



Published in final edited form as:

Prev Sci. 2009 March ; 10(1): 54–65. doi:10.1007/s11121-008-0116-7.

Efficacy of the Chicago Parent Program with Low-Income African American and Latino Parents of Young Children

Deborah Gross, DNSc, RN, FAAN,
Rush University College of Nursing

Christine Garvey, PhD, RN,
Rush University College of Nursing

Wrenetha Julion, PhD, RN,
Rush University College of Nursing

Louis Fogg, PhD,
Rush University College of Nursing

Sharon Tucker, PhD, RN, and
Mayo Clinic

Hartmut Mokros, PhD
Rutgers University

Abstract

This study tested the efficacy of a 12-session parent training program, the Chicago Parent Program (CPP), which was developed in collaboration with African American and Latino parents. Using growth curve modeling, data were analyzed from 253 parents (58.9% African American, 32.8% Latino) of 2–4 year old children enrolled in 7 day care centers serving low-income families. Day care centers were matched and randomly assigned to intervention and waiting-list control conditions. At 1-year follow-up, intervention group parents used less corporal punishment and issued fewer commands with their children. Intervention children exhibited fewer behavior problems during observed play and clean-up sessions than controls. Additional group differences were observed when dose was included in the analytic model. Parents who participated in at least 50% of CPP sessions also reported greater improvements in parenting self-efficacy, more consistent discipline, greater warmth, and a decline in child behavior problems when compared to reports from controls. The implications of these results for preventive parent training with low-income African American and Latino parents and the role of intervention dose on parent-child outcomes are discussed.

Keywords

parent training; ethnic minority; prevention; preschool

Parent training is one of the most widely studied interventions for reducing childhood behavior problems, increasing positive parenting behaviors, and reducing parent reliance on harsh disciplinary strategies (Kazdin, 1997; McMahon, 1999; Sanders, 2007). Moreover, many studies have shown that parent training effects can be maintained over time (Gross et al., 2003; Irvine, Biglan, Smolkowski, Metzler, & Ary, 1999; Strayhorn & Weidman, 1991; Webster-Stratton, 1998b). As a result, parent training is increasingly used, both exclusively or as a component of more comprehensive prevention programs to reduce behavioral risk among children from low-income families (Conduct Problems Prevention Group, 1999; Dumas, Prinz, Smith, & Laughlin, 1999; Gottfredson et al., 2006).

Preventive interventions targeting low-income families typically include a large number of African-American and Latino families, primarily due to the fact that these ethnic minority groups are disproportionately represented among those living in poverty (Corcoran & Adams, 1997). Yet many of the empirically-supported interventions used to help low-income and ethnic minority parents were originally developed and tested on middle-income and non-Latino White samples (Coard, Wallace, Stevenson, & Brotman, 2004; Forehand & Kotchick, 1996; Gorman & Balter, 1997).

Research shows that economically disadvantaged families tend to receive less benefit from parent training than families from higher socioeconomic groups (Lundahl, Risser, & Lovejoy, 2006), a finding some have attributed to the various correlates of economic disadvantage (Dumas & Wahler, 1983). However, it is possible that diminished parent training effectiveness may also be due to low social validity and the perception among low-income parents that these programs are not geared to their immediate concerns as parents raising young children in highly stressful environments (Gottfredson et al., 2006).

These concerns were integral to the design of a new parent training program called the Chicago Parent Program. The purpose of this study was to test the efficacy of the Chicago Parent Program (CPP) for promoting positive parenting and reducing behavior problems in 2–4 year old African American and Latino children enrolled in day care centers serving low-income families. The CPP was developed in collaboration with a parent advisory group of African American and Latino parents from a range of economic backgrounds so it would be culturally and contextually relevant for ethnic minority and low-income parents raising young children in urban communities.

One of the most effective parent training programs developed to date has been the Incredible Years BASIC Program (IYP; Brestan & Eyberg, 1998; Webster-Stratton, 1998b). The IYP uses videotaped vignettes of parent-child interactions, group discussion, and a “collaborative process” for supporting parenting self-efficacy and problem-solving skills (Webster-Stratton, 1998a). Created over 25 years ago, the IYP was not specifically designed for low-income, ethnic minority parents of preschool children and the majority of families depicted in the scenes are Caucasian.

To examine the generalizability of IYP, three studies evaluated its effectiveness for preventing behavior problems in young ethnic minority preschool children. Reid et al. (Reid, Webster-Stratton, & Beauchaine, 2001) analyzed IYP effects among parents and children from Seattle-area Head Start centers (19% African American, 11% Hispanic, 12% Asian American, and 58% non-Hispanic White). Although at 1-year follow-up, intervention group parents had significant and sustained improvements in parenting behavior and attitudes, initial reductions in observed child behavior problems were not maintained. Gross et al. (2003) also showed improvements in parenting behaviors from the IYP among low-income, largely African-American (57%) and Latino (29%) parents of toddlers in Chicago. However, there were no lasting reductions in child behavior problems based on parent reports or observer ratings at the 1-year follow-up. Similarly, Brotman et al. (2003) found significant initial improvements in parent responsiveness and a decrease in parental reports of behavior problems in 20 African American and 10 Latino preschool children in New York following IYP. However, these effects were not maintained at the 6-month follow-up.

The Chicago Parent Program (CPP)

The Chicago Parent Program (CPP) is grounded in the assumption that parents play a critical role in shaping a child’s behavior and personality both as role models, as social learning theory suggests (Bandura, 1997), and through the quality and consistency of behavioral interaction (Patterson, 1982). The CPP therefore reinforces parent behaviors that increase positive

attention for desired child behavior and reduce harsh and inconsistent responses to problematic child behavior. The CPP capitalizes on the strengths of the Webster-Stratton model as it also employs videotaped vignettes, a group discussion format that corresponds to principles being addressed in each of the vignettes, and a collaborative interpersonal style for guiding the way group leaders engage parents in the intervention. Parents receive weekly homework assignments and handouts summarizing important points from each session.

Unique to the development of the CPP is its design in partnership with a parent advisory council of seven African-American and five Latino parents from different Chicago neighborhoods. This council advised the program authors on (a) challenging situations they faced as parents, (b) the types of situations and contexts they'd like to see on videotape, and (c) how to optimally depict parenting strategies in a manner congruent with their values, lifestyle, and culture (Gross, Garvey, Julion, & Fogg, 2007).

The perspectives of the advisory council about the acceptability and effectiveness of different discipline strategies, about how stress affects their parenting, and about why strategies such as time-out and parent-child play are sometimes viewed as a White, middle-class value provided important insights for the design of the CPP. In addition, once completed, the advisory council reviewed and assessed the program's content and videotaped scenes for their usefulness and relevance. Based on their feedback, only those scenes rated as useful and relevant were retained in the program (for more information on the development of the CPP, see Gross, Garvey, Julion, & Fogg, 2007).

