

Change in Child Abuse Potential as a Predictor of Post-assessment Child Disruptive Behaviors After Participation in PACE

Amanda H. Costello · Angela D. Moreland ·
Lisa Jobe-Shields · Rochelle F. Hanson ·
Jean E. Dumas

Published online: 17 December 2014
© Springer Science+Business Media New York 2014

Abstract Well-established research indicates that behavioral parent training (BPT) has a robust impact on improving parent–child relationships; however few studies have investigated predictors or mechanisms of change within the context of BPT. The purpose of the current study was to examine: (a) if change in parent child abuse potential (as measured by the Child Abuse Potential Inventory) predicted change in post-assessment child disruptive behaviors (as measured by the Eyberg Child Behavior Inventory) in the Parenting Our Children to Excellence (PACE) program, and (b) if this relation was present when selecting for clinically-elevated child disruptive behavior at pre-assessment. The current study utilized secondary data analysis collected from PACE. A hierarchical multiple regression was conducted on the full and clinically-elevated samples to test study objectives. Decreased parental child abuse potential predicted decreased child disruptive behavior. For the elevated model, this effect trended toward significance. Although small, these findings suggest the importance of addressing parenting-related changes in BPT, which may subsequently affect both parent and child functioning at post-assessment. Future investigations should continue to examine putative

predictors or mediators of parent and child outcomes in BPT, with parent child abuse potential as one such predictor. Study limitations and future directions for research were discussed.

Keywords Behavioral parent training · Child disruptive behaviors · Parental child abuse potential · Parent–child interactions · Child physical abuse

Introduction

The quality of early parent–child interactions can have long-lasting positive and negative outcomes on both child and family functioning (Begle and Dumas 2011). Positive interactions, characterized by an authoritative parenting style (e.g., parental warmth and consistent limit-setting), are associated with increased emotional well-being, pro-social skill development, and coping competence for children, as well as increased sense of efficacy for parents (Begle and Dumas 2011; Steinberg 2001). Negative interactions, however, can have myriad poor consequences, including worsening child behavior problems and parental risk for maltreatment (Begle et al. 2010). This interplay between child behavior problems and parental risk for maltreatment is often defined as a *coercive cycle* between parent and child, which operates by behavioral principles of positive and negative reinforcement (Dishion and Patterson 1996; Patterson and Reid 1984; Urquiza and McNeil 1996). Specifically, parental punitive or coercive discipline is positively reinforced by child compliance; by contrast, escalating child disruptive behaviors are negatively reinforced by escape or avoidance of parental commands (Chaffin et al. 2004). Thus, parents and children become “stuck” in this coercive cycle, whereby parents increase

Present Address:

A. H. Costello (✉)
CARES Institute, Rowan University School of Osteopathic
Medicine, 42 East Laurel Avenue, Stratford, NJ 08084, USA
e-mail: costelloa@rowan.edu

A. D. Moreland · L. Jobe-Shields · R. F. Hanson
Department of Psychiatry and Behavioral Sciences, National
Crime Victims Research and Treatment Center, Medical
University of South Carolina, Charleston, SC, USA

J. E. Dumas
University of Geneva, Geneva, Switzerland

the frequency or intensity of punitive practices as child behavior problems worsen. If left untreated, these risky parenting practices may lead to physically abusive parenting. Additionally, child behavior problems may worsen to the point of being clinically diagnosed disruptive behavior disorders.

Untreated early and ongoing physically abusive parenting practices can have a significant negative impact on child physical, behavioral, emotional, and social development, with children between the ages of 0–4 years of age at the greatest risk for physical violence (Alink et al. 2012; Kolko 2002; Norman et al. 2012; Runyon et al. 2004). Specifically, robust evidence demonstrates that children who have been physically abused are at greater risk for psychological disorders, including depression, anxiety, and oppositional or conduct-disordered behaviors, than children who do not experience physical abuse (Norman et al. 2012). There is also some evidence that physically abused children are at higher risk for developing physical health problems, like cardiovascular disease, Type II diabetes, obesity, and hypertension later in life (Norman et al. 2012). Children who have experienced physical abuse are also more likely to present with a dysregulated stress response system, often exacerbated by poor social functioning (Alink et al. 2012). Perhaps most troubling is that these children are more likely to abuse their own partners or children in the future (Runyon et al. 2004). When focusing on preschool-aged children, researchers have demonstrated that those who have been maltreated earlier in life are more likely to present with poorer adaptive functioning in later childhood (English et al. 2005) and psychological distress (e.g., depression and anxiety symptoms) in adulthood (Kaplow and Widom 2007). Preschool-aged children (i.e., children 5 years of age or younger) exposed to physical maltreatment have also been found to present with more intense and stable disruptive behaviors and/or anxiety and depression throughout childhood and into adolescence, compared to children physically abused at an older age or normal controls (Keiley et al. 2001).

Relatedly, untreated early child disruptive behaviors may predict conduct-disordered behavior in adolescence, as well as increased risk for disability, psychopathology, poor family functioning, and criminality as adolescents and adults (Burke et al. 2010; Comer et al. 2013; Kaminski et al. 2008). Therefore, decades of research have investigated the use of interventions targeted at improving early parent–child interactions, with an emphasis on “breaking” the coercive cycle between parent and child (Kaminski et al. 2008).

