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Child and parental outcomes following involvement in a preventive intervention: Efficacy of the PACE program

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Abstract

This study evaluated whether engagement (i.e., attendance and quality of participation) in the PACE (Parenting our Children to Excellence) program predicted positive child and parent outcomes. PACE in an 8-week preventive intervention aimed at parents of preschool children. The study investigated the relation of engagement to outcomes in an ethnically diverse sample of 610 parents and among a subset of those parents at high risk for child maltreatment. Overall results demonstrated that engagement in PACE significantly improved child and parent outcomes at post-assessment and/or one-year follow-up assessment. Results for the high risk subsample were even stronger, as engagement significantly improved almost all of the child and parent outcomes at post-assessment, which continued to significantly improve in the year following program completion. Findings provide support for the efficacy of PACE in improving child and parent outcomes in an ethnically diverse community population and among parents considered at risk for child maltreatment.

Research has repeatedly shown that the quality of parent-child interactions has both short- and long-term effects on family functioning and the well-being of children and parents alike. Harmonious interactions contribute to child coping competence and behavioral adjustment, and to parental satisfaction and efficacy (Eisenberg, Fabes, & Spinrad, 2006; Moreland & Dumas, 2007). Conversely, dysfunctional parent-child interactions predict detrimental outcomes, such as child behavior problems (Eisenberg et al., 2006), parenting stress (Levac, McCay, Merka, & Reddon-D'Arcy, 2008; Ricketts & Anderson, 2008), and risk for child maltreatment (Begle, Dumas, & Hanson, in press).

Detrimental outcomes are most likely when dysfunctional parent-child interactions become chronic or are accompanied by other adverse factors, such as poverty or neighborhood disadvantage (e.g., Dodge, Coie, & Lynam, 2006). For example, low socioeconomic status (Way, Chung, Jonson-Reid, & Drake, 2001) and negative neighborhood characteristics (Coulton, Crampton, Irwin, Spilsbury, & Korbin, 2007) increase risk of child maltreatment, especially when their effects are cumulative (Begle et al., in press).

Researchers have long focused on ways to promote harmonious parent-child interactions, and thus increase the likelihood of positive child and parent outcomes (e.g., Kaminski, Valle, Filene, & Boyle, 2008). Evidence shows that behaviorally-oriented parent training programs can increase positive parenting practices, and thus contribute to increases in child coping competence and parental satisfaction and efficacy, and decreases in child behavior problems, parenting stress, and child maltreatment. Such programs have been applied successfully in diverse ethnocultural contexts, serving as a time-limited, cost effective means of fostering positive family interactions (Chaffin et al., 2004; Kazdin, 2005; Lundahl, Risser, & Lovejoy, 2006; Serketich & Dumas, 1996).

Parent training can be used to treat existing behavioral disorders (e.g., Barkley et al., 2000; Brestan & Eyberg, 1998; Sanders, Markie-Dadds, Tully, & Bor, 2000) or, in a prevention perspective, to “nip early risk factors in the bud” (Conduct Problems Prevention Research Group, 1999; Sanders, 2008; Webster-Stratton & Taylor, 2001; Zubrich et al., 2005). Although there is growing evidence for the efficacy of preventive parenting programs, limited parental engagement has been an ongoing challenge that threatens the internal and external validity of these programs, as well as their adoption on a large scale (Lochman, 2000; Spoth & Redmond, 2000). To address this challenge, researchers have begun to focus on predictors of engagement (e.g., Dumas, Moreland, Gitter, Pearl, & Nordstrom, 2006; Dumas, Nissley-Tsiopinis, & Moreland, 2007; Spoth, Redmond, & Shin, 2000), in an attempt to remove some of the obstacles that frequently limit attendance and participation in parent training. Prevention programs now commonly offer childcare, transportation, meals or snacks, make-up sessions, and monetary incentives (e.g., August, Realmuto, Hektner, & Bloomquist, 2001; Conduct Problems Prevention Research Group, 2002; Dumas et al., 2007; Webster-Stratton, Reid, & Hammond, 2001).

The present study evaluates the efficacy of PACE, a preventive intervention that aims to promote harmonious parent-child interactions in low- and high-risk families, and thus increase the likelihood of positive child and parent outcomes. PACE is an 8-week, behaviorally-oriented, structured group parenting program designed for parents of preschoolers and delivered at the daycare centers the children attend. The program was developed by Dumas on the basis of research on the promotion of parenting effectiveness and child coping competence (Dumas, Prinz, Smith, & Laughlin, 1999), and was designed to evaluate and reduce common obstacles to engagement in prevention programs. It is manualized in terms of content and process, and addresses childrearing concerns and challenges commonly experienced by parents of young children in a format that fosters active parental participation and mutual support. Sessions cover eight topics: (1) Bringing out the best in our children, (2) Setting clear limits for our children, (3) Helping our children behave well at home and beyond, (4) Making sure our children get enough sleep, (5) Encouraging our children's early thinking skills, (6) Developing our children's self-esteem, (7) Helping our children do well at school, and (8) Anticipating challenges and seeking support.

