

Preventing Child Behavior Problems

Brotman, LM, Calzada, E, Kingston, S, Huang, KY, Dawson-McClure, S, Kamboukos, D, Rosenfelt, A, Schwab, A, Petkova, E. Promoting effective parenting practices and preventing child behavior problems in school among ethnically diverse families from underserved, urban communities. *Child Development*, in press.

Promoting Effective Parenting Practices and Preventing Child Behavior Problems in School among Ethnically Diverse Families from Underserved, Urban Communities

This study examines the efficacy of a family intervention among 171 children enrolled in Pre-Kindergarten in eight public elementary schools in a large urban school district serving an ethnically diverse population. The universal preventive intervention, *ParentCorps*, includes a series of 13 group sessions for parents and children held at the school during early evening hours and facilitated by trained school staff and mental health professionals. *ParentCorps* resulted in statistically significant and medium-size effects on effective parenting practices and child behavior problems in school. The intervention effects were of similar magnitude for families at different levels of risk at baseline and for Black and Latino families. Attendance at intervention sessions by families at higher risk was similar to that by families at lower risk and the number of sessions attended was meaningfully related to improvements in effective parenting practices. Study findings will help refine models of healthy development and inform prevention science studies, including further development and evaluation of universal family and school interventions for raising healthy children from underserved, urban communities.

The negative association between socioeconomic disadvantage and healthy child development has been clearly documented. Social causation theory posits a gene-environment interaction to explain the effect of poverty on child behavior. According to this theory, genetic risk for problems remains latent unless children are exposed to the stress of poverty, often under circumstances or situations beyond the parents' or child's control. A quasi-experimental, longitudinal study (Costello, Compton, Keeler & Angold, 2003) found support for social causation theory linking poverty and child behavior problems. In a sample of ethnic minority children, the causal influence of poverty was specific to behavior problems (as compared to anxiety and depression) and this relation was partially mediated through the lack of effective parenting practices. Findings from the study raised the possibility that financial stress constrains parents' ability to devote scarce time resources to parenting. Unfortunately, most families of young children dealing with the multiple stressors of living in disadvantaged, urban communities do not receive adequate support for raising healthy children or in anticipating or addressing common behavior problems. Importantly, when parenting programs or preventive services are available to families living in poverty, they are unlikely to be evidence-based (Sanders, 2008).

Widely available and easily accessible empirically-supported parenting interventions for young children could have an enormous public health impact given that approximately half of children with significant behavior problems at school entry are expected to show more serious behavioral and academic difficulties throughout elementary school and into adolescence (Campbell, 1995; Lavigne et al., 1998; McGee, Silva, & Williams, 1984). A large body of developmental research suggests that interventions that successfully alter trajectories of behavior problems in school settings among ethnically diverse youth from disadvantaged, urban communities may result in reduced disparities across a range of important educational, mental health and physical health outcomes (Arnold et al., 1999; Bowman, Donovan, & Burns, 2001;

Bub, McCartney, & Willett, 2007; Farnworth, Schweinhart, & Berrueta-Clement, 1985; Hinshaw, 1992; Huesmann, Eron, & Yarmel, 1987; McClelland, Morrison, & Holmes, 2000; Patterson, Bank, & Stoolmiller, 1990; Vitaro, Larocque, Janosz, & Tremblay, 2001).

Although there are a number of parenting interventions based on social learning models that have been shown to enhance effective parenting practices and reduce or prevent behavior problems in young children (e.g., Cunningham, Bremner, & Boyle, 1995; Eyberg, Boggs & Algina, 1995; Forehand & McMahon, 1981; Sanders, 2008; Shaw, Dishion, Supplee, Gardner, & Arnds, 2006; Webster-Stratton, 2001), efforts toward broad dissemination to families from disadvantaged, urban communities would be significantly threatened if programs are not found to be engaging or relevant for this traditionally underserved population. Effective engagement may be hindered by logistical barriers to attendance, such as competing time demands, inflexible work schedules and inability to cover costs associated with program attendance (e.g., transportation, child care). In addition, a review of the literature on family interventions suggests that standard engagement techniques may be less effective for ethnic minority families (Harachi, Catalano, & Hawkins, 1997). There is a well-documented historical trend of underutilization of formal “professional” services within certain ethnic minority populations (Cheung & Snowden, 1990; Sue & Sue, 1995), which has been attributed to several factors including perceptions that the interventions are culturally inappropriate or irrelevant. Beyond issues of engagement, some theorists and researchers have argued that ethnic minority families may not fare as well in programs that were developed for and validated with non-minority samples (Dent, Sussman, Ellickson, & Brown, 1996; Forehand & Kotchick, 1996; Harachi, Catalano, Kim, & Choi, 2001). Efforts that are not culturally-informed may not attract and benefit the majority of ethnic minority families. Given that ethnic minority families are overrepresented in disadvantaged, urban communities in the United States, the failure to reach and effectively serve this group

would greatly limit the public health impact of evidence-based family interventions for promoting healthy child development. The current study describes findings from a randomized controlled trial of *ParentCorps*, a family intervention designed specifically to promote effective parenting practices and prevent behavior problems among ethnically diverse children from disadvantaged, urban communities.

Developmental models underscore the important role of the early family environment, and effective parenting practices in particular, in the promotion of healthy development and the prevention of behavior problems in young children (Cicchetti & Richters, 1993; CPPRG, 1992; Lahey, Waldman, & McBurnett, 1999; Shaw et al., 1998). There is a strong body of research implicating specific parent behavior management practices (e.g., inconsistent, non-contingent, harsh and disengaged parenting) in the development of behavior problems (Loeber & Dishion, 1983; McCord, 1979; Patterson & Stouthamer-Loeber, 1984). There is also considerable evidence for the role of positive reinforcement, scaffolding and proactive parenting as contributing to the development of social, emotional and academic competencies (Gardner, Ward, Burton, & Wilson, 2003; Patterson, Reid, & Dishion, 1992). Although some work with ethnic minority families suggests that cultural factors may moderate relations between parenting practices and behavior problems, the literature confirms the important role of consistent and non-harsh behavior management practices and positive parenting in the healthy development of all children, regardless of cultural background. Parents from diverse cultures typically share the common goal of wanting their children to succeed and they experience similar types of behavior as problematic and stressful. Despite important differences across cultural groups, the basic principles underlying effective parenting practices are considered cross-culturally robust (Sanders, 2008).

In preventive intervention trials with low-income, ethnically diverse families of young

children, Webster-Stratton and colleagues (Gross, Fogg, & Tucker, 1995; Webster-Stratton, 1998; Webster-Stratton, Reid, & Hammond, 2001) and Brotman and colleagues (Brotman, Gouley, et al., 2005; Brotman, Gouley, et al., 2008) have demonstrated that the Incredible Years Series (modified in the Brotman studies) leads to enhanced disciplinary strategies, fewer coercive interchanges between parent and child and increased proactive parenting. Results from two randomized controlled trials document immediate effects (during the Head Start year) on parenting practices and behavior problems at home (Webster-Stratton, 1998; Webster-Stratton et al., 2001). Importantly, these effects were not significantly moderated by ethnic/racial group, such that African American, Latino, White and Asian families benefited similarly (Reid, Stratton, & Beauchaine, 2001). Brotman and colleagues found that family intervention in the preschool period with Black and Latino siblings of adjudicated youth resulted in long-term changes in three aspects of effective parenting (i.e., harsh discipline, responsive parenting and home-based parent involvement in education), a five-fold difference in the rate of physical aggression observed at home, and benefits for social competence observed in a novel peer entry task and the stress response (cortisol levels) in anticipation of the peer entry task among children in the intervention relative to the control condition (Brotman, et al., 2007; Brotman, Gouley, et al., 2008). Consistent with the prevention model that informed this work, as well as findings from other recently completed prevention trials that included ethnically diverse samples (Bierman et al., 2002; Dishion, Shaw, Connell, Gardner, Weaver & Wilson, 2008), changes in effective parenting practices (both harsh discipline and responsive parenting) mediated the intervention effect on child behavior (Brotman, O'Neal, Huang, Gouley, Rosenfelt, & Shrout, 2009).