The topics covered in the 11-weekly CPP sessions include: the concept of child-centered time; the importance of family routines and traditions; the value of praise and encouragement; the role of rewards for reducing challenging behavior; the importance of setting clear limits and of following through on limit-setting; the need to establish consequences in response to misbehavior parents want stopped; and the use of specific parenting strategies such as ignore, distract, and time-out; stress management; and problem-solving skills. Two months after the 11th session, a booster session is offered to help parents continue using the program principles without the ongoing support of the parent group. Videotaped scenes were filmed in parents' homes and in public places (e.g., a grocery store, a Laundromat) to portray situations that are familiar, relevant, and stressful for parents. Of the families depicted in these scenes, 46% are African American, 23% are Latino, and 31% are non-Latino White. The narrator is a Latina.

CPP design did not involve the development of intervention modules specifically tailored to whether the parent audience is African American or Latino. Indeed, the primary contribution provided by the parent advisory council was to assure that the CPP is structured so that program principles and scenes are maximally relevant across racial/ethnic groups. Thus, the CPP exposes all parent groups to the same weekly protocols. Nonetheless, parent groups frame discussions of CPP concepts in culturally specific ways. For example, during the session on managing stress, Latino parents may talk about the stress of being immigrants and concerns about maintaining traditions in a non-Latino world while African American parents may talk about the stress of racism and how that affects their parenting behavior.

Initial examination of the CPP, which included 253 families of 2–4 year old children attending day care (92% African-American or Latino), reported short term efficacy in reducing child behavior problems. The study also noted a high level of parental satisfaction with the parent training protocol (Gross et al., 2007). Specifically, significant improvements of children's classroom behavior problems, based on teacher ratings, were reported following completion of parent training. In addition, 88% of participating parents reporting they would "highly recommend" the program to other parents and the remaining 12% of parents reporting they would "recommend" the program. There were no differences between Latino and African-

American parents on their program satisfaction scores. The current study furthers our understanding of CPP efficacy by assessing its effect on parent-child outcomes over a longer period of time. Therefore, the purpose of this study is to test the efficacy of the CPP for improving parenting and reducing child behavior problems in a low-income community sample of African American and Latino parents and their young children up to 1-year post-intervention.

Method

Participants

Seven Chicago day care centers were chosen to participate in the study. Day care center inclusion criteria were that the center (a) had over 90% of their families eligible to receive low-income childcare subsidies, (b) was licensed by the Department of Children and Family Services, (c) provided full-day child care, (d) enrolled at least 60 children in the target age group, (e) had space on site to run a weekly parent group, and (f) director was willing to allow their site to be randomized. Eight centers meeting these criteria were approached for participation and seven agreed to participate. One center refused participation because they could not commit to providing the space and resources needed to support weekly parent groups (see Figure 1).

The day care centers were matched on size, racial/ethnic composition, percent single-parent households, and median income and randomly assigned to an intervention or control condition. Participants in the control condition completed all measures but did not receive the intervention. After two years, new parents were recruited from these centers to serve in the intervention condition and receive the CPP (i.e., control group parents did *not* receive the intervention at a later point in the study).

Participants needed to be a parent or legal guardian of a 2–4 year old child enrolled at the participating center and speak English. Only one child per parent was included in the study. If more than one child in the family met the age criterion, the youngest child within the target age range was selected for the study.

The target population included 858 families enrolled in the seven day care centers (3 intervention, 4 waiting-list control centers). From this population, 292 parents (156 intervention, 136 control) enrolled in the study (34% of eligible population). There were no differences between the target population and the sample on racial/ethnic group, median income, single-parent status, and child gender.

Equivalence of baseline scores by condition was examined for the demographic variables and each of the parent and child outcomes. There were no differences between intervention and control parents on parent age, educational level, employment status, marital status, or child age. However, there were significant differences between these two groups on parent race/ethnicity, $\chi^2(3, N = 253) = 11.4, p < .01$; and child gender, $\chi^2(1, N = 253) = 5.5, p < .05$. Specifically, there were more Latino parents in the intervention group (37%) than in the control group (28%) and fewer boys in the intervention group (48.9%) than in the control group (63.6%). To control for baseline differences on ethnicity and child gender, these variables were included as covariates in the analytic models.

Compared to the intervention group, control group parents used fewer positive parent behaviors during play, $t(249) = -2.78, p < .01$; and their children exhibited fewer aversive behaviors during play, $t(213) = -2.57, p < .05$; and clean-up, $t(179) = -2.45, p < .05$. There were no baseline differences on the parent-reported variables or any other observed parent-child variables.

Procedures

Parents were recruited from intervention or control centers from 2002–2004 and assessed at baseline, post-intervention (3-months after baseline), 6-months post-intervention, and 1-year post-intervention. These assessment intervals are consistent with guidelines established by the Society for Prevention Research requiring at least one long-term follow-up of at least 6 months after the intervention (Flay et al., 2005). At each of the four assessment intervals, parents completed a set of questionnaires and were videotaped with their child. Parents in both conditions were paid \$30 for each completed set of questionnaires and videotaped session (maximum total of \$120). If parents remained in the study through the 1-year follow-up assessment, they also received a copy of their videotaped play and clean-up sessions. Parents attending the intervention received free childcare and dinner at each session but they were not paid to attend the intervention.

Parent groups were led by two facilitators hired, trained, and supervised by the study investigators. Over the course of the study, 10 group leaders led 16 parent groups at participating day care centers. Five group leaders were African-American, 3 were Mexican-American, and 2 were non-Latino White. Nine group leaders had graduate degrees in nursing, psychology, or another health-related field and one had a bachelor's degree. Efforts were made to ensure that at least one of the group leaders at each site was from the same ethnic or racial group as the majority of parents served at that site. Group leaders completed a weekly protocol checklist to assess whether the CPP was being implemented consistently across sessions and group leaders. Random observations of parent groups were also conducted by one of the authors to assure intervention fidelity.

Videotaped sessions included a 15-minute free play during which parents were asked to play with their child as they normally would. At the end of the 15 minutes, the data collector would stop the play and introduce a new set of toys in a bag to be emptied out onto the floor. The data collector then let the parent and child play with the new set of toys for 5 minutes. This 5-minute play was used to allow the parent and child time to get used to the new toys and was not coded. At the end of the five minutes, the parent was asked to try and get the child to clean-up the toys but was instructed to do so without touching the toys (to prevent the parent from cleaning up the toys themselves). The clean-up session was videotaped for up to five minutes. These play and clean-up sessions were later coded by 12 research assistants (9 non-Latino White, 2 Latino, and 1 Asian; 7 female) blind to experimental group assignment. Research assistants were provided 100–130 hours of training in the use of the DPICS and demonstrated at least 90% inter-rater reliability in coding test tapes prior to coding study tapes. Inter-rater reliabilities were subsequently calculated on a random selection of 58 videotaped sessions.

Variables and Measures

Parent outcomes of interest were parenting self-efficacy, discipline strategies, and parent behavior during the free-play and clean-up sessions. Child outcomes were frequencies of behavior problems based on parent report and observation during the free-play and clean-up sessions. Variables and measures are described below.