Previous studies have evaluated child and family variables associated with engagement in the PACE program (Dumas et al., 2007), as well as the efficacy of monetary incentives to promote engagement in the program (Dumas et al., in press), but studies have yet to examine the efficacy of PACE as a preventive intervention. Thus, the current study evaluated child and parent outcomes immediately following completion of the program and at one year follow-up. Based on reports from similar interventions and evidence for the efficacy of the engagement strategies utilized in PACE, we hypothesized that higher levels of engagement (measured in terms of session attendance and quality of participation in session) would be related to: (1) higher levels of child coping competence and lower levels of child behavior problems, and (2), higher levels of parental satisfaction and efficacy, and lower levels of parenting stress and of child abuse potential.

In addition, given the link between dysfunctional parent-child interactions and risk for child maltreatment, the study evaluated the efficacy of the PACE program for a subset of parents considered at high risk for engaging in child abuse. A cumulative risk index reflecting 19 empirically supported risk factors (described below) was used to determine which parents fell in the top 10^{th} percentile for child abuse potential. We hypothesized that increased engagement in the program would be related to the same child and parent outcomes as proposed above for this subset of parents.

Method

Participants

The study was conducted in Indianapolis, a large Midwestern city in the United States. The 610 caregivers who participated in the program consisted of 566 mothers or mother figures and 44 fathers or father figures (hereafter referred to as “parents”). Each parent represented a distinct family and had primary caregiving and educational responsibilities for one target child between the ages of 3 and 6 at time of recruitment. Parents ranged in age from 17 to 63 (M = 31.05, SD = 7.12). Forty-nine percent described their ethnicity as African American, 46% as European American, and 5% as Other (i.e., Asian, Native American, Hispanic, or Biracial). Forty-seven percent were married or lived with an adult partner; 53% were single. Parents had an average of 12.64 years of education (SD = 2.68), with 13% of parents not completing high school. Mean yearly household income was $26,572 ($SD$ = $11,109), which is well below the median household income in Indianapolis ($40,421) at the time of study (U.S. Census, 2005). Statistics provided by daycare center directors indicated that approximately 1 in 2 families qualified for subsidized childcare (M = 0.51, SD = 0.35). Boys were represented in comparable proportions to girls (53% vs. 47%), with a mean age of 4.45 for boys (SD = 0.77, range = 2.90 to 6.00) and 4.36 for girls (SD = 0.79, range = 2.87 to 5.96).

Procedures

All procedures were approved by the Institutional Review Boards of Purdue University and of the Centers for Disease Control and Prevention. Fifty daycare centers were recruited with the help of Child Care Answers, an Indianapolis childcare provider training and licensing agency. To receive the program, centers had to serve: (1) a minimum of 35 families with children between the ages of 3 and 6 at time of recruitment, and (2) an economically and ethnically diverse population. All parents of children ages 3 to 6 were eligible to participate in PACE. Families did not have to meet set income criteria and were not recruited to obtain predetermined percentages of participants from different ethnic groups.

At each center, recruitment strategies included displaying poster advertisements in numerous locations, sending program registration forms to all eligible parents, and staffing a registration table twice a week for four weeks during which eligible parents were informed about PACE and invited to participate. Poster advertisements summarized the content of each session and stated that the program was free and that, at each session, parents and children would receive a free meal, free childcare, and $3 in cash to cover cost of transportation. Parents were given opportunities to ask questions before deciding to participate and providing informed consent. Parents who decided to participate enrolled in the program by turning in a completed enrollment form or attending the first session.

Parents completed a *Parent Survey* at pre, post, and 1-year follow up, which included all of the sociodemographic, child, and parent measures described below. The survey is a structured interview individually administered by trained staff at the parents' home or at their children's daycare center, depending on parent preference. Parents provided informed consent before each interview and received $35 in cash at completion.

Tracking—To obtain pre, post, and follow-up measures, trained research assistants implemented a standardized procedure to track all parents who enrolled in the program, whether they attended sessions or not. As necessary: (1) Up to five attempts were made to contact the parent by phone, leaving a scripted message if needed each time to ask the parent to contact the PACE office. (2) Alternate contact person(s), provided by the parent at program enrollment, were contacted to request the parent's new contact information and to

ask the parent to call the office. (3) A letter was mailed to the parent's most recent address on file. (4) A letter was delivered to the daycare center the child attended at the time the parent enrolled in PACE, to be forwarded to the family. (5) A trained interviewer went to the parent's last known address to schedule or conduct an interview in person.

Program fidelity—Each PACE parenting group was conducted by a trained leader and assistant. Training, supervision, and fidelity assessments focused on program *content* and *process* and followed procedures described elsewhere (Dumas, Lynch, Laughlin, Smith, & Prinz, 2001). Content training pertained to the topics to be covered in each session, and to their rationale, presentation, and supporting materials (videotapes, posters, handouts). Process training focused on effective communication skills. It emphasized the importance of involving parents in all aspects of each session and provided specific instruction on how to encourage and channel parental discussion, avoid criticism and unsolicited advice giving, provide frequent positive feedback, and deal with resistance. Training was conducted in small groups and consisted of didactic presentations, vignettes, modeling, role-playing, discussions, and practice sessions. In the course of training, staff competence was evaluated using formal quizzes and live observations. In addition, throughout the study, group leaders received weekly supervision that included feedback from weekly fidelity assessments.

