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Behavioral Parent Training in Infancy: What About the Parent–Infant Relationship?

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Behavioral parent training (BPT) and attachment interventions have demonstrated efficacy in improving outcomes for young children. Despite theoretical overlap in these approaches, the literature has evolved separately, particularly with respect to outcome measurement in BPT. We examined the impact of the Infant Behavior Program (IBP), a brief home-based adaptation of Parent–Child Interaction Therapy, on changes in attachment-based caregiving behaviors (sensitivity, warmth, and intrusiveness) at postintervention and 3- and 6-month follow-ups during a videotaped infant-led play. Sixty mother–infant dyads were randomly assigned to receive the IBP (n = 28) or standard care (n = 30). Infants were an average age of 13.52 months and predominately from ethnic or racial minority backgrounds (98%). We used bivariate correlations to examine the association between attachment-based caregiving behaviors and behaviorally based parenting do and don't skills and structural equation modeling to examine the direct effect of the IBP on attachment-based caregiving behaviors and the indirect effect of behaviorally based parenting skills on the relation between intervention group and attachment-based caregiving behaviors. Behaviorally based parenting do and don't skills were moderately correlated with attachment-based caregiving behaviors. Results demonstrated a direct effect of the IBP on warmth and sensitivity at postintervention and 3- and 6-month follow-ups. The direct effect of the IBP on warmth and sensitivity at the 3- and 6-month follow-ups was mediated by increases in parenting do skills at postintervention. Findings suggest that behaviorally based parenting skills targeted in BPT programs have a broader impact on important attachment-based caregiving behaviors during the critical developmental transition from infancy to toddlerhood.

Behavioral parent training (BPT) programs have been shown to be efficacious in reducing child externalizing behavior problems, such as aggression, and increasing positive parenting behaviors, such as praise for positive child behaviors (Serketich & Dumas, 1996; Thomas & Zimmer-Gembeck, 2007). In BPT, therapists typically teach parents specific behavioral skills, such as effective communication skills and consistent discipline strategies, to decrease child behavior problems (Kaminski, Valle, Filene, & Boyle, 2008). Despite strong evidence for BPT in improving child outcomes, research has identified high-risk families with the greatest need benefit the least from BPT (Lundahl, Risser, & Lovejoy, 2006). Thus, research has increasingly focused on expanding the reach of these programs to high-risk families, such as families from underrepresented ethnic and racial minority groups and low-income backgrounds (Bagner, Rodríguez, Blake, & Rosa-Olivares, 2013; McCabe, Yeh, Lau, & Argote, 2012) and families with a child with and at risk for developmental delay (Bagner & Eyberg, 2007; McIntyre, 2008). Although BPT demonstrates efficacy and shows promise in reaching high-risk families, research examining the underlying theoretical assumptions of BPT is limited. Therefore, the current study examined the direct and indirect effects of a BPT program on behavioral and attachment-based measures of the parent–child relationship during infancy.

Conceptually, BPT is grounded in social learning theory in which children's experiences shape their behaviors (Dumas, 1989; Serketich & Dumas, 1996). For younger children, the parent–child relationship and home

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environment represent the most significant experience (Maccoby, 1992). Based on social learning theory, the majority of BPT programs include the following assumptions: (a) behaviors are a function of the reinforcements and punishments that children receive within their environments, (b) negative behaviors are learned and sustained by the positive and negative reinforcements children receive from their parents, (c) positive reinforcement of child prosocial behaviors and consistent ignoring or punishment of child negative behaviors can shift social contingencies, and (d) maintenance and generalization of gains rely on consistent positive reinforcement (Serketich & Dumas, 1996). Building on the social learning theoretical foundation, therapists typically teach parents specific behavioral skills to consistently reinforce their child's prosocial behaviors and ignore or punish their child's negative behaviors. Learning these skills is thus theorized to decrease child externalizing behaviors, increase child prosocial behaviors, and promote a positive parent–child relationship.

In addition to social learning theory, attachment theory influenced the theoretical framework of some evidence-based BPT programs. In attachment theory, warm and responsive behaviors in caregivers are theorized to lead to a child's secure internal model of self and others (Ainsworth, Blehar, Waters, & Wall, 1978). By the end of their 1st year of life, infants raised by caregivers who display sensitive and responsive behaviors are able to use their caregivers as a secure base from which to explore the environment (Cummings & Davies, 1996). In attachment theory, both parents are considered attachment figures, though the mother has typically been considered the principal attachment figure during infancy (Bowlby, 1982). Specific maternal behaviors, such as maternal sensitivity, warmth, and intrusiveness, have been shown to influence the development of the parent–child relationship. For example, maternal sensitivity during infancy and early childhood predicted a secure parent–child attachment and positive child developmental outcomes (Beijersbergen, Juffer, Bakermans-Kranenburg, & Van Ijzendoorn, 2012; Wolff & Ijzendoorn, 1997). A robust relation was also found between maternal warmth and the development of a positive parent–child relationship (Maccoby & Martin, 1983). Caregiver intrusiveness has been suggested to be negatively associated with positive parent–child relationship outcomes (Ainsworth et al., 1978), though subsequent findings examining intrusive caregiving and the parent–child relationship have been mixed (Eshel, Landau, Daniely, & Ben-Aaron, 2000; Ispa et al., 2004). Parenting interventions in early childhood that are derived from attachment theory such as Attachment and Biobehavioral Catchup Intervention (Dozier, Lindhiem, & Ackerman, 2005) and Child–Parent Psychotherapy (Lieberman, 2004), seek to improve parental sensitivity through the provision of feedback to parents. Randomized controlled trials of the Attachment and Biobehavioral Catchup Intervention and Child–Parent Psychotherapy showed significant improvement in child attachment security for families receiving the interventions compared to control groups (Cicchetti, Rogosch, & Toth, 2006; Dozier et al., 2009).