Taken together, these studies clearly document the potential of family intervention for preventing or reducing behavior problems in home settings among young ethnically diverse

children from low-income families. Unfortunately, these prevention trials do not provide evidence for the generalization of intervention effects on behavior problems to the school setting. Behavior problems in the classroom are robust predictors of later school problems and drop out, and such problems are substantially elevated among children from disadvantaged, urban communities. In 2007, students from low-income families were about ten times more likely to drop out of high school than their more affluent counterparts (Cataldi, Laird, & Kewalramani, 2009). Thus, the public health significance of family intervention for children from underserved communities rests, in part, on the demonstration of intervention effects on behavior problems in school settings.

One strategy to reach ethnically diverse families of young children from disadvantaged, urban communities and to increase the chance of preventing behavior problems in school is to provide family intervention in the context of universal Pre-K (UPK) programs in urban public school settings. This approach takes advantage of the national movement toward UPK in public schools and provides an opportunity for systematic, non-stigmatizing intervention for families of all children in Pre-K at the transition to formal schooling (Mitchell, 2004). A family intervention that is framed around the promotion of school success considers the goal shared by parents from diverse cultures of helping children to do well. A universal approach that brings parents together from the same school community also builds on the assumption that effective parenting skills are learned through exposure to other members of the community, interactions with knowledgeable and experienced parents and modeling by effective parents. Importantly, as shown in numerous trials, a universal approach to prevention, one that is offered to all children in high-risk schools or communities, has the potential to yield the largest benefits for those at highest risk for problems (August, Realmuto, Hektner, & Bloomquist, 2001; Dawson-McClure, Sandler, Wolchik, & Millsap, 2004; Gardner, Connell, Trentacosta, Shaw, Dishion, & Wilson, 2009;

Kellam, Poduska, Brown, Windham, & Ialongo, 2005; Reid, Webster-Stratton, & Baydar, 2004). Despite the potential for this approach to reach ethnic minority families and to promote positive school outcomes, we are unaware of any universal family intervention for the prevention of behavior problems that is being tested with ethnically diverse preschoolers in urban public schools in disadvantaged communities.

The current study aims to evaluate the potential efficacy and acceptability of *ParentCorps*, a new culturally-informed family intervention that could be broadly disseminated as a universal preventive intervention to ethnically diverse children attending Pre-K programs in public schools in disadvantaged, urban communities. *ParentCorps* was informed by the prevention science and developmental literatures with extensive input and collaboration from community stakeholders, parents, and teachers (Brotman, Kingston, Bat-Chava, Calzada & Caldwell, 2008; Caldwell et al., 2005; Calzada et al., 2005). Intervention content and delivery strategies were designed to be relevant and engaging to all families and, at the same time, to be sufficient to address the needs of the highest risk children. The intervention focuses on issues relevant to residence in disadvantaged, urban communities (e.g., exposure to community violence, over-crowded schools, and diverse immigrant populations) and is based on an understanding that families living in high-risk environments have a broad spectrum of strengths (e.g., traditional cultural values, extended care networks) and are characterized by diverse family circumstances (e.g., financial strain, number of children and adults in the home, marital status). *ParentCorps* recognizes that parenting practices vary within and between cultures and that a parent's culture informs nearly all aspects of being a parent, including family roles and responsibilities, concerns about child behavior, expectations and aspirations for the future and the kind of parenting strategies that are deemed appropriate to use. The *ParentCorps* model has an explicit focus on cultural values, beliefs and norms and encourages parents to identify and work toward individual

goals for their children and themselves that are meaningful and culturally relevant.

A key aspect of our approach is that *ParentCorps* is a family intervention delivered in school settings and co-facilitated by Pre-K teachers and other school staff. Following a successful open pilot with Black and Latino families from one disadvantaged, urban community (N = 47; Caldwell et al., 2005; Calzada et al., 2005), we developed, implemented, and evaluated a program to train school staff to deliver *ParentCorps* with university-based mental health professionals (Brotman, et al., 2008). This study established educators' interest in and the acceptability of a family intervention for promoting healthy development and preventing behavior problems in the context of a large urban school district serving ethnically diverse students.

The current randomized controlled trial tests the immediate effects of *ParentCorps* on effective parenting practices and child behavior problems in the Pre-K classroom. In addition, the study considers two critical translational research questions: *who benefits* (moderators of the intervention effects) and *who participates* (predictors of parent engagement in the intervention). First, we investigated whether, relative to controls, intervention families show increases in effective parenting practices and intervention children are rated by teachers as having fewer behavior problems in the classroom, immediately post-intervention. Second, we studied whether intervention efficacy with respect to both parenting practices and child behavior is the same for Black and Latino families and for those at higher and lower levels of risk (defined as baseline levels of effective parenting practices and child behavior problems). Third, in light of the long-term goal of reaching an ethnically diverse, urban population with a sustainable empirically-supported family intervention, we examined predictors of engagement, whether the intervention effect on parenting practices depends on the intervention dose (i.e., number of intervention sessions attended) and whether attendance rates or intervention effects were greater during the

second year of intervention implementation. Finally, given that the family intervention took place in the school context, and with involvement of teachers and other school staff, we investigated whether the intervention had an effect on two important predictors of academic achievement: parent involvement in child education and child school readiness skills.

Method

Group Randomized Trial and Setting

Eight public schools in one community school district in New York City were recruited to participate in a group (school) randomized trial. At the time of the study, approximately 75% of the student population in these schools was from ethnic minority backgrounds and 64% was eligible for free lunch (150% of the poverty threshold; NYC Department of Education, 2004). The eight schools were chosen because they represented all of the public elementary schools in the district with at least one UPK class designated to serve lower-income children (relative to the general community) through a federally-subsidized program. Principals from these eight schools were approached for participation in the randomized trial after one year of relationship-building activities. All eight principals agreed to participate. Of note, teachers in both intervention and control schools received professional development on the content of the family intervention prior to randomization. The results of this professional development are reported elsewhere (Brotman, et al., 2008) and the possible implications of this pre-trial training are discussed below.

The eight schools were randomly assigned to intervention ($n = 4$) or control ($n = 4$) conditions. A matched-pairs procedure was used to assign schools to condition based on the number (2 to 4) and type (full or half-day) of UPK classes and school-level student demographics (% eligible for free lunch, % non-white). Two consecutive cohorts of Pre-K students were recruited. In the second year, one control school with two half-day classes discontinued its UPK program; therefore the second cohort does not include children from that

school. To compensate, enrollment was opened in one of the three remaining control schools to include children attending two half-day classes that were not designated specifically for lower-income children.