Behavioral parent training (BPT) is one such class of interventions shown to have a robust, positive effect on both parent and child outcomes (Kaminski et al. 2008; Lundahl et al. 2006). BPT programs target parenting

practices as the proximal variable, while viewing change in child behaviors as a distal variable (Lundahl et al. 2006). Thus, most manualized BPT programs focus on the parent of the referred child. To address which *components* of parent training programs are most strongly associated with positive changes in parent and child outcomes, Kaminski et al. (2008) conducted a meta-analysis in which four major components emerged: (a) teaching parents how to interact positively with their child (i.e., using praise and child-led play), (b) teaching parents how to consistently and appropriately use discipline, (c) teaching parents how to promote emotional communication in the home (i.e., reflecting back what their child says, engaging in feelings identification, decreasing criticism), and (d) encouraging parents and children to practice these skills together outside of the clinic. The majority of manualized BPT programs incorporate the above components; with many of these programs identified as a “well-established” or “probably efficacious” evidence-based practice (see Eyberg et al. 2008 for a review of all programs). Thus, research on BPT has demonstrated a strong evidence base for increasing appropriate parenting practices, as well as decreasing child disruptive behaviors.

Although a solid evidence base has been established for BPT, most research in this area has focused on studying short- and long-term parent and child outcomes for both parents and children, without much knowledge on specific mechanisms or predictors of change (Beauchaine et al. 2005; Weersing and Weisz 2002). Thus, an important “next step” of BPT research is to move beyond examining parent and child outcomes of manualized BPT programs and instead focus on the specific processes of change within these programs (Kaminski et al. 2008). The few studies that have investigated putative predictors or mechanisms of change in BPT have found that a decrease in harsh or negative parenting or an increase in effective discipline strategies have mediated the relation between involvement in BPT and improvement in child outcomes (Beauchaine et al. 2005; Gardner et al. 2010; Hagen et al. 2011). However, in regard to parent child abuse potential and child disruptive behaviors, these outcomes have typically been studied simultaneously with reductions in both child maltreatment risk (Chaffin et al. 2004; Hurlburt et al. 2013; Prinz et al. 2009) and child disruptive behaviors (Kaminski et al. 2008). On exception is the study by Chaffin et al. (2004), which demonstrated that reduction in negative parenting practices partially mediated the relation between involvement in parent–child interaction therapy (Eyberg and Robinson 1982; McNeil and Hembree-Kigin 2010) and subsequent physical abuse recidivism rates. However this mediator was not studied in relation to child outcomes.

We expanded on past research within BPT, by venturing beyond treatment outcome work, to investigate the role of parental child abuse risk as a potential predictor of subsequent change in child behavior for parents who attended the Parenting our Children to Excellence (PACE) program (Begle and Dumas 2011). PACE is a behaviorally-based preventive intervention targeted at both low- and high-risk parents of preschool-aged children. It was developed as an 8-week, group-based program, delivered to parents in community-based daycare settings. Sessions were manualized and covered eight major topic areas: (a) bringing out the best in our children, (b) setting clear limits for our children, (c) helping our children behave well at home and beyond, (d) making sure our children get enough sleep, (e) encouraging our children's early thinking skills, (f) developing our children's self-esteem, (g) helping our children do well at school, and (h) anticipating challenges and seeking support (Begle and Dumas 2011; Dumas et al. 1999). Parents attended sessions without their child, but were encouraged to practice skills with their children at home via weekly assigned home activities. PACE has been found to show improvements in parental child abuse potential, stress, and satisfaction, as well as child coping competence (Begle and Dumas 2011). We expanded upon the efficacy of PACE, by examining whether or not change in parental child abuse potential predicted child disruptive behaviors at post-assessment. Specifically, we hypothesized that, following completion of the PACE program, lower self-reported parental child abuse potential would significantly predict a lower level of parent-reported child disruptive behaviors. Additionally, given that PACE was a preventive intervention, focusing on both low- and high-risk parents and children, we also sought to examine if change in parental child abuse potential predicted change in child disruptive behavior for children who were clinically elevated in this domain at pre-assessment. Consistent with the first hypothesis, we predicted that for parents with children in the clinically-elevated group, lower self-reported child abuse potential following completion of the PACE program would significantly predict a lower level of parent-reported child disruptive behaviors at post-assessment (Fig. 1).

Method

Participants

Data utilized in this study were collected from parents living in the Indianapolis, Indiana area, who were recruited through their children's daycare centers to participate in PACE. Six hundred ten parents were initially enrolled in the program, and 483 parents completed at least one

session of PACE. Seventy-one parents reported having a child with clinically elevated disruptive behavior at pre-assessment. In the full sample, parents ranged in age from 17 to 63 years old ($M = 31.67$, $SD = 7.18$) and had a child between the ages of 3 and 6 at time of recruitment ($M = 4.41$, $SD = .78$). The majority of parents (51.6 %) self-identified as Caucasian, with 43.1 % of parents self-identifying as African American, and 5.4 % of parents as Other (i.e., Asian, Native American, Hispanic, or Biracial). The majority of parents were female (92.5 %). Thirty-four percent of parents had received some college education, and the average yearly household income was \$26,572, which was substantially lower than the average in Indianapolis at the time of the study (\$40,421) (Begle and Dumas 2011). Additionally, statistics provided by daycare centers indicated that 1 in 2 families qualified for subsidized childcare at the time of the study ($M = .51$, $SD = .35$) (Begle and Dumas 2011). Table 1 demonstrates demographic information for both the full and clinically-elevated samples.

Procedure

Before data collection commenced, all procedures were approved by the Institutional Review Boards of Purdue University and the Centers for Disease Control and Prevention. Fifty daycare centers were recruited for the study, with the help of Child Care Answers, a childcare provider and licensing agency in Indianapolis (Begle and Dumas 2011). To be able to participate in the program, daycare centers had to serve a minimum of 35 families with children between the ages of 3 through 6 years old, and families had to be from an ethnically diverse population. Recruitment strategies at these daycare centers consisted of the following: (a) displaying poster advertisements, (b) sending program registration forms to eligible parents, and (c) providing a registration table for 4 weeks, during which time eligible parents were able to learn more about the study and invited to participate. Information discussed during recruitment emphasized that the program was free of charge, provided a summary of the content of PACE sessions, and reported that at each session, parents and children would receive a free meal, childcare would be provided, and parents would be given a \$3.00 transportation voucher. Parents were able to ask questions before agreeing to participate and signing the informed consent, and parents who enrolled in the study either completed an enrollment form or attended the first PACE session (Begle and Dumas 2011).