Similar to the early childhood parenting interventions derived from attachment theory, most BPT programs targeting young children draw on attachment theory and focus on providing feedback to parents. Examples of these BPT programs include Parent–Child Interaction Therapy (PCIT; Blizzard, Bagner, & Eyberg, in press), The Incredible Years (Webster-Stratton & Hancock, 1998), Helping the Non-Compliant Child (Forehand & McMahon, 1981), and Positive Parenting Program (Triple P; Sanders, 1999). For example, in the first phase of PCIT, the Child-Directed Interaction (CDI) phase, the therapist teaches and coaches parents to use behavioral skills (e.g., praising, reflecting speech, describing behaviors) that are thought to promote a positive and more secure relationship between the parent(s) and their child. Although some BPT programs are grounded in attachment theory, empirical work examining the effect of early childhood BPT programs on caregiving behaviors consistent with attachment theory is limited (O'Connor, Matias, Futh, Tantam, & Scott, 2013; Thomas & Zimmer-Gembeck, 2007, 2011).

Although early childhood BPT programs and attachment-based interventions aim to improve the parent–child relationship, different outcomes are assessed depending on the specific parenting behaviors targeted in the intervention. On one hand, studies on BPT examine improvements in the parent–child relationship by measuring changes in parenting behaviors consistent with social learning theory (Speltz, De Klyen, Greenberg, & Dryden, 1995), such as increases in praises and decreases in criticisms, that we refer to herein as "behaviorally based parenting skills." On the other hand, studies on attachment-based interventions examine improvements in the parent–child relationship by measuring changes in parenting behaviors related to a secure parent–child attachment (Speltz et al., 1995), including increases in sensitivity and warmth and decreases in intrusiveness. In the current study, we examine these caregiving behaviors associated with a secure parent–child attachment that we refer to herein as "attachment-based caregiving behaviors." Although different variables are measured in BPT programs and attachment-based interventions to reflect changes in the parent–child relationship, there is evidence of theoretical overlap between these intervention approaches. For example, a meta-analysis of early childhood attachment interventions across 70 studies demonstrated that interventions that were brief and included a behavioral focus were the most effective in improving children's attachment security (Bakermans-Kranenburg, Van Ijzendoorn, & Juffer, 2003). However, behaviorally based parenting skills were not reported in the meta-analysis, and limited research on BPT has examined attachment-based caregiving behaviors

(O'Connor et al., 2013; Thomas & Zimmer-Gembeck, 2011).

To our knowledge, only two studies on BPT programs implemented in early childhood examined attachment-based caregiving behaviors. First, Thomas and Zimmer-Gembeck (2011) examined the impact of PCIT on maternal sensitivity in a randomized controlled trial for children with a history of or at risk for maltreatment. At treatment completion, families receiving PCIT demonstrated significantly higher levels of maternal sensitivity during a child-directed play compared to families in a waitlist control group (Thomas & Zimmer-Gembeck, 2011). Second, O'Connor and colleagues (2013) examined the impact of the Incredible Years program with an added literary component on maternal sensitive responding, mutuality, and children's attachment narratives in a randomized controlled trial for children with disruptive behavior problems. Results showed a significant treatment effect on maternal sensitive responding during a free play scenario for families receiving the Incredible Years program compared to families in a waitlist control group. Results also showed moderate associations between child-centered parent skill use (e.g., praise) and maternal sensitive responding. Although both studies found treatment effects on maternal sensitivity, neither study examined maternal warmth or intrusiveness. In addition, both studies examined maternal sensitivity at pre- and posttreatment, limiting the ability to examine potential mechanisms of change by testing for mediation across follow-up time points. BPT programs directly target increases in positive behavioral parenting skills, such as praises, descriptions, and reflections, and it follows that increased use of these behavioral parenting skills may serve as a mechanism for change in broader attachment-related constructs, such as warmth and sensitivity. In BPT, parents are also taught to decrease criticisms, negative talk, and questions, as they are thought to take the lead away from the child. Thus, decreases in these directive behavioral parenting skills may serve as a mechanism for change in the attachment-related construct of intrusiveness.

Moreover, although infancy is a critical period for development of the parent–child attachment (Ainsworth et al., 1978; Bakersman-Kranenburg et al., 2003; Cummings & Davies, 1996), no study has examined the impact of BPT programs delivered in infancy on attachment-based caregiving behaviors. Intervening on behavior problems during infancy is promising, particularly as these interventions have the potential to be brief in duration relative to interventions delivered later in childhood (Bakersmans-Kranenburg et al., 2003). Attachment-based interventions have shown efficacy in increasing maternal sensitivity and secure attachment in infancy (Bakermans-Kranenburg et al., 2003). Similarly, research on a home-based adaptation of PCIT for high-risk infants, the Infant Behavior Program (IBP), showed a positive impact on behaviorally based parenting skills and infant behavior (Bagner et al., 2016) but did not examine impacts on attachment-based caregiving behaviors. The existing body of research points to a need to examine the extent to which BPT programs delivered in infancy impact attachment-based caregiving behaviors and the potential mediating role of behaviorally based parenting skills on subsequent changes in attachment-based caregiving behaviors.

In the present study, we examined the impact of the IBP on changes in attachment-based caregiving behaviors (warmth, sensitivity, and intrusiveness) in a randomized controlled trial in which families were randomly assigned to receive the IBP or standard care. The IBP includes only the CDI phase of PCIT, and thus is an appropriate intervention for examining the impact of a BPT program on attachment-based caregiving behaviors. We hypothesized the following: (a) behaviorally based parenting do skills (i.e., praises, behavioral descriptions, and reflections) and attachment-based caregiving behaviors (warmth, sensitivity) would be positively associated at baseline, whereas behaviorally based parenting don't skills (i.e., negative talk, questions, commands) and attachment-based caregiving intrusiveness would be positively associated at baseline, and (b) families randomly assigned to receive the IBP would show significantly higher levels of sensitivity and warmth and lower levels of intrusiveness at a postassessment and at 3- and 6- month follow-ups than families assigned to standard care. In addition, as parents receiving the IBP are explicitly taught to increase their use of parenting do skills and decrease their use of parenting don't skills through in vivo coaching and ongoing progress monitoring, we hypothesized that the effect of the IBP on changes in attachment-based caregiving behaviors would be mediated by changes in parenting skills. Specifically, we hypothesized that the effect of the IBP on increases in sensitivity and warmth would be mediated by increases in parenting do skills and decreases in parenting don't skills. We also hypothesized that the effect of the IBP on decreases in intrusiveness would be mediated by increases in parenting do skills and decreases in parenting don't skills.

