—	—	—	.564 **
	—	—	—	—	—	—	—	—	1.000

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

Table 5 shows the raw means for the child outcomes as well as overall F-scores assessing differences in outcomes as a function of membership in the four instructional groups. There were significant differences among groups on school readiness, mathematics achievement in kindergarten, grade three reading achievement, grade retention, and high school completion above and beyond the influence of family background and levels of program participation. The nature of these group differences as well as other differences is addressed next.

Table 5
ANOVA Summary Statistics Linking
Instructional Group Status to Child Outcomes

Outcome	<i>N</i>	Mean	<i>F</i> -value	<i>p</i>
School readiness at kindergarten entry	766	49.4	11.58	< .001 *
Word analysis in kindergarten	987	65.9	1.92	.125
Math achievement in kindergarten	988	64.2	7.62	< .001 *
Reading achievement in third grade	844	98.7	3.38	.018 *
Reading achievement in eighth grade	880	147.1	1.74	.157
Grade retention (K-grade 8, %)	895	24.2	2.95	.032 *
Special education placement (grades 1-12, %)	895	14.5	0.86	.460
High school completion (%)	875	65.4	3.44	.016 *
Juvenile delinquency (%)	911	17.0	.299	.826

Note. Original $n = 989$. *F*-value and *p*-value are based on one-way ANOVA with instructional group as the independent variable with no covariates. The pattern of results was similar with covariates. * $p < .05$

Links Between Instructional Group Membership and Child Outcomes

We first tested in separate models whether membership in high teacher directed (HT) or high child initiated (HC) instructional groups was associated with child outcomes. Table 6 shows the regression coefficients and significance levels for each of the study outcomes adjusted for background factors including, race, gender, risk status, number of years of preschool, full-day kindergarten, and follow-on intervention (See Appendix A for unadjusted coefficients). Relative to lower levels of either teacher-directed or child-initiated instruction, higher levels were more associated with shorter-term rather than longer-term outcomes. Generally, HT instruction was a stronger and more consistent predictor than HC instruction with the exception of school readiness and high school completion. HT instruction was significantly associated with greater school readiness, word analysis and math achievement in kindergarten, 3rd and 8th reading achievement scores, and lower rates of grade

retention. HC instruction was associated with significantly greater school readiness, 3rd grade reading achievement, lower rates of grade retention, and higher rates of high school completion. These findings indicate that both teacher-directed and child-initiated instruction approaches contribute to child outcomes. They do not assess the combined effects of these two instructional approaches, however.

Table 6
Preliminary Regression Findings for Child-Initiated and
Teacher-Directed Phonics-Based Indicators

	Child-initiated (HC)		Teacher-directed (HT)	
	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>
School readiness	5.194	.000	3.759	.000
Word analysis	.767	.414	4.858	.000
Math achievement	1.844	.096	4.706	.000
Reading grade 3	4.577	.000	6.192	.000
Reading grade 8	2.700	.111	4.884	.003
Grade retention ¹	-.103	.012	-.094	.148
Special education ¹	.004	.181	-.063	.686
High school completion ²	.084	.024	-.027	.439
Juvenile delinquency ¹	-.025	.744	-.027	.873

Note. Child-initiated and teacher-directed predictors were entered simultaneously into regression models adjusting for race, gender, risk status, number of years of preschool, and full-day kindergarten and follow-on where appropriate.

¹ Beta's are based on multiple regression and *p*-values are based on logistic regression.

² Beta's and *p*-values are based on multiple regression.

In the rest of this section, we summarize regression findings of the impact of membership in the four instructional groups for the short-term, intermediate, and long-term child outcomes. Coefficients for the dichotomously-coded instructional groups, HT + HC, LT + HC, and HT + LC, are relative to the LT + LC group (low ratings on teacher-directed and child-initiated instruction), which is not included in the tables. For ease of interpretation, all estimates are metric (unstandardized) coefficients from hierarchical multiple regression analyses. Significance levels for the dichotomous outcomes of grade

retention, juvenile delinquency, and high school completion are from hierarchical logistic regression analyses.

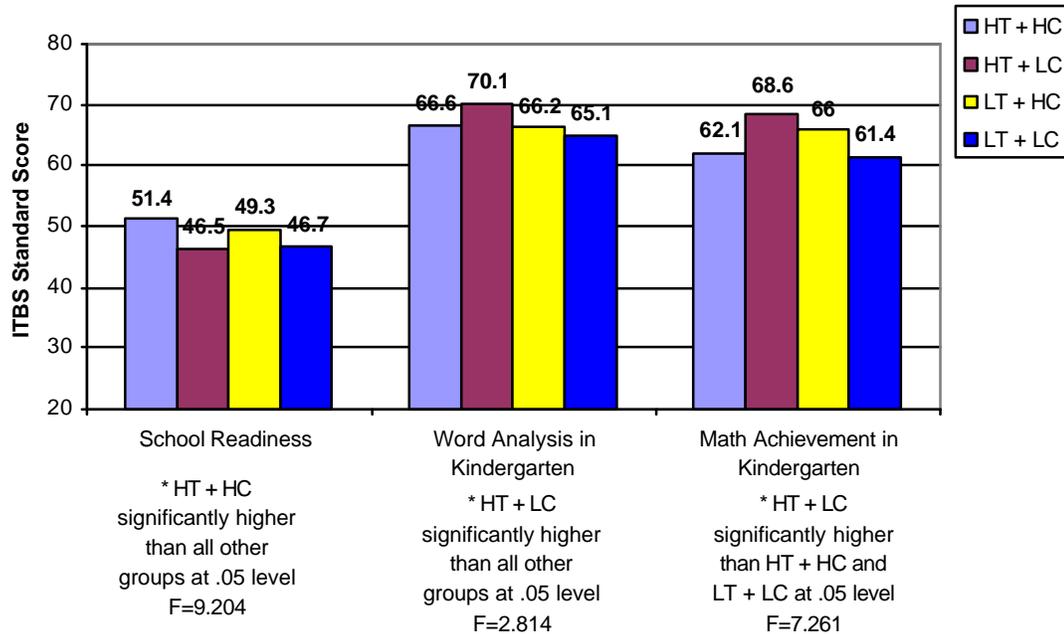
Table 7
Metric Coefficients for Four Hierarchical Regression Models Predicting Short-Term Outcomes