Procedures

All families with children enrolled in the federally-subsidized UPK classes in participating schools were eligible for the study if they had a primary caregiver who spoke English. Study personnel presented the study to parents during Pre-K orientation and were available to answer questions and consent families throughout the first four weeks of school. Families were consented for the condition to which the school had been randomly assigned (i.e., families in control schools were asked to participate in a study of child development; families in intervention schools were asked to participate in a study of child development and were informed that they would be invited to participate in the family intervention). As detailed below, in the intervention schools, 13 weekly groups were delivered in the school setting during early evening hours from January through April. Assessments included home visits with video-taped observations of parent-child interactions and parent interviews, teacher questionnaires, and tests of school readiness skills in the school setting.

At the time of consent, families were asked to choose one parent or guardian who would be designated as the child's "primary caregiver" and would participate in parent interviews. If a family had more than one child in Pre-K, the firstborn child was enrolled. After providing written consent, parents participated in a brief phone interview in which they reported on demographic information and were scheduled for a Time 1 interview to take place in the home. Parents and children participated in two assessments during the Pre-K year. Time 1 assessments were conducted in the fall of the child's Pre-K year, prior to the start of the intervention, and Time 2 assessments were conducted in the late spring of the Pre-K year, at post-intervention.

Parents completed interviews about parenting practices and their child's behavior, and the parent and child were video-taped during a semi-structured play interaction at home. If a parent objected to having interviewers come to the home, a home visit was not feasible (e.g., no opportunity for a private interview) or a parent repeatedly missed scheduled home visits, arrangements were made to complete the interview (without observations) at the school or by mail (8% of interviews at Time 1 and 16% at Time 2). During the same time periods pre- and post-intervention, Pre-K teachers completed questionnaires about child behavior problems and parent involvement in school and children completed study-administered tests of school readiness. Assessment procedures for parents, teachers and children were identical across conditions. Interviewers were blind to the condition of the school.

Participants

Two cohorts of children attending Pre-K in eight schools were recruited for the study in two consecutive years. During this period, 554 children (340 in intervention schools, 214 in control schools) were enrolled in Pre-K. Of those, 410 (74%) children had at least one caregiver who spoke English and were considered eligible to participate (70% of those enrolled in Pre-K in intervention schools and 81% of those enrolled in Pre-K in control schools). A total of 171 families consented to participate in the study, resulting in an overall participation rate of 42%; 118 (50% of eligible families) were in intervention schools and 53 (31% of eligible families) were in control schools. Data were collected for all consented families ($n = 171$) at Time 1 and for 162 families (95%) at Time 2.

Study children were an average of 4.14 years old ($SD = .33$ years) at Time 1 and 56% were girls. Thirty-nine percent of children were Black (19% African American, 20% AfroCaribbean), 24% were Latino, 13% were White, 12% were Asian, and 12% were of mixed race/ethnicity. Thirty-two percent resided in single-parent families. The mean age of primary caregivers was

33.8 years ($SD = 7.6$ years). The majority of primary caregivers were mothers (88%); 11% were fathers and 1% were maternal grandmothers. The mean number of children in the family was 2.26 ($SD = 1.33$, range = 1 to 7). More than half (53%) of primary caregivers were born outside the United States.

Preventive Family Intervention

ParentCorps included a series of 13 two-hour groups held at the child's school during early evening hours (5–7 pm). Parent and child groups were held concurrently in adjacent classrooms with some group activities to bring parents and children together to allow parents to practice new skills. *ParentCorps* groups were led by university mental health professionals (i.e., psychologists, social workers) and co-facilitated by trained Pre-K teachers, educational assistants, and family workers (responsible for parent outreach).

University mental health professionals were selected for their experience in group facilitation and behavior management practices. They received training by the program developers and ongoing supervision that relied on well-established and manualized procedures. The school staff received initial training in program philosophy, content and facilitation strategies, and participated in mock groups, role plays, and activities to promote learning. They received a detailed group leader's guide that describes all content, materials, and specific roles for each leader. During the 13-week program, all school staff who co-facilitated groups received ongoing supervision prior to each group from the university mental health professionals. Training and supervision procedures were systematically documented.

Parent Groups. These groups aimed to enhance the following effective parenting practices: establishing structure and routines for children, providing opportunities for positive parent-child interactions during child-directed play, using positive reinforcement (e.g., praise, star charts) to encourage compliance and social and behavioral competence, selectively ignoring mild

misbehaviors, and providing consistent, non-physical consequences for misbehavior (e.g., Time Out, loss of privileges). Each parenting practice was introduced by a 5-minute segment from a *ParentCorps* video series that illustrates behavior management principles and key concepts in the context of the daily lives and interactions of three families living in one urban neighborhood. A well-known male African American television personality is the narrator. Culture was discussed explicitly in each group (e.g., cultural values related to obedience and respect for elders, the influence of parents' own childhood experiences on their beliefs about parenting). To facilitate acceptance of new practices, individualize the use of new practices to the family's unique sociocultural context, increase motivation for change, and enhance enactment of practices at home, group leaders used the following strategies: didactics, discussion, group activities, role plays, homework assignments, and problem-solving discussions about the homework and other interactions that occurred between groups. Parents received a workbook with additional information about the skills, homework assignments and activities to help apply the practices in the context of their family's unique experience. Parents also received an item each week from a *ParentCorps* toolkit that was intended to help them implement the practices at home (e.g., a timer for Time Out).

In addition, through group discussions, activities and homework assignments, parents were encouraged to set individual goals for their children and to communicate about strategies for achieving these goals to important adults in their child's life, including teachers and other caregivers. The group provided a setting for families to share ideas and practice communicating with others about their values, goals, and plans for parenting. Moreover, because teachers and other school staff co-facilitated groups, there were numerous opportunities to directly increase parent-teacher communication. Parents heard from teachers about their use of effective behavior management practices at school and in turn shared ideas based on how their child responded to

the practices at home. Teachers heard parents' perspectives about daily struggles and the challenges of implementing these practices at home.

Child Groups. Following a detailed guide, group leaders used effective behavior management practices to promote children's positive behaviors and reduce or prevent behavior problems. Children were exposed to the skills that parents were learning (e.g., star charts, Time Out), thereby increasing children's familiarity with and acceptance of these practices when parents implemented them at home. Groups also enabled leaders to observe children's behavior, provide positive reinforcement to children and positive feedback to parents at the end of each group, and support parents in working toward their individual behavioral goals for their children.

Intervention Fidelity. Fidelity was measured with content and process checklists completed by group leaders (independent raters completed checklists for a subset of groups that were videotaped). A high level of fidelity to intervention manuals was established (> 90% for each session for parent and child groups; limited variability in fidelity ratings precluded an examination of fidelity as a predictor of outcome). Details on attendance and satisfaction are presented below.

Reducing Barriers to Engagement. Many features of the family intervention were intended to overcome barriers that commonly reduce attendance at family interventions and impede implementation of effective parenting practices at home. Strategies for engaging parents have been carefully described in intervention manuals and are considered an essential aspect of intervention implementation. Groups were held at the Pre-K child's school and brought together families of students and teachers from different classes, thereby promoting a sense of school community. Before, during and after the group, families and teachers had numerous opportunities to communicate and develop supportive relationships. Explicit invitations to attend groups were made to all adult caregivers, including those living outside the home. In addition, initial group sessions focus on increasing motivation and establishing a commitment to complete

the full series and include activities to anticipate, problem-solve and overcome logistical barriers to attendance. To further reduce barriers and increase motivation for attendance, meals were served in each group, raffles with small prizes were held, childcare was provided for younger siblings and a creative arts group was offered for older children in the family.