METHOD

The current study is a secondary data analysis of a randomized controlled trial of the IBP. The primary outcome data on the IBP are reported elsewhere (Bagner at al., 2016) and demonstrated that infants receiving the IBP displayed significantly lower levels of behavior problems across post and 3- and 6-month follow-up assessments and were significantly more compliant with maternal commands at the 6-month follow-up compared to infants in standard care. In addition, mothers demonstrated significantly higher levels of behaviorally based parenting do skills and lower levels of behaviorally based parenting don't skills over time during a child-directed play compared to mothers in the standard care

group. Study procedures were approved by the university and hospital Institutional Review Boards.

Participants

Families with a 12- to 15-month-old were recruited by research staff during well and sick visits at a pediatric primary care clinic in a large children's hospital in the southeastern United States. The mother was the identified primary caregiver of all families participating in the study. To meet study inclusion criteria, mothers had to rate their infant above the 75th percentile on the Brief Infant-Toddler Social and Emotional Assessment (Briggs-Gowan & Carter, 2006), a screener of infant behavior problems. Mothers had to speak either English or Spanish. If bilingual, mothers chose to complete assessments (and intervention sessions if assigned to the intervention group) in the language in which they felt more comfortable. English-speaking mothers were required to receive an estimated IQ score of 70 or higher on the Vocabulary and Matrix Reasoning subtest version of the Wechsler Abbreviated Scale of Intelligence (Wechsler, 1999), and Spanish-speaking mothers were required to receive an average scaled score of 4 or higher on the Vocabulary and Matrix Reasoning subtests of the Escala de Inteligencia Wechsler Para Adultos–Third Edition (Pons et al., 2008).

Sixty mother–infant dyads consented to participate and were randomly assigned to the IBP or standard care group (both groups are described next in more detail). Data for the current study include the 58 families that completed the baseline assessment. Forty-eight families completed the postintervention assessment (80% retention) and 46 families completed the 3- and 6-month follow-up assessments (77% retention). Eight families in the IBP group (29%) did not complete the intervention, consistent with dropout rates in standard PCIT (Eyberg, Boggs, & Jaccard, 2014). No families assigned to the standard care group broke randomization by switching to the IBP. Infants were between 12 and 15 months, with an average age of 13.52 months (SD = 1.31). The majority of infants were reported to have Hispanic ethnicity (94.8%) and White race (82.8%). Mothers ranged from 17 to 42 years of age, with an average age of 29.9 (SD = 5.3). The majority of mothers (90%) reported a Hispanic ethnicity and a racial distribution of 80% White, 10% Black, 1.7% biracial, 1.7% Asian, and 6.7% "other." The mean IQ T score (across Vocabulary and Matrix Reasoning subtests) for mothers was 46.35 (SD = 12.55). The majority of mothers (60.34%) reported attending some college. A majority of families (60%) reported incomes below the poverty line. Spanish was the primary language spoken by the majority of caregivers (56.7%). Using independent samples t tests, IBP and standard care groups did not differ on any demographic characteristics.

Procedure

Families that met study criteria at the time of screening were scheduled for a baseline assessment, during which parent-rating forms and behavioral observations of mother–infant interactions were administered. At the completion of the baseline assessment, mother–infant dyads were randomized using a computer-generated random numbers list to receive the IBP or standard care (Bagner et al., 2016). In the standard care condition, infants received health care in the pediatric primary care clinic but did not receive the IBP. A second assessment was conducted approximately two months following the baseline assessment and represented the postintervention assessment. Follow-up assessments were conducted approximately three and six months after the postintervention assessment. All assessments took place at families' homes, and families were compensated $50 for completion of each assessment. Videotaped behavioral observations between the mother and infant were incorporated within each home assessment. Behavioral observations were 5 min long at all assessments (infant-led play) with the exception of an additional 5-min cleanup situation at the 6-month follow-up (not included in the current study). The 5-min infant-led play observation was used to code both behaviorally based parenting skills and attachment-based caregiving behaviors.

Outcome Measures

Attachment-Based Caregiving Behaviors

The first and third authors, who are both bilingual and were masked to group status, coded attachment-based caregiving behaviors on three global scales using the Early Parenting Coding System (EPCS; Winslow & Shaw, 1995): sensitivity/responsiveness (the extent to which the mother promptly and appropriately responds to the infant's bids), warmth/positive affect (the extent to which the mother shows positive affect and warmth toward the infant), and intrusiveness/over control (the extent to which the mother gives commands unnecessarily, physically manipulates or restricts infant, or prevents infant from attempting task(s) by doing it for him or her). Behavior was coded on a 4-point scale, with 1 representing the lowest level of the behavior and 4 representing the highest level of the behavior. The EPCS has demonstrated reliability and validity in examining these behaviors with young children and their mothers (Graziano, Keane, & Calkins, 2010). Four criterion tapes (not associated with the study) were used to train the coders to meet 80% reliability. Of the 30% of baseline assessments coded a second time to assess reliability, the weighted kappas for all codes (across the infant-led play) ranged from .71 to .80, with an average of .76.

Behaviorally Based Parenting Skills

The Dyadic Parent–Child Interaction Coding System–Third Edition (DPICS; Eyberg, Nelson, Dukes, & Boggs,

2005) was utilized to measure behaviorally based parenting skills. The DPICS-III has demonstrated reliability and validity with parents of infants and from predominately Hispanic backgrounds (Bagner et al., 2016; McCabe et al., 2012). For the current study, parent codes were categorized into do skills (behavioral descriptions, reflections, and praises), reflecting verbalizations parents are taught to use during infant-led play, and don't skills (questions, commands, and negative talk), reflecting verbalizations parents are taught to not use during infant-led play. Undergraduate student coders were trained to meet 80% reliability using a DPICS-III criterion tape and were masked to intervention condition. Overall, kappa for DPICS codes in the current study was .89.