Parenting self-efficacy—The Toddler Care Questionnaire (TCQ; Gross & Rocissano, 1988) was used to assess parenting self-efficacy. This 38-item scale rates a single dimension of parenting confidence in managing tasks and situations pertinent to raising young children (e.g., confidence in managing toilet training, setting limits in destructive behavior). Scale scores may range from 38 (indicating very little parenting confidence) to 190 (indicating a great deal of parenting confidence). The validity of the TCQ has been supported in prior research showing significant associations with child development knowledge (Conrad, Gross, Fogg, & Ruchala, 1992) and parent-child outcomes (Gross, Conrad, Fogg, & Wothke, 1994;

Gross, Fogg, & Tucker, 1995; Morawska & Sanders, 2006). Alpha reliability of the scale score in the current study was .94.

Parent discipline strategies—The Parenting Questionnaire (PQ; McCabe, Clark, & Barnett, 1999) was adapted with permission for use in this study. The PQ was originally developed for a study of protective factors in African-American urban families of 6th grade children. In its original form, the PQ contains three subscales that were associated with child behavior including parent demandingness (23 items), warmth (22 items), and corporal punishment (5 items). Parents rate each item on a scale of 1 (*almost never*) to 5 (*very often*).

Some items on the demandingness scale were not appropriate for very young children and the scale's internal consistency reliability in this sample was low (.45). However, six items were relevant to parents of toddlers and captured well their ability to set and maintain a standard of behavior for their children. These items were: "There are times when I just don't have the energy to make my child behave as he/she should," "My child can talk me into letting him/her off easier than I had intended," "My child convinces me to change my mind after I have refused a request," "I threaten punishment but do not end up punishing my child," "I give my child too many chances when they misbehave," and "Even when my mind is made up my child can change my opinion." The alpha reliability of this set of items, labeled *following through on discipline*, was .80. Alpha reliabilities of the corporal punishment and warmth subscales were .68 and .84, respectively.

Parent behavior—Observed parent behavior was assessed from the free-play and clean-up sessions using the Dyadic Parent-Child Interactive Coding System-Revised (DPICS-R; Webster-Stratton, 1998b). The DPICS-R has been used extensively by Webster-Stratton and others and has been highly sensitive to parent training effects (Gross et al., 2003; Tucker, Gross, Fogg, Delaney, & Lapporte, 1998; Webster-Stratton, 1998b). Two sets of parent behaviors were assessed. The first was a ratio of the sum of all positive parent behaviors (labeled praise, unlabeled praise, acknowledgements, positive physical behaviors, and positive parent affect) divided by all negative parent behavior (critical statements, physical negative behaviors, negative commands). Inter-rater reliability using intraclass correlation was .90. This ratio, which was positively skewed, was transformed to create a normally distributed variable called *positive parent behavior* using a logit transformation.

A second variable, *total commands*, was created from the sum of all commands given by the parent. Inter-rater reliability for total commands using intra-class correlation was .88. Total commands and positive parent behavior were estimated separately for the play and clean-up sessions.

Child behavior problems—Child behavior problems were measured by parent report and by observational coding of aversive child behavior. Parent-reported child behavior problems were measured using the Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999), a 36-item survey designed for parents of children 2–16 years old. Each item is measured along two scales. The Intensity Scale assesses parent perception of the frequency of each child problem on a scale of 1 (*the behavior never happens*) to 7 (*the behavior is always happening*). The Problem Scale indicates whether each of the child behaviors listed is considered by the parent to be a problem with the target child on a binary scale (scored as *yes* or *no*). The validity of the ECBI has been reported in previous studies (Doctoroff & Arnold, 2004; Gross et al., 2007; Koniak-Griffin & Verzemnieks, 1995). Alpha reliability of the Intensity and Problem Scale scores in the current study were .91 and .92, respectively.

Aversive child behavior was assessed based on observed frequencies of seven problem behaviors coded separately from the videotaped play and clean-up sessions using the DPICS-

R (Webster-Stratton, 1998b). Aversive child behavior was the summed frequencies of all child non-compliance, destructive behavior, physically negative behavior, crying, whining, yelling, and smart talk. Inter-rater reliability for aversive child behavior using intraclass correlations was .73.

Results

Intervention Dose

Intervention dose was calculated as number of CPP sessions attended by intervention group parents, not including the booster session (range = 0–11 sessions). Mean dose was 4.3 ($SD = 4.2$) group sessions. Approximately one third ($n = 51$) of parents did not attend any parent group sessions. Among the 135 parents enrolled in the CPP, 54.8% ($n = 74$) attended five or fewer of the 11 group sessions. Parents who participated in the booster session ($n = 44$) were also more likely to have attended 6 or more parent group sessions, $\chi^2(1, 135) = 44.1, p < .001$. It was hypothesized that dose of intervention would affect parent and child outcomes. Therefore, analyses were run twice for each dependent variable, first comparing outcomes for the intervention and control conditions and again with dose added in the model to examine its effect on the dependent variables. For the second set of analyses, intervention dose was divided into three levels of control group, *low dose* (0 – 5 sessions), and *high dose* (6–11 sessions). The decision to define high dose at 6 or more sessions was based on median split of attendance among intervention parents.

Demographic and study variables were examined at baseline to determine if there were differences between parents and children in the low and high dose level groups. There were no demographic differences between these two groups. However, children in the high dose group demonstrated more baseline problem behaviors than the low dose group on aversive child behaviors, $t(131) = -2.7, p < .01$; and on the ECBI Intensity Scale, $t(133) = -2.0, p = .05$.

Sample Attrition

Figure 1 presents the flow of participants in the study. Thirty nine (13%) participants dropped out of the study before their 1-year follow-up. Attrition in the control condition was attributed to 17 parents (12.5%) who were lost to follow-up and one parent (0.7%) who withdrew. Attrition in the intervention condition was attributed to 11 parents (7.1%) lost to follow-up, 9 parents (5.8%) who withdrew, and 1 parent who was dropped from the study due to emotional problems that interfered with her ability to participate in group discussion. There were no differences between those who completed the study and those who did not on any of the study variables. Demographic data for the final sample is shown in Table 1.

Summary of the Analytic Model

To minimize potential site effects, sites were assigned to blocks using stochastic matching (Rassler, 2002), a method using aggregate information to create equivalent groups. The two groups were matched on race/ethnicity, household income, proportion of single-parent households, and number of children enrolled in the day care center. This method of matching is an extension of propensity matching (Rubin, 1987), which assumes that random fluctuations will not affect the equivalence of two matched samples. In propensity matching, the values are aggregated across variables while in stochastic matching the values are aggregated across individuals. The matched groups were then randomly assigned to the intervention and control conditions. To confirm that stochastic matching had been effective, site effects were then examined using the baseline dependent variables in a random effects model. No significant site effects were found for any of the dependent variables.