Parents were assessed in the original study at three time points: pre-assessment, post-assessment, and 1-year follow up. At each assessment point they completed a Parent Survey, which consisted of a demographics form, as well

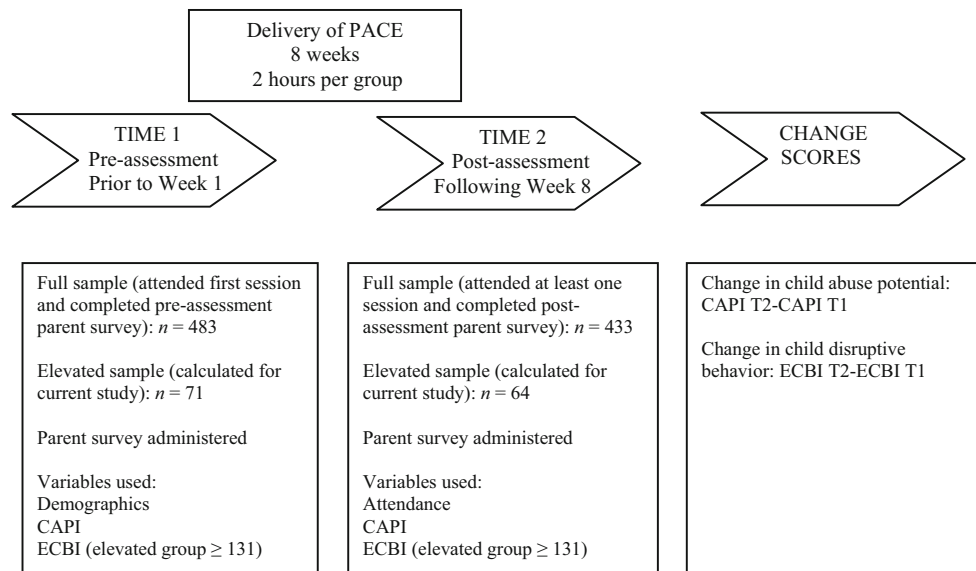


Fig. 1 Timeline of parent participation and data collection in PACE

Table 1 Sample demographics

Descriptive information	Full sample ^a	Clinically elevated sample ^b
	<i>M (SD)</i> or %	<i>M (SD)</i> or %
Parent age	31.67 (7.18)	32.13 (9.08)
Parent ethnicity		
African American	43.1 %	42.3 %
Caucasian	51.6 %	53.5 %
Other	5.4 %	4.2 %
Parent sex		
Female	92.5 %	90.1 %
Male	7.5 %	9.9 %
Parent level of education	Some college (34.4 %)	Some college (33.8 %)
ECBI (pre)*	104.15 (28.05)	150.42 (20.02)
ECBI (post)*	98.93 (27.44)	133.99 (26.01)
CAPI (pre)*	107.06 (80.24)	157.53 (106.20)
CAPI (post)*	97.90 (79.28)	143.32 (97.19)
Sessions attended	5.67 (2.38)	5.55 (2.51)
Child age	4.41 (.78)	4.42 (.78)
Child sex		
Male	54.9 %	63.4 %
Female	45.1 %	36.6 %

* Significant difference between groups of parents

^a *n* = 483, ^b *n* = 71

as numerous self-report measures assessing child and parent outcomes. In the current study, only two measures, the Child Abuse Potential Inventory (Milner 1986) and the Eyberg Child Behavior Inventory (Boggs et al. 1990) were utilized from the larger Parent Survey. Additionally, only

pre- and post-assessment data were used in study analyses. Surveys were administered by a trained research staff either at the parent's home or at the daycare center, which was dependent on parental preference. Parents received \$35.00 at each completion of pre and post study measures, and received \$50.00 for completion of measures at 1-year follow up (Begle and Dumas 2011). Research assistants followed a standardized tracking procedure to follow all parents who were enrolled in PACE, regardless of whether or not they attended subsequent sessions. Specifically, the following was done (in this order) to track parents in the study: (a) making up to five attempts to contact the parent by phone, leaving a scripted message, (b) other individuals, who were designated as alternate contact persons by the enrolled parent, were contacted by phone, (c) a letter was mailed to the parent, using the most recent mailing address on file, (d) a letter was sent to the daycare center attended by the parent's child, to be forwarded on to the parent, and (e) a trained interviewer went to the parent's home to schedule or administer the Parent Survey (Begle and Dumas 2011).

PACE Program Fidelity

Each group session was facilitated by both a trained leader and assistant, and training and supervision focused on adherence to both content (i.e., whether or not session topics were covered and supporting materials were administered and discussed) and process variables (i.e., effective communication skills) within each session (see Dumas et al. 2001 for training and supervision procedures). Formal training of group leaders and assistants consisted of

didactic presentations, vignettes, modeling, role-playing, engaging in discussions, and practicing delivering the modules (Begle and Dumas 2011). Leaders and assistants were also administered quizzes and were observed, to ensure competence in delivering PACE. Throughout the course of PACE, group leaders wore a lapel microphone, and sessions were audiotaped and coded by trained research assistants for fidelity to both program content and process skills (Begle and Dumas 2011). A more detailed review of fidelity procedures can be found in Dumas et al. (2001). Overall, group leaders demonstrated a high level of fidelity (79 %) to content (range 20–100 %; inter-rater reliability, kappa = .79) and to process variables (91 %; range 63–100 %; inter-rater reliability, kappa = .88).

Measures

Demographic Characteristics

Demographic information was collected at pre-assessment and included parent gender, age, ethnicity, marital status, education, family income, and child gender and age.