School Personnel Participation in Family Intervention. Over the course of two years, the majority of the Pre-K teachers (80%) and educational assistants (77%) in the intervention schools co-facilitated groups (78% of all classroom-based staff). School personnel were paid the hourly rate for their position (as designated by the school district) to co-facilitate groups during after-school hours. Each year, all intervention classrooms had at least one participating teacher. However, because of teacher turnover, not all staff participated for two consecutive years. For example, over the two years, there were 10 primary teachers in the intervention classrooms; only 4 of these teachers taught in the same classrooms for two years; 3 of the 4 teachers (from 3 of the 4 intervention schools) facilitated groups for two years. Of the 6 remaining teachers (2 in year 1 only and 4 in year 2 only), 5 (83%) facilitated groups during that year. The two teachers who did not participate in the after-school groups were unable to do so because of personal logistical reasons. In both cases, at least one other teacher from the school and one educational assistant from the classroom participated in the groups.

Control Condition

As noted above, teachers in both conditions received professional development on the content of the family intervention during the spring of the school year prior to randomization of schools and enrollment of the first cohort. The rate of teacher turnover in the control schools was similar to the rate described above for the intervention schools. Families in the control condition received Pre-K services as usual (full or half-day classes, a drop-in room for parents and occasional workshops held by Pre-K family workers). Family workers are paraprofessionals

whose primary responsibility is to outreach to Pre-K parents. They typically staff the drop-in room, organize craft activities and hold workshops on topics such as nutrition, domestic violence and asthma. There is no indication that family workers in control schools provided workshops that substantially overlapped with *ParentCorps* content. Structured parent-teacher communication was generally limited to three events throughout the school year (orientation and parent-teacher conferences twice a year, typically for 10-15 minutes, with a focus on academic progress).

Measures

Effective Parenting Practices. Three methods were used: 1) parent report of use of effective disciplinary practices; 2) a test of knowledge of effective parent behavior management practices; and 3) observation of parenting effectiveness in the context of a parent-child semi-structured play interaction in the home conducted by independent evaluators, blind to intervention condition. Parents reported their use of different disciplinary practices on the Parenting Practices Interview (PPI; Webster-Stratton, 1998). Items are rated on a scale of 1-5. The Appropriate Discipline scale (8 items, $\alpha = .61$) and the Clear Expectations scale (4 items, $\alpha = .70$) were used in the current study. The two scales were significantly correlated ($r = .36$) and were combined to create a composite scale of parent-reported effective disciplinary strategies. The 6-month stability of the composite scale in the control group was .43, which is consistent with the stability of similar measures of parenting (Holden & Miller, 1999; Huang, Caught, Lee, Miller & Genevro, 2009). The Effective Parenting Test (EPT; Calzada & Brotman, 2002) was used to assess knowledge of effective parent behavior management practices. The EPT was developed based on the Behavioral Vignettes Test (Baker, 1989) to provide a measure of parents' ability to identify appropriate behavioral practices for preschool-aged children. The EPT presents 12 vignettes with 4 response choices, where one answer is correct (scored as 1) and the other

answers are incorrect (scored as 0). The number of correct responses was summed and the percentage of correct responses was calculated. In previous studies, prior to training, community members and parents scored 49% and 44% correct, and following training, scores increased by 16% and 15%, respectively.

The Global Impressions of Parent Child Interactions-Revised (GIPCI-R; Brotman, Calzada, & Dawson-McClure, 2003; Brotman, Gouley et al., 2005) was used to make global ratings of parenting behavior during a 15-minute semi-structured play interaction in the home that increased in structure and parent-directedness (i.e., free play, puzzle task, clean-up). A series of parenting behaviors were rated on a scale of 1-5. In the current study, a composite was used of two correlated indices assessing parenting effectiveness and scaffolding of child behavior ($r = .34$). Interactions were videotaped and rated by trained individuals blind to time and intervention status; 76% and 53% of tapes were rated by two individuals at Time 1 and Time 2, respectively. Inter-rater reliability for the composite of the two codes (effectiveness and scaffolding) was fair ($ICC = .54$; Shrout, 1998). Correlations among the three measures of effective parenting practices (i.e., PPI, EPT, GIPCI-R) are shown in Table 1.

Child Behavior Problems. We selected a teacher rating scale that would capture overall adaptive behavior as well as externalizing and internalizing problems, and a second teacher rating scale that would provide comprehensive coverage of behavior problems in the classroom. The Behavior Assessment System for Children-Preschool Version (BASC; Reynolds, & Kamphaus, 2004) includes broadband scales of externalizing problems (e.g., aggression, disruptive behaviors, hyperactivity), internalizing problems (e.g., anxiety, depression, somatization), and adaptive skills (e.g., adaptability, social skills). Pre-K teachers rated how often the child has engaged in each behavior during the past 4 weeks on a 4-point scale (0 = *never* to 3 = *almost always*). Internal consistency ranged from .83 to .94 for these three scales

and intercorrelations ranged from .28 to .46. The adaptive skills scale was reverse coded and all three scales were rescaled to 0-100. The New York Teacher Rating Scale (NYTRS; Miller et al., 1995) is a 36-item teacher rating scale designed to assess children's diagnostic descriptors of oppositional defiant disorder and conduct disorder. Teachers rate children's conduct problems over the past four weeks on a 4-point scale (from 0 = *not at all* to 3 = *very much*). In the current sample, the 14-item Defiance scale had adequate internal consistency ($\alpha = .73$) and 6-month stability ($r = .64$). The Defiance scale (rescaled to 0-100) was significantly correlated with the BASC Externalizing Scale ($r = .72$; $p < .001$) and the two scales were combined. Correlations among the Externalizing (BASC/NYTRS), Internalizing (BASC) and Adaptive Behavior (BASC) scales are shown in Table 1.

Predictors of Academic Achievement. Two predictors of academic achievement were examined: parent involvement in child education and child school readiness skills. We measured parent involvement with teacher ratings on the Involvement Questionnaire (INVOLVE-T; Webster-Stratton et al., 2001). The 18-item scale was completed by teachers, based on their perception of parent involvement during the past 2 months. For this study, the Involvement in Education scale was used (6 items, $\alpha = .90$, 6-month stability $r = .69$).

School readiness skills were evaluated with the Developmental Indicators for the Assessment of Learning-3 (Speed DIAL-3; Mardell-Czudnowski & Goldenberg, 1998). The DIAL-3 is a standardized test that assesses motor, language and conceptual skills related to school readiness. These skills are considered the foundation of academic learning and are related to success in the classroom. The Speed DIAL-3 was used in the current study and is a shorter version of the DIAL-3 that requires 15 minutes to administer. It yields a Total Score based on all three domains of the DIAL-3: Motor (e.g., building, copying), Concepts (e.g., naming colors, identifying body parts) and Language (e.g., letters and sounds, naming actions). The Speed DIAL was

administered by trained study personnel in the school setting. The measure was standardized based on a sample of 1560 children aged 3-0 to 6-11. The Speed DIAL has adequate test-retest reliability for children entering Pre-K ($r > .70$).

Demographic Characteristics. Parents reported on family demographics including child gender, race/ethnicity, language preference, marital status, employment, and poverty (household income and family size).