Group leader fidelity was assessed with procedures also described in Dumas et al. (2001). Leaders wore a lapel microphone attached to a small portable recorder to audiotape all sessions. Trained coders working under the supervision of an expert coder listened to these tapes weekly and coded them for fidelity to program content and process with the help of checklists developed for that purpose. Results from these assessments were sent to the group leaders' supervisor on a weekly basis for ongoing feedback and provided overall estimates of adherence to protocol. On average, group leaders covered 79% of all content items (range: 20-100%; inter-rater agreement, *kappa* = 0.79) and attained an average process score of 91% (range: 63-100%; inter-rater agreement, *kappa* = 0.88).

Measures

Attendance—Whether the parent attended each session (1) or not (0) served as the measure of attendance, which was summed to form an overall attendance score ranging from 0 to 8.

Quality of participation—After each session, the group leader and assistant independently completed a rating of each parent's quality of participation by answering the question, “Overall, how well did the parent participate during the session?” Ratings ranged from “1 Did not participate or obstructed group functioning and activities,” to “5 Participated enthusiastically. Was obviously interested and attentive to other group participants.” Each anchor point had specific definitions. Leaders and assistants were trained to use the measure through examples and observations of PACE sessions. As their answers were internally consistent (Cronbach's $\alpha = .92$ for leaders and .94 for assistants) and highly correlated ($r = .71$, $p < .001$), they were aggregated and averaged over all attended sessions to yield a single quality of participation score per parent.

Sociodemographic characteristics—Sociodemographic information obtained at pre-intervention included parent gender, age, ethnicity, marital status, education, family income, child gender and age.

Child coping competence—The *Coping Competence Scale* (*CCS_R;* Moreland & Dumas, 2007) measured child competence at pre, post, and follow-up assessment. The CCS_R consists of 26 items rating competence on a 5-point Likert scale, from (1) Very

good to (5) Very poor. The scale has high internal consistency (Cronbach α = .91 in Moreland & Dumas, 2007, and .93 at pre-intervention in the current study) and correlates significantly with other measures of adjustment in the preschool years (Moreland & Dumas, 2007).

Child behavior problems—Parents completed the *Eyberg Child Behavior Inventory-2* (*ECBI*; Boggs, Eyberg, & Reynolds, 1990) at the three time points. This 36-item inventory assesses disruptiveness along two subscales. The Intensity subscale, which measures frequency-of-occurrence of commonly observed disruptive behaviors from (1) never to (7) always, was used in the present study. The scale was internally consistent (Cronbach α = .91 in Boggs et al., 1990, and .91 at pre-intervention in the current study). Among clinic referred children, the ECBI has shown high concurrent validity with other measures of externalizing and internalizing child behavior (e.g., Boggs et al., 1990). Responses were summed at each time point to obtain quantitative ratings of intensity of child behavior problems, with higher scores reflecting more disruptive behavior.

Parental competence—Parents completed the *Parental Sense of Competence Scale* (*PSOC;*Johnston & Mash, 1989) at each time point. This 16-item questionnaire evaluates the extent to which respondents find fulfillment in their responsibilities as parents on a 6-point scale from (1) Strongly agree to (6) Strongly disagree. Nine items yield a summary score of *parental satisfaction* and the remaining seven one of *parental efficacy*. These subscale scores have adequate internal consistency (Cronbach α = .75 and .76 respectively in Johnston & Mash, 1989, and .74 and .72 at pre-intervention in the current study). When examined among parents of children age 5 to 12, the satisfaction and efficacy subscales demonstrated adequate concurrent validity with other measures of family functioning (e.g., Ohan, Leung, & Johnston, 2000). Scores were recoded so that higher scores reflect higher parental satisfaction and efficacy.

Parenting stress—Parents provided ratings of their own level of stress at each time point with the *Parenting Stress Index/Short Form* (*PSI/SF*; Abidin, 1997). This 36-item inventory asks respondents to rate how well each item applies to their own situation on a 5-point Likert scale from (1) Strongly agree to (5) Strongly disagree. The PSI/SF yields a total score and three subscale scores. The total score was used in this study. This score, which is internally consistent (Cronbach α = .91 in Abidin, 1997, and .91 at pre-intervention in the current study), increases as parenting stress becomes more pronounced. Concurrent and discriminant validity have been demonstrated for the full-version of the PSI (Abidin, 1983), which yields results that are highly correlated with the PSI/SF (Abidin, 1990).

Child abuse potential—Parents completed the *Child Abuse Potential* (*CAPI*; Milner, 1986), a 160-item, self-report screening instrument for child physical abuse risk, on which items are endorsed in an ‘agree/disagree,’ forced-choice format. The main risk indicator (i.e., the 77-items Abuse Scale) was used in the current study. Internal consistency estimates for the CAPI Abuse Scale ranged from .85 to .98 for physically abusive parents and general population groups (Milner, 1994). The CAPI also showed high internal consistency at pre-intervention in the current study (Cronbach α = .90).