Attendance

Attendance was coded as either 0 (did not attend) or 1 (attended). The number of sessions attended was summed to form an overall attendance score. Scores ranged from 0 (attended no sessions) to 8 (attended all sessions).

Child Abuse Potential

The Child Abuse Potential Inventory-IV (CAPI; Milner 1986) was administered to parents to determine risk for abuse. The CAPI is a 160-item self-report measure used as a screening device for physically abusive and non-abusive parents. It contains six abuse risk factors including: distress, unhappiness, rigidity, problems with child/self, problems from family, and problems from others. It also contains a 77-item broadband dimension for identifying child abuse, which is comprised of weighted scores from the six abuse risk factors. There are two possible clinical cutoffs for the abuse risk score on the CAPI; a score of 166 is considered the “signal detection” cutoff (i.e., reducing the number of false negatives and false positives), and a score of 215 is considered the more conservative cutoff. Both have been used in research and clinical studies; however, Milner (1986) suggests using the more conservative cutoff score of 215, to reduce the rate of false positive classifications. Internal consistency on the CAPI is strong and ranges from .95 to .86 (Milner 1986). The CAPI also has high test–retest reliability at a 1-day interval (.91) to a 3-month interval (.75). The present study used the

broadband abuse risk score at pre- and post-assessment. Additionally, a change score was created for the study, in which post-assessment abuse risk scores were subtracted from pre-assessment abuse risk scores, to assess change in abuse potential over time after involvement in PACE. In the full sample, the CAPI change score ranged from -238.00 to $+6.00$ ($M = -8.59$, $SD = 47.51$), indicating, that, albeit small, on average, parent child abuse potential scores decreased by post-assessment. Additionally, for the elevated sample, the CAPI change score ranged from -189.00 to $+158.00$ ($M = -7.32$, $SD = 61.01$), also indicating that, albeit small, on average, parent child abuse potential scores decreased by post-assessment.

Child Disruptive Behaviors

Parents also completed the Eyberg Child Behavior Inventory-2 (ECBI; Boggs et al. 1990). The ECBI is a 36-item self-report inventory measuring child disruptive behaviors. It contains two subscales: the Intensity subscale, which measures the frequency of child behavior problems on a scale of 1 (never) to 7 (always), and the Problem subscale, which is a dichotomous yes/no variable, indicating whether or not the parent believes the specific disruptive behavior is a problem. The current study used scores from the pre- and post-assessment Intensity subscale. The clinical cutoff for the ECBI Intensity scale is 131, indicating clinically elevated disruptive behaviors. Thus, higher scores on this measure indicate higher levels of disruptive behaviors. The ECBI Intensity scale has demonstrated strong internal consistency (Cronbach $\alpha = .91$) and high concurrent validity with other measures assessing child internalizing and externalizing behaviors (Boggs et al. 1990).

Results

Overall, 483 parents attended at least one session of PACE, with 71 of these parents reporting clinically-elevated child disruptive behavior at pre-assessment (i.e., ECBI score was greater than or equal to 131). In the full sample, parents had a mean ECBI score of 104.15 ($SD = 28.05$), and parents in the clinically-elevated sample had a mean ECBI score of 150.42 ($SD = 20.02$). Four hundred thirty-three parents and 64 parents in the full and clinically-elevated samples, respectively, had data at both pre- and post-assessment. Overall, parents in the full and clinically-elevated samples did not differ significantly on demographic characteristics. Parents did differ in scores on the study outcome variables. Parents in the full sample reported lower post-assessment ECBI scores ($M = 98.93$, $SD = 27.44$) than parents in the clinically-elevated sample ($M = 133.99$, $SD = 26.01$), who had scores hovering around the ECBI clinical cutoff at

the end of PACE. Additionally, parents in the full sample reported lower pre ($M = 107.06$, $SD = 80.24$) and post-CAPI scores ($M = 97.90$, $SD = 79.28$) than parents in the clinically-elevated group (pre: $M = 157.53$, $SD = 106.20$; post: $M = 143.32$, $SD = 97.19$). Neither group of parents met the clinical cutoff for abuse risk on the CAPI using either the signal detection (166) or more conservative (215) cutoff on the CAPI (Milner 1986), although there was considerable variability around the mean. Parents in both groups attended about five sessions of PACE. Table 1 lists scores across the predictor and outcome measures.

A bivariate correlational matrix was conducted and contained the following variables: parental attendance, pre- and post-assessment scores on the CAPI, change in CAPI from pre-post assessment, and pre- and post-assessment scores on the ECBI. Table 2 demonstrates the correlational matrix. Overall, pre- and post-assessment scores on the CAPI were highly correlated with each other and with the CAPI change score. Pre- and post-CAPI scores were also highly correlated with pre- and post-ECBI scores. Parental attendance was negatively associated with post ECBI scores, and higher scores on the ECBI at post-assessment were associated with fewer sessions attended.

The first aim of the study was to assess whether or not change in parent child abuse potential (as measured by the CAPI change score) was predictive of child externalizing behavior at post-assessment for the full sample of participants. To test this aim, a hierarchical multiple regression predicting ECBI scores at post-assessment was conducted. To note, data collected in PACE were nested within settings (i.e., daycare centers). Unconditional models conducted in previous research using the same sample (e.g., Begle and Dumas 2011) indicated that daycare centers did not explain a significant amount of variance for child disruptive behaviors. Daycare centers did explain 13 % of the variance of child abuse potential. Generally, it has been proposed that intraclass correlation coefficients greater than or equal to 0.25 (i.e., at least 25 % of the variance between predictors and outcomes explained by clustering effects) indicate the need to consider using hierarchical linear modeling techniques (Guo 2005; Heinrich and Lynn 2001; Kreft 1996). Thus, for the current study, the 13 % of

the variance in child abuse potential explained by daycare centers was considered low enough to utilize hierarchical regression, rather than hierarchical modeling techniques.