This study employed an intent-to-treat model. The effectiveness of the CPP for improving parent and child outcomes up to 1-year post-intervention was analyzed using growth curve modeling with the SAS software program, PROC MIXED. The dependent variables were parenting self-efficacy, parental warmth, following through on discipline, use of corporal punishment, total commands, positive parent behavior, parent-reported child behavior problems, and aversive child behavior. In the first set of analyses, the independent variables included experimental group, Latino ethnicity, and child gender (the last two variables were included to control for baseline differences found by experimental condition). A second set of analyses then included dose level. In both sets of analyses, participants were nested within daycare centers and daycare centers were crossed with intervention condition. The model had a random component for individual and intercept, and fixed effects for time, ethnicity (dummy-coded for Latino or non-Latino), a three level linear dose effect (control group, low dose level of intervention, high dose level of intervention coded as 0, 1 and 2, respectively), and interaction effects for dose level and time. Two effect sizes, Cohen's d and η^2 are reported for each dependent variable representing the difference in means and rate of change between intervention and control groups (for the first set of analyses without dose level) or between the control and high dose level groups (for the second set of analyses which included dose level). All effects reported are from baseline to the 1-year follow-up.

Parent-child interaction videotapes for two participant dyads were incomplete. Therefore, the final sample used to analyze data from parent questionnaires (parenting self-efficacy, discipline strategies, and parent-reported child behavior problems) was 253 and to analyze parent-child interaction outcomes (positive parent behavior, total commands, aversive child behavior) was 251.

In this analysis, we chose degrees of freedom based on the number of participants and data collection intervals. However, we acknowledge that there are other approaches for calculating degrees of freedom for cluster-randomized trials. The strategy employed in this study is consistent with that recommended by Singer and Willet (2003) and used in other similar studies (e.g., Schoenwald, Carter, Chapman, & Sheidow, 2008). To determine whether center effects would significantly alter the analyses, we reanalyzed the data in PROC MIXED using two alternative statistical methods for estimating degrees of freedom that simultaneously adjust for center effects: Satterthwaite and Kenward-Roger approximations (Giesbrecht & Burns, 1985; Kenward & Roger, 1997). Both sets of analyses arrived at nearly identical results as obtained using numbers of participants and data collection intervals for calculating degrees of freedom, suggesting that the stochastic matching strategy was successful in minimizing center effects in this study.

Center Intraclass Correlations

Intraclass correlations were calculated to estimate the amount of variance explained by center effects. None of the intraclass correlations were significant. The median center variance accounted for across the dependent variables was 2.5% (range = 0% – 14.0%).

Effect of CPP on Parenting Self-Efficacy, Discipline, and Parent Behavior

Final model estimates for parenting self-efficacy, warmth, following through on discipline, corporal punishment, positive parent behavior, and total commands by condition and dose level are displayed in Table 2 and Table 4. Comparing intervention and control conditions, intervention parents used less corporal punishment, $F(1, 818) = 5.39, p < .05, d = -.24, \eta^2 = .011$; and fewer commands during the play session, $F(1, 992) = 4.72, p < .05, d = -.32, \eta^2 = .011$; and clean-up session, $F(1, 984) = 7.65, p < .01, d = -.29, \eta^2 = .024$. However, there was no effect of the intervention on parenting self-efficacy, $F(1, 818) = 1.81, p = .18, d = .23, \eta^2 = .004$; following through more consistently on discipline, $F(1, 818) = 1.60, p = .21, d = .08$,

$\eta^2 = .008$; and showing greater warmth, $F(1, 818) = 1.88, p = .17, d = .11, \eta^2 = .014$. At 1-year post-intervention, control parents exhibited greater improvements in positive behavior during play, $F(1, 992) = 4.52, p < .05, d = -.18, \eta^2 = .020$. There were no differences in positive parent behavior during the clean-up session, $F(1, 984) = .03, p = .51, d = -.06, \eta^2 = .016$.

Different outcomes were found when dose level was included in the analytic model. There was a linear effect for dose level on parenting self-efficacy, $F(1, 818) = 3.69, p < .05, d = .37, \eta^2 = .013$, indicating that CPP had a significant effect on parenting self-efficacy for parents who attended at least half of the parent group sessions. There was also a linear dose effect on parents' reports of following through more consistently on their discipline, $F(1, 818) = 6.99, p < .01, d = .29, \eta^2 = .044$; using less corporal punishment, $F(1, 818) = 7.66, p < .01, d = -.30, \eta^2 = .022$; and showing greater warmth with their children, $F(1, 818) = 3.37, p < .05, d = .08, \eta^2 = .026$. Parents who attended at least half of CPP sessions also issued fewer total commands during the observed free play, $F(1, 992) = 6.55, p < .01, d = -.49, \eta^2 = .013$; and clean-up session, $F(1, 984) = 11.59, p < .001, d = -.38, \eta^2 = .031$. However, there were no CPP dose level effects found for positive parent behavior during the free play session, $F(1, 992) = 2.16, p = .14, d = -.06, \eta^2 = .025$; and clean-up session, $F(1, 984) = .03, p = .85, d = -.00, \eta^2 = .020$.

Effect of CPP on Child Behavior Problems

Final model estimates for parent-reported child behavior problems and observed aversive child behaviors by experimental condition and dose level are presented in Table 3 and Table 4.

Comparing intervention to control conditions, children of parents in the intervention group exhibited fewer aversive behaviors during the play session, $F(1, 992) = 7.14, p < .01, d = -.43, \eta^2 = .012$; and clean-up session, $F(1, 984) = 56.94, p < .01, d = -.46, \eta^2 = .014$. However, there were no intervention effects on parent-reports of child behavior problems on the ECBI Intensity, $F(1, 818) = 1.55, p = .21, d = -.17, \eta^2 = .006$; or Problem Scales, $F(1, 818) = 1.16, p = .28, d = -.10, \eta^2 = .003$.

When dose level was added into the model, analyses showed significant linear effects for dose level on child behavior problems as measured by parent report and observation. Children of parents attending at least half of the group sessions had fewer behavior problems on the ECBI Intensity Scale, $F(1, 818) = 3.96, p < .05, d = -.31, \eta^2 = .013$; and fewer aversive behaviors during the free play session, $F(1, 992) = 16.60, p < .001, d = -.64, \eta^2 = .038$; and clean-up session, $F(1, 984) = 9.32, p < .001, d = -.46, \eta^2 = .019$. No significant changes were found on ECBI Problem Scale scores by dose level, $F(1, 818) = 1.55, p = .21, d = -.09, \eta^2 = .008$.

Discussion

The purpose of this study was to test the efficacy of the Chicago Parent Program (CPP) for promoting positive parenting and reducing child behavior problems in African-American and Latino parents of young children from low-income urban communities. The results of this study indicate that the CPP was effective for reducing parent reliance on corporal punishment, number of commands, and observed child behavior problems up to 1-year post-intervention. However, the greatest effects were found when analyses accounted for the number of intervention group sessions parents attended. Parents who attended at least 50% of the CPP sessions reported increased parenting self-efficacy, increased consistency in their use of discipline, greater expression of warmth toward their children, and fewer child behavior problems than control parents.

Parent attendance rates were low with average attendance at 4.3 of 11 CPP sessions. Although these participation rates are not inconsistent with those reported in other preventive parent training studies (Irvine et al., 1999; Myers, Alvy, Arrington, & al., 1992; Orrell-Valente,

Pinderhughes, Valente, Laird, & Conduct Problems Prevention Group, 1999), low attendance rates diminish intervention effectiveness and increase the potential for Type II error.