	School readiness		Word analysis		Math achievement	
	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>
Model 1 (unadjusted)						
HT + HC	5.653	.000	2.175	.064	1.801	.195
HT + LC	-.215	.899	3.159	.096	7.448	.001
LT + HC	3.121	.005	.658	.579	4.728	.001
Model 2 (adjusted)						
HT + HC	4.654	.000	1.539	.183	.725	.600
HT + LC	-1.057	.526	4.978	.012	7.232	.002
LT + HC	2.793	.010	1.066	.368	4.628	.001
Gender	-.377	.617	1.155	.150	.244	.799
Race	5.974	.000	2.287	.164	6.659	.001
Risk	-.667	.007	-1.137	.000	-1.319	.000
Years pre-K	3.357	.000	3.903	.000	2.956	.002
Full-day K	—	—	3.054	.001	.565	.601
Model 3						
HT + HC	4.315	.000	.597	.607	1.165	.406
HT + LC	-1.133	.496	5.031	.010	7.206	.002
LT + HC	1.838	.120	-1.255	.324	5.712	.000
Gender	-.432	.566	1.079	.174	.281	.769
Race	6.222	.000	2.579	.113	6.522	.001
Risk	-.631	.011	-1.086	.000	-1.343	.000
Years pre-K	3.106	.000	3.541	.000	3.124	.001
Full-day K	—	—	3.195	.000	.498	.645
Parent involvement	2.301	.046	5.490	.000	-2.570	.071
Model 4						
HT + HC	-18.246	.018	-10.210	.275	-22.683	.043
HT + LC	-53.609	.451	318.533	.000	508.471	.000
LT + HC	-35.734	.000	-9.787	.293	-22.940	.039
Gender	-.416	.576	1.091	.167	.295	.754
Race	5.144	.002	2.111	.206	5.245	.009
Risk	-.612	.012	-1.068	.000	-1.320	.000
Years pre-K	3.034	.000	3.472	.000	3.061	.001
Full-day K	—	—	3.693	.000	1.567	.185
Parent involvement	-6.912	.006	2.502	.403	-10.702	.003
Parent inv X HT + HC	9.211	.003	4.277	.245	9.543	.030
Parent inv X HT + LC	21.173	.457	-125.236	.000	-200.127	.000
Parent inv X LT + HC	14.354	.000	3.402	.337	11.086	.009

Short-term outcomes. As shown in Models 1 and 2 in Table 7, whether entered alone or with the covariates, membership in the HT + HC group and in the LT + HC group was associated with significantly higher school readiness at kindergarten entry than membership in the comparison group (LT + LC). Moreover, the HT + HC group scored significantly higher than all other groups including the LT + HC group. In Model 2, children in the HT + HC group scored 4.7 points higher than children in the LT + LC group, which corresponds to an effect size of .43 standard deviations. Children in the LT + HC group scored 2.8 points higher than children in the comparison group, an effect size of .26 standard deviations. The HT + LC group was indistinguishable from the comparison group. Note that one point on the ITBS corresponds to about one month. Adjusted means

for the four groups are shown in Figure 3. The performance of the HT + HC group ($M = 51.4$) exceeded the national average whereas that of the LT + HC ($M=49.3$) group was at the national average.

Figure 3. Adjusted Means for Kindergarten Achievement by Instructional Group



As shown in Model 2 of Table 7, the HT + LC group had significantly higher word analysis scores at the end of kindergarten than all other groups. This indicates the positive impact of a skills focused emphasis in enhancing literacy. Children in the HT + LC group scored 3 to 5 points higher than children in the other groups. Relative to the LT + LC group, the effect size was .39 standard deviations.

Membership in the HT + LC instruction group also was associated with significantly higher math achievement at the end of kindergarten than the other groups. Based on Model 2 in Table 7, the HT + LC group scored, on average, 7.2 points higher than the comparison group (effect size = .47). In addition, the LT + HC group scored 4.6 points higher than the comparison group (effect size = .30). Adjusted group means are displayed in Figure 3. Surprisingly, the HT + HC group, which had a dual instruction focus on teacher-directed and child-initiated activities, did not maintain their advantage over the other groups at the end of kindergarten. This may be due in part to the positive and compensatory effect of the length of preschool and participation in full-day kindergarten (see Model 2, Table 7).

Intermediate outcomes. Membership in the HT + HC and LT + HC groups was associated with significantly higher 3rd and 8th grade reading achievement, and with significantly lower rates of grade retention. After adjusting for background and program participation factors, this trend remained except that the LT + HC group was no longer significantly associated with 8th grade reading achievement and was only marginally associated with lower rates of grade retention. Children in the HT + HC group scored 4.3 (ES = .26) and 4.7 (ES = .22) points higher than the comparison group on ITBS reading in grades 3 and 8 respectively. Children in the LT + HC group scored 3.5 (ES = .21) points higher on ITBS reading in 3rd grade. A similar pattern occurred for the dichotomous outcome, at or above national norms in reading. The LT + LC group experienced the greatest reading difficulties. In both third and eighth grades, the HT + LC group had the highest rates of reading achievement at or above the national average.

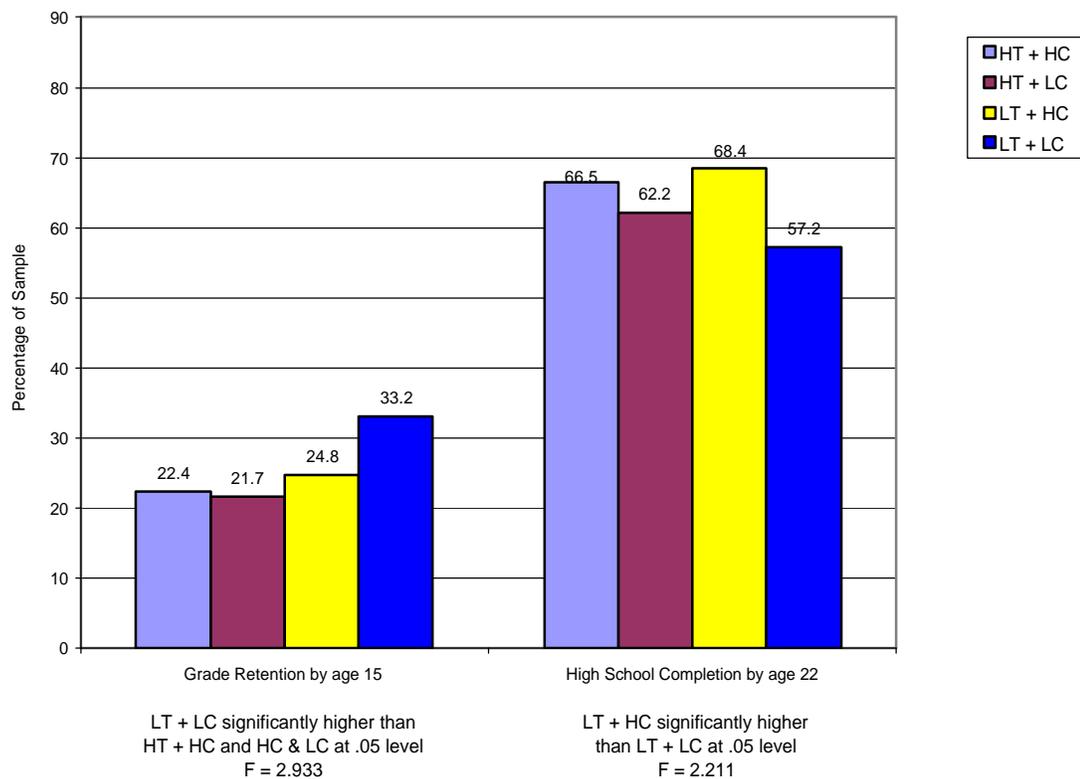
Table 8
Metric Coefficients for Four Hierarchical Regression Models Predicting Intermediate Outcomes