Intervention

The IBP is a home-based adaptation of the CDI phase of PCIT for high-risk infants and their families (Bagner et al., 2016). Parents in the IBP are taught to follow their infant's lead in play by increasing their use of behaviorally based parenting do skills and decreasing their use of behaviorally based parenting don't skills (defined earlier). The acronym PRIDE is used to facilitate learning of the do skills (i.e., *P*raising the infant, *R*eflecting the infant's speech, *I*mitating the infant's play, *D*escribing the infant's behavior, and expressing *E*njoyment in the play). Parents are also taught to ignore disruptive behaviors, such as temper tantrums and whining. Consistent with standard PCIT, the first session of the intervention is a teach session during which parents learn the do and don't skills and role-play the skills with the therapist. Doctoral students in clinical psychology served as therapists for the intervention and were supervised by a PCIT Master Trainer (author Daniel Bagner). Sessions took place weekly in the parents' home for approximately 1–1.5 hr. In between sessions, parents were instructed to practice the skills they learned with their infant for 5 min each day and document practice using weekly logs.

Families were offered a maximum of seven sessions, including the teach session. Families completed the intervention in an average of 6.1 sessions, with a range of five to seven sessions. All sessions were videotaped. Adherence was assessed and coded for 63% of randomly selected sessions. Across sessions, the average percentage to which the therapist adhered to key elements of each session was 97%.

Data Analysis

Analyses were conducted in SPSS version 20. Bivariate correlations were conducted to examine the relation between attachment-based caregiving behaviors and behaviorally based parenting skills at baseline. Direct effects were examined in AMOS 20 with intervention group predicting levels of attachment-based caregiving behaviors at postintervention and at 3- and 6-month follow-ups. A dummy coded variable (scored 1 or 0) was used for the two conditions (IBP or standard care). Structural equation modeling (SEM) was used to test the proposed mediation model, with intervention group predicting behaviorally based parenting skills at postintervention and behaviorally based parenting skills predicting attachment-based caregiving behaviors and 3- and 6-month follow-ups. Consistent with previous research (Garcia, Bagner, Pruden, & Nichols-Lopez, 2015), do and don't skills were treated as continuous variables because the means were highly variable. SEM allows for a more appropriate test of mediation than regression because it does not a priori assign variables as a cause or effect, and thus permits an appropriate framework for testing a theory-driven conceptual model (MacKinnon & Fairchild, 2009).

The change in both mediators (i.e., behaviorally based parenting do and don't skills) was represented by frequencies on the postintervention assessment while controlling for baseline levels of the skills. We proposed that increases in behaviorally based parenting do skills and decreases in behaviorally based parenting don't skills from baseline to postintervention would predict increases in the attachment-based caregiving behaviors of warmth/positive affect and sensitivity/responsiveness from baseline to 3- and 6-month follow-ups and that increases in behaviorally based parenting do skills and decreases in behaviorally based parenting don't skills from baseline to postintervention would predict decreases in the attachment-based caregiving behavior of intrusiveness/over control from baseline to 3- and 6-month follow-ups This SEM model allowed us to meet the assumption of temporal precedence. In analyses of direct and indirect effects, baseline levels of attachment-based caregiving behaviors and behaviorally based parenting do and don't skills were included as covariates to examine change over time.

In preliminary analyses, we examined potential associations between demographic variables and attachment-based caregiving behaviors and behaviorally based parenting skills at baseline. Infant age, ethnicity, and maternal level of education were negatively correlated with intrusiveness ($r = –.40$, $p = .002$; $r = –.32$, $p = .016$; and $r = –.29$, $p = .024$, respectively). Therefore, infant age (in months), infant ethnicity, and mother's level of education were included as covariates in all direct and indirect effects analyses. Missing values analysis indicated missngness was consistent with a missing at random pattern (Rubin, 1976). Maximum likelihood estimation, which creates estimates using all available observations for participants and provides unbiased parameter estimates, was utilized in analyses of direct and indirect effects (Schafer & Graham, 2002).

RESULTS

Descriptive Analyses

Descriptive statistics were conducted to examine the distribution of attachment-based caregiving behaviors at baseline.

The minimum was 1 and the maximum was 4 for all three behaviors. The modal rating for warmth/positive affect and sensitivity/responsivity was 2, and the modal rating for intrusiveness/over control was 1. At baseline, warmth/positive affect and sensitivity/responsivity were highly correlated (r = .84, p < .001), and intrusiveness/over control was weakly correlated with warmth and sensitivity (r = .27–.28, p < .05). Given the strong correlation between warmth/positive affect and sensitivity/responsivity at baseline and previous research indicating both constructs were associated with a secure parent–child attachment (Beijersbergen et al., 2012; Maccoby & Martin, 1983), we constructed a latent construct called "responsive caregiving" for direct and indirect effects analyses using warmth and sensitivity as indicators (loadings of .95 and .94, respectively). Latent variables have been shown to reduce measurement error and help address unexplained variance (Cheung & Lau, 2007). Intrusiveness/over control was examined in separate models.

Table 1 presents means, standard deviations, and correlations of the attachment-based caregiving behaviors (i.e., responsive caregiving and intrusiveness) and behaviorally based parenting skills (i.e., do and don't skills) for the entire sample, as well as for the intervention and standard care groups separately. Independent samples t tests showed no differences between the intervention group and standard care on levels of attachment-based caregiving behaviors or behaviorally based parenting skills at baseline. Without accounting for covariates, families receiving the IBP showed significantly higher scores on responsive caregiving at post and at the 3- and 6-month follow-ups compared to the standard care group. Families receiving the IBP showed significantly lower scores on intrusiveness at post and at the 3-month follow-up compared to the standard care group, but there were no group differences on intrusiveness at the 6-month follow-up. For parenting do skills, families receiving the IBP showed significantly higher scores at post and at the 3- and 6-month follow-ups compared to the standard care group. Families receiving the IBP also showed significantly lower levels of parenting don't skills at post and at the 3-month follow-up compared to the standard care group, but there were no group differences on don't skills at the 6-month follow-up.