Inclusion of dose level in the analyses was crucial for detecting some parent training effects. Mean effect sizes for observed child behavior problems, parent use of commands, and parenting self-efficacy increased by 50% when dose level was included in the model. Thus, children of parents who attended the most sessions appear to have reaped the greatest benefit.

A limitation of the study design is that parents were not randomly assigned to dose level; parents chose how many CPP group sessions they attended. As a result, it is possible that other factors associated with parent attendance may have accounted for improvements in child behavior. For example, children in the high dose level group had more baseline behavior problems scores than children in the low dose level group. This finding is consistent with others who report higher participation rates among parents whose children have more behavior problems (Haggerty et al., 2002; Heinrichs, Bertram, Kuschel, & Hahlweg, 2005; Reid, Webster-Stratton, & Baydar, 2004) and who wish to improve their parenting skills (Gross, Julion, & Fogg, 2001; Perrino, Coatsworth, Briones, Pantin, & Szapocznik, 2001). Thus, it appears that parents of children with more challenging behavior attend more sessions. This suggests that preventive parent training is engaging those parents it is designed to help. However, the greater reduction in child behavior problems found among the children in the high dose group may be the result of a regression toward the mean. It is also possible that parents who are able to follow through more consistently with attending a parent group may also be more likely to follow through on their discipline and other strategies taught in parenting programs. It would be useful to conduct a controlled examination of the effects of different dose levels on preventive parent training outcomes to control for confounds associated with individual differences in parent attendance and better understand the role of intervention dose.

The greatest decrease in observed child behavior problems occurred at 6 months post-intervention which were maintained at the 1 year follow-up. This pattern suggests that child behavior improvements may have resulted from the accrued effects of improved parent behavior. For example, higher intervention dose levels were associated with increases in warmth and reductions in parents' use of corporal punishment. Research shows that high levels of maternal warmth coupled with low levels of corporal punishment during the preschool years predict greater self-regulation in later childhood (Colman, Hardy, Albert, Raffaelli, & Crockett, 2006). It is possible that an accumulation of improvements in parenting behavior may have led to greater self-regulation in the children. Future research will examine the mediational role of improvements in parenting behavior on improvements in children's behavior.

Although the CPP led to decreases in corporal punishment, intervention parents were never admonished to not spank their children. This intervention decision was based on the advice of the parent advisory council and on the literature indicating greater acceptance of spanking among African-American and Mexican-American parents (Baumrind, 1996; Frias-Armenta & McCloskey, 1998; Horn, Cheng, & Joseph, 2004; McCabe, Yeh, Garland, Lau, & Chavez, 2005). Instead, many non-physical discipline strategies were offered to parents in the program. In addition, videotaped scenes showed parents using strategies such as time-out in a variety of contexts, including public places. For example, two scenes show an African-American mother giving her son a time-out in a Laundromat. Scenes like these may help parents understand how such strategies can be effectively used in different contexts.

Despite the positive results, some important limitations remain. First, there were significant baseline differences for positive parent behavior and child aversive behavior between intervention and control participants. Although the analyses examine rate of change rather than mean difference, this non-equivalence is a design limitation. Second, we did not examine the

differential effectiveness of the Chicago Parent Program by parent race or ethnicity. Although African-American and Latino parents were involved in the development of this program, it is possible that this intervention is more effective for one group than another. In addition, Latino parents of different descent were commingled in the analyses (i.e., parents of Mexican, Puerto Rican, and “other” Latin descent), even though there is substantial cultural heterogeneity across these subgroups. Due to concerns about limited power to adequately test a hypothesis of differential effectiveness by racial and ethnic group, this question remains unanswered.

Another limitation was that only English-speaking Latino parents were recruited into this study. The Chicago Parent Program has since been translated into Spanish and future research will examine its effectiveness for Spanish-speaking Latino parents. The need for all Latinos to have access to empirically supported parenting programs is particularly crucial given projections that by 2010, Latinos will become the largest ethnic minority group in the United States (Zambrana & Logie, 2000).

Nonetheless, the findings provide support for the efficacy of the Chicago Parent Program. This remains one of the few studies showing sustained improvements in young children’s behavior problems from preventive parent training delivered to economically disadvantaged African American and Latino families. These results also suggest that parent training programs designed in partnership with parents can be effective for a culturally and economically diverse population of parents.

Acknowledgments

The authors acknowledge the support of the participating day care centers and parents and the extraordinarily helpful comments of David Henry, Daniel Shaw, David Olds, Lauren Wakschlag, Susan Breitenstein, Alison Ridge, and the anonymous reviewers. This study was supported by a grant from the National Institute for Nursing Research, #R01 NR004085.

References

- Bandura, A. *Self-efficacy: The exercise of control*. New York: W.H. Freeman & Company; 1997.
- Baumrind D. The discipline controversy revisited. *Family Relations* 1996;44:405–414.
- Brestan E, Eyberg S. Effective psychosocial treatments of conduct-disordered children and adolescents: 29 years, 82 studies, and 5,272 kids. *Journal of Clinical Child Psychology* 1998;27:180–189. [PubMed: 9648035]
- Brotman LM, Klein R, Kamboukos D, Brown EJ, Coard SI, Sosinsky LS. Preventive intervention for urban, low-income preschoolers at familial risk for conduct problems: A randomized pilot study. *Journal of Clinical Child and Adolescent Psychology* 2003;32:246–257. [PubMed: 12679283]
- Coard SI, Wallace SA, Stevenson HC, Brotman LM. Towards culturally relevant preventive interventions: The consideration of racial socialization in parent training with African American families. *Journal of Child and Family Studies* 2004;13:277–293.
- Colman RA, Hardy SA, Albert M, Raffaelli M, Crockett L. Early predictors of self-regulation in middle childhood. *Infant and Child Development* 2006;15:421–437.
- Conduct Problems Prevention Group. Initial impact of the Fast Track Prevention Trial for conduct problems: I. The high risk sample. *Journal Consulting and Clinical Psychology* 1999;67:631–647.
- Conrad B, Gross D, Fogg L, Ruchala P. Maternal confidence, knowledge, and quality of mother-toddler interaction: A preliminary study. *Infant Mental Health Journal* 1992;13:353–362.
- Corcoran, M.; Adams, T. Race, sex, and the intergenerational transmission of poverty. In: Duncan, DJ.; Brooks-Gunn, J., editors. *Consequences of growing up poor*. New York: Russell Sage Foundation; 1997. p. 461-517.
- Doctoroff GL, Arnold D. Parent-rated externalizing behavior in preschoolers: The predictive utility of structured interviews, teacher reports, and classroom observations. *Journal of Clinical Child and Adolescent Psychology* 2004;33:813–818. [PubMed: 15498748]