	Reading grade 3		Reading grade 8		Grade retention ¹		Special education ¹	
	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>
Model 1 (unadjusted)								
HT + HC	4.537	.005	4.713	.026	-.116	.004	.028	.405
HT + LC	1.814	.478	5.502	.116	-.094	.148	-.044	.370
LT + HC	4.627	.005	4.382	.040	-.103	.012	.023	.492
Model 2 (adjusted)								
HT + HC	4.321	.006	4.687	.026	-.108	.007	.038	.304
HT + LC	1.753	.508	5.397	.141	-.115	.101	-.011	.686
LT + HC	3.480	.031	2.675	.209	-.084	.045	.047	.181
Gender	5.039	.001	5.384	.000	-.162	.000	-.114	.000
Race	-2.334	.318	-6.254	.049	.101	.095	.014	.795
Risk	-1.661	.000	-1.767	.001	.031	.001	.018	.022
Years pre-K	.420	.702	1.105	.460	-.059	.025	-.021	.371
Full-day K	-.349	.777	-1.982	.233	-.037	.218	.034	.216
Follow-on	6.346	.000	4.654	.001	-.115	.000	-.067	.011
Model 3								
HT + HC	3.340	.036	3.643	.087	-.108	.007	.038	.309
HT + LC	1.694	.519	5.194	.155	-.116	.107	-.014	.685
LT + HC	1.025	.556	.095	.967	-.084	.046	.047	.181
Gender	4.911	.000	5.329	.000	-.162	.000	-.114	.000
Race	1.970	.396	-5.735	.070	.099	.112	.011	.776
Risk	-1.648	.000	-1.736	.001	.031	.001	.018	.022
Years pre-K	.086	.937	.702	.639	.059	.025	-.021	.317
Full-day K	-.292	.811	-2.046	.217	-.038	.217	.034	.221
Follow-on	5.557	.000	3.804	.025	-.114	.000	-.067	.013
Parent involvement	5.692	.000	5.834	.007	-.003	.933	-.006	.963
Model 4								
HT + HC	-23.330	.068	3.976	.816	-.124	.016	.001	.962
HT + LC	1.033	.992	137.302	.385	-.120	.111	-.033	.504
LT + HC	-6.089	.631	-1.034	.951	-.065	.294	.025	.544
Gender	4.921	.000	5.305	.000	-.162	.000	-.114	.000
Race	-2.856	.232	-5.749	.081	.081	.200	-.005	.969
Risk	-1.548	.000	-1.742	.001	.032	.001	.019	.016
Years pre-K	-.217	.843	.733	.628	-.060	.024	-.021	.323
Full-day K	1.013	.455	-2.085	.263	-.039	.232	.043	.133
Follow-on	5.447	.000	3.669	.032	-.114	.000	-.068	.011
Parent involvement	-.188	.964	5.833	.285	-.012	.971	-.069	.273
Par inv X HT + HC	10.504	.038	-.124	.985	-.056	.554	.101	.155
Par inv X HT + LC	.736	.966	-52.997	.403	-.044	.789	.037	.405
Par inv X LT + HC	3.440	.478	.385	.952	-.035	.546	.058	.430

¹ Logistic regression was used for special education and grade retention. Beta's are based on multiple regression and *p*-values are based on logistic regression.

Membership in the HT + HC and LC + HC groups was associated with significantly lower rates of grade retention by eighth grade (Table 8). The HT + HC group had a rate of grade retention that was 10.8 percentage points lower than the LT + LC group. The LT + HC group's retention rate was 8.4 percentage points lower than the LT + LC group. The HT + LC group's retention rate was 11.5 percentage points lower but due to a small sample size, this difference was only marginally significant. Adjusted rates of grade retention are displayed in Figure 4. They reveal that children enrolled in centers with no distinct instructional approach (LT + LC) had highest rates of grade retention. The retention rates for the other three instructional groups were not statistically different from each other. In addition, as shown in Table 8 there were no significant differences in the rates of special education among the 4 groups.

Figure 4. Adjusted Rates of 2 Longer-Term Outcomes by Instructional Group



Long-term outcomes. As shown in Table 9, in unadjusted and adjusted models, membership in HT + HC and LT + HC instructional groups was associated with significantly higher rates of school completion. In Model 2, which included the covariates, the HT + HC group had a 9.3 percentage point higher rate of school completion than the LT + LC group. The LT + HC group had an 11.2 percentage point higher rate of school completion. The HT + LC group's completion rate was 5 percentage points higher but this was not significant. As shown in Figure 4, adjusted rates of school completion by age 21 were 68.4% (LT + HC), 66.5% (HT + HC), 62.2% (HT + LC), and 57.2% (LT + LC). The difference between LT + HC and HT + HC groups was not significant. These findings

suggest an emphasis on child-initiated activities, while not showing immediate positive effects, has substantial beneficial effects many years after program participation.