To control for pre-assessment ECBI scores, this variable was entered at Block 1. Then, relevant demographic characteristics (i.e., parent ethnicity, child sex, and child age) were entered at Block 2. Parent ethnicity was dummy coded as a dichotomous variable comparing African American parents and parents self-identifying as “Other” to Caucasian parents. Additionally, child sex was dummy coded as a dichotomous variable, comparing males to females. Parental attendance was entered at Block 3, and finally, the CAPI change score was entered at Block 4. Results from this model are presented in Table 3. Overall, after controlling for pre-assessment ECBI scores, relevant demographic information, and parental attendance, change in child abuse potential uniquely explained 0.7 % of the variance ($R^2 = .61$, $F(1, 426) = 7.81$, $p = .005$) of change in child disruptive behavior. Perhaps not surprisingly, pre-assessment ECBI scores explained the majority of the variance, 59 %, in change ECBI scores at post-assessment.

Clinically Elevated Sample

A bivariate correlational matrix was conducted between predictor and outcome variables within the clinically elevated sample. Table 4 demonstrates the correlational matrix. Consistent with the full sample, CAPI pre- and post-scores were highly correlated with each other and the CAPI change score. The CAPI pre- and post-scores were also correlated with the ECBI pre- and post-scores. Again, parental attendance was negatively associated with post-ECBI scores.

The second aim of the study was to assess whether or not change in parental child abuse potential was predictive of post-assessment child disruptive behaviors, after selecting for clinically-elevated child disruptive behaviors at pre-assessment. Consistent with the first study aim, a hierarchical multiple regression predicting post-assessment ECBI scores was conducted. Pre-assessment ECBI scores were entered at Block 1, the same demographic characteristics (i.e., parental ethnicity, child sex, and child age)

Table 2 Correlations of predictor and outcome variables, full sample

	Attendance	CAPI T1	CAPI T2	Δ CAPI	ECBI T1	ECBI T2
Attendance	–					
CAPI T1	.01	–				
CAPI T2	.01	.82**	–			
Δ CAPI	.001	–.31**	.28**	–		
ECBI T1	–.002	.27**	.26**	–.01	–	
ECBI T2	–.09*	.21**	.26**	.07	.76**	–

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

Table 3 Hierarchical multiple regression predicting change in child externalizing behavior, full sample

	Post-treatment child externalizing behavior			
	ΔR^2	B	SE B	β
Step 1	.59**			
ECBI (pre)		.75	.03	.76**
Step 2	.005			
Parent ethnicity		2.71	1.69	.04
Child sex		-1.75	1.69	-.03
Child age		-1.28	1.05	-.03
Step 3	.006*			
Attendance		-.90	.35	-.07*
Step 4	.007**			
CAPI (change)		.04	.01	.08**
Total R^2	.61**			
<i>n</i>	433			

Parents attended ≥ 1 session of the PACE program

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

were entered at Block 2, parental attendance was entered at Block 3, and the CAPI change score was entered at Block 4. Overall, after controlling for pre-assessment ECBI scores, relevant demographic information, and parental attendance, change in child abuse potential did not significantly predict change in child disruptive behavior. However, this relation tended toward significance, and explained 2.5 % of the variance $R^2 = .58$, $F(1, 57) = 3.45$, $p = .06$ of change in child disruptive behavior. Again, not surprisingly, pre-assessment ECBI scores explained the majority of variance, 39 %, of post-assessment ECBI scores (Table 5).

Discussion

Overall, change in parental physical abuse potential predicted parent report of child disruptive behaviors after 8 weeks of participation in PACE; however, this change was very small, and did not manifest when selecting for children with clinically-elevated disruptive behaviors at pre-assessment. Although this effect was small, the current

Table 4 Correlations of predictor and outcome variables, elevated sample

	Attendance	CAPI T1	CAPI T2	Δ CAPI	ECBI T1	ECBI T2
Attendance	–					
CAPI T1	-.03	–				
CAPI T2	.003	.80**	–			
Δ CAPI	-.02	-.34**	.27*	–		
ECBI T1	-.13	.32*	.35**	-.17	–	
ECBI T2	-.29*	.18	.29*	.16	.63**	–

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

Table 5 Hierarchical multiple regression predicting change in child externalizing behavior, full sample, selecting for clinically elevated ECBI at pre-assessment

	Post-assessment child externalizing behavior			
	ΔR^2	B	SE B	β
Step 1	.39**			
ECBI (pre)		.88	.11	.69**
Step 2	.10*			
Parent ethnicity		8.44	4.75	.16
Child sex		-11.00	5.14	-.20*
Child age		-4.40	2.91	-.13
Step 3	.06**			
Attendance		-2.57	.96	-.24*
Step 4	.02			
CAPI (change)		.07	.04	.17
Total R^2	.58			
<i>n</i>	64			

Clinically elevated ECBI scores were ≥ 131 at pre-assessment; this number was derived from the ECBI manual (Eyberg and Pincus 1999)

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

study does suggest that parental physical abuse potential may uniquely predict child disruptive behavior following BPT, and this study appears to be the first to target this predictor. Indeed, researchers have found that change in parenting practices (both an increase in authoritative parenting and a decrease in punitive parenting), as well as an increased parental sense of efficacy, mediate the relation between attendance in BPT and a decrease in child disruptive behaviors, including noncompliance, aggression, and inattention (Beauchaine et al. 2005; Gardner et al. 2010; Hagen et al. 2011; McTaggart and Sanders 2007). However, as stated previously, there do not appear to be investigations of parental child abuse risk as a potential predictor or mediator of child outcomes within BPT.

