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BRIEF REPORT

Parent and Child Trauma Symptoms During Child–Parent Psychotherapy: A Prospective Cohort Study of Dyadic Change

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Five randomized controlled trials have shown that child–parent psychotherapy (CPP) improves trauma symptoms in children. Less is known about parent symptoms or moderators of symptom change. In a sample of 199 parent (81% biological mother; 54% Latina/o) and child (aged 2 to 6 years; 52% male; 49% Latina/o) dyads who participated in an open treatment study of CPP, this study investigated whether parent and child symptoms similarly decreased during treatment and whether improvement was moderated by parent, child, and treatment characteristics. Parents completed baseline and posttreatment interviews regarding exposure to traumatic events, posttraumatic stress symptomatology (PTSS), and other mental health indices. Latent difference score analysis showed that PTSS significantly decreased by more than 0.5 *SD* for parents and children. The PTSS improvement in parents was associated with reductions in child avoidance, $r = .19$, $p = .040$, and hyperarousal, $r = .33$, $p < .001$. Girls showed a greater reduction than boys in reexperiencing, $\beta = -.13$, $p = .018$, and hyperarousal, $\beta = -.20$, $p = .001$. Contrary to expectations, parent and child improvement in PTSS was greater for those with fewer parental lifetime stressors, $\beta_{range} = .15$ to $.33$, and for those who participated in fewer treatment sessions, $\beta_{range} = .15$ to $.21$. The extent of improvement in parent PTSS varied based on clinician expertise, $\beta = -.20$, $p = .009$. Significant reductions in parent and child PTSS were observed during community-based treatment, with CPP and symptom improvement varying according to child, parent, and treatment characteristics.

Children in their first five years of life are disproportionately exposed to interpersonal traumatic experiences, such as domestic violence and maltreatment, that may lead to symptoms in the child and parent as well as to disturbances in the attachment relationship; this can result in the need for relationship-based clinical interventions (Chu & Lieberman, 2010; Scheeringa & Zeanah, 2001). Child–parent psychotherapy (CPP) was developed to improve psychological and relational functioning in trauma-exposed young children and their primary caregivers (Lieberman, Ghosh Ippen, & Van Horn, 2015). Results from five randomized controlled trials have demonstrated that CPP significantly reduces posttraumatic stress symptoms (PTSS) and enhances mental and relational health in mother–child dyads (Cicchetti, Rogosch, & Toth, 2006; Lieberman, Ghosh Ippen, & Van Horn, 2006; Lieberman, Van Horn, & Ghosh Ippen, 2005; Toth, Maughan, Manly, Spagnola, & Cicchetti, 2002). However, this research has been characterized by relatively small sample sizes, a focus on biological mothers only, and inclusion of families exposed to a particular type of trauma. Moreover, evaluation is needed to determine whether PTSS improvement in children is related to PTSS improvement in their parents, and which individual or treatment characteristics predict symptom improvement in dyads receiving CPP. Using a large, diverse sample of caregivers and traumatized young children who participated in CPP, the present study employed latent difference score analysis within a dyadic framework to evaluate pre- to post treatment changes in child and parent PTSS and to investigate whether trauma symptom reduction varied as a function of child, family, and treatment characteristics.

There are a number of evidence-based interventions that target young children who have been exposed to trauma (e.g., parent–child interaction therapy [PCIT], trauma-focused

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cognitive behavioral therapy [TF-CBT], and CPP; Chaffin et al., 2004; Cohen, Mannarino, & Staron, 2006; Lieberman et al., 2015). However, longitudinal and intervention studies of PTSS subsequent to interpersonal trauma have revealed the difficult-to-change nature of PTSS in young children. Without treatment, PTSS in children remain high (Meiser-Stedman, Smith, Glucksman, Yule, & Dalgleish, 2008). In one investigation, overall child PTSS did not remit over two years, even with treatment; in fact, avoidance and numbing *increased* over time (Scheeringa, Zeanah, Myers, & Putnam, 2005). In a study of trauma-focused therapy effectiveness (TF-CBT or PCIT), child PTSS appeared to decrease following treatment, but this effect lost significance after statistically adjusting for trauma exposure and demographics (Eslinger, Sprang, & Otis, 2015).