Table 9
Metric Coefficients for Four Hierarchical Regression Models Predicting Long-Term Outcomes

	High school completion ¹		Juvenile delinquency ¹	
	<i>B</i>	<i>p</i> -value	<i>B</i>	<i>p</i> -value
Model 1 (unadjusted)				
HT + HC	.090	.050	-.033	.348
HT + LC	.073	.312	-.027	.643
LT + HC	.147	.002	-.025	.497
Model 2 (adjusted)				
HT + HC	.093	.041	-.029	.359
HT + LC	.050	.510	-.010	.873
LT + HC	.112	.015	-.012	.744
Gender	.114	.000	-.234	.000
Race	-.172	.013	.047	.383
Risk	-.050	.000	.018	.021
Years pre-K	.019	.548	-.028	.176
Full-day K	-.059	.095	.003	.956
Follow-on	.023	.517	-.004	.798
Model 3				
HT + HC	.090	.059	-.029	.356
HT + LC	.049	.514	-.011	.859
LT + HC	.098	.052	-.012	.747
Gender	.114	.000	-.234	.000
Race	-.170	.014	.045	.412
Risk	-.051	.000	.019	.021
Years pre-K	.017	.582	-.029	.175
Full-day K	-.059	.097	.002	.966
Follow-on	.019	.596	-.004	.817
Parent involvement	.033	.482	-.003	.919
Model 4				
HT + HC	.512	.166	-.053	.210
HT + LC	.936	.761	-.028	.699
LT + HC	.546	.140	-.053	.295
Gender	.114	.000	-.233	.000
Race	-.146	.041	.045	.438
Risk	-.051	.542	.018	.027
Years pre-K	.020	.542	-.027	.204
Full-day K	-.078	.047	.014	.671
Follow-on	.021	.560	-.006	.806
Parent involvement	.174	.142	-.062	.327
Parent involvement X HT + HC	-.170	.242	.056	.465
Parent involvement X HT + LC	-.362	.769	.048	.301
Parent involvement X LT + HC	-.176	.212	.094	.225

¹ Logistic regression was used for juvenile delinquency. Beta's are based on multiple regression and *p*-values are based on logistic regression. Multiple regression was used for high school completion.

None of the instructional groups were associated with lower rates of juvenile delinquency in either unadjusted or adjusted models. Adjusted rates of delinquency by age 18 (not displayed) were 15.7% (HT + HC), 16.6% (HT + LC), 16.4% (LT + HC), and 18.6% (LT + LC).

Parental Involvement and Child Outcomes Above and Beyond the Influence of Instruction

Following a similar modeling approach, we investigated the effect of parent involvement in school after the influence of other explanatory factors entered, including membership in the four instructional groups. Parent involvement was measured on a scale from 1 to 5 with teacher ratings aggregated at the level of the CPC site in which children were assigned the rating for their site.

Short-term outcomes. After entering parent involvement in the model, shown in Model 3 of Table 7, parent involvement was significantly associated with higher levels of school readiness and word analysis skills controlling for instructional focus and background factors. For every 1 point increase in parent involvement ratings there was a 2.3 (ES = .21) and 5.5 (ES = .43) point increase in school readiness and word analysis scores respectively. Interestingly, the magnitude of the LT + HC instructional group dropped from $B = 2.8$ to $B = 1.8$ and was no longer a significant predictor after controlling for parent involvement. This finding indicates that parent involvement helps mediate the effects of instruction on school readiness.

We also tested interactions between instructional variables and parent involvement (see Model 4, Table 7). Significant interactions were found between parent involvement and groups with high child-initiated activities (HT + HC and LT + HC) in predicting school readiness and math achievement such that the estimated effects of membership in these instructional groups was strengthened by the presence and involvement of parents in the program. Although significant interactions also were found between parent involvement and the HT + LC group for word analysis and math achievement, the size of the interaction term suggests that multicollinearity explains these findings.

Intermediate outcomes. Parent involvement was associated with significantly higher 3rd grade and 8th grade reading achievement above and beyond instructional approaches and background factors (see Model 3 of Table 8). A one-point increase in parent involvement ratings corresponded to 5.7 (ES = .35) and 5.8 (ES = .27) point increases in 3rd and 8th grade reading achievement scores respectively. The magnitudes of the HT + HC and LT + HC instructional groups were reduced substantially after adding parent involvement to the model for 3rd and 8th grade reading achievement. For example, the coefficient for the LT + HC instructional group dropped from $B = 3.48$ to $B = 1.03$ with a corresponding drop in effect size of .21 to .06.

Parent involvement was not significantly associated with reductions in grade retention or special education placement. The lone significant interaction between instruction and parent involvement indicated that the positive impact on early reading achievement of membership in the HT + HC group was strengthened by higher levels of parent involvement in the program.

Long-term outcomes. Parent involvement was not associated with juvenile delinquency by age 18 and high school completion by age 22 (see Table 9). There also were no significant interactions between parent involvement and instructional groups in predicting high school completion and juvenile delinquency.

Supplemental Analyses

Additional analyses were conducted to determine if the above findings were similar for (a) different covariate specification, (b) alternative measures of parent involvement, and (c) child and program interaction effects.

Risk indices. We investigated if a different pattern of results might emerge when controlling for individual risk indices as compared to the cumulative risk index. Analyses were conducted with individual risk indices including single parent status, parent education, and family and neighborhood income levels rather than the risk index (Note 1). Generally, patterns remained the same in terms of the direction and magnitude of effects as compared to analyses controlling for the risk composite (Note 2).

Parent involvement. We also examined type and level (individual vs. site) of parent involvement to determine if variations in how the variable was measured played a role in the importance of parent involvement to the prediction of study outcomes. When considered at the individual child level ($N = 802$, $M = 2.74$, $SD = 1.27$, Range = 1 to 5) teacher reported parent involvement in the child's school activities significantly predicted all outcomes in the expected direction at the .01 level of significance (Note 3).

A parent report (site-level) measure of the amount of involvement that occurred in preschool and kindergarten ($N = 989$, $M = 8.46$, $SD = .39$, Range = 7.86 to 9.86) was also examined. The pattern of results was similar to that of teacher reports (Note 4).

Child and program interactions. Analyses were also conducted to examine interactions with child (gender and risk status) and program (years of preschool) factors and instructional groups in the prediction to child outcomes (see Appendix B). Previous studies have demonstrated that instructional focus may differentially influence girls and boys (Cole, Dale, Mills, & Jenkins, 1993; Mills, Cole, Jenkins, & Dale, 2001). Few significant interactions emerged except that gender interacted with the LT + HC group ($B = 4.912$; $p < .05$) to predict kindergarten word analysis and risk interacted with the LT + HC group ($B = -.039$; $p < .05$) to predict special education placement. Children in the LT + HC group were more likely to have higher word analysis scores if they were female and less likely to be placed in special education when they were at higher risk.