- Dumas J, Prinz RJ, Smith EP, Laughlin J. The Early Alliance prevention trial: An integrated set of interventions to promote competence and reduce risk for conduct disorder, substance abuse, and school failure. *Clinical Child and Family Psychology Review* 1999;2:37–53. [PubMed: 11324096]
- Dumas J, Wahler R. Predictors of treatment outcome in parent training: Mother insularity and socioeconomic disadvantage. *Behavioral Assessment* 1983;5:301–313.
- Eyberg, S.; Pincus, D. *Eyberg Child Behavior Inventory and Sutter-Eyberg Student Behavior Inventory-Revised: Professional manual*. Odessa, FL: Psychological Assessment Resources; 1999.
- Flay BR, Biglan A, Boruch RF, Castro FG, Gottfredson D, Kellam S, Moscicki EK, Schinke S, Valentine JC, Ji P. Standards of evidence: Criteria for efficacy, effectiveness, and dissemination. *Prevention Science* 2005;6:151–175. [PubMed: 16365954]
- Forehand R, Kotchick B. A wake-up call for parent training. *Behavior Therapy* 1996;27:187–206.
- Frias-Armenta M, McCloskey L. Determinants of harsh parenting in Mexico. *Journal of Abnormal Child Psychology* 1998;26:129–139. [PubMed: 9634135]
- Giesbrecht FG, Burns JC. Two-stage analysis based on a mixed model: Large-sample asymptotic theory and small-sample simulation results. *Biometrics* 1985;41:477–486.
- Gorman JC, Balter L. Culturally sensitive parent education: A critical review of quantitative research. *Review of Educational Research* 1997;67:339–369.
- Gottfredson D, Kumpfer K, Polizzi-Fox D, Wilson D, Puryear V, Beatty P, et al. The Strengthening Washington DC Families Project: A randomized effectiveness trial of family-based prevention. *Prevention Science* 2006;7:57–74. [PubMed: 16555144]
- Gross D, Conrad B, Fogg L, Wothke W. A longitudinal model of maternal self-efficacy, depression, and difficulty temperament during toddlerhood. *Research in Nursing & Health* 1994;17:207–215. [PubMed: 8184132]
- Gross D, Fogg L, Tucker S. The efficacy of parent training for promoting positive parent-toddler relationships. *Research in Nursing & Health* 1995;18:489–499. [PubMed: 7480850]
- Gross D, Fogg L, Webster-Stratton C, Garvey C, Julion W, Grady J. Parent training with multi-ethnic families of toddlers in day care in low-income urban communities. *Journal of Consulting and Clinical Psychology* 2003;71:261–278. [PubMed: 12699021]
- Gross D, Fogg L, Young M, Ridge A, Cowell J, Sivan A, et al. Reliability and validity of the Eyberg Child Behavior Inventory with African American and Latino parents of young children. *Research in Nursing & Health* 2007;30:213–223. [PubMed: 17380522]
- Gross, D.; Garvey, C.; Julion, W.; Fogg, L. Preventive parent training with low-income, ethnic minority parents of preschoolers. In: Briesmeister, JM.; Schaefer, CE., editors. *Handbook of parent training: Helping parents prevent and solve problem behaviors*. Vol. 3rd ed.. Hoboken, NJ: John Wiley & Sons; 2007. p. 5-24.
- Gross D, Julion W, Fogg L. What motivates participation and drop-out among low-income urban families of color in a prevention intervention? *Family Relations* 2001;50:246–254.
- Gross D, Rocissano L. Maternal confidence in toddlerhood: Its measurement for research and clinical practice. *Nurse Practitioner* 1988;13:19–22. 28–29. [PubMed: 3374866]
- Haggerty KP, Fleming CB, Lonczak HS, Oxford ML, Harachi TW, Catalano R. Predictors of participation in parenting workshops. *The Journal of Primary Prevention* 2002;22:375–387.
- Heinrichs N, Bertram H, Kuschel A, Hahlweg K. Parent recruitment and retention in a universal prevention program for child behavior and emotional problems: Barriers to research and program participation. *Prevention Science* 2005;6:275–286. [PubMed: 16075192]
- Horn IB, Cheng TL, Joseph J. Discipline in the African American community: The impact of socioeconomic status on beliefs and practices. *Pediatrics* 2004;113:1236–1241. [PubMed: 15121935]
- Irvine A, Biglan A, Smolkowski K, Metzler C, Ary D. The effectiveness of a parenting skills program for parents of middle school students in small communities. *Journal Consulting and Clinical Psychology* 1999;67:811–825.
- Kazdin A. Parent management training: Evidence, outcomes, and issues. *Journal of the American Academy of Child and Adolescent Psychiatry* 1997;36:1349–1356. [PubMed: 9334547]
- Koniak-Griffin D, Verzemnieks J. The relationship between parental ratings of child behaviors, interaction, and home environments. *Maternal Child Nursing* 1995;23:44–56.

- Kenward MG, Roger JH. Small sample inference for fixed effects from restricted maximum likelihood. *Biometrics* 1997;53:983–997. [PubMed: 9333350]
- Lundahl B, Risser HJ, Lovejoy MC. A meta-analysis of parent training: Moderators and follow-up effects. *Clinical Psychology Review* 2006;26:86–104. [PubMed: 16280191]
- McCabe KM, Clark R, Barnett D. Family protective factors among urban African American youth. *Journal of Clinical Child Psychology* 1999;28:137–150. [PubMed: 10353074]
- McCabe KM, Yeh M, Garland AF, Lau AS, Chavez G. The GANA program: A tailoring approach to adapting Parent Child Interaction Therapy for Mexican Americans. *Education and Treatment of Children* 2005;28:111–129.
- McMahon, R. Parent training. In: Russ, S.; Ollendick, T., editors. *Handbook of psychotherapies with children and families*. New York: Kluwer Academic; 1999. p. 153-180.
- Morawska A, Sanders M. Self-administered behavioural family intervention for parents of toddlers: Effectiveness and dissemination. *Behavior Research and Therapy* 2006;44:1839–1848.
- Myers H, Alvy K, Arrington A, et al. The impact of a parent training program on inner-city African-American families. *Journal of Community Psychology* 1992;10:132–147.
- Orrell-Valente J, Pinderhughes E, Valente E, Laird R. Conduct Problems Prevention Group. If it's offered, will they come? Influences on parents' participation in a community-based conduct problems prevention program. *American Journal of Community Psychology* 1999;27(6):753–783. [PubMed: 10723534]
- Patterson, G. *Coercive family process*. Eugene, OR: Castalia; 1982.
- Perrino T, Coatsworth J, Briones E, Pantin H, Szapocznik J. Initial engagement in parent-centered preventive interventions: A family systems perspective. *Journal of Primary Prevention* 2001;22(1): 21–44.
- Rassler, S. *Statistical matching: A frequentist theory, practical applications, and alternative Bayesian approaches*. NY: Springer-Verlag; 2002.
- Reid J, Webster-Stratton C, Beauchaine T. Parent training in Head Start: A comparison of program response among African American, Asian American, Caucasian, and Hispanic mothers. *Prevention Science* 2001;2:209–227. [PubMed: 11833925]
- Reid MJ, Webster-Stratton C, Baydar N. Halting the development of conduct problems in Head Start children: The effects of parent training. *Journal of Clinical Child Psychology* 2004;33:279–291.
- Rubin, D. *Multiple imputation for nonresponse in surveys*. New York: John Wiley & Sons; 1987.
- Sanders, M. The Triple P-Positive Parenting Program: A public health approach to parenting support. In: Briesmeister, JM.; Schaefer, CE., editors. *Handbook of parent training: Helping parents prevent and solve problem behaviors*. Vol. 3rd ed.. Hoboken, NJ: John Wiley & Sons; 2007. p. 203-233.
- Schoenwald SK, Carter RW, Chapman JE, Sheidow AJ. Therapist adherence and organizational effects on change in youth behavior problems one year after multisystemic therapy. *Administration and Policy in Mental Health and Mental Health Services Research* 2008;35:379–394. [PubMed: 18561019]
- Singer, JB.; Willett, JB. *Applied longitudinal data analysis: Modeling change and event occurrence*. NY: Oxford University Press; 2003.
- Strayhorn JM, Weidman CS. Follow-up one year after parent-child interaction training: Effects on behavior of preschool children. *Journal of the American Academy of Child and Adolescent Psychiatry* 1991;30:138–143. [PubMed: 2005049]
- Tucker S, Gross D, Fogg L, Delaney K, Lapporte R. The long-term efficacy of a behavioral parent training intervention for families with 2-year-olds. *Research in Nursing & Health* 1998;21:199–210. [PubMed: 9609505]
- Webster-Stratton, C. Parent training with low-income families: Promoting parental engagement through a collaborative approach. In: Lutzker, JR., editor. *Handbook of child abuse research and treatment*. New York: Plenum Press; 1998a. p. 183-209.
- Webster-Stratton C. Preventing conduct problems in Head Start children: Strengthening parenting competencies. *Journal of Consulting and Clinical Psychology* 1998b;66:715–730. [PubMed: 9803690]
- Zambrana R, Logie L. Latino child health: Need for inclusion in the US national discourse. *American Journal of Public Health* 2000;90(12):1827–1833. [PubMed: 11111250]