Results from this study suggest that child physical abuse risk may be an important predictor of subsequent child outcomes to examine within BPT programs. Specifically, targeting parental physical abuse risk in BPT may help to “break” the coercive cycle of negative parent–child interactions. It may be warranted for therapists or group

leaders to consider utilizing treatment modules or coaching work targeted at reducing facets of child abuse risk. Potential areas for intervention may include negative perceptions of the child, effective discipline, and increasing or enhancing parental social support. Some of these suggestions are already noted as being integral components of BPT, such as consistent and appropriate discipline skills and fostering positive interactions and effective emotional communication between parents and children (Kaminski et al. 2008). It may be indicated to apply these treatment components more specifically to decreasing parental child abuse potential, which then may serve to predict decreases in child disruptive behavior.

This study was also unique because it demonstrated that change in child physical abuse potential was related to change in child disruptive behaviors in parents with very young children. Children between the ages of 0 through 4-years-old are at the greatest risk for physical violence by caregivers, and children who experience early maltreatment (including physical abuse) are at an increased likelihood of presenting with poor adaptive functioning as well as disruptive behaviors and psychological distress through adolescence and into adulthood (English et al. 2005; Klapow and Widom 2007; Keiley et al. 2001; Norman et al. 2012). Therefore, intervening early to break the coercive cycle between parents and children is imperative to reduce risky parent and child behaviors, as well as improve functioning. Studies assessing mediators, moderators, and predictors within BPT have typically included parents with children ranging from preschool-aged through older childhood (i.e., eight through 12 years old; see Beauchaine et al. 2005; Gardner et al. 2010; Hagen et al. 2011; McTaggart and Sanders 2007), and have not specifically targeted preventive interventions directed toward very young children. The current study was not only able to demonstrate that child physical abuse potential was a significant predictor of child disruptive behaviors, but also that this effect was seen for children between the ages of 3- and 5-years old, targeting a much younger group of children than most of the other studies examining mediators, moderators, and predictors in BPT. This is especially important because intervening early regarding the coercive parent-child cycle may serve to prevent child disruptive behavior problems from worsening in intensity and stability over time, thereby potentially preventing the risk for physical child abuse in the future.

The present study has multiple limitations, which should be noted. To begin, given this study was one of the first to directly test whether or not child physical abuse potential was predictive of child disruptive behavior in BPT, we focused our efforts on assessing this relation immediately after parents completed the PACE program. We determined that focusing on parental change immediately after

participation in PACE would be sufficient in attempting to establish if a significant predictor of child outcomes could be identified. Thus, due to the preliminary goal of determining whether or not a specific parental variable could indeed affect child outcomes in PACE, efforts were focused on the immediate post-assessment period. However, given that a small effect was found between child physical abuse potential and child disruptive behaviors, future studies should assess whether or not this effect is maintained over time. An additional limitation is that all data were collected via self-report from the parent, which may have resulted in biased perceptions of abuse risk and child disruptive behaviors. Future studies would be strengthened by a multi-method and/or multi-informant (e.g., teacher or daycare worker report) approach to data collection. Including data from other sources may yield a comprehensive view of how change in parental child physical abuse potential may affect child behavior across the home, school, and community.

Since PACE was developed as a preventive intervention, a range of low- to high-risk parents and children were targeted for inclusion in the study. Because of this range of risk in the overall sample, the CAPI and ECBI were not clinically elevated at pre-assessment. Thus, a “floor effect” may have occurred in the current study, given that parents were already reporting low levels of child disruptive behavior problems and physical abuse risk. Interestingly, children in the clinically-elevated group did not drop below the clinical cutoff on the ECBI (e.g., 131) after parents completed PACE, and this lack of improvement may have diminished the study outcomes. It is possible that a different pattern of findings may have emerged if an exclusively “at-risk” (i.e., clinically elevated on study measures at pre-treatment) sample, in regard to both child abuse potential and child disruptive behaviors, had been targeted.

Additionally, parents did not directly work with their children during the PACE group sessions. Although they were asked to practice skills at home, the lack of in vivo practice during PACE may have accounted for the weak link between parenting behaviors and subsequent child outcomes, particularly among the clinically-elevated group. Therefore, child behavioral outcomes may have been too distal of a factor to have been targeted in the present study. Future research should examine parental physical abuse as a predictor within BPT programs including both parents and their children in program sessions.

Additional research should examine potential predictors, mediators, and moderators of child outcomes in BPT, and replication is needed for studies examining child physical abuse risk. The CAPI is one of the most widely used measures of child physical abuse risk (Choate 2009), and thus researchers should continue to use this assessment as

an outcome measure. However, other indicators of physical abuse risk may be warranted to examine. One such indicator is behavioral observation of parent–child interactions. Including behavioral observation of parent–child interactions may be an important measure of change in parenting behaviors; given it is a more objective means of assessing this construct (Aspland and Gardner 2003). Specifically, this multi-method approach to assessment could be used to see if change in parental characteristics (e.g., child physical abuse risk) is associated with change in behavior during parent–child interactions.

Another potential area of research may be to investigate which specific program components are associated with changes in child abuse potential and subsequent child disruptive behaviors. A multitude of factors associated with risk for child physical abuse have been identified, including factors related to the parent (e.g., low parenting satisfaction and control), the child (e.g., age, including children aged 3–8 years old; physical health problems), socio-demographic and household characteristics (e.g., low socioeconomic status, chaotic or disorganized households), parent–child relations (e.g., negative interactions) and poor social support (Begle et al. 2010). Begle et al. (2010), using a cumulative risk model, supported the idea that parental physical abuse increases as a function of an increased frequency of risk factors. Many of these risk factors are already targeted in BPT programs, like teaching parents consistent and appropriate discipline skills, improving parent–child relationships by positive attention and praise, and teaching parents how to foster emotional intelligence in their children (Kaminski et al. 2008). Thus, it would be clinically useful to assess which of these specific components may be most strongly related to change in child physical abuse potential. If specific components can be identified, it may be helpful for clinicians to target these in therapy with parents and children at risk for physical abuse.