Parent Engagement in Intervention. Attendance and satisfaction were measured at each of the 13 group sessions. Satisfaction with parent groups was assessed using an 11-item measure that was completed by parents at the end of each group. (For this study, only ratings from the primary caregiver were considered). Parents were asked to rate their satisfaction at the end of each group on a 5-point scale ranging from *Strongly Agree* (1) to *Strongly Disagree* (5) with respect to the following: relevance (usefulness of group, plan to use the skills and overall enjoyment of group); evaluation of group leaders (e.g., “*Leader did a good job today*”) and comfort level assessed for each group leader (e.g., “*Leader made me and the other group members feel comfortable and confident as parents in today’s group*”). A total satisfaction score was computed as an average of the 13 sessions. Satisfaction scores were also computed for groups divided into three topic areas: introductory sessions (sessions 1 – 2; focusing on cultural and contextual influences on parenting and child development and individual goal-setting); parent-child relationship building and positive reinforcement (sessions 3 – 6; routines, play, praise, star charts) and discipline (sessions 7, 8, 9 and 11; ignoring, effective commands, time out, consequences for misbehavior). The other sessions (sessions 10, 12, and 13; dealing with difficult feelings, problem-solving, social support, planning for the future) were not evaluated in these analyses since they included content across domains.

Approach to Analyses

Missing Data, Attrition and Imputation Strategies. At Time 1, teacher, child, parent and home observation data were available from 161 (94%), 151 (88%), 136 (80%), and 100 (58%) participants, respectively; at Time 2, 150 (88%), 139 (81%), 124 (73%) and 85 (50%) had data from these sources. The reasons for missing home observation data were similar at both times; of the families with parent interview data but no observations (36 and 39 at Times 1 and 2), approximately 1/3 refused to be videotaped, 1/3 completed the interview outside the home (at school, by mail or phone) and 1/3 had technical difficulties with the taping.

Overall, there were no differences by intervention condition in the percent of missing data on the four sources of data at either time. None of the demographic characteristics predicted missing data at Time 1, with the exception of gender (more missing data for boys than for girls, 17% vs. 7%). There were no baseline differences on any of the variables considered in this study (e.g., demographic characteristics, parenting practices, child behavior, parent involvement and child school readiness) for children with and without Time 2 data (p values $> .10$).

We used multiple imputation methods (Little & Rubin, 2002) to account for missing data on all measures with the exception of the home observation data. [Nearly half of the sample had missing home observation data; when there is a large percentage of missing data, the estimates tend to have larger standard errors and make the results less stable (Little & Rubin, 2002)]. The SAS Multiple Imputation (MI) procedure was used with 10 replicated imputations; the imputation made use of the joint distribution of all the outcome variables considered in this study. We imputed Time 1 data first, and then imputed Time 2 data. As per Little and Rubin (2002), imputations were conducted separately for the control and intervention groups to account for the possibility of different missing data patterns by group. SAS PROC MIANALYZE was used to combine the results for the final inference testing (SAS 9.1.3 Software, 2002).

Statistical Analyses. We first analyzed the correlational structure of the data and made two

observations about the random effects of teacher/classroom and school. For parenting practices (reported by parents, test of knowledge and observed), the school effect was stronger (*ICC* ranged from .00 to .09) than the teacher effect, which was virtually zero. For teacher-reported measures (of child behavior and parent involvement) and tests of child school readiness, the teacher/classroom effect was stronger (*ICC* ranged from .00 to .37) than the school effect. For consistency across analyses, the covariance structures for all outcomes were modeled in the same way and include random effects for both school and teacher/classroom.

The primary outcomes (Effective Parenting Practices and Child Behavior Problems) are multivariate constructs consisting of multiple domains. Effective Parenting Practices comprises two domains: 1) parent report of effective practices, and 2) test of parenting knowledge (observed parenting practices was not included in the multivariate analyses due to the relatively large amount of missing data and our inability to impute missing values). Child Behavior Problems comprises three domains: 1) externalizing problems, 2) internalizing problems, and 3) adaptive behavior. All domains within an outcome were analyzed simultaneously, adopting an approach similar to MANOVA to test multivariate mixed effects models using the SAS PROC MIXED procedure. The predictors of the two secondary outcomes (Parent Involvement in Education and Child School Readiness) were analyzed individually using univariate mixed effects models.

To assess the intent to treat (ITT) effect of the intervention, the post-intervention value of the outcomes was modeled as a function of the indicator for intervention (0 for control and 1 for the intervention), adjusting for the Time 1 value of the respective outcome and child gender. The models for the primary outcomes also included domain and the domain-by-intervention interaction. A significant domain-by-intervention interaction would indicate that the effect of the intervention is different for different domains of the multivariate construct. A non-significant

interaction was followed by refitting the model without the interaction term and an intervention effect common for all domains was reported from this reduced model.

To assess whether the intervention effect was the same across the levels of baseline risk (i.e., T1 values of the respective outcome) and for Blacks and Latinos, we performed moderation analyses. *ParentCorps* was initially pilot tested with Black and Latino families and these are the two largest racial/ethnic groups in the current study. We recognize that these two groups are heterogeneous (e.g., the Black group includes U.S.-born African Americans and U.S.- and foreign-born AfroCaribbeans), and that this is merely one of numerous options for examining “cultural group” differences. The models used to assess the intervention effect were expanded to include the potential moderator and moderator-by-intervention interaction.

The effect of attendance at intervention sessions (total of 13 sessions) on parenting practices was studied in a dose-response analysis. Effective Parenting Practices at Time 2 was modeled as a function of the number of sessions attended, adjusting for Time 1 level of parenting and child gender. Given that the study design involved the recruitment of two consecutive cohorts within the schools, we considered the possibility that there might be higher attendance and larger intervention effects for the second cohort. We evaluated whether there was an intervention-by-cohort interaction for Effective Parenting Practices and Child Behavior Problems.

In interpreting the results, especially for moderation effects, effect sizes as well as significance tests were considered because the study had less than 80% power to detect small effects. The following convention was used to interpret effect sizes: *Cohen's* $d = .2$ is a small effect; $d = .5$ is a medium effect; and $d = .8$ is a large effect. Power calculations indicate that the sample size in the current study can detect medium effect sizes in the intent-to-treat models (with adjustment for nesting) and medium to large size effects for the moderation analyses of cultural group.

Results

Baseline Equivalence

Tables 2 and 3 display baseline characteristics of children, families and schools by intervention condition. Means and standard deviations are reported using non-imputed data and all outcome measures were rescaled (0 – 100). Analyses of baseline equivalence were conducted with the full sample ($n = 171$) using non-imputed data for demographic characteristics and observations and imputed data for effective parenting practices, child behavior problems, parent involvement and child school readiness. There were no significant differences (p values $> .10$) between the intervention conditions for any of the demographic, child, parent or school characteristics, with the exception of child gender. The gender difference reflects a significant difference in the percent of boys enrolled in Pre-K in intervention schools (47%) versus boys in the control schools (59%; $p < .01$) and not a difference in study recruitment rates. All analyses of intervention effects include gender as a covariate.

Since the analytic plan included an examination of intervention effects for the two largest cultural groups, baseline equivalence was examined separately for Black ($N = 67$) and Latino families ($N = 52$). No significant baseline differences were found between the intervention and control conditions for either group (p values $> .10$).