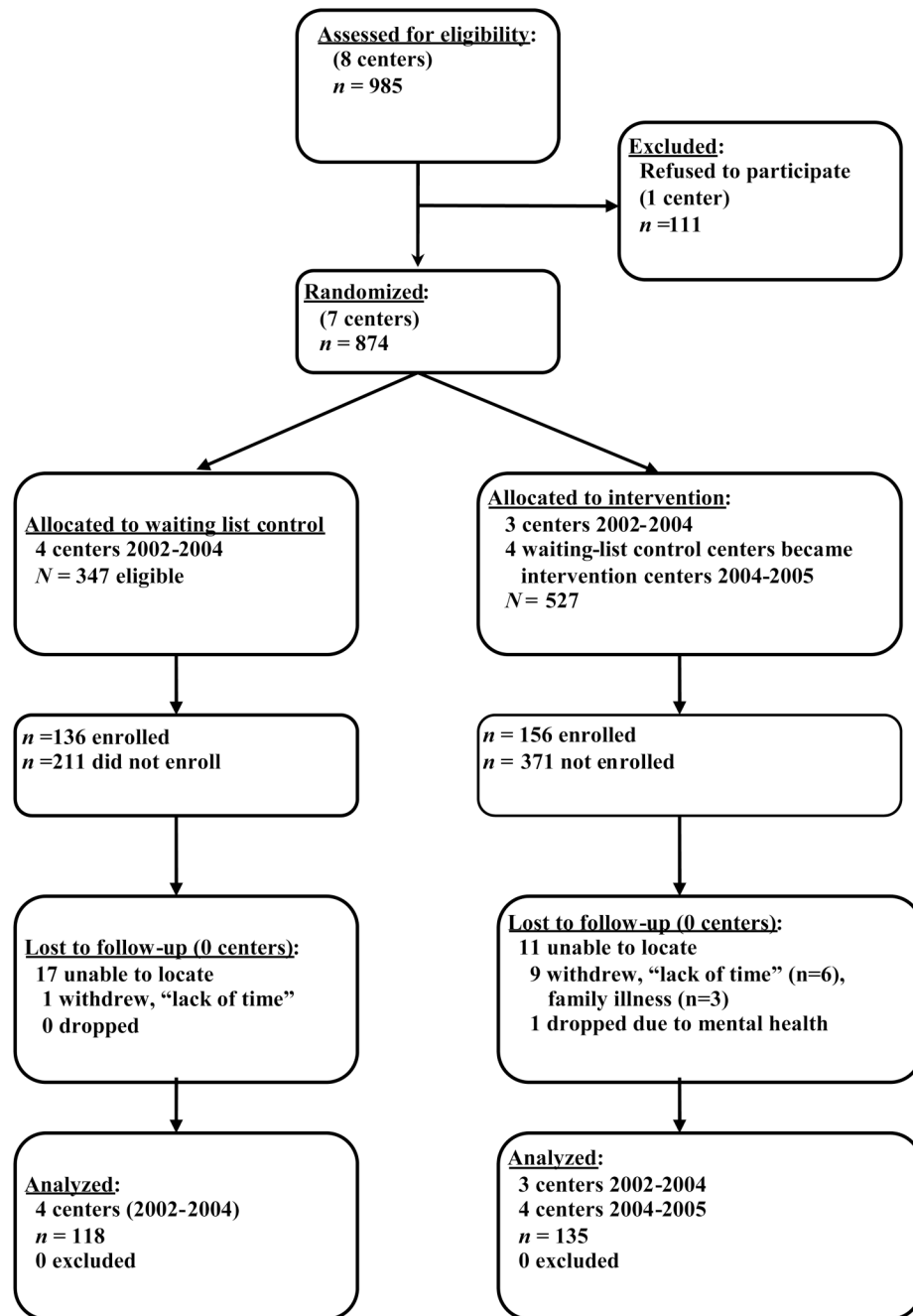


Figure 1.
Flowchart of participant retention across experimental conditions.

Table 1

Parent Relationship to Child, Race/Ethnicity, Educational Level, Employment and Marital Status, and Child Age and Gender by Condition

Variable	Intervention Group (<i>n</i> = 135)		Control Group (<i>n</i> = 118)	
	<i>f</i>	%	<i>f</i>	%
Relationship to Child				
Mother	124	91.9	101	85.6
Father	6	4.4	11	9.3
Foster Parent	1	0.7	3	2.5
Grandparent	3	2.2	2	1.7
Other	1	0.7	1	0.8
Highest Educational Level ^a				
Grade School	5	3.7	6	5.1
Some High School	19	14.1	14	11.9
High School/GED	38	28.1	29	24.6
Associate Degree	6	4.4	9	7.6
Vocational Degree	7	5.2	6	5.1
Some College	44	32.6	43	36.4
College Degree	11	8.1	11	9.3
Graduate Degree	4	3.0	0	0
Parent Race/Ethnicity ^b				
African-American	70	51.9	79	67.0
Latino	50	37.0	33	28.0
Mexico ^c	32	64.0	20	60.6
Puerto Rico ^c	12	24.0	6	18.2
Other Country of Origin ^c	6	12.0	7	21.1
White (not Latino)	11	8.1	1	0.8
Other	4	3.0	5	4.2
Employment Status				
Full Time	71	52.6	79	66.9
Part Time	23	17.0	16	13.6
In School	13	9.6	7	5.2
Working and In School	13	9.6	5	4.2
Unable to Work	2	1.5	1	0.8
Looking for Job	8	5.9	10	8.5
Other	5	3.7	0	0
Marital Status				
Married	33	24.4	34	28.8
Single	82	60.7	74	62.7
Partnered	15	11.1	8	6.8
Other	4	3.0	2	1.7
Child Age				
2 years old	42	31.1	39	33.1
3 years old	69	51.1	45	38.1
4 years old	24	17.8	34	28.8
Child Gender ^d				
Boys	66	48.9	75	63.6
Girls	69	51.1	43	34.4

Notes. *n* = 253.