Theoretical and empirical evidence has indicated that caring for the mental health of *both members of the caregiver–child dyad* is essential for symptom reduction and sustained mental health improvement in early childhood. Based on a review of 17 studies that examined concurrent symptomatology in caregivers and young children following trauma, Scheeringa & Zeanah (2001) articulated a relational model of posttraumatic stress in early childhood, concluding that PTSS in either member of the parent–child dyad can exacerbate mental health symptoms in the other member, regardless of whether parent and child were exposed to the same or different traumatic event(s). A more recent review by Leen-Feldner et al. (2013) concluded that methodologically rigorous studies uniformly support a significant positive association between parent and child PTSS, above and beyond other related risk factors.

Child–parent psychotherapy (CPP) is a dyadic intervention based on the dual premise that the quality of attachment is a primary organizer of young children's responses to danger and safety, and early childhood psychological problems are best addressed within the context of the primary attachment relationship (Lieberman et al., 2015). Targets of the intervention include (but are not limited to) parents' and children's responses to trauma reminders, maladaptive mental representations of themselves and each other, and interactions and behaviors that foster fear, anger, and emotional withdrawal. With regard to trauma symptoms specifically, CPP has been shown to reduce overall PTSS in young children and posttraumatic avoidance in mothers exposed to domestic violence at the end of treatment and at 6-month follow-up (Lieberman et al., 2005, 2006). The current study extended this and other investigations by examining symptom change during CPP in a larger sample of young children exposed to multiple types of interpersonal trauma and including a variety of types of primary caregivers.

In addition, with the exception of Ghosh Ippen, Harris, Van Horn, and Lieberman (2011), previous research on CPP has not explored predictors of symptom change during treatment. Meta-analyses have shown variability in symptom change following child-focused psychosocial interventions (Sandler et al., 2014), making it imperative to identify for whom and under what conditions symptom reduction can be maximized. For example, greater improvements have been observed among youth at the highest risk due to high pretreatment distress or contextual hardship (e.g., low socioeconomic status, family conflict, limited community resources) and among individuals treated by more extensively trained providers (Sandler et al., 2014). Meta-analytic findings have also shown that a lower "dosage" of relationship-based intervention may be most effective in improving observed parent–child interaction quality among lower income families (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003; Mortensen & Mastergeorge, 2014). Therefore, we tested the hypotheses that PTSS improvement would be greatest for higher risk parent–child dyads (i.e., those with greater trauma exposure and lower income) and dyads treated by clinical staff as compared to trainees. We also examined symptom improvement as a function of length of treatment.

Method

Participants

The study included a cohort of parent–child dyads who had been referred for outpatient mental health services at a university-affiliated clinical research program at an urban public hospital. Between 2003 and 2011, 373 families with children aged 2 to 6 years sought services for their child due to interpersonal trauma exposure (e.g., community violence, domestic violence, caregiver death) and completed the informed consent process. Of these families, 42 (11.6%) dropped out during the initial assessment period, and 115 families (30.8%) completed the baseline assessment and at least one treatment session, but did not complete treatment or a posttreatment assessment. An additional 17 families were missing measures of either parent or child PTSS at both baseline and posttreatment and were excluded from the analytic sample. The final sample included 199 families who completed an assessment at pre- and posttreatment (60.1% of those who entered treatment). This rate of attrition is commensurate with what has been observed for low-income families who access child mental health services (Gross, Julion, & Fogg, 2001).