Association Between Attachment-Based Caregiving Behaviors and Behaviorally Based Parenting Skills

Table 1 presents correlations between attachment-based caregiving behaviors and behaviorally based parenting skills at baseline and across postintervention and follow-up. As hypothesized, responsive caregiving and parenting do skills were moderately correlated at baseline (r = .46, p < .001). Responsive caregiving was also moderately correlated with parenting don't skills (r = .49, p < .001). There was a small but statistically significant correlation between intrusiveness and responsive caregiving at baseline (r = .29, p < .001). As hypothesized, intrusiveness and parenting don't skills were moderately correlated at baseline (r = .42, p < .001).

Direct Effects

Table 2 presents standardized and unstandardized regression coefficients for the direct effects of intervention group on attachment-based caregiving behaviors across all assessment time points. The first series of models tested direct effects of intervention group on the latent construct of responsive caregiving at postintervention and 3- and 6-month follow-ups. Intervention group membership significantly predicted responsive caregiving at postintervention, such that mothers who received the IBP displayed higher levels of responsive caregiving than mothers in the standard care group. Specifically, the unstandardized regression coefficient suggests that mothers who received the IBP were observed to be 1.58 points higher in responsive caregiving, on average, than mothers in the standard care group. Similarly, intervention group membership significantly predicted responsive caregiving at the 3- and 6-month follow-ups and indicated that mothers in the intervention group were rated to be 1.29 and 1.73 points higher in responsive caregiving than mothers in the standard care group, respectively.

The second series of models tested a direct effect of intervention group on intrusiveness/over control at postintervention and 3- and 6-month follow-ups. Although the regression coefficients were in the expected direction, there was not a significant direct effect of intervention group on intrusiveness at any time point.

Indirect Effects

Indices of model fit for the indirect effect of behaviorally based parenting do skills on the relation between intervention group membership and responsive caregiving behaviors demonstrated good model fit (Bollen & Long, 1993) for both the 3- and 6-month follow-up models. Figure 1 displays standardized and unstandardized regression coefficients for the 3-month follow-up model. There was a significant direct effect of intervention group membership (i.e., IBP or standard care) on parenting do skills (p < .001). The path from parenting do skills to responsive caregiving was also significant (p < .01). The path from intervention group membership to responsive caregiving was not significant. The standardized indirect effect for the path from intervention group membership to responsive caregiving through behaviorally based parenting do skills was .198, indicating a medium effect (Preacher & Kelley, 2011).

In the 6-month follow-up model, indices also suggested a good fitting model. Figure 2 displays standardized and unstandardized regression coefficients for the model. The paths from intervention group membership to parenting do

TABLE 1
Correlations, Means, and Standard Deviations Between Behaviorally Based Parenting Skills and Attachment-Based Caregiving Behaviors

Correlations	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
1. Baseline Responsive Caregiving	—															
2. Postresponsive Caregiving	.46**	—														
3. 3-Month Responsive Caregiving	.42**	.70**	—													
4. 6-Month Responsive Caregiving	.42**	.76**	.88**	—												
5. Baseline Intrusiveness	.29*	.03	.18	.12	—											
6. Post Intrusiveness	.10	.15	.02	.05	.59**	—										
7. 3-Month Intrusiveness	.23	.25	.34*	.34*	.36*	.45**	—									
8. 6-Month Intrusiveness	.23	.09	.16	.01	.54**	.63**	.53**	—								
9. Baseline Parenting "Do" Skills	.46**	.02	.09	.15	.40**	.17	.06	.36*	—							
10. Baseline Parenting "Don't" Skills	.49**	.14	.14	.16	.42**	.45**	.35*	.33*	.41**	—						
11. Postparenting "Do" Skills	.44**	.72**	.59**	.62**	.11	.14	.29	.12	.12	.08	—					
12. Postparenting "Don't" Skills	.24	.13	.01	.04	.45**	.55**	.22	.35*	.16	.38**	.11	-				
13. 3-Month Parenting "Do" Skills	.44**	.55**	.58**	.56**	.03	.02	.36*	.17	.06	.18	.83**	.11	-			
14. 3-Month Parenting "Don't" Skills	.21	.08	.14	.11	.41**	.58**	.23	.48**	.33*	.47**	.05	.71**	.02	-		
15. 6-Month Parenting "Do" Skills	0.28	.49**	.60**	.62**	.03	.15	.34*	.17	.11	.06	.68**	.21	.71**	.14	-	
16. 6-Month Parenting "Don't" Skills	.24	.11	.20	.28	.28	.44**	.33*	.39**	.39*	.51**	0.01	.52**	−0.01	.61**	0.05	-
Total Sample[a]	2.44 (0.96)	2.68 (1.01)	2.66 (1.07)	2.76 (1.00)	2.26 (1.16)	1.98 (1.11)	2.16 (1.12)	1.91 (1.08)	4.20 (4.27)	25.36 (21.79)	8.06 (9.66)	15.34 (18.52)	7.76 (11.43)	13.25 (15.68)	9.81 (11.98)	15.04 (13.67)
Intervention Group[a]	2.62 (1.00)	3.45** (0.94)	3.28** (1.07)	3.53** (0.65)	2.10 (1.15)	1.50 (0.89)	1.74** (1.15)	1.63** (1.01)	4.00 (3.85)	23.86 (19.76)	14.30** (11.85)	7.25** (7.40)	13.05** (14.90)	7.47** (8.68)	17.31** (14.11)	13.05 (13.93)
Standard Care Group[a]	2.25 (0.88)	2.11 (0.63)	2.18 (0.81)	2.14 (0.78)	2.43 (1.17)	2.33 (1.14)	2.48 (1.00)	2.12 (1.12)	4.42 (4.74)	26.92 (23.97)	3.44 (3.21)	21.33 (21.89)	3.58 (4.85)	17.83 (18.46)	3.87 (4.79)	16.62 (13.55)

Note: Significant differences between groups from *t* tests are indicated by asterisk(s) on the mean values of the intervention group.

[a]Values are mean (standard deviation).