Child abuse cumulative risk index—A cumulative risk index (Begle et al., in press) was created using 19 empirically supported risk factors for child abuse: whether the parent was abused as a child, high parenting stress, negative parental control attributions, low parental satisfaction, poorer child physical health, high child disruptive behavior, younger parent age, single marital status, lower income level, lower parent educational attainment level, unemployed status, more home disorganization, larger family size, less household

space, negative parent-child interactions, adverse neighborhood characteristics, less available resources, decreased involvement in the neighborhood, and less access to peer networks. Parent's scores on each risk factor were dichotomized, so that scores in the top 25% were coded as 1 to indicate higher risk and scores in the bottom 75% coded as 0 to indicate lower risk. These dichotomous scores were summed to create the cumulative risk index ranging from 0 to 20 (M = 9.03, SD = 3.46). See Appendix A for means and percentiles. Parent scoring in the top 10^{th} percentile (score of 14 or above) were selected to form a high risk subsample of 72 parents.

Data Analysis Plan

Data analysis proceeded in three steps. First, preliminary analyses were conducted to obtain descriptive statistics and bivariate correlations. Second, given the presence of missing data, *t*-tests were conducted to examine possible differences among parents who completed all measures and those who did not. Finally, to reflect the nested structure of the data and examine patterns of growth in child and parent measures over time, outcomes analyses relied on three-level hierarchical modeling (HLM3) using HLM 6.0 (Raudenbush, Bryk, Cheong, & Congdon, 2004). HLM conceptualizes changes over time using multiple levels where occasions of measurement (level-1) are nested within individuals (level-2), which may be nested within settings (level-3). HLM provides statistical benefit over traditional approaches to the assessment of change, as it allows researchers to model both inter- and intra-individual variability in growth, rather than ignoring rate of change at the individual level and relying on group mean values alone (Hess, 2000). In other words, this technique investigates individual variability through correlations, changes in variance, and shifts in mean values over time (McArdle, 1988), while also allowing researchers to examine changes as a function of intervention even for participants who may have missing data at some time points. In our analyses, time served as the level-1 variable; attendance and quality of participation served as level-2 predictors, with the sociodemographic characteristics entered as covariates; and, given that participants were nested within daycare centers, analyses controlled for daycare center at level-3.

HLM analyses were conducted in stepwise manner. First, unconditional models were estimated for each outcome variable (child coping competence, child behavior problems, parental satisfaction, parental efficacy, parenting stress, and child abuse potential). Results showed the pattern of mean changes across time (fixed effects) and whether the rates of change differed across participants and daycare centers (random effects) for each outcome variable. Intraclass correlations (ICC) were also calculated at this step, to indicate the percentage of variation in scores on each outcome measure across parents and daycare centers.

Second, conditional models were estimated to examine whether attendance and quality of participation predicted changes in the outcome variables across time. Specifically, the level -2 predictors (attendance and quality of participation) and covariates (parent gender, parent age, parent ethnicity, parent marital status, family income, child gender, and child age) were added to the slope of each outcome variable, to determine the extent to which they explained differences in change across time. The level-2 predictors and covariates were group mean centered (i.e., each individual score was subtracted from the variable's overall mean) to account for possible mean differences between daycare centers. Identical HLM procedures were applied on the data from the overall sample and from the high risk subsample. An *a priori* significance level of $\alpha = .05$ was set for all statistical tests.

Results

Preliminary Analyses

Of the 610 parents who enrolled in the PACE program, 127 did not attend any session (although data on child and parent outcomes was still obtained from these parents). Of the remaining 483, 79% attended at least 1 session, 60% attended at least 4 sessions, and 48% completed at least 7 of the 8 sessions (M = 4.32, SD = 3.12). See Table 1 for descriptive information on enrollment and attendance. Regarding quality of participation, 94% of the 483 eligible parents received a rating of at least a 3 out of 5 on the measures completed by group leaders and assistants, and 41% at least a 4 out of 5 (M = 3.85, SD = 0.48). Bivariate correlation analyses indicated that attendance and quality of participation were significantly correlated (r = .20, p < .01), and that correlations between all of the outcome variables were significant (r = .19 to .62, p < .01) (see Table 2).

Of the 72 parents in the high risk subsample, 71% attended at least 1 session, 43% attended at least 4 sessions, and 31% completed at least 7 of the 8 sessions (M = 3.46, SD = 3.19). Regarding quality of participation, 98% of these parents received a rating of at least a 3 out of 5, and 43% of at least a 4 out of 5 (M = 3.90, SD = 0.48). Within this subsample, bivariate correlations indicated that attendance and quality of participation were not significantly correlated (r = -.05, *ns*), but that most of the outcome variables were significantly correlated (r = .19 to .71, p < .05) (see Table 2).

Level-1 and level-2 variables were examined for normality. There was no significant skewness (i.e., values > 2.0; Curran, West, & Finch, 1996) (M = 0.25, range -.48 to .89) or kurtosis (i.e., values > 7.0; Curran et al., 1996) (M = 0.21, range -.34 to .75). Consequently, normality was assumed.