Child demographics were as follows: mean age = 49.14 months (SD = 11.90, range: 24 to 72 months); 51.8% male; 48.7% Latina/o, 20.3% multiracial, 14.7% Caucasian, 8.6% African American, 4.1% Asian American, 3.0% other. Parent demographics were as follows: mean age = 34.63 years (SD = 8.44); 85.9% biological parents (80.9% biological mothers); 54.0% Latina/o, 19.7% Caucasian, 9.1% African American, 7.6% Asian American, 5.6% multiracial, 3.5% other; 47.6% of parents reported having a high school education or less, and 73.1% who reported being single (unmarried/not living with a partner). Median monthly family income was $1,500.00 (range: 0 to more than $10,000 per month). Two-sided independent t tests and Pearson chi-square tests that compared the final analytic sample (n = 199) to families who were not included due to reasons described above (n = 174) found no significant group differences in parent or child age, biological parent status, or child sex, child race (Hispanic vs. non-Hispanic), income, or parent or child trauma exposure.

Procedure

The institutional review boards of San Francisco General Hospital and the University of California, San Francisco approved all study procedures. Families were referred for treatment by pediatric care or mental health clinics, social service agencies, family resource centers, the family court system, the California Department of Human Services, and outpatient hospital clinics due to child exposure to interpersonal trauma. Families in which the parent or child was diagnosed with a severe intellectual disability and/or the parent presented with suicidal/homicidal ideation, severe psychosis, or active substance abuse were deemed ineligible for the present study and were referred to appropriate services. Eligible families who agreed to participate were assigned to a clinician for a baseline assessment. Comprehensive information was gathered on the family's historical and current circumstances and functioning. All measures were administered in interview or paper format in the parent's native language (English or Spanish) by licensed mental health professionals or psychology/social work interns and postdoctoral fellows supervised by a licensed clinician.

Child–parent psychotherapy (Lieberman et al., 2015) was conducted with the parent–child dyad in unstructured weekly hour-long sessions. Grounded in a dual attachment lens and trauma lens, a primary treatment goal was to foster physical and emotional safety in the caregiver–child relationship as a vehicle for restoring the child's healthy developmental progress following traumatic experiences. CPP employs the following intervention modalities: (a) cocreation of a trauma narrative between parent and child, use of play and language to identify and address traumatic triggers, and building of an emotional vocabulary; (b) unstructured, reflective developmental guidance to provide psychoeducation; (c) modeling protective behavior; (d) insight-oriented interpretations to increase self-understanding in parent and child; (e) emotional support; and (f) assistance with problems of living, including crisis intervention, case management, and service referrals. In the current study, therapists followed the same procedures as that of the original randomized trial (Lieberman et al., 2005) and the current manual (Lieberman et al., 2015). Fidelity to the model was monitored through weekly individual and group supervision with expert therapists.

Measures

Posttraumatic stress disorder symptomatology (PTSS). Child PTSS was assessed using the 30-item Posttraumatic Stress Scale from the Traumatic Symptoms Checklist for Young Children (TSCYC), which has demonstrated reliability and predictive validity (Briere et al., 2001). This scale includes three 10-item subscales that rate hyperarousal (e.g., being easily startled), reexperiencing (e.g., bad dreams or nightmares), and avoidance (e.g., not wanting to talk about something bad that happened) over the past month on a scale of 1 (*not at all*) to 4 (*very often*). Clinicians administered the TSCYC as an interview to probe and clarify parent responses. Although the instrument was validated and normed for children ages 3 to 12 years, it was also used for 2-year-old children in the current study ($n = 36$). Internal consistency of the scale was identical for children below three years of age and children above three years of age (Cronbach's $\alpha = .90$).