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

TABLE 2
Direct Effects of Infant Behavior Program on Attachment-Based Caregiving Behaviors

	Postregression Coefficient	*3-Month Regression Coefficient*	*6-Month Regression Coefficient*
Responsive Caregiving	.75 (1.58)***	.61 (1.29)***	.81 (1.73)***
Intrusiveness/ Over Control	−.23 (–.51)	−.25 (–.56)	−.18 (–.39)

Note: Post-, 3-month, and 6-month regression coefficients represent direct effects of the intervention; unstandardized coefficients are in parentheses.

*$p < .05$. **$p < .01$. ***$p < .001$.

skills and from parenting do skills to responsive caregiving were both significant ($p < .001$). The path from intervention group membership to responsive caregiving was also significant ($p < .01$). The standardized indirect effect for the path from intervention group membership to responsive caregiving through behaviorally based parenting skills was .165, indicating a medium effect (Preacher & Kelley, 2011).

We subsequently tested an indirect effects model with parenting don't skills at postintervention as the mediator, and responsive caregiving at 3- and 6-month follow-up time points as the outcome. Statistics indicated poor model fit for the 3-month (CMIN $\chi^2 = 8.61$, $p = .28$; root mean square error of approximation [RMSEA] > .05, PCLOSE p value = .376; comparative fit index [CFI] = 0.99, Tucker-Lewis index [TLI] = 0.92) and 6-month (CMIN $\chi^2 = 10.59$, $p = .157$; RMSEA > .05, PCLOSE p value = .233; CFI = 0.981, TLI = 0.85) follow-up models.

We also examined the indirect effect of behaviorally based parenting do skills on the relation between intervention group membership and intrusiveness at follow-up. Model fit indices indicated poor fit for the 3-month (CMIN $\chi^2 = 0.00$, $p = .000$; RMSEA > .010, PCLOSE p value = .000; CFI = 1.00, TLI = 0.00) and 6-month (CMIN $\chi^2 = 0.00$; $p = .000$; RMSEA > .010, PCLOSE p value = .001; CFI = 1.00, TLI = 0.00) follow-up models. Finally, we tested the indirect effect of behaviorally based parenting don't skills on the relation between intervention group membership and intrusiveness at follow-up. Model fit indices indicated poor fit for both 3-month (CMIN $\chi^2 = 0.00$, $p = .000$; RMSEA > .010, PCLOSE p value = .160; CFI = 0.00, TLI = 0.00) and 6-month (CMIN $\chi^2 = 0.00$; $p = .000$; RMSEA > .010, PCLOSE p value = .001; CFI = 1.00, TLI = 1.00) follow-up models.

Alternative Models

Given the associations between attachment-based caregiving behaviors and behaviorally based parenting skills, as well as the paucity of research examining overlap in these theoretical frameworks, we also tested an indirect effects model with the latent construct of responsive caregiving at postintervention as the mediator, and behaviorally based parenting do skills at 3-and 6-month follow-up time points as the outcome. Model fit statistics demonstrated good model fit at 3-month follow-up (CMIN $\chi^2 = 2.03$, $p = .958$; RMSEA < .05, PCLOSE p value = .972; CFI = 1.00, TLI = 1.00). The path between intervention group and responsive caregiving was statistically significant ($p < .001$). However, there was not a statistically significant path between responsive caregiving and parenting do skills

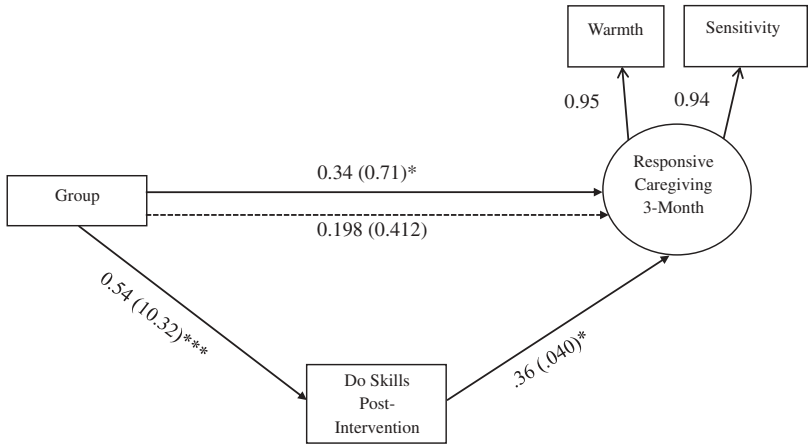

FIGURE 1 Indirect effects of parenting skills on relation between Infant Behavior Program and responsive caregiving at 3-month follow-up. *Note*: Values outside parentheses represent standardized regression weights and values inside parentheses represent unstandardized regression weights; dotted line represents indirect effect. Model fit indices: CMIN $\chi^2 = 2.77$, $p = .964$; root mean square error of approximation < .001, PCLOSE p value = .93; comparative fit index = 1.00, Tucker-Lewis index = 1.00. Regression weights for nonsignificant covariates: maternal education, β = 0.03 (0.24); infant age in months, β = −0.10 (−0.08); infant ethnicity, β = 0.004 (0.02); baseline maternal warmth/positive affect, β = 0.14 (0.14); baseline maternal sensitivity/responsivity, β = .009 (.010); and baseline parenting do skills, β = 0.09 (0.02).