Intervention Effects on Effective Parenting Practices and Child Behavior Problems

Primary Outcomes. As shown in Table 4, ITT analyses revealed a significant intervention effect on both multivariate constructs: Effective Parenting Practices ($p < .01$) and Child Behavior Problems ($p < .05$). For both Effective Parenting Practices and Child Behavior Problems, the domain-by-intervention interaction was near zero and not statistically significant. This indicates that the intervention effect was similar on the two domains of parenting practices (parent report and test) and the three domains of child behavior (externalizing, internalizing and adaptive

behavior). The intervention resulted in medium-size effects for both Effective Parenting Practices ($d = .50$) and Child Behavior Problems ($d = .56$).

The intervention effects on the primary outcomes of Effective Parenting Practices and Child Behavior Problems were not significantly moderated by baseline levels of the corresponding outcome. The intervention effects were also not significantly moderated by group, with similar medium-size effects for Black and Latino families on Effective Parenting Practices ($d = .60$; $d = .63$) and Child Behavior Problems ($d = .61$; $d = .43$).

Observed Parenting Effectiveness. Additional analysis of the intervention effect on parenting practices utilized independent observations in the home (available on a subset only). At baseline, nearly half of the sample was rated relatively high on the measure of observed parenting practices (scores above 75 on a 100-point scale), while the other half ranged from very low parenting effectiveness (scores of 10) to moderate (scores of 60). The intervention effect on observed parenting practices was moderated by the baseline score of this measure (*Interaction term* = $-.49$, $SE = .24$, $p < .05$); there was a large intervention effect ($d = 1.44$) for parents who had baseline scores below the median and a small effect ($d = 0.21$) for parents with baseline scores above the median. As shown in Figure 1, the intervention increased the level of parenting effectiveness for those who were initially observed to have low effectiveness to the same level as those initially observed to have high effectiveness.

Dose-Response Relations. The number of sessions attended was significantly related to increased Effective Parenting Practices (parent report and test) with a monotone linear increase of the effect with each additional session attended (*Estimate* = $.71$, $SE = .17$, $p < .001$).

Cohort Effects. There was no significant difference in the number of intervention sessions attended nor was there a cohort-by-intervention interaction on Effective Parenting Practices. There was, however, a significant cohort-by-intervention interaction on Child Behavior Problems

(*Interaction term* = -4.80, *SE* = 2.32, *p* < .05), with larger effects on Child Behavior Problems in Cohort 2 relative to Cohort 1 (Cohort 1: *d* = .26; Cohort 2: *d* = .81).

Intervention Effects on Predictors of Academic Achievement

For purposes of hypothesis generation, we considered intervention effects on secondary outcomes related to academic achievement (Parent Involvement in Education and Child School Readiness), with consideration of baseline levels of these measures and cultural group as potential moderators. Overall, there were small and non-significant intervention effects on Parent Involvement (*d* = .22) and Child School Readiness (*d* = .11) and these effects were not significantly moderated by baseline levels. Interestingly, in contrast to the findings for Effective Parenting Practices and Child Behavior Problems, where comparable intervention effects were found for Black and Latino families, a different pattern emerged for predictors of academic achievement. There was a trend for the group-by-intervention interaction effect on Parent Involvement (*Estimate* = -13.38, *SE* = 7.83, *p* < .10). The intervention effect for Black families was medium (*d* = .57) and there was no evidence of an intervention effect for Latino families (*d* = .05). For Child School Readiness, although the group-by-intervention interaction was not significant (*Estimate* = -7.71, *SE* = 5.07, *ns*), there was a small-to-medium effect for Black families (*d* = .38) and no effect for Latinos (*d* = -.10).

Predictors of Parent Engagement in Intervention

Of the total number of study families in the intervention schools (*n* = 118), average attendance was 5.93 (*SD* = 5.05) of 13 group sessions. Seventy-one percent participated in at least one session and 54% attended five or more sessions. Of all of the demographic characteristics considered in this study (including those listed in Table 2), marital status and parental education were the only significant predictors of the number of intervention sessions attended. Two-parent families attended an average of 3 more sessions than single-parent families

($B = 2.79$, $SE = 1.01$, $p < .01$) and more educated parents attended an average of 2 more sessions than less educated parents ($B = 2.04$, $SE = .94$, $p < .05$). Although teacher ratings of Parent Involvement in Education at Time 1 (about 6 weeks into the Pre-K school year) predicted level of attendance at groups (which started about four months later; $B = .80$, $SE = .02$, $p < .01$), this relation was no longer significant once marital status and parent education were controlled.

Baseline Effective Parenting Practices, Child Behavior Problems and Child School Readiness did not predict the number of sessions attended, indicating that higher risk families were as likely as lower risk families to attend groups.

Overall, parents reported high levels of satisfaction with *ParentCorps*, with averages across the 13 sessions ranging from “*Strongly Agree*” to “*Agree*” for all 11 items on the questionnaire. There was no significant relation between overall program satisfaction and attendance ($r = -.16$). Satisfaction was also examined by group topic. Ratings for the first two sessions (which focused on cultural and contextual influences on parenting and child development and setting goals for children) were higher than those for sessions that focused on learning effective parenting practices in terms of parent-child relationship-building and positive reinforcement ($t(38) = 5.24$, $p < .001$) and discipline ($t(34) = 5.21$, $p < .001$). There were no significant differences in satisfaction ratings between sessions that focused on relationship-building and positive reinforcement versus discipline ($t(66) = .54$, $p = .59$).

Discussion

In disadvantaged, urban communities, family processes that support healthy development are often disrupted, placing young children at high risk for entering school with behavior problems, academic underachievement and school drop-out. Parenting interventions have been shown to reduce or prevent behavior problems in children from diverse cultural backgrounds.

Unfortunately, most families living in underserved communities do not have access to or take advantage of evidence-based parenting programs. To address this need, we developed a universal intervention, *ParentCorps*, designed specifically to be engaging and relevant for ethnically diverse families of preschoolers living in disadvantaged, urban communities. *ParentCorps* was successfully pilot tested in one community with Black and Latino families (Caldwell et al., 2005; Calzada et al., 2005). We then developed a model for delivering this family intervention to children enrolled in Universal Pre-K (UPK) in public schools in disadvantaged, urban communities. We demonstrated previously that Pre-K teachers and educational assistants were motivated to co-facilitate groups for families during after-school hours and that they successfully learned the content of the family intervention (Brotman, et al., 2008).

The current study aimed to test the efficacy of *ParentCorps* among families of Pre-K students in a large urban school district. Among ethnically diverse families, the universal intervention led to significant and medium-size effects on effective parenting practices and child behavior problems in the classroom immediately post-intervention. Additional studies are required to document longer-term benefits with regard to child behavior in Kindergarten classrooms and to ascertain whether such improvements are reported by teachers not directly involved in the intervention. Overall, study findings add to the growing body of evidence indicating that family intervention delivered in the preschool period results in important benefits for children at risk for behavior problems and academic underachievement based on residence in disadvantaged communities (Brotman, Dawson-McClure et al., 2005; Brotman, Gouley, et al., 2005, 2008; Gross et al., 2003; Lunkenheimer et al., 2008; Webster-Stratton, 1998; Webster-Stratton et al., 2001).

Two important steps toward maximizing the public health impact of interventions for raising healthy children are identifying families who are likely to benefit (or not) and elucidating

predictors of parental engagement in interventions. Regarding who benefits, neither cultural group nor baseline risk status were significant moderators of intervention effects on either primary outcome. Medium-size effects were observed for both Black and Latino families on effective parenting practices and child behavior problems. Families at higher risk for problems (i.e., parents with lower baseline levels of effective parenting practices and children with higher baseline levels of behavior problems) benefited comparably from the intervention. Based on observations of effective parenting by independent evaluators blind to intervention condition, the intervention resulted in very large effects for higher-risk parents (those who exhibited low levels of effective parenting practices at baseline).