Of the 610 parents who enrolled in the program, 610 completed the *Parent Survey* at pre-intervention, 519 (85%) at post-intervention, and 437 (72%) at the one-year follow-up. As no missing data existed at levels 2 or 3, patterns of level-1 missing data were examined at each time point. HLM allows for missing data at level 1 under the assumption that data is either missing completely at random (MCAR) or missing at random (MAR). No significant difference was found among parents with and without missing data on any level 1 variable, showing that the MCAR assumption was met. HLM used maximum likelihood estimation (MLE) to allow for missing data and different sample sizes at each time point, by utilizing data on repeated-measures variables from all parents who had completed at least one survey.

Hierarchical Linear Modeling (HLM) – Overall Sample

Unconditional models—As Table 3 shows, the unconditional models resulted in significant chi-squares for all level-2 predictors. This indicated that there were significant mean changes in each outcome variable at the individual level (fixed effects) and that the rates of change differed across parents enrolled in the PACE program (random effects). Level-2 ICC values showed that individual factors explained from 56% to 69% of the variance in child and parent outcomes. Level-3 unconditional models resulted in non-significant chi-squares for 3 out of the 6 outcomes measured – child behavior problems, parental satisfaction, and parental efficacy. This indicated that the mean of these variables did not change significantly at the daycare level (fixed effects), and that their rate of change did not differ across daycares (random effects). ICC values indicated that daycare center explained from 0.4% to 6% of the variance in child and parent outcomes for most variables. The only exception was child abuse potential, as daycare center explained 13% of the variance in this variable.

Conditional models—Table 4 summarizes the results of the fixed effects models that assessed whether attendance (N=610) and quality of participation (N=483) predicted changes in the outcome variables across time. Tests of hypothesis 1 showed that program attendance did not significantly predict change in *child coping competence* across time. Conversely, increased quality of participation predicted positive change in child coping competence from pre- to follow-up assessment, showing that participation in sessions contributed significantly to child coping competence over time. Increased attendance and quality of participation were not significantly associated with *child behavior problems* over time. In other words, attendance and quality of participation in PACE did not significantly reduce parental reports of child disruptive behavior by one-year follow-up. Overall, hypothesis 1 was partially supported in that active participation in the program effectively improved child outcomes in the year following program completion.

As Table 4 shows, fixed effects results for hypothesis 2 demonstrated that attendance was not significantly associated with *parental satisfaction*, although higher quality of participation in the program significantly predicted increasing levels of parental satisfaction across the three time points. Attendance and quality of participation did not predict change in *parental efficacy* over time. Similarly, attendance was not a significant predictor of *parenting stress* across the three time points. However, higher quality of participation marginally predicted lower levels of parenting stress at one-year follow-up – showing that participation in PACE tended to significantly decrease parenting stress in the year following program completion. Finally, higher attendance in the PACE program significantly decreased rates *of child abuse potential* over time, although quality of participation did not significantly predict a change in this variable across the three time points. All analyses were rerun to exclude parents who enrolled in the program but did not attend any PACE parenting sessions (N=483). Results did not change, except for the fact *child abuse potential* did not change over time as a function of attendance.

In sum, results for hypothesis 2 indicate that attendance in the PACE program predicted a decrease in child abuse potential following program completion, but did not significantly improve the other parental outcomes (i.e., parental satisfaction and efficacy, parenting stress). A parent's quality of participation while attending sessions slightly increased parental satisfaction and decreased parental stress over time, but did not predict an increase in parental efficacy or a decrease in child abuse potential.

Hierarchical Linear Modeling (HLM) – High Risk Subsample

Unconditional models—In keeping with the overall sample results, Table 3 shows that analyses of the unconditional models (random effects) resulted in significant chi-squares for all level-2 analyses when we focused on the high risk subsample only. This indicated that there were significant mean changes in each outcome variable at the individual level (fixed effects) and that the rate of change differed across parents within the high risk subsample (random effects). Level-2 ICC values showed that individual factors explained from 54% to 76% of the variance in child and parent outcomes within this subsample. Level-3 unconditional models for child behavior problems, parental satisfaction, parental efficacy, and child abuse potential resulted in non-significant chi-squares, demonstrating that significant mean changes were not present at the daycare level (fixed effects), and that the rate of change did not differ across daycare level (random effects) for these variables. ICC values for these variables showed that daycare center explained 6%, 7%, 1%, and 11% of the variance, respectively. Conversely, level-3 unconditional models for child coping competence and parenting stress resulted in significant chi-squares, with ICC values of 26% and 15%, respectively. In other words, variations across daycare centers explained a significant portion of the variance in these variables.

Conditional models—Fixed effects results (see Table 4) indicated that neither attendance (N=72) nor quality of participation (N=51) in the PACE program significantly predicted change in *child coping competence* over the three time points for the high risk subsample. Similarly, neither increased attendance nor quality of participation were significantly associated with lower *child behavior problems* from pre- to one-year follow-up assessment. Thus, attendance and active participation did not significantly improve child outcomes for parents in the high risk subsample.