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

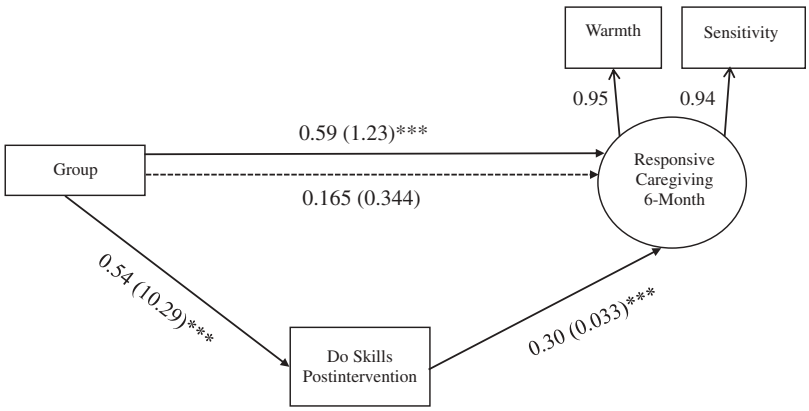

FIGURE 2 Indirect effects of parenting skills on relation between Infant Behavior Program and responsive caregiving at 6-month follow-up. *Note*: Values outside the parentheses represent standardized regression weights and values inside the parentheses represent unstandardized regression weights; dotted line represents indirect effect. Model fit indices: CMIN $\chi^2 = 2.58$, $p = .784$; root mean square error of approximation < .001, PCLOSE: $p = .845$; comparative fit index = 1.00, Tucker-Lewis index = 1.00. Regression weights for covariates: maternal education, β = −0.10 (−0.08); infant age in months, β = −0.13 (−0.10); infant ethnicity, β = 0.08 (0.41); baseline maternal warmth/positive affect, β = 0.10 (0.09); baseline maternal sensitivity/responsivity, β = .014 (.015); and baseline parenting do skills β = 0.15 (0.036).
***$p < .001$.

($p = .250$). Model fit statistics were also good for the 6-month follow-up model (CMIN $\chi^2 = 2.20$, $p = .948$; RMSEA < .05, PCLOSE p value = .964; CFI = 1.00, TLI = 1.00). Similarly, the path between group and responsive caregiving was statistically significant ($p < .001$), but the path between responsive caregiving and parenting do skills was not significant ($p = .955$).

We did not examine whether intrusiveness mediated the relation between intervention group membership and decreases in parenting do or don't skills given the nonsignificant direct effects of group on intrusiveness, as well as the poor model fit for the indirect effect models (with parenting do and don't skills as the mediators and intrusiveness as the outcome). Similarly, we did not examine whether responsive caregiving at postintervention mediated the relation between receiving the IBP and changes in parenting don't skills at follow-up given the poor model fit for the indirect effect models (with parenting don't skills as the mediator and responsive caregiving as the outcome).

DISCUSSION

The current study examined the association between behaviorally based parenting skills and attachment-based caregiving behaviors in the context of a randomized controlled trial of a BPT program for high-risk infants at baseline, postintervention, and follow-up. Despite the theoretical overlap between these constructs, little empirical work has examined associations between these indicators of the parent–child relationship. We found that parenting do skills targeted in the BPT program were moderately and positively correlated with warmth/positive affect and sensitivity/responsivity at baseline. These findings are consistent with previous research demonstrating that child-centered parenting behaviors (e.g., praise) are moderately and positively associated with maternal sensitive responding (O'Connor et al., 2013). The moderate associations indicated that although related, these behaviorally based parenting skills and attachment-based caregiving behaviors are distinct from one another, which provided justification for examining the direct effects of the IBP on warmth/positive affect and sensitivity/responsivity, which we examined in direct and indirect effects model as a latent construct.

In examining the direct effects, intervention group membership significantly predicted higher levels of responsive caregiving at postintervention and 3- and 6- month follow-up assessments. These findings suggest that, in addition to changes in behaviorally based parenting skills that are targeted directly in the intervention, the intervention led to broader effects on attachment-based caregiving behaviors that are not directly targeted by the IBP. According to the EPCS, a change of 1 or greater indicates a qualitative shift in caregiver behavior (Winslow & Shaw, 1995). Across all time points, the direct effect of the IBP on responsive caregiving was greater than 1, suggesting that caregivers who received the IBP showed reliably higher levels of warmth and sensitivity. Our study is the first to examine the effects of a BPT on attachment-based caregiving behavior in infancy, and it is particularly noteworthy to observe these effects during a critical time point for developing a secure parent–child relationship (Ainsworth et al., 1978; Kochanska & Kim, 2013).

Direct effects on constructs related to a secure parent–child relationship across all time points are also promising

for examining the underlying theoretical assumptions of BPT programs. The IBP draws on the CDI phase of PCIT, and our findings are consistent with the underlying theory that coaching parents to use behaviorally-based parenting do skills promotes a positive relationship between parents and their children (Zisser & Eyberg, 2010). To expand on this work, future studies should examine the impact of other evidence-based BPT programs on attachment-based caregiving behaviors. These findings also have significant implications for measurement research in parenting. A child's attachment to their caregiver is one component of the parent–child relationship that also includes parent characteristics, discipline strategies, and contextual variables (Allen, 2016). Thus, parenting is a dynamic construct, and more than 100 methods for measuring parenting constructs exist (Hurley, Huscroft-D'Angelo, Trout, Griffith, & Epstein, 2014). However, little empirical work has examined multiple methods of parenting measures (Lindhiem & Shaffer, 2016). Our findings point to a need to further compare the utility of minute-by-minute and global observational coding frameworks in parenting research. These findings also may have implications for clinicians assessing client outcomes following BPT programs. Although minute-by-minute coding of DPICS at weekly sessions is part of the PCIT model to help clinicians guide treatment progress, global coding frameworks that assess attachment-based caregiving behaviors, like the EPCS, may be utilized as an additional brief outcome measure to demonstrate more global changes in the parent–child relationship. Within the managed care context in mental health, community mental health providers face mounting time pressures, increasing the appeal of brief outcome measures (Richardson & Austad, 1991).

Given the direct effects of the IBP on warmth and sensitivity, as well as the theoretical background of PCIT, we tested indirect effects of parenting skills on the relation between the intervention and these attachment-based caregiving behaviors. The current findings supported our hypothesis that levels of behaviorally based parenting do skills at postintervention mediated the relation between receiving the IBP and responsive caregiving at the 3- and 6-month follow-up assessments. Given the limited empirical work in this area, we also examined responsive caregiving as a mediator of the relation between receiving the IBP and increases in parenting do skills. However, the path between responsive caregiving and parenting do skills was not significant, further supporting our hypothesis. Therefore, behaviorally based parenting skills seem to serve as a mechanism for change in attachment-based indicators of parent–child relationship quality. Increased use of praise, descriptions, and reflections, which are concrete skills taught during the context of the IBP, accounted for change in broader attachment-based constructs associated with a secure parent–child attachment. These findings may have implications for the implementation of interventions targeting the early parent–child relationship in systems and communities. Specifically, behaviorally based parenting skills targeted in PCIT and other evidence-based BPT programs provide concrete strategies to teach parents how to interact with their children. Prior research has indicated that clinicians described the objective measures of behaviorally based parenting skill use as strengths of the protocol (Christian, Niec, Acevedo-Polakovitch, & Kassab, 2014). Employing concrete strategies that appeal to clinicians may support initiatives to develop training models for the dissemination of PCIT and other evidence-based BPT programs into community settings and child-serving systems (Herschell et al., 2015).