Regarding predictors of parental engagement, the majority of demographic characteristics considered in this study, including cultural group, family income and employment, did not significantly predict attendance at intervention sessions. The *ParentCorps* intervention model and content were designed to be engaging to ethnically diverse families living in disadvantaged, urban communities and numerous strategies were put into place to directly overcome barriers to attendance (e.g., childcare) and enactment of skills at home (e.g., providing necessary materials). Program materials feature ethnic minority families, and discussion topics, group activities and homework assignments take into consideration circumstances associated with living in poverty and in underserved, urban communities. Although these program features appear to have aided in engaging families across a range of many important socio-cultural factors, single-parent status and lower parental education predicted lower attendance at intervention sessions. These findings highlight the importance of reducing barriers to attendance for single parents who may work additional shifts, for example, limiting their availability to be involved in interventions offered in early evening hours. Parents with lower levels of formal education may face different barriers to engagement in school-based prevention programs if, for example, they have had negative

experiences in their own schooling that shape their perceptions and interactions with their children's school. Thus, interventionists should pay particular attention to barriers related to work schedules and mistrust of the school system when working in underserved, urban communities.

Importantly, *ParentCorps* was found to be engaging to families of children at varying levels of risk for behavior and academic problems. As stated above, *ParentCorps* was also found to be equally effective for children at varying levels of risk. These two findings are very encouraging given the accumulating evidence from prevention studies that universal interventions may yield the largest benefits for the highest risk children (August et al., 2001; Dawson-McClure et al., 2004; Kellam et al., 2005; Reid et al., 2004). Taken together, these findings support *ParentCorps*' potential to reach and benefit families most in need of preventive services.

Analyses of cohort effects suggest that the intervention effect on child behavior problems was greater during the second year of program implementation. Therefore, the medium size effect (for the total sample) may be an underestimate of the potential program impact, but an overestimate of actual impact during the first year of implementation. The finding of stronger intervention effects for the second cohort for child behavior problems in the classroom, but not for effective parenting practices, suggests that the teachers may be important agents of change. Teachers who were involved in delivery of the family intervention may have learned new behavior management practices during the first year and then applied these practices in the classroom setting in the second year. These changes in classroom management may have resulted in additional benefits for child behavior. If teachers are, in fact, generalizing skills learned during the groups to the classroom setting, explicit classroom management training for teachers, in combination with facilitation of the groups for families, may result in even greater benefits for children. Future research should explore these possibilities.

Because *ParentCorps* was delivered in school settings with participation by teachers, and based on the literature documenting associations between behavior problems, parenting practices and academic achievement, we considered whether there were benefits for children on predictors of academic achievement. Overall, there were small intervention effects, which were not statistically significant. Interestingly, by considering cultural group as a potential moderator of intervention effects, a pattern of findings emerged suggesting additional intervention benefits for Black families, but not for Latino families, on teacher ratings of parent involvement in child education and independent tests of child school readiness. The possibility that the intervention led to increased school involvement among Black parents supports the inclusion of school staff in the delivery of family intervention and highlights the potential value of this approach to promoting academic achievement and reducing educational disparities (Hill, 2001; Hill, et al., 2004; Kao & Rutherford, 2007). Findings from several studies indicate that there may be issues of trust and cultural barriers between ethnic minority parents and school personnel and that these issues may be exacerbated when low-income ethnic minority parents are paired with White school staff (Hughes, Gleason, & Zhang, 2005; Lareau & Horvat, 1999; McAllister, Wilson, Green, & Baldwin, 2005; McKay, Atkins, Hawkins, Brown, & Lynn, 2003). The increased contact between parents and school staff that occurred in the context of the intervention may have changed the comfort level between parents and staff and led to increased parent involvement.

Given that many of these same factors relevant to parent involvement in Black families also apply to Latino families, it is not clear why an increase in parent involvement was not found among Latinos. Nearly all primary teachers were White, and educational assistants were 50% White and 33% Latino; therefore, it does not appear plausible that the cultural background of the teachers accounts for a difference in intervention effects for Blacks and Latinos. Language

barriers may impede some Latino parents from participating more fully at their children's school. Other aspects of acculturation, such as beliefs about teachers as authority figures, and lower levels of formal education among Latino parents may be related to the ways in which parents participate in their child's formal education. Future research should carefully examine parent and child characteristics (including parent immigrant status and previous educational experiences) that might be related to parent involvement in families from different cultural groups and inform strategies for engaging parents in children's schools.

For Black families, this study raises the possibility that universal behavioral family intervention may lead to small benefits in terms of child school readiness. The developmental literature suggests numerous mechanisms that could account for intervention effects on academic functioning. Most obviously, increased parent involvement in education could have a direct effect on school readiness skills. Reductions in behavior problems in the classroom could also directly facilitate learning and achievement (Arnold et al., 1999; Bowman et al., 2001; McClelland et al., 2000; Vitaro et al., 2001). These links between parenting practices, parent involvement in child education, behavior problems and academic achievement in early childhood deserve further study to better understand the development of academic skills and to inform strategies for reducing disparities in educational attainment for Black and Latino children.

Limitations

This study of *ParentCorps* was limited by a relatively small sample size and low power to detect small effects once the nested nature of the data was taken into account. The relatively small sample size precluded our ability to examine subgroup differences in a more comprehensive manner. This study was also limited by missing data on the observed measure of effective parenting practices, although available data substantiated the findings from parent

report and the test of knowledge of effective practices. Furthermore, to obtain buy-in from the participating schools, teachers and assistants in all schools received training to co-facilitate the family intervention, including learning effective practices for managing children's behavior (Brotman, et al., 2008). By training teachers in both intervention and control conditions, we potentially made it more difficult to detect differences between the conditions attributable to the family intervention, especially during the first year of implementation. This may be particularly true for child behavior in the classroom, child school readiness and parent involvement in education, since these might all be directly affected by teacher behaviors.

An important limitation is that teachers, the sole providers of ratings on child behavior problems, were aware of intervention status and, within the intervention condition, were actively involved in the delivery of the family intervention. The training of teachers from schools in both conditions could have biased teacher ratings in favor of either condition or, on the other hand, could have reduced the bias. However, evidence that the effect on child behavior was not completely due to reporter biases is provided by the finding of a stronger effect for the second cohort relative to the first, the significant and medium-size intervention effects on parenting practices assessed by multiple methods, meaningful relations between attendance and improvements in parenting practices, and the small intervention effect on an independent test of school readiness for Black children.

Finally, this initial study of *ParentCorps* yielded relatively low rates of study recruitment overall and differential recruitment in intervention and control conditions. This limits our ability to generalize findings to the entire Pre-K population. Fortunately, conditions were equivalent at baseline on all relevant demographic, parent, child and school characteristics. We considered all available data from this study to understand the characteristics of the sample, how these characteristics influenced parent engagement in the intervention, and how the intervention

affected different subgroups of families. This information, as well as the practical experiences in carrying out this trial, informed the design of a more comprehensive school randomized trial with over 1000 Black children from disadvantaged, urban communities. This larger trial, with recruitment rates of 75% across schools in both conditions, will allow for comprehensive evaluation of long-term intervention outcomes assessed by multiple sources across behavioral and academic domains. This large-scale trial of *ParentCorps* was designed to test moderators and mediators of intervention effects and will allow for generalization of findings to families of children attending Pre-K programs in public elementary schools in urban communities.