As Table 4 shows, fixed effects results for the high risk subsample demonstrate that increased attendance and quality of participation were significantly associated with improved *parental satisfaction* across the three time points. Increased attendance, but not participation, was also significantly associated with *parental efficacy* over the year following program completion. Similarly, both higher attendance and quality of participation in PACE significantly predicted decreased *parenting stress* over time. Finally, higher attendance and quality of participation significantly predicted lower rates of *child abuse potential* across the three time points. In sum, higher attendance and quality of participation significantly predicted improved parental outcomes in the year following program completion for parents in the high risk subsample. All analyses were rerun to exclude high risk parents who enrolled in the program but did not attend any PACE parenting sessions (N=51); none of the results changed upon excluding these parents.

Discussion

Our findings show that parents who actively participated in sessions reported improved child and parental outcomes following intervention and over a one-year follow-up period, while attendance was marginally related to child and parental outcomes. While different aspects of child adjustment and parental outcomes were better predicted by either attendance or quality of participation in the program, the hypotheses were partially supported in that overall results indicate positive child and parental outcomes following increased engagement in PACE. In the overall sample of 610 parents, those who *attended* more PACE sessions tended to report less child abuse potential over the year following completion of the program. Improvements in child and parent outcomes, among the 483 parents who attended at least one session and had quality of participation ratings, were also related to *increased quality of participation* in sessions, as active participation predicted increased child coping competence and parental satisfaction, and decreased parenting stress at the one-year follow-up assessment. Although 21% of parents enrolled in the program but did not attend any of the intervention sessions, these engagement rates are similar to other preventive intervention programs in the literature (e.g., 20.8% in Heinrichs, 2006) and likely represent engagement rates for this population as a whole, rather than for this specific program. Findings for the subsample of 72 high risk parents were consistent with those of the overall sample but provided even more promising results that engagement in the PACE program contributed to positive child and parent outcomes among this population. Specifically, high risk parents who attended the program more regularly reported higher parental satisfaction and efficacy, and less parenting stress and child abuse potential at the one-year follow-up assessment. Similarly, high risk parents who participated more actively in sessions were more likely to report increased parenting satisfaction, decreased parenting stress, and lower child abuse potential at follow-up.

In comparing the overall sample to the high risk subsample, results indicate that attendance and quality of participation were not as consistently related within each of the samples. Specifically, quality of participation had a much stronger impact on child and parent outcomes in the overall sample than did attendance, while both measures of engagement were significantly related to improved child and parent outcomes among the high risk

subsample. Although engagement rates tended to be similar among parents in both the overall sample and the subsample, future investigations should focus on differences among the high risk subsample that may have accounted for this finding.

Results from the overall sample are consistent with findings from other preventive interventions, in showing that increased engagement in behaviorally-oriented parenting programs effectively improve parent and child outcomes immediately following program completion and, in many cases, over a significant follow-up period (usually one year) (Bradley et al., 2003; CPRPG, 2002; Gershater, Molko, Lutzker, & Wesch, 2003; Sanders, 2008). Similarly, results from the high risk subsample are consistent with findings from other preventive parenting programs targeting families from high risk populations, which demonstrate improvements in child and family outcomes following program completion (CPPRG, 1999; Jones, Daley, Hutchings, Bywater, & Eames, 2008; Webster-Stratton, Reid, & Hammond, 2004).

Limitations

Important limitations must be considered. First, although the study focused on a large sample of families drawn from multiple daycare programs, the extent to which these families are representative of the population is unknown. Although we believe that the sample was representative of English-speaking families from lower to lower-middle class families in general, we caution against overgeneralization of findings because families were self-selected for participation in the study. Similarly, although the fact that the sample was ethnically diverse is a study strength o, the sample consisted mostly of African American and European American parents. The large percentage of African American families who agreed to be a part of the program is very encouraging, given the underrepresentation of minority families in this research area. However, our findings cannot be generalized to other racial/ethnic groups. Third, the measures used in the study were limited to parental self-report of child and parent outcomes; inclusion of data from other informants would have improved the robustness of the findings. Fourth, analyses were based on all parents who enrolled in the study, including those who did not subsequently attend any sessions. Although the engagement rates were similar to that of other studies (e.g., Heinrichs, 2006), results included parents who had not attended any sessions and may have varied if those parents had not been included. However, analyses were rerun on parents who did not attend any sessions and the majority of results were identical, indicating that this limitation was minimal. In addition, the bivariate correlations between the attendance and quality of participation variables were quite small, which may have been due to restriction of range; as nearly all families received a 3 or higher (out of 5) on their quality of participation ratings. Finally, our results may only be relevant to similar universal prevention programs. They may not generalize to targeted settings in which parents of children with behavioral problems are invited to enroll.

Implications for Preventive Parenting Programs

When examining behaviorally-oriented parenting programs, empirically validated prevention programs often include one-on-one, home-based interventions with an extensively trained professional or paraprofessional staff (e.g., Healthy Families America, Family Connections, PCIT, S.T.E.P., Project SafeCare). Although some individualized parent training programs have been shown to be effective in improving child and parental outcomes, barriers to implementation (i.e., individual barriers such as intense work schedules, lack of financial resources, and limited time; implementation barriers such as intensive therapist training and high cost) may present major challenges when attempting to deliver such programs to high risk families. Thus, for those parents facing barriers

associated with individualized prevention programs, group parent training programs may be a more realistic and practical option.