Our study was the first to our knowledge to examine the direct and indirect effects of BPT on intrusiveness. In support of our first hypothesis, intrusiveness was moderately positively correlated with parenting don't skills. However, intervention group membership did not predict significantly lower levels of caregiver intrusiveness at postintervention or follow-up time points. In addition, our indirect effects model examining whether parenting do or don't skills mediated the relation between intervention group membership and intrusiveness indicated poor model fit at both 3 and 6 months. Overall, these findings suggest that the IBP did not have a significant direct effect on intrusiveness, and our hypothesis that behaviorally based parenting skills would mediate the effect of the IBP on intrusiveness at follow-up was not supported. It is possible that the lack of variability in intrusiveness ratings at baseline limited the ability to detect statistically significant group differences in ratings of intrusiveness over time. The lack of support for this hypothesis may also be related to our primarily Hispanic sample. In prior research with Latino and African American families, intrusiveness did not predict negative change in child engagement, suggesting that this construct may not be a reliable target for examining the parent–child relationship in BPT programs or attachment-based interventions (Ispa et al., 2004). Our findings also suggest the need to further examine parenting don't skills targeted in BPT programs, such as commands, particularly among racial and ethnic minority families. For example, Hispanic mothers frequently use verbal commands to receive compliance with their children, compared to other strategies (Livas-Dlott et al., 2010; Ramos, Blizzard, Barroso, & Bagner, under review). Thus, it may be that indicators of relationship quality (i.e., warmth, sensitivity, and intrusiveness) may be perceived and utilized differently across cultures. The impact of the IBP on parenting don't skills was also not maintained at 6-month follow-up, suggesting the need to further examine parenting don't skills over time following brief parenting interventions.

Although the current study is the first to our knowledge to examine attachment-based caregiving behaviors following a BPT program targeting infants, certain limitations should be noted. First, the sample for the current study is largely homogeneous in terms of ethnicity and

socioeconomic status. Our findings expand knowledge of the impact of a BPT program on attachment-based caregiving behaviors in a high-risk sample of infants from predominately low-income and ethnic minority backgrounds, but it is important to replicate this work in ethnically, racially, and socioeconomically diverse samples. Second, although both fathers and mothers were invited to participate in the intervention, only mothers enrolled in the study as primary caregivers and participated in the observation with the infant. Father involvement in behavioral parent training may be related to maintenance of behavioral improvements (Bagner, 2013; Bagner & Eyberg, 2003), and attachment insecurity in infancy with either parent has also been shown to predict behavior problems in later childhood (Kochanska & Kim, 2013). Thus, examining the impact of BPT programs on fathers' attachment-based caregiving is an important next step for future research.

Third, although we measured caregiving behaviors that have been shown to be related to a secure parent–child attachment, we did not directly measure the parent–child attachment. Future studies should include direct measures of parent–child attachment, such as the Q-Sort (Waters & Deane, 1985) or Strange Situation (Ainsworth et al., 1978). In addition, we utilized observational coding systems to measure behaviorally based parenting skills and attachment-based caregiving behaviors. Although observational coding systems can be clinically useful and utilize masked raters to provide an objective assessment of behavior, multimethod assessments including behavioral and self-report measures provide a more comprehensive view of child and parent behaviors (Dirks, Reyes, Briggs-Gowan, Cella, & Wakschlag, 2012; Haynes, 2001).

Fourth, although the current article focused on the impact of IBP on measures of parent–child relationship quality, we did not examine improvements in child disruptive behavior, a key outcome targeted in BPT programs. In examining mechanisms of effects on child behavior, previous work has indicated behaviorally based parenting skills mediated the relation between BPT and reductions in child disruptive behaviors (Bagner & Eyberg, 2007; Gardner, Hutchings, Bywater, & Whitaker, 2010). In examining attachment-based interventions, maternal sensitivity may serve as a casual mechanism in enhancing secure parent–child attachment (Bakermans-Kranenburg et al., 2003). In addition, findings of a meta-analysis indicated a significant association exists between insecure parent–child attachment and child disruptive behaviors (Fearon, Bakermans-Kranenburg, Van Ijzendoorn, Lapsley, & Roisman, 2010). Given these findings, future work should examine how these related constructs may impact child behavior differently. A next important step will be to examine parenting do skills and warmth and sensitivity as potential mediators of the relation between receiving BPT and changes in child disruptive behaviors.

Finally, although we examined the direct effects of the IBP on attachment-based caregiving behaviors, we did not examine baseline levels of attachment-based caregiving behaviors as moderators of treatment improvement. An important next step will be to examine whether caregivers who display low levels of responsive caregiving at baseline improve at significantly different rates than caregivers who display high levels of responsive caregiving at baseline. Future work also should explore these questions in a larger and more heterogeneous sample.

Despite these limitations, the current study demonstrated initial impacts of a brief, home-based BPT program with infants on critical aspects of the parent–child relationship. It is particularly noteworthy that a brief BPT program targeting infants impacted related, but distinct measures of parent–child relationship quality. Collectively, these results suggest that, in addition to behaviorally based parenting skills, BPT programs impact attachment-based caregiving behaviors. Our results also suggest promise for parenting do skills targeted in BPT programs as a mechanism for impacting warm and sensitive caregiving. Moreover, our findings have important clinical implications. Behaviorally based parenting skills represent concrete strategies that facilitate training in BPT for clinicians in different service systems and can be endorsed as having a broader impact on the parent–child relationship.

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