Discussion

Since 1967 the Child-Parent Centers have provided comprehensive services to low-income children to enhance their school success. The findings of this study of over 900 children who attended the CPC preschool program indicate that the benefits of comprehensive services also apply to the classroom. We found that the use of preschool curriculum that blended a teacher-directed, basic skills approach with child-initiated learning activities was most consistently and strongly associated with child outcomes measured between kindergarten entry and high school completion. This was especially the case for school readiness at kindergarten entry and reading achievement in the elementary grades. Curriculum approaches that emphasized only teacher-directed or child-initiated activities were less strongly and consistently associated with children's school performance over time. Two exceptions to this overall pattern are noteworthy. A teacher-directed instructional focus with relatively low levels of child-initiated activities was more associated with kindergarten achievement in word analysis and mathematics than the other curriculum approaches. A child-initiated instructional approach was more associated with high school completion by age 22 than the other curriculum approaches, especially approaches low in both teacher directedness and child initiation, and high in teacher directedness and low in child initiation.

A second major finding of the study was that parent involvement in school activities as rated by classroom teachers was independently associated with school performance and achievement beginning and kindergarten and continuing through mid-adolescence. Findings based on parent ratings of school involvement yielded similar results. These results are the first empirical demonstration that parent involvement in early childhood programs contributes to children's outcomes above and beyond the influence of curriculum, family background, and length of program participation in preschool, kindergarten, and school-age components. Overall, findings of the study indicate that the successful integration of a diverse set of classroom learning activities and opportunities for parent involvement are origins of the long-term effects of preschool participation in the Child-Parent Centers reported in previous studies (Reynolds, 2000; Reynolds et al., 2001) and possibly in other programs for children at risk.

Contributions to Preschool Curriculum Research

This study adds to previous research by examining the effects of various combinations of teacher directed and child initiated instruction and taking the influence of parent involvement within the educational program into account. The present study assessed a comprehensive set of outcomes including short-term, intermediate, and long-term outcomes focusing on school readiness, achievement, special education placement, attainment, and social adjustment.

The nature of instruction in early childhood education has always been an issue in both academic and practitioner circles but has become more contentious in recent years. The typical contrast made is whether to focus on pre-specified reading content in teacher directed instruction or to design activities around children's inclinations and interests.. These two options were a key distinction made in the Planned Variation studies in the early years of Head Start and they continue today as educators, politicians, and policymakers argue about the best way to teach reading (Camilli, Vargas, & Yuecko, 2003; Snow, Burns, & Griffin, 1998) or to structure early intervention programs like Head Start (Jacobson, 2003). Recognizing the enduring importance of this question, we attempted to add to the conversation by examining data from one of the longest running and most documented early intervention programs in the United States, the Chicago Child-Parent Centers. From this database we could explore the effects of varied instructional approaches as they relate to a key aspect of the program, the involvement of parents in the education of young children.

Based on our reading of the literature and our understanding of early childhood theory, we began from the position that contrasting teacher and child activity separately would provide limited insight into interactions in classrooms. Classrooms have teachers and children working together, therefore, we worked to describe the curriculum as the jointly considered degree of teacher direction and child initiation in activities. While 3 of 4 children experienced programs with high degrees of child initiated learning, they were fairly evenly split between programs in which the teachers used greater amounts of teacher direction with a focus on specific early reading content and those in which there was less teacher direction.

Using this hybrid notion of curriculum, we then turned to examining child outcomes. The patterns of outcomes indicate that a high degree of child initiated learning, regardless of level of teacher direction, promotes higher levels of school readiness, third and eighth grade reading, and high school completion. In contrast, increased end-of-kindergarten achievement in early literacy and math is related to greater teacher directed curriculum. This difference could be explained in a variety of ways but the explanation most compelling to us is that a teacher directed basic skills preschool program promotes early literacy skills that makes the transition to kindergarten and kindergarten achievement easier. Longer-term child outcomes, especially high school completion, come with the benefits typically attributed to child initiated activity – engagement based on child interest, social learning, and learning how

to learn. The current discussions about the role of academic content in early childhood classrooms could be informed by recognition that young children benefit from enriched environments that include active learning opportunities using a variety of approaches. In addition, any focus on short-term gains, as is the goal in the new Head Start curriculum revisions, will likely leverage minimal long-term gains. More balance, with attention to producing learners who read rather than early readers should ultimately be more effective. This does not lessen the importance of high quality teaching – in fact, it probably reinforces the need for active teachers who support children in active learning.

School-level parent involvement, which can be seen to be as an extension of the instructional resources in the school, a broadening of the social networks in the community, and an instructional enhancement for parents, provided additional boost for children beyond their classroom experience in readiness, kindergarten word analysis, and 3rd and 8th grade reading. Parallel enhancement of student achievement was not evident for kindergarten mathematics, grade retention, special education, high school graduation or juvenile delinquency. As a social resource in a school the inclusion of parents in programming appears to be most relevant to child outcomes most proximal to the involvement and is probably not appropriately considered an inoculation for later achievement. Our finding that the presence of parents in the program helped strengthen the impact of instruction on school readiness is encouraging evidence for integrating family-school partnerships in early education. Additional research should examine how continued parent connections to school mediate the effects of early and later curriculum models. It must be remembered that these data, generated in communities challenged by poverty in the 80's have had major changes with movement of families into the workforce through welfare reform. Availability of parents for school activities is inevitably reduced when they are working and parent involvement programming must continue to evolve to match family need and school resources.

How does curriculum approach and parent involvement in the program contribute to children's outcomes over time? Although our study did not address this question directly, previous reports in the CLS (Reynolds, 2000; Reynolds et al., 1996) and in other projects (Campbell et al., 2001; Schweinhart et al., 1993) indicate that at least two mechanisms explain the long-term effects of preschool participation. The first mechanism is that early education provides a cognitive advantage at school entry that initiates a chain of positive effects that lead to better school performance and adjustment culminating in higher rates of school completion or lower rates of delinquency. Another mechanism of effects is associated with family support behaviors in which changes in parenting practices and family-school relations enhance children's school achievement and social adjustment and thus contribute to long-term effects of preschool participation. The findings of the present study show that curriculum practices in preschool and parent involvement promote children's school readiness and early achievement patterns that are crucial for promoting lasting effects (Campbell et al., 2000; Schweinhart et al., 1993). In further support of the contributions of these mechanisms, Niles, Reynolds, Clements, and Robertson (2003), using path analysis for children in the CPC preschool program, found that a curriculum emphasizing phonics and a variety of educational activities, parent involvement in school, and length of preschool were significant predictors of school readiness, which then led to greater school achievement and performance, culminating in higher educational attainment and better social adjustment. In future studies, other social and psychological mediators that explain long-term effects of preschool deserve fuller investigation.