Parents' PTSS were measured by one of two instruments, the Davidson Trauma Scale (DTS; Cronbach's $\alpha = .82$; Davidson et al., 1997) or the Posttraumatic Stress Scale Interview (PSSI; Cronbach's $\alpha = .88$; Foa, Riggs, Dancu, & Rothbaum, 1993), with the same instrument used within individuals at pre- and post-treatment to assess trauma symptoms in the past two weeks. The DTS was used in the initial phase of the study but was replaced by the highly similar PSSI, which was free and used in community mental health clinics nationally to assess caregiver symptoms and CPP effectiveness. The DTS and PSSI are both 17-item measures that assess the frequency and severity of the 17 trauma symptoms described in Criteria B, C, and D of the posttraumatic stress disorder diagnostic criteria in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994). Items on both measures are worded very similarly. The DTS rating scale ranges from 0 (*not at all*) to 4 (*every day*), whereas the PSSI scale ranges from 0 (*not at all*) to 3 (*5 or more times per week*). For this study, items were scored identically such that any item endorsed as occurring more than *not at all* was assigned a 1, and endorsed symptoms were summed for each cluster (i.e. hyperarousal, reexperiencing, or avoidance).

Exposure to traumatic events. Children's lifetime exposure to traumatic events was assessed in an interview with the parent using the 24-item Traumatic Events Screening Inventory–Parent Report Form, Revised (TESI-PRR; Ghosh Ippen et al., 2002). Parents' lifetime trauma exposure was assessed in interview format using the Life Stressors Checklist–Revised (LSC-R), which includes 30 items that assess the occurrence of stressful life events (Wolfe, Kimerling, Brown, Chrestman, & Levin, 1996). For both measures, the total score is the sum of the number of traumatic events endorsed. Children were exposed to an average of 5.98 traumatic life events ($SD = 2.91$, range: 1 to 15), and parents were exposed to 12.83 stressful life events on average ($SD = 4.79$, range: 2 to 23).

Treatment characteristics. To meet criteria as a CPP treatment session, sessions had to last at least 30 min and focus on the parent–child relationship in the context of child exposure to interpersonal trauma. On average, families completed 21.47 CPP sessions ($SD = 9.30$, range = 4 to > 35) over an average period of 36 weeks (range = 4 to 180 weeks). The number of treatment sessions was positively correlated with parental exposure to traumatic events, $r = .16$, $p = .026$, child exposure to trauma, $r = .21$, $p = .004$, and child trauma symptoms at baseline, $r = .22$, $p = .002$. The number of sessions was not associated with parental symptoms at baseline, $p = .610$. Either a

licensed clinical staff member ($n = 39$ families) or a supervised therapist trainee ($n = 160$ families) conducted the CPP, based on provider availability at the time of referral. Families treated by staff and trainees did not differ in parent and child exposure to trauma, baseline parent and child PTSS, or family income, ps = .110 to .900. However, staff were more likely to see parents who identified as Latino/a, $\chi^2(1, 198) = 10.24$, $p = .001$, were non–English speaking, $\chi^2(1, 198) = 24.15$, $p < .001$, and had less than a high school education, $\chi^2(1, 191) = 5.46$, $p = .020$.

Data Analysis

First, we tested longitudinal measurement invariance to determine whether PTSS domain scores (hyperarousal, reexperiencing, and avoidance) could be represented by a single common factor at both assessments. We used this approach to understand whether systematic changes in PTSS symptoms were linked across these three domains or whether changes in symptoms in each domain needed to be modeled independently. Next, we used a latent difference score model to describe longitudinal change in these symptoms across time and to test how initial levels of PTSS were related to change in PTSS over time. Finally, we predicted change in parents' and children's symptoms over time from prior trauma exposure, sociodemographic characteristics, and characteristics of treatment implementation.