While several group parent training programs have been developed to target effective parenting skills (e.g., Group Triple P, Sanders, 2008; 1-2-3 Magic, Bradley et al., 2003; Parenting Wisely, Segal, Chen, Gordon, Kacir, & Gylys, 2003; The Incredible Years, Webster-Stratton et at., 2004), many are characterized by limitations that may reduce their feasibility with high risk parents that face multiple barriers to engagement. Specifically, these programs can be expensive for organizations to deliver because they require intensive training for staff members and/or technical equipment for program delivery. Further, many existing group parent training programs are lengthy to deliver (i.e., 22-24 weeks), consist of only one component within a comprehensive community intervention, focus solely on the reduction of conduct problems, or rely primarily on instruction through videotapes.

Addressing these limitations, findings from the current study provide evidence for PACE as an effective preventive parenting program aimed at improving child and parenting outcomes following engagement. The program is equal to or shorter in duration than most existing programs, is designed to be delivered in a group format to maximize the number of parents that can be served at one time, and can be implemented by paraprofessional staff; thus, increasing cost-effectiveness. Overall, evidence from this study provide support for the effectiveness of PACE in targeting community samples of parents, as well as parents considered at high risk for child maltreatment. Future studies should continue to evaluate the effectiveness of this promising intervention among additional populations and in randomized controlled trials, as well as investigate how “much” attendance and/or participation across the 8 sessions may produce the most benefits, and for whom.

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Appendix A

Cumulative Risk Index: Means and Percentiles

Risk Factor	*M (SD)*	25th percentile
Parent abused as a child[a]	--	--
High parental stress	85.26 (20.69)	98.00
Negative parental control attributions	130.54 (13.39)	121.00
Low parental satisfaction	37.39 (6.98)	32.00
Poorer child physical health	7.50 (0.89)	7.00
High child disruptive behavior	0.01 (1.80)	0.90
Younger parent age	31.05 (7.12)	26.00
Single marital status[b]	--	--
Lower income level	7.72 (3.97)	4.00
Lower parent education attainment level	4.86 (1.19)	4.00

Risk Factor	*M (SD)*	25th percentile
Unemployment status[c]	--	--
More home disorganization	38.80 (14.39)	47.00
Larger family size	4.03 (1.33)	5.00
Less household space	0.76 (0.37)	0.50
Negative parent-child interactions	0.01 (1.54)	-1.05
Adverse neighborhood characteristics	27.25 (8.54)	21.00
Less available resources	10.03 (3.45)	8.00
Decreased involvement in neighborhood	16.07 (3.90)	16.00
Less access to peer network	46.22 (5.91)	43.00

[a] Parent abused as a child dichotomized as high risk

[b] Single marital status dichotomized as high risk

[c] Unemployment status dichotomized into high risk

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Table 1
Enrollment and Attendance Descriptive Characteristics

	Overall sample		High risk sample	
Initial PACE sample (N)	1050	100%		
Not enrolled	440	41.9%		
Enrolled sample	610	58.1%	72	100%
Enrolled but never attended program	127	20.8%	21	29.2%
Enrolled and attended program	483	79.2%	51	70.8%
Attended 1 session	63	13.0%	10	19.6%
Attended 2 sessions	35	7.2%	3	5.9%
Attended 3 sessions	22	4.6%	7	13.8%
Attended 4 sessions	25	5.2%	3	5.9%
Attended 5 sessions	46	9.5%	2	3.9%
Attended 6 sessions	61	12.6%	4	7.8%
Attended 7 sessions	109	22.6%	10	19.6%
Attended all 8 sessions	122	25.3%	12	23.5%

J Prim Prev. Author manuscript; available in PMC 2011 April 6.

Table 2

Bivariate correlations between predictor and outcome variables at Time 1 (pre-intervention)

Overall sample (N=610)								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Predictor variables								
1. Attendance	1.00							
2. Quality of participation	.20**	1.00						
Outcome variables								
3. Child coping competence	-.00	.16**	1.00					
4. Child behavior problems	.02	-.04	-.50**	1.00				
5. Parental efficacy	-.11**	.02	.23**	-.33**	1.00			
6. Parental satisfaction	-.14**	-.05	.36**	-.40**	.62**	1.00		
7. Parenting stress	.08	-.08	-.45**	.50**	-.33**	-.67**	1.00	
8. Child abuse potential	-.03	-.06	-.19**	.29**	-.22**	-.45**	.59**	1.00

High risk subsample (N=72)								
Predictor variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1. Attendance	1.00							
2. Quality of participation	.05	1.00						
Outcome variables								
3. Child coping competence	.00	.08	1.00					
4. Child behavior problems	.05	.16	-.48**	1.00				
5. Parental efficacy	-.05	-.15	.19	-.26*	1.00			
6. Parental satisfaction	-.03	.15	.34	-.31**	.41**	1.00		
7. Parenting stress	.14	-.23	-.53**	.48**	-.37**	-.71**	1.00	
8. Child abuse potential	.12	-.08	-.36**	.25*	-.44**	-.58**	.65**	1.00

** $p < .01$

Note. Quality of participation for the overall sample included 610 parents and for the high risk subsample included 72 parents, as only parents who attended more than one session received quality of participation ratings.