Limitations

This study has three limitations. The curriculum approaches of the centers were based on retrospective reports of Head Teachers. Our measure was a relative one and not absolute, and thus should be interpreted within the comprehensive services of the Child-Parent Centers. Prospective reports and repeated classroom observations of the learning environment would have provided more complete documentation of the implemented curriculum. Nevertheless, as the instructional leaders of the program, Head Teachers were the most knowledgeable about the curricula of the centers. They were asked about specific aspects of the instructional environment that were verified with available records. In addition, inter-rater reliability was relatively high.

Second, our measure of parent involvement was defined narrowly. We used aggregated teacher ratings of participation in school activities since school participation—enhancing family-school relations—is the key feature of the parent involvement component in the CPC program. Alternative measures of involvement deserve greater attention in future studies, however, including home support for learning and parenting practices. To the extent that parent involvement and curriculum were measured with error, however, our estimates of effects may be conservative. For example, reliability estimates from observational data of classroom activities in the range of 80-90% rather than the 70-80% observed in our study, would have increased the effect sizes we reported. A similar pattern would be likely for the measure of parent involvement.

Finally, the inference that curriculum approaches and parent involvement were linked to child outcomes over time was based on the natural variation that occurred between sites rather than by experimental control. Although the latter approach often provides greater confidence about cause and effect, our findings are strengthened by the inclusion of a comprehensive set of family and program variables that contribute to the relations among curriculum, parent involvement, and child outcomes. Our findings demonstrated the added value of curriculum and parent involvement in school above and beyond the influence of levels of program participation and family demographics.

Implications

Enhancing the effects of preschool programs is a major goal of educational policy across the nation. With investments in early education increasing at all levels of government, identifying the essential features of effective programs is one of the highest priorities for improving current programs and for ensuring that new programs are immediately successful. Our study indicates that two readily alterable factors, instructional approach and parent involvement, significantly contributed to children's early learning thus provide a strong foundation for promoting the long-term effects reported in many previous studies. Greater attention to these crucial program features can help enhance the effectiveness new and existing early childhood programs.

The effectiveness of curriculum approaches and family involvement depends in large part on the organization of programs and quality of teachers. From the beginning the Child-Parent Centers were organized under a single administrative system in public schools beginning at age 3 and continuing to the early school grades. This single administrative system promotes stability in children's learning environment that provides smooth transitions (Reynolds, Wang, & Walberg, 2003). Moreover, as a public school program, all teachers have bachelor's degrees and certification in early childhood education. They are compensated well and turnover is minimal. Finally, as a child development program,

comprehensive family services provide many opportunities for positive learning experiences in school and at home. Because each center has a staffed parent resource room and provides school-community outreach, parental involvement is more intensive than in other programs. These levels of services certainly contributed to the findings of this study. To the extent possible, these program characteristics should be encouraged in other programs.

This study helps illustrate the complexity of understanding the production of development through early childhood programming. Policy fixes and research designs that focus on one aspect of interactions among teacher, child and parent roles in learning have produced unclear results. Continued attention to the dynamic relationships in classrooms and their connections to children's school performance will help prioritize limited resources available to programs, determine which curriculum designs will support achievement, and inform the training and professional development of early educators. Reflecting the diversity of young children, it is clear that one size does not fit all and that the search for "best practice" might be better thought of as "better practices."

In conclusion, two components of preschool intervention—a blended instructional approach and parental involvement—significantly contributed to children's short- and long-term school performance. These components, although not exclusively responsible for program impacts, can be major elements in promoting early learning for children at risk.

Notes

1. For parent education, single parent status, and family income risk indices, a code of 1 (at risk) was assigned for cases with missing data. A variable indicating the number of missing risk indices was computed and added to supplemental analyses examining individual risk indices.
2. Some of the observed differences were the following. The magnitude of effects decreased for each of the instructional variables for 8th grade reading achievement: $B = 3.694$, $p = .074$ for HT + HC; $B = 2.205$, $p = .517$ for HT + LC; and $B = 1.348$, $p = .533$ for LT + HC compared to $B = 4.687$, $p = .026$; $B = 5.397$, $p = .141$; and $B = 2.675$, $p = .209$ respectively. Other changes include that the instructional group LT + HC changed from significant ($B = 3.480$, $p = .031$) to marginally significant ($B = 3.170$, $p = .067$) for 3rd grade reading achievement and from marginally significant ($B = -.070$, $p = .075$) to significant ($B = -.101$, $p = .015$) for grade retention.
3. Of the 989 participants in the CLS, 522 (52.8%) parents completed the survey indicating the number of instances in which parents were involved with their child education in preschool and kindergarten. Results indicated that when parents were more highly involved in their individual children's education, children were more prepared for school ($B = 1.402$), scored higher on ITBS word analysis ($B = 1.960$) and math ($B = 1.606$) and reading achievement tests ($B = 3.362$ and $B = 3.502$ for 3rd and 8th grades respectively), were less likely to experience grade retention ($B = -.062$) or special education placement, and were more likely to graduate high school ($B = .054$) and less likely to be arrested ($B = -.030$).
4. For example, consistent with teacher reports, higher parent reported involvement significantly predicted higher word analysis ($B = 4.828$, $p = .000$), and 3rd ($B = 3.586$, $p = .043$) and 8th ($B = 5.015$, $p = .026$) grade reading achievement scores. Parent reported parent involvement was a significant predictor of math achievement ($B = 3.450$, $p = .027$) whereas teacher reported parent involvement was marginally significant and in the opposite direction ($B = -2.570$, $p = .071$). Consistent with teacher reports, parent reported involvement was not a significant predictor of grade retention, special education placement, high school

completion, or juvenile delinquency. In contrast with the teacher reported measure, parent reported involvement was not a significant predictor of school readiness.