Finally, program adherence may be a potential moderator to consider in BPT targeting parents at risk for physical abuse. On average, in the present study, both content and process adherence to PACE was high; however, in other applications of BPT, this may not be the case. Future studies should examine how adherence to a manualized BPT program may help (or hinder) parent and child outcomes related to physical abuse risk and disruptive behaviors, respectively. Researchers examining how fidelity to treatment in BPT is related to parent and child outcomes have found that increased adherence to both content and process skills has predicted increases in positive parenting as well as positive attitudes related to parenting (Eames et al. 2009; Forgatch et al. 2005). Thus, adherence to BPT programs used in the context of preventing or intervening with parents at risk for physical abuse may be an indicated area of research to pursue.

Results from the present study suggest that change in parental child abuse potential may be an important predictor of change in child disruptive behavior following attendance in BPT. In a diverse sample of parents who attended a preventive intervention, change in parental child abuse potential was found to be a significant predictor over and above attendance in PACE. This effect was found after only 8 weeks of attendance in the program. Although these results were diminished when selecting for children with clinically-elevated disruptive behaviors at pre-assessment, there is still evidence to suggest that targeting parental child abuse risk may be an important predictor of child outcomes. More research is needed to see if this effect is present in other populations of at-risk parents and children attending BPT programs. If such an association emerges, clinicians implementing BPT may consider focusing attention and coaching work on components or modules within BPT aimed at reducing parental child abuse potential. This extra attention aimed at parental risk for physical abuse may help to successfully “break” the coercive cycle so pronounced in these negative parent–child interactions.

References

- Alink, L. R. A., Cicchetti, D., Kim, J., & Rogosch, F. A. (2012). Longitudinal associations among child maltreatment, social functioning, and cortisol regulation. *Developmental Psychology*, *48*, 224–236. doi:10.1037/a0024892.
- Aspland, H., & Gardner, F. (2003). Observational measures of parent–child interaction: An introductory review. *Child and Adolescent Mental Health*, *8*, 136–143. doi:10.1111/1475-3588.00061.
- Beauchaine, T. P., Webster-Stratton, C., & Reid, M. J. (2005). Mediators, moderators, and predictors of 1-year outcomes among children treated for early-onset conduct problems: A latent growth curve analysis. *Journal of Consulting and Clinical Psychology*, *73*, 371–388. doi:10.1037/0022-006X.73.3.371.
- Begle, A. M., & Dumas, J. E. (2011). Child and parental outcomes following involvement in a preventive intervention: Efficacy of the PACE program. *Journal of Primary Prevention*, *32*, 67–81.
- Begle, A. M., Dumas, J. E., & Hanson, R. F. (2010). Predicting child abuse potential: An empirical investigation of two theoretical frameworks. *Journal of Clinical Child and Adolescent Psychology*, *39*(2), 208–219. doi:10.1080/15374410903532650.
- Boggs, S., Eyberg, S., & Reynolds, L. (1990). Concurrent validity of the ECBI. *Journal of Clinical Child Psychology*, *19*, 75–78. doi:10.1207/s15374424jccp1901_9.
- Burke, J. D., Waldman, I., & Lahey, B. B. (2010). Predictive validity of childhood oppositional defiant disorder: Implications for the DSM-V. *Journal of Abnormal Psychology*, *119*, 739–751. doi:10.1037/a0019708.
- Chaffin, M., Silvosky, J. F., Funderburk, B., Valle, L. A., Brestan, E. V., Balachova, T., ... Bonner, B. L. (2004). Parent–child interaction therapy with physically abusive parents: Efficacy for reducing future abuse reports. *Journal of Consulting and Clinical Psychology*, *72*, 500–510. doi:10.1037/0022-006X.72.3.500.