Latent difference scores are conceptually very similar to the difference between two manifest variables (for a thorough introduction to these models, see McArdle, 2009). However, applying a latent variable approach to repeated measures data has some important advantages. Specifically, (a) it better accounts for measurement error within and across time, thereby generating a more accurate understanding of how symptoms changed over time and how other variables were related to these longitudinal changes; and (b) it allows for the use of full information maximum likelihood, a modern approach to missing data that uses all available information, minimizing bias and maximizing statistical power relative to approaches such as listwise deletion. All models were run using Mplus 7.4. Missing data was handled through the use of full information maximum likelihood estimation. The proportion of missing data for study variables ranged from 1% to 20%. However, most missing data was concentrated at the second assessment and was due to attrition from the study. Because the symptom scores at the first and second assessment were strongly correlated, bias due to missing data should be minimal (Collins, Schafer, & Kam, 2001). Model fit was evaluated using the root mean square error of approximation (RMSEA), comparative fit index/Tucker-Lewis index (CFI/TLI), and standardized root mean square residual (SRMR) fit statistics. According to Hu and Bentler (1999), values of RMSEA $\leq .06$, CFI/TLI values $\geq .95$, and SRMR values $\leq .08$ indicate good model fit. We also report the Bayesian information criterion (BIC), for which smaller values indicate better fit, adjusted for model complexity.

Results

Longitudinal Measurement Invariance

Descriptive statistics for parent and child PTSS indicators at baseline and follow-up and zero-order correlations among all variables are available in the online Supplementary Information. We tested longitudinal measurement invariance models separately for parents' and children's PTSS. Although there are multiple levels of measurement invariance (i.e., configural, weak, strong), we were specifically interested in strong factorial invariance (i.e., equal factor loadings and factor intercepts across assessments), which is required for meaningful interpretation of change in a latent variable over time. Strong factorial invariance means that the relation between latent and manifest variables are the same across multiple assessments, thereby reflecting that the latent variables share a common scale for the factor loadings (covariances) and factor intercepts (means). Fit statistics for different levels of measurement invariance in parents' and children's PTSS across assessments are available in the online Supplementary Information. For parents' and children's PTSS, weak factorial invariance was fully supported (i.e., factor loadings appeared to be equal across assessments). These models were used as a baseline to evaluate the fit of the strong factorial invariance models. For parents' PTSS, adding the constraints for strong factorial invariance did not decrease model fit, $\chi^2(2) = 0.30$, $p = .859$, and the strong factorial invariance model overall model fit was good, $\chi^2(9) = 3.45$, $p = .944$, RMSEA = .000, 90% confidence interval (CI) [.000, .013]), CFI = 1.000, TLI = 1.000, SRMR = .020, BIC = 4074.671. For children's PTSS, the strong factorial invariance constraints significantly decreased model fit, $\chi^2(2) = 16.14$, $p < .001$, BIC = 5729.486. The results of these tests indicated that a common latent factor could be used to investigate change in parent's PTSS, but should not be used for children's symptoms. Consequently, we created a separate latent difference score for each domain of children's PTSS (i.e., hyperarousal, reexperiencing, and avoidance), but retained a single latent PTSS factor to represent change in parents' symptoms across domains over time.

Descriptive Analysis of Longitudinal PTSS Change

Parents' and children's latent difference scores were examined within in a single model to determine how changes in parents' symptoms were related to changes in children's symptoms. This model fit the data well, $\chi^2(33) = 41.52$, $p = .147$, RMSEA = .036, 90% CI [.000, .067], CFI = .991, TLI = .983, SRMR = .030, BIC = 9829.253. Over time, the average level of parents' symptoms decreased by 0.58 points, $SE = 0.10$, $p < .001$. Children's PTSS also decreased for reexperiencing ($M = -2.37$, SE = 0.36, $p < .001$), hyperarousal ($M = -3.03$, $SE = 0.40$, $p < .001$) and avoidance ($M = -1.43$, $SE = 0.31$, $p < .001$). Change scores for children's symptoms were strongly positively correlated, with rs ranging from .43 to .58 (ps < .001). Changes in parents' symptoms were not correlated with

changes in children's reexperiencing symptoms, $r = .14$, $p = .127$, but were positively associated with changes in children's hyperarousal, $r = .33$, $p < .001$, and avoidance symptoms, $r = .19$, $p = .040$. The correlation between the initial symptom score and the change score was $-.43$ for parent PTSS, $-.61$ for child reexperiencing, $-.59$ for child arousal, and $-.46$ for child avoidance. These substantial correlations indicate that, for parents and for children, initial symptom levels were strongly related to the change in symptoms over time; individuals who started higher tended to decrease more relative to individuals who started lower.