J Prim Prev. Author manuscript; available in PMC 2011 April 6.

Table 3

Descriptive Statistics and Unconditional Model Results

	Descriptive Statistics			Unconditional Models			
	Pre-intervention M (SD)	**Post-intervention M (SD)**	**1-year follow-up M (SD)**	**Level-2 ICC**	**Level-2 Chi-square**	**Level-3 ICC**	**Level-3 Chi-square**
			Overall sample (N=610)				
Child coping competence	6.23 (1.23)	6.50 (1.08)	6.63 (1.09)	.69	4346.76***	.05	82.67**
Child behavior problems	103.11 (28.99)	98.49 (27.47)	97.69 (28.95)	.66	3471.38***	.02	63.85
Parental satisfaction	37.40 (85.64)	38.90 (6.78)	38.98 (6.88)	.66	3389.62***	.01	59.62
Parental efficacy	30.24 (5.12)	31.25 (4.85)	31.83 (5.04)	.56	2429.13***	.00	41.95
Parenting stress	85.64 (21.52)	82.18 (20.23)	81.25 (21.81)	.62	3361.65***	.06	95.48***
Child abuse potential	110.55 (83.83)	98.13 (79.00)	98.59 (80.72)	.58	4742.99***	.13	172.40***
			High risk subsample (N=72)				
Child coping competence	6.42 (1.48)	6.52 (1.33)	6.63 (1.42)	.57	435.00***	.26	55.12***
Child behavior problems	105.49 (30.42)	97.94 (29.29)	95.25 (27.39)	.61	224.43***	.06	35.99
Parental satisfaction	37.00 (8.61)	39.37 (7.52)	39.08 (7.68)	.68	367.73***	.07	32.11
Parental efficacy	30.31 (5.03)	31.57 (4.97)	31.98 (5.57)	.54	196.98***	.01	26.52
Parenting stress	91.31 (24.73)	83.52 (24.09)	85.31 (24.66)	.63	381.10***	.15	40.14*
Child abuse potential	166.97 (105.19)	143.70 (92.97)	140.16 (94.41)	.76	731.21***	.11	31.51

*$p < .05$

**$p < .01$

***$p < .001$

J Prim Prev. Author manuscript; available in PMC 2011 April 6.

Table 4

Fixed effects of attendance and participation on outcome variables

	Overall sample					
	Attendance (N=610)			Participation (N=483)		
Fixed effects	**Coefficient**	**SE**	**t (49)**	**Coefficient**	**SE**	**t (49)**
Child coping competence						
Intercept	0.01	0.04		0.02	0.04	
Slope	0.00	0.01	0.32	0.11	0.05	2.18*
Child behavior problems						
Intercept	102.67	1.26		102.99	1.37	
Slope	0.07	0.20	.34	-1.10	1.97	-0.56
Parental satisfaction						
Intercept	37.57	0.32		37.38	0.35	
Slope	0.01	0.04	0.15	0.70	0.32	2.18*
Parental efficacy						
Intercept	30.32	0.19		30.05	0.20	
Slope	-0.03	0.03	-0.97	0.08	0.24	0.35
Parenting stress						
Intercept	85.02	1.25		85.97	1.40	
Slope	-0.12	0.15	-0.78	-2.02	1.16	-1.75(*)
Child abuse potential						
Intercept	107.74	5.61		109.60	6.02	
Slope	0.79	0.44	1.82(*)	-0.53	4.53	-0.12

	High risk subsample					
	Attendance (N=72)			Participation (N=51)		
Fixed effects	**Coefficient**	**SE**	**t (49)**	**Coefficient**	**SE**	**t (49)**
Child coping competence						
Intercept	0.22	0.16		0.25	0.20	
Slope	0.05	0.04	1.37	0.09	0.05	1.68

	High risk subsample					
	Attendance (N=72)			Participation (N=51)		
Fixed effects	**Coefficient**	**SE**	**t (49)**	**Coefficient**	**SE**	**t (49)**
Child behavior problems						
Intercept	104.67	3.76		106.24	5.38	
Slope	-5.79	1.86	-3.12	-5.77	1.48	-3.89
Parental satisfaction						
Intercept	37.78	1.10		37.51	1.40	
Slope	1.10	0.44	2.48*	2.58	1.09	2.38*
Parental efficacy						
Intercept	30.46	0.59		30.35	0.84	
Slope	1.16	0.42	2.75**	0.73	0.50	1.46
Parenting stress						
Intercept	88.42	3.43		90.71	4.26	
Slope	-3.86	1.06	-3.65**	-4.37	1.14	-3.85**
Child abuse potential						
Intercept	156.73	14.54		164.95	17.25	
Slope	-12.69	4.90	-2.59*	-14.01	4.86	-2.89**

** $p < .01$

$p < .05$

* $p < .10$

J Prim Prev. Author manuscript; available in PMC 2011 April 6.