- Choate, P. W. (2009). Parenting capacity assessments in child protection cases. *The Forensic Examiner*, 18, 52–59.
- Comer, J. S., Chow, C., Chan, P. T., Cooper-Vince, C., & Wilson, L. A. S. (2013). Psychosocial treatment efficacy for disruptive behavior problems in very young children: A meta-analytic examination. *Journal of the American Academy of Child and Adolescent Psychiatry*, 52, 26–36.
- Dishion, T. J., & Patterson, S. G. (1996). *Preventive parenting with love, encouragement, and limits: The preschool years*. Eugene, OR: Castalia.
- Dumas, J. E., Lynch, A. M., Laughlin, J. E., Smith, E. P., & Prinz, R. J. (2001). Promoting intervention fidelity: Conceptual issues, methods, and preliminary results from the EARLY ALLIANCE prevention trial. *American Journal of Preventive Medicine*, 20, 38–47. doi:10.1016/S0749-3797(00)00272-5.
- Dumas, J. E., Prinz, R. J., Smith, E. P., & Laughlin, J. (1999). 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*, 2, 37–53. doi:10.1023/A:1021815408272.
- Eames, C., Daley, D., Hutchings, J., Whitaker, C. J., Jones, K., Hughes, J. C., & Bywater, T. (2009). Treatment fidelity as a predictor of behaviour change in parents attending group-based parent training. *Child: Care Health, and Development*, 35, 603–612. doi:10.1111/j.1365-2214.2009.00975.x.
- English, D. J., Graham, J. C., Litrownik, A. J., Everson, M., & Bangdiwala, S. I. (2005). Defining maltreatment chronicity: Are there differences in child outcomes? *Child Abuse and Neglect*, 29, 575–595. doi:10.1016/j.chiabu.2004.08.009.
- Eyberg, S. M., Nelson, M. M., & Boggs, S. R. (2008). Evidence-based psychosocial treatments for children and adolescents with disruptive behavior. *Journal of Clinical Child and Adolescent Psychology*, 37, 215–237. doi:10.1080/15374410701820117.
- Eyberg, S. M., & Pincus, D. (1999). *Eyberg child behavior inventory and sutter-eyberg student behavior inventory-revised: Professional manual*. Odessa, FL: Psychological Assessment Resources.
- Eyberg, S. M., & Robinson, E. A. (1982). Parent–child interaction training: Effects on family functioning. *Journal of Clinical Child Psychology*, 11, 130–137. doi:10.1080/15374418209533076.
- Forgatch, M. S., Patterson, G. R., & DeGarmo, D. S. (2005). Evaluating fidelity: Predictive validity for a measure of component adherence to the Oregon model of parent management training. *Behavior Therapy*, 36, 3–13. doi:10.1016/S0005-7894(05)80049-8.
- Gardner, F., Hutchings, J., Bywater, T., & Whitaker, C. (2010). Who benefits, and how does it work? Moderators and mediators of outcome in an effectiveness trial of a parenting intervention. *Journal of Clinical Child and Adolescent Psychology*, 39, 568–580. doi:10.1080/15374416.2010.486315.
- Guo, S. (2005). Analyzing grouped data. *Children and Youth Services Review*, 27, 637–652. doi:10.1016/j.chilyouth.2004.11.017.
- Hagen, K. A., Ogden, T., & Bjørnbekk, G. (2011). Treatment outcomes and mediators of parent management training: A one-year follow-up of children with conduct problems. *Journal of Clinical Child and Adolescent Psychology*, 40, 165–178. doi:10.1080/15374416.2011.546050.
- Heinrich, C. J., & Lynn, L. E. (2001). Means and ends: A comparative study of empirical methods for investigating governance and performance. *Journal of Public Administration Research and Theory*, 11, 109–138. doi:10.1093/oxfordjournals.jpart.a003490.
- Hurlburt, M. S., Nguyen, K., Reid, J., Webster-Stratton, C., & Zhang, J. (2013). Efficacy of the incredible years group parent program with families in head start who self-reported a history of child maltreatment. *Child Abuse and Neglect*, 37, 531–543. doi:10.1016/j.chiabu.2012.10.008.
- Kaminski, J. W., Valle, L. A., Filene, J. H., & Boyle, C. L. (2008). A meta-analytic review of components associated with parent training effectiveness. *Journal of Abnormal Child Psychology*, 36, 567–589. doi:10.1007/s10802-007-9201-9.
- Kaplow, J. B., & Widom, C. S. (2007). Age of onset of child maltreatment predicts long-term mental health outcomes. *Journal of Abnormal Psychology*, 116, 176–187. doi:10.1037/0021-843X.116.1.176.
- Keiley, M. K., Howe, T. R., Dodge, K. A., Bates, J. E., & Pettit, G. S. (2001). The timing of child physical maltreatment: A cross-domain growth analysis of impact on adolescent externalizing and internalizing problems. *Developmental Psychopathology*, 13, 891–912.
- Kolko, D. J. (2002). Child physical abuse. In J. E. B. Myers, L. Berliner, J. Briere, C. T. Hendrix, C. Jenny, & T. A. Reid (Eds.), *The APSAC handbook on child maltreatment* (pp. 21–53). Thousand Oaks, CA: Sage.
- Kreft, I. G. (1996). *Are multilevel techniques necessary? An overview including simulation studies*. Los Angeles: California State University. (unpublished manuscript).
- Lundahl, B., Risser, H. J., & Lovejoy, M. C. (2006). A meta-analysis of parent training: Moderators and follow-up effects. *Clinical Psychology Review*, 26, 86–104. doi:10.1016/j.cpr.2005.07.004.
- McNeil, C. B., & Hembree-Kigin, T. L. (2010). *Parent–child interaction therapy* (2nd ed.). New York: Springer.
- McTaggart, P., & Sanders, M. R. (2007). Mediators and moderators of change in dysfunctional parenting in a school-based universal application of the Triple P Positive Parenting Programme. *Journal of Children’s Services*, 2, 4–17.
- Milner, J. S. (1986). *The child abuse potential inventory manual* (2nd ed.). DeKalb, IL: Psytec.
- Norman, R. E., Byambaa, M., De, R., Butchart, A., Scott, J., & Vos, T. (2012). The long-term health consequences of child physical abuse, emotional abuse, and neglect: A systematic review and meta-analysis. *PLoS Med*, 9, e1001349.
- Patterson, G. R., & Reid, J. B. (1984). Social interaction processes within the family: The study of the moment-to-moment transactions in which human social development is embedded. *Journal of Applied Developmental Psychology*, 5, 237–262.
- Prinz, R. J., Sanders, M. R., Shapiro, C. J., Whitaker, D. J., & Lutzker, J. R. (2009). Population-based prevention of child maltreatment: The US Triple P system population trial. *Prevention Science*, 10, 1–12. doi:10.1007/s11121-009-0123-3.
- Runyon, M. K., Deblinger, E., Ryan, E. E., & Thakkar-Kolar, R. (2004). An overview of child physical abuse: Developing an integrated parent–child cognitive-behavioral treatment approach. *Trauma, Violence, & Abuse*, 5, 65–85. doi:10.1177/1524838003259323.
- Steinberg, L. (2001). We know some things: Parent–adolescent relationships in retrospect and prospect. *Journal of Research on Adolescence*, 11, 1–19.
- Urquiza, A. J., & McNeil, C. B. (1996). Parent–child interaction therapy: An intensive dyadic intervention for physically abusive families. *Child Maltreatment*, 1, 134–144.
- Weersing, V. R., & Weisz, J. R. (2002). Mechanisms of action in youth psychotherapy. *Journal of Child Psychology and Psychiatry*, 43, 3–29.