We tested whether the amount of change (in *SD* units) differed among the three domains of child symptoms and whether the amount of change differed between children's and parents' symptoms. An omnibus test indicated that the amount of change differed across the three child symptom domains, $\chi^2(2) = 7.404$, $p = .025$. The decreases in children's arousal symptoms ($z = -0.59$) and reexperiencing symptoms ($z = -0.52$) were greater than their decrease in avoidance symptoms ($z = -0.36$); $\chi^2(1) = 6.570$, $p = .010$ and $\chi^2(1) = 4.171$, $p = .041$, respectively. There was no difference between the amount of change in children's reexperiencing and change in arousal symptoms. The decrease in parents' symptoms ($z = -0.50$) was not significantly different from the decrease in any domain of child symptoms.

Predictive Analysis of Longitudinal PTSS Change

In the next model, parent and child difference scores that statistically adjusted for initial status (i.e., a residualized change score) were included as the dependent variables, and child age and gender, family income, number of sessions, staff status, parent lifetime exposure to stressful events, and child exposure to traumatic events were included as independent variables. Controlling for initial status was particularly important for these analyses because of the strong correlations between initial symptom levels and change scores in this sample. The predictive model fit the data well, $\chi^2(73) = 96.70$, $p = .033$, RMSEA = .040, 90% CI [0.012, 0.061], CFI = .977, TLI = .961, SRMR = .036, BIC = 16522.799. Greater parental lifetime exposure to stressful events and a greater number of treatment sessions predicted less than average improvement in child reexperiencing, hyperarousal, and avoidance symptoms, and parental PTSS (see Table 1). Female children exhibited a greater than average reduction in reexperiencing symptoms and hyperarousal symptoms. In addition, treatment conducted by a staff member, as opposed to a trainee, was related to greater than average decreases in parental PTSS.

Discussion

The present study investigated the extent of PTSS change over the course of CPP and examined whether symptom change over the course of treatment varied as a function of child, family, and treatment characteristics. Two previous studies, one randomized controlled trial (RCT) and one effectiveness trial, showed that CPP led to reductions in child and/or maternal PTSS (Lieberman et al., 2006, 2005; Weiner, Schneider, & Lyons, 2009). The RCT showed that CPP significantly reduced child trauma symptoms and maternal trauma-related avoidance in a sample of mother–child dyads exposed to domestic violence (Lieberman et al., 2006, 2005). In the effectiveness trial (Weiner et al., 2009), trauma symptoms in children in foster care decreased significantly, but the sample size did not permit the analysis of moderators, and caregiver trauma symptomatology was not measured. The current open treatment study of CPP extends this research by using rigorous analytic methods to examine change and predictors of change in parent and child trauma–related symptoms in a large, diverse sample of parents (including mothers, fathers, and other caregivers) and young children exposed to a range of a variety of traumatic events.

Latent difference score analyses revealed a considerable reduction in overall parental PTSS (>0.5 *SD*). In addition, there was a more robust positive correlation between symptom change in parents and change in children's hyperarousal symptoms compared to the correlation between parental symptom change and child avoidance or reexperiencing symptoms. Based on this, we might speculate that improvement in parent PTSS during CPP may be most strongly related to a change in children's hyperarousal symptoms. However, we cannot rule out the possibility that measures of hyperarousal are more sensitive (due to these symptoms being more observable) than measures of more internalizing-type symptoms such as avoidance and intrusion. The correlation between parent and child symptom change is consistent with findings from a recent review of the association between parent and child trauma symptoms (Leen-Feldner et al., 2013).