References

- Camilli, G., Vargas, S., & Yuecko, M. (2003). Teaching children to read: The fragile link between science and federal education policy. *Education Policy Analysis Archives, 11*(15).
- Campbell, F. A., Pungello, E. P., Miller-Johnson, S., Burchinal, M., & Ramey, C. T. (2001). The development of cognitive and academic abilities: Growth curves from an early childhood educational experiment. *Developmental Psychology, 37*(2), 231-242.
- Chicago Board of Education. (1988). Chicago EARLY: Instructional activities for ages 3 to 6. Vernon Hills, IL: ETA.
- Chicago Longitudinal Study. (1999). A study of children in the Chicago public schools: User's guide (Version 6). Madison, WI: University of Wisconsin.
- Cole, K. N., & Dale, P. S. (1991). Individual differences in language-delayed children's responses to direct and interactive preschool instruction. *Topics in Early Childhood Special Education, 11*(1).
- Cole, K. N., Dale, P. S., Mills, P. E., & Jenkins, J. R. (1993). Interaction between early intervention curricula and student characteristics. *Exceptional Children, 60*, 17-28.
- Consortium for Longitudinal Studies. (1983). *As the twig is bent: Lasting effects of preschool programs*. Hillsdale, NJ: Lawrence Earlbaum Associates.
- Dale, P. S., & Cole, K. N. (1988). Comparison of academic and cognitive programs for young children. *Exceptional Children, 54*, 439-447.
- Epstein, J. L. (1995). School/family/community partnerships: Caring for the children we share. *Phi Delta Kappan, 76*(9), 701-713.
- Goffin, S. (1994). *Curriculum models in early childhood education: Appraising the relationship*. New York: Merrill.
- Golbeck, S. L. (2001). Instructional models for early childhood: In search of a child-regulated/teacher-guided pedagogy. In S. Golbeck (Ed.), *Psychological perspectives on early childhood education: Reframing dilemmas in research and practice* (pp. 3-34). Mahwah, NJ: Lawrence Erlbaum Associates.
- Hart, C. H., Burts, D. C., Durland, M. A., Charlesworth, R., DeWolf, M., & Fleege, P. O. (1998). Stress behaviors and activity type participation of preschoolers in more and less developmentally appropriate classrooms: SES and sex differences. *Journal of Research in Childhood Education, 12*(2), 176-196.

- Henderson, A. T., & Mapp, K. L. (2002). A new wave of evidence: The impact of school, family, and community connections on student achievement (Annual Synthesis). Austin, TX: National Center for Family and Community Connections with Schools Southwest Educational Development Laboratory.
- Huston-Stein, A., Friedrich-Cofer, L., & Susman, E. J. (1977). The relation of classroom structures to social behavior, imaginative play, and self-regulation of economically disadvantaged children. *Child Development, 48*, 908-916.
- Jacobson, L. (2003). Head Start imbroglio a struggle for hearts, minds, votes. *Education Week*, June 18, 2003.
- Karnes, M. B., Shwedel, A. M., & Williams, M. B. (1983). A comparison of five approaches for educating young children from low-income homes. In Consortium for Longitudinal Studies (Ed.), *As the twig is bent: Lasting effects of preschool programs* (pp. 133-169). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Karnes, M. B., Teska, J. A., & Hodgins, A. S. (1970). The effects of four programs of classroom intervention on the intellectual and language development of 4-year-old disadvantaged children. *American Journal of Orthopsychiatry, 40*(1), 58-76.
- Marcon, R. A. (1992). Differential effects of three preschool models on inner city 4-year-olds. *Early Childhood Research Quarterly, 7*, 517-530.
- Mattingly, D. J., Prislun, R., McKenzie, T. L., Rodriguez, J. L., & Kayzar, B. (2002). Evaluating evaluations: The case of parent involvement programs. *Review of Educational Research, 72*(4), 549-576.
- Miedel, W. T., & Reynolds, A. J. (1999). Parent involvement in early intervention for disadvantaged children: Does it matter? *Journal of School Psychiatry, 37*, 379-402.
- Miller, L. B. (1979). Development of curriculum models in Head Start. In J. Valentine (Ed.), *Project Head Start: A legacy of the war on poverty* (pp. 195-200). New York: The Free Press.
- Miller, L. B., & Bizzell, R. P. (1983). Long-term effects of four preschool programs: Sixth, seventh, and eighth grades. *Child Development, 54*, 727-741.
- Miller, L. B., & Dyer, J. L. (1975). Four preschool programs: Their dimensions and effects. *Monographs of the Society for Research in Child Development, 40*(5-6, Serial No. 162).
- Mills, P. E., Cole, K. N., Jenkins, J. R., & Dale, P. S. (2001). Early exposure to direct instruction and subsequent juvenile delinquency: A prospective examination. *Council for Exceptional Children, 69*, 85-96.

- Niles, M. D., Reynolds, A. J., Clements, M., & Robertson, D. L. (2003). The origin of the cognitive and scholastic effects of early childhood intervention: Findings from the Chicago Longitudinal Study. Paper presented at the annual meeting of the Society of Social Work and Research, San Diego, CA, January 2003.
- Olds, D. L., & Kitzman, H. (1993). Review of research on home visiting for pregnant women and parents of young children. *Future of Children*, 3(3).
- Rescorla, L., Hyson, M. C., & Hirsh-Pasek, K. (Eds.). (1991). *Academic instruction in early childhood: Challenge or pressure? (Vol. 53)*. San Francisco: Jossey-Bass.
- Reynolds, A. J. (1995). One year of preschool intervention or two: Does it matter? *Early Childhood Research Quarterly*, 10, 1-31.
- Reynolds, A. J. (2000). Success in early intervention: The Chicago Child-Parent Centers.
- Reynolds, A. J., Mavrogenes, N. A., Bezruczko, N. (1996). Cognitive and family-support mediators of preschool effectiveness. *Child Development*, 67(3), 1119-1140.
- Reynolds, A. J., Temple, J. A., Robertson, D. L., & Mann, E. A. (2001). Long-term effects of an early childhood intervention on educational achievement and juvenile arrest: A 15-year followup of low-income children in public schools. *Journal of the American Medical Association*, 285(18), 2339-2346.
- Reynolds, A. J., Temple, J. A., Robertson, 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, 267-303.
- Reynolds, A. J., Wang, M. C., & Walberg, H. J. (Eds.). (2003). *Early childhood programs for a new century*. Washington, DC: CWLA Press.
- Schweinhart, L. J., Barnes, H. V., & Weikart, D. P. (1993). Significant benefits: The High/Scope Perry Preschool study through age 27. Monographs for the High/Scope Educational Research Foundation. Ypsilanti, MI: High/Scope Educational Research Foundation.
- Schweinhart, L. J., Weikart, D. P. (1988). Education for young children living in poverty: Child-initiated learning or teacher-directed instruction? *Elementary School Journal*, 89(2), 213-225.
- Schweinhart, L. J., Weikart, D. P., & Larner, M. B. (1986). Consequences of three preschool curriculum models through age 15. *Early Childhood Research Quarterly*, 1, 15-45.
- Seitz, V. (1990). Intervention programs for impoverished children: A comparison of educational and family support models. *Annals of Child Development*, 7, 73-103.