^a One parent in the intervention group did not provide education data.

^b Intervention group had more Latino parents than the control group, $\chi^2(3, n = 253) = 11.4, p < .01$.

^c Frequencies and percents of ethnic descent within the Latino category.

^d Intervention group had more girls than the control group, $\chi^2(1, n = 253) = 5.5, p < .05$.

Final Model Estimates for Parent Outcomes

Table 2

	Parenting Self-Efficacy	Following Through	Warmth	Corporal Punishment	Commands (Play)	Commands (Clean Up)	Positive Beh. (Play)	Positive Beh. (Clean Up)
Intercept ¹	166.6*	20.9*	93.4*	7.5*	70.8*	13.6*	1.4*	1.4*
Ethnicity ^{1,2}	-8.1	0.3	-2.4*	-0.4	-4.3	-0.3	0.0	0.1
Child Gender ^{1,3}	0.4	0.2	1.6	-0.4	-1.2	-2.5*	0.0	0.1
Group ¹	-2.5	-0.6	-2.7*	-0.1	-0.1	1.3	0.4*	-0.1
Time ¹	1.3*	-0.1	-0.2	0.1	-5.4*	-1.5*	0.0	-0.2*
Group × Time ¹	1.0	0.2	0.5	-0.2*	-4.0*	-1.3*	-0.1*	-0.0
Intercept ⁴	188.8*	20.9*	93.3*	7.5*	68.3*	13.2*	1.5*	1.4*
Ethnicity ^{4,2}	-8.1	0.2	-2.2*	-0.4	-4.9	-0.3	0.0	0.0
Child Gender ^{4,3}	0.4	0.2	1.6	-0.4	-1.5	-2.6*	0.0	0.1
Dose Level ^{4,5}	-2.0	-0.3	-1.8*	-0.1	3.0	1.5*	0.2*	0.0
Time ⁴	1.1*	-0.2*	-0.3	0.1	-5.3*	-1.4*	0.0	-0.2*
Dose × Time ^{4,5}	0.9	0.3*	0.4*	-0.2*	-2.9*	-1.0	0.0	0.0

¹ Model estimates for group by time analyses.

² Fixed race/ethnicity intercept term Latinos (0), non-Latinos (1).

³ Fixed child gender intercept term boys (0), girls (1).

⁴ Model estimates for dose level by time analyses.

⁵ Fixed dose level control group (0), low dose level of intervention (1), high dose level of intervention (2). All estimates are raw coefficients.

* p < .05. All significant effects were found to be significant for Type III F ratios and the associated t-statistic.

Table 3

Final Model Estimates for Child Outcome

	Aversive Behavior (Play)	Aversive Behavior (Clean Up)	Intensity (ECBI) ^a	Problems (ECBI) ^b
Intercept ¹	12.7*	3.3*	95.9*	5.3*
Ethnicity ^{1,3}	-2.6	1.2	4.5	1.4
Child Gender ^{1,4}	1.0	-1.5*	-3.0	-0.1
Group ¹	4.6*	2.7*	2.4	1.0
Time ¹	0.1	0.3	-1.0	-0.2
Group × Time ¹	-2.1*	-1.4*	-1.3	-0.3
Intercept ²	11.8*	2.9*	94.9*	2.9*
Ethnicity ^{2,3}	-2.7	1.1	4.1	1.4
Child Gender ^{2,4}	0.9	-1.6*	-3.2	-0.2
Dose Level ^{2,5}	4.4*	2.4*	3.1	0.9
Time ²	0.5	0.4	-0.7	-0.2
Dose × Time ^{2,5}	-1.9*	-1.0*	-1.2*	-0.2

¹ Model estimates for group by time analyses.

² Model estimates with dose level included in analyses.

³ Fixed race/ethnicity intercept term Latinos (0), non-Latinos (1).

⁴ Fixed child gender intercept term boys (0), girls (1).

⁵ Fixed dose level control group (0), low dose level of intervention (1), high dose level of intervention (2).

^a Eyberg Child Behavior Inventory – Intensity Scale.

^b Eyberg Child Behavior Inventory – Problem Scale. All estimates are raw coefficients.

* $p < .05$. All significant effects were found to be significant for Type III F ratios and the associated t-statistic.

Table 4
Random Effects Models for Parent and Child Outcomes

	Estimate	SE	z
Parenting self-efficacy			
Individual within center	180.69	20.53	8.80*
Center	0.0	0.0	0.0
Residual	187.23	9.62	19.46*
Following Through			
Individual within center	11.50	1.29	8.93*
Center	0.57	0.58	0.98
Residual	7.75	0.46	16.90*
Warmth			
Individual within center	51.67	5.50	9.40*
Center	0.07	0.95	0.07
Residual	27.20	1.61	16.94*
Corporal Punishment			
Individual within center	3.05	0.35	8.78*
Center	0.42	0.32	1.32
Residual	2.36	0.14	16.97*
Commands (play)			
Individual within center	304.95	53.51	5.70*
Center	87.15	68.27	1.28
Residual	1050.10	54.19	19.38*
Commands (clean up)			
Individual within center	28.05	4.30	6.52*
Center	1.13	1.57	0.72
Residual	71.90	3.73	19.30*
Positive Parent Behavior (play)			
Individual within center	0.34	0.05	7.15*
Center	0.0	0.0	0.0
Residual	0.0	0.0	0.0
Positive Parent Behavior (clean up)			
Individual within center	0.21	0.03	6.22*
Center	0.03	0.03	1.02
Residual	0.58	0.03	19.30*
Aversive Child Behavior (play)			
Individual within center	42.99	8.44	5.10*
Center	9.42	7.18	1.31
Residual	184.07	9.50	19.38*
Aversive Child Behavior (clean up)			
Individual within center	12.88	3.25	3.96*
Center	1.90	1.91	1.00
Residual	82.75	4.29	19.30*
Child Intensity (ECBI)			
Individual within center	409.27	44.65	9.17*
Center	9.95	17.75	0.56
Residual	320.69	16.48	19.46*
Child Problems (ECBI)			
Individual within center	22.05	2.60	8.47*
Center	0.84	1.09	0.77
Residual	25.78	1.33	19.46*

Notes. ECBI = Eyberg Child Behavior Inventory. Estimates are raw coefficients.

* $p < .05$.