Raising Healthy Children: Implications for Policy and Practice

Study findings contribute to the literature on family interventions for raising healthy children. The intervention model specifies that *ParentCorps* increases effective parenting practices and thereby prevents child behavior problems and promotes academic success. Although a formal test of mediation is required to establish a link between parenting and child outcomes, the current findings are consistent with this model in which effective parenting practices are a key factor in promoting healthy development among ethnically diverse children living in disadvantaged, urban communities. Further, this study shows the promise of a universal family intervention delivered in the school setting for preventing child behavior problems in school among children attending Pre-K programs in underserved communities. Public school teachers were receptive to being trained to co-facilitate the family intervention in collaboration with mental health professionals and the majority agreed to work additional hours after school to deliver the 13-week intervention. Findings also suggest that the intervention may lead to additional positive outcomes related to academic achievement for Black families. Different patterns for Black and Latino families highlight the importance of carefully considering cultural group as a moderator of intervention outcomes and suggest the possibility of culturally-specific

pathways linking parenting practices, child behavior problems in the classroom and academic achievement.

Findings from this study provide further evidence in support of public investment in universal family intervention for young children at risk for negative outcomes. The study also supports the feasibility of prevention delivery models that embed parenting programs in public schools and involve teachers and other school staff in family intervention during early childhood. Effectiveness and dissemination studies are necessary for determining the best strategies for attracting and serving all families, and longitudinal follow-up studies are essential for understanding fully the long-term health and educational benefits of early universal family intervention.

Table 1

Correlations among Study Outcomes at Baseline

	1	2	3	4	5	6	7
1. Parent-Report of Parenting	-						
2. Test of Parenting Knowledge	.08	-					
3. Observed Parenting Practices	.03	.05	-				
4. Externalizing Problems	-.06	.04	.01	-			
5. Internalizing Problems	-.08	.02	.12	.43***			
6. Adaptive Skills	.07	.04	.04	-.36***	-.44***		
7. Parent Involvement	-.04	.06	-.06	-.08	-.10	.43***	
8. School Readiness Skills	.15	.26**	.18+	.02	-.10	.34***	.32***

Note. + $p < .10$; ** $p < .01$; *** $p < .001$.

Table 2.

Baseline Demographic Characteristics, Parent and Child Outcomes

	Total Sample		Intervention		Control	
	N=171		N=118		N=53	
% male	44.4%		39.0%		56.6%	
% of married primary caregivers	67.5%		70.4%		60.8%	
% of caregivers \geq high school diploma	44.0%		43.5%		45.1%	
% caregiver employed	36.1%		38.3%		31.4%	
% below poverty guidelines (150%)	54.4%		52.9%		57.5%	
	M	SD	M	SD	M	SD
Child age	4.14	.33	4.16	.33	4.10	.34
Primary caregiver age	33.84	7.59	33.70	7.25	34.16	8.37
Parent Report of Effective Parenting	66.91	11.49	66.56	11.01	67.75	12.67
Test of Effective Parenting Knowledge	43.49	13.51	42.29	13.57	45.94	13.23
Observed Parenting Effectiveness	65.63	21.86	65.04	21.07	66.94	23.84
Externalizing Behaviors	7.71	11.22	6.15	9.52	10.96	13.67
Internalizing Behaviors	7.45	6.11	6.94	6.19	8.51	5.86
Adaptive Skills	51.59	15.97	52.85	17.21	48.93	12.75
Parent Involvement in Education	70.97	21.62	73.40	20.89	66.11	22.47
Test of Child School Readiness	46.18	16.23	45.65	16.33	47.44	16.11

Note. M and SD are based on non-imputed data. All parenting and child outcomes were rescaled to 0-100 scale. *P* values were $>.15$ for all baseline measures, with the exception of % male ($p=.03$). This difference reflects differences within the intervention and controls schools and not a difference in recruitment rates for boys relative to girls.

Table 3

School-level Characteristics for the Total Sample and by Intervention Condition

	Total Sample	Intervention	Control
	N=8	N=4	N=4
	%	%	%
% students eligible for free lunch	74	76	73
% students below math standards	10	8	11
% student stability	92	92	92
% of Black students	52	46	58

Note. School-level information was obtained for 2003-2004 school year, the year of randomization. *p values* > .50 for all measures.

Table 4

Intervention Effects on Effective Parenting Practices and Child Behavior Problems

	Parenting Practices ¹		Child Behavior Problems ²	
	Estimate	SE	Estimate	SE
<i>Intent-to-Treat Analyses</i>				
Intercept	51.62***	1.95	19.00***	1.86
Gender	.61	1.68	1.03	1.01
T1 Outcome Measure	.41***	.08	.53***	.06
Intervention	4.90*	2.18	-4.76*	2.17
<i>Effect Size</i>	.50		.56	

Note. In the multivariate analyses, all parenting and child outcome measures were rescaled to 0 - 100. Analyses were conducted first by including 5 predictors: gender, T1 outcome measure, intervention status, domain, and the domain-by-intervention interaction. Because the domain-by-intervention interaction was not significant across analyses, we eliminated this term and reran the analyses. This table shows results from this reduced model. The model also included domain(s) as control variable(s) (estimates for the domains are not shown).

* $p < .05$; *** $p < .001$.

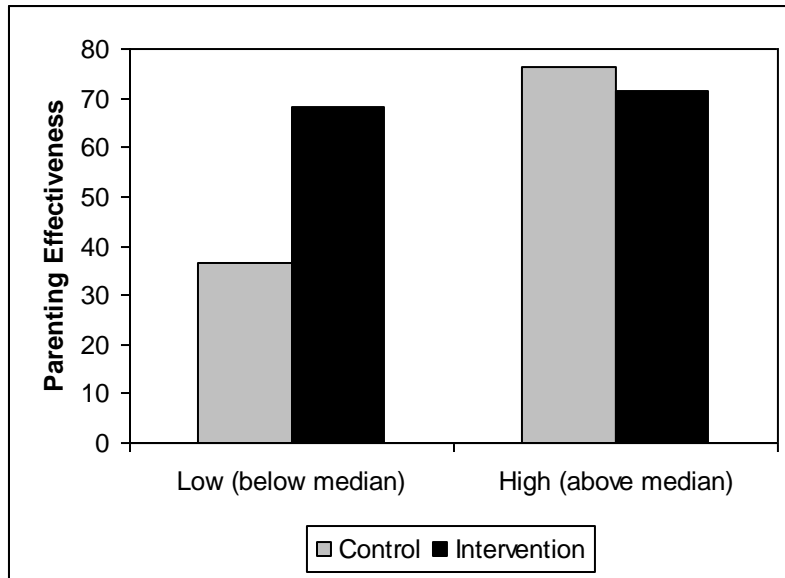
¹ Effective Parenting Practices consists of two domains: Parent self-report of practices and Test on parenting knowledge.

² Child Behavior Problems consists of three domains: Externalizing, Internalizing and Adaptive Behavior.

Figure Caption

Figure 1

Intervention Effect on Observed Parenting Practices Moderated by Baseline Levels



Note. Low and high groups are based on a median split of baseline parenting effectiveness scores. For the parents with low T1 effectiveness, the effect size was 1.80 (very large effect); for parents with high T1 effectiveness, the effect size was 0.15.

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