- Smith, P. K., & Connolly, K. J. (1986). Experimental studies of the preschool environment: The Sheffield project. *Advances in Early Education and Day Care, 4*, 27-66.
- Snow, C. E., Burns, M. S., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children*. Washington, DC: National Academy Press.
- Stipek, D. (1991). Characterizing early childhood education programs. In K. Hirsch-Pasek (Ed.), *Academic instruction in early childhood: Challenge or pressure?* San Francisco: Jossey-Bass.
- Stipek, D., Feiler, R., Byler, P., Ryan, R., Milburn, S., & Salmon, J. M. (1998). Good beginnings: What differences does the program make in preparing young children for school? *Journal of Applied Developmental Psychology, 19*(1), 41-66.
- Stipek, D., Feiler, R., Daniels, D., & Milburn, S. (1995). Effects of different instructional approaches on young children's achievement and motivation. *Child Development, 66*, 209-223.
- Sullivan, L. M. (1971). *Let us not underestimate the children*. Glenview, IL: Scott, Foreman and Company.
- White, K. R., Taylor, M. J., & Moss, V. D. (1992). Does research support claims about the benefits of involving parents in early intervention programs? *Review of Educational Research, 62*(1), 91-125.

Appendix A

Table A1
Hierarchical Multiple Regression Analyses for Short-Term Outcomes

	School readiness		Word analysis		Math achievement	
	<i>B</i>	<i>p</i> -value	<i>B</i>	<i>p</i> -value	<i>B</i>	<i>p</i> -value
Model 1						
Child-initiated (HC)	5.72	.000	1.36	.150	2.44	.027
Teacher-directed (HT)	5.17	.000	5.57	.000	6.22	.000
Model 2						
Child-initiated (HC)	5.19	.000	.77	.414	1.84	.096
Teacher-directed (HT)	3.76	.000	4.86	.000	4.71	.000
Gender	-.10	.890	1.18	.136	.48	.605
Race	4.23	.008	-.17	.922	3.12	.110
Risk	-.49	.038	-.84	.002	-1.50	.000
Years pre-K	2.32	.001	3.15	.000	1.98	.039
Full-day K			3.17	.000	-.57	.568

Table A2
Regression Analyses for Intermediate Outcomes

	Reading grade 3		Reading grade 8		Grade retention ¹		Special education ¹	
	<i>B</i>	<i>p</i> -value	<i>B</i>	<i>p</i> -value	<i>B</i>	<i>p</i> -value	<i>B</i>	<i>p</i> -value
Model 1								
Child-initiated (HC)	5.13	.000	3.25	.055	-.45	.004	.26	.271
Teacher-directed (HT)	6.19	.000	5.04	.001	-.51	.003	-.27	.156
Model 2								
Child-initiated (HC)	4.58	.000	2.70	.111	-.40	.025	.37	.129
Teacher-directed (HT)	6.19	.000	4.88	.003	-.43	.016	-.08	.707
Gender	5.16	.000	4.96	.001	-.90	.000	-.92	.000
Race	-5.86	.014	-8.21	.010	.71	.055	.20	.659
Risk	-1.31	.001	-1.25	.014	.23	.000	.22	.001
Years pre-K	-.62	.573	.71	.630	-.32	.047	-.25	.202
Full-day K	.55	.626	-1.21	.429	-.22	.198	.31	.402
Follow-on	5.83	.000	3.56	.029	-.42	.012	-.37	.064

¹ Logistic regression was used for special education and grade retention. Beta's are based on multiple regression and *p*-values are based on logistic regression.

Table A3
Regression Analyses for Long-Term Outcomes

	High school completion ¹		Juvenile delinquency ¹	
	<i>B</i>	<i>p</i> -value	<i>B</i>	<i>p</i> -value
Model 1				
Child-initiated (HC)	.09	.013	-.22	.270
Teacher-directed (HT)	-.05	.875	-.22	.210
Model 2				
Child-initiated (HC)	.08	.024	-.17	.441
Teacher-directed (HT)	-.03	.439	-.14	.491
Gender	.11	.000	-1.87	.000
Race	-.16	.030	.43	.313
Risk	-.05	.000	.19	.002
Years pre-K	.03	.433	-.20	.286
Full-day K	-.07	.025	.01	.972
Follow-on	.02	.523	.12	.556

¹ Logistic regression was used for juvenile delinquency. Beta's are based on multiple regression and *p*-values are based on logistic regression. Multiple regression was used for high school completion.

Appendix B
Interactions with Background Factors and Curriculum Variables Predicting Child Outcomes

	Gender X			Risk X			Years pre-kindergarten X		
	HT + HC	HT + LC	LT + HC	HT + HC	HT + LC	LT + HC	HT + HC	HT + LC	LT + HC
School readiness	-.713	.252	.158	-1.233 #	-.236	-.864	1.148	-2.570	-1.298
Word analysis	2.566	-.755	4.912 *	-1.159	.899	-1.459 #	1.647	-.181	-.746
Math achievement	1.640	-2.772	2.157	-1.281	-.742	-1.302	1.644	-4.899	1.382
Reading grade 3	4.403	-1.454	2.371	-1.037	2.191	-.869	.644	-5.070	-5.154 #
Reading grade 8	3.227	-4.112	6.531 #	-1.059	2.695	-1.382	6.638 #	-11.766 #	-1.509
Grade retention	.033	-.018	-.079	-.007	-.044	-.051 #	-.036	.022	-.057
Special education	.022	-.016	-.006	-.032 #	-.038	-.039 *	-.121 #	-.154 #	-.104 #
High school completion	-.048	.189	-.006	.049	.052	.012	.103	.072	.032
Juvenile delinquency	-.011	-.121	-.010	-.008	-.015	.021	-.051	.095	-.054

Note. Statistics based on multiple regression analyses with curriculum factors entered in the first model, background factors (gender, race, risk, years pre-K, full-day K, follow-on) entered in the second model, and interaction terms entered in the final model.

$p < .10$. * $p < .05$. ** $p < .01$

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