The present study also found that the extent of parent and child PTSS improvement varied depending on child, parent, and treatment characteristics. Despite having the same level of symptomatology at baseline, female children exhibited greater reductions in two of the three PTSS domains, reexperiencing and hyperarousal, compared to male children. This finding is somewhat inconsistent with previous studies that reported no gender differences in treatment effectiveness (Cohen et al., 2006; Eslinger, Sprang, & Otis, 2015). If the current finding is replicated, it would be important to examine parent–child gender interaction as a potential mechanism underlying gender effects at this young age. It may be that female or male children benefit more than the other sex when a same-sex primary caregiver is involved in treatment.

Reductions in parent and child PTSS were greater in families who reported fewer traumatic life events for parents, whereas extent of child exposure to trauma was not related to symptom change. One possible explanation is that parents with a higher level of lifetime trauma exposure are often living in conditions of ongoing trauma exposure. For these parents and their children, the immediate goal of treatment is to provide parents with the tools to enhance their families' physical and contextual safety. As a result, these dyads may not experience

Table 1
Predicting Longitudinal Change in Posttraumatic Stress Symptoms (PTSS)

	Latent Change in PTSD Symptoms											
	Child reexperiencing			Child hyperarousal			Child avoidance			Parent PTSD		
Variable	β	*SE*	*p*	β	*SE*	*p*	β	*SE*	*p*	β	*SE*	*p*
Baseline symptoms	−0.71	0.04	<.001	−0.66	0.04	<.001	−0.64	0.05	<.001	−0.49	0.08	<.001
Child age	0.04	0.06	.490	0.02	0.06	.786	0.04	0.07	.498	−0.09	0.07	.203
Parent trauma	0.15	0.07	.024	0.13	0.07	.052	0.17	0.07	.025	0.33	0.09	<.001
Child trauma	0.01	0.06	.825	−0.05	0.06	.420	0.01	0.07	.909	−0.09	0.08	.242
Treatment sessions	0.17	0.06	.004	0.21	0.06	.001	0.17	0.07	.013	0.15	0.08	.045
Staff[a]	−0.04	0.06	.501	−0.08	0.06	.152	−0.08	0.06	.221	−0.20	0.08	.009
Income ($1,000s)	0.01	0.06	.893	0.00	0.06	.999	0.11	0.07	.130	0.13	0.08	.089
Child sex[3]	−0.13	0.06	.018	−0.20	0.06	.001	−0.06	0.06	.382	0.00	0.07	.976
R^2	.50			.48			.36			.35		

Note. PTSD = posttraumatic stress disorder.
[a]Therapist-in-training = 0, staff = 1.
[b]Female = 1, male = 2.
Standardized regression coefficients are completely standardized for the continuous predictors and partially standardized for the binary predictors.

the same reductions in PTSS as dyads whose treatment could focus immediately on symptom reduction.

Although some meta-analyses indicate larger treatment effects on child symptoms with a higher level of provider training (see Sandler et al., 2014 for a review), a number of cross-sectional studies have failed to find differences in treatment outcomes resulting from level of training or experience (for a review, see Goldberg et al., 2016). In the current study, parental PTSS decreased more when the dyad was treated by a licensed clinical staff member rather than a therapist-in-training, but child improvement did not differ in this manner. This finding may reflect different dynamics in the therapeutic relationship of parents with clinicians of varying degrees of experience. Compared to therapists-in-training, staff were more experienced and likely more skilled and efficient in delivering the treatment model. However, for young children, it is possible that access to trauma-informed, relationship-based treatment is more important for symptom reduction than is therapist experience, at least when trainees are supervised by competent and experienced clinicians.

Parents and children who participated in a greater number of CPP sessions exhibited less improvement than those who participated in fewer sessions. Although a similar phenomenon has been documented in other young child populations (e.g., Bakermans-Kranenburg et al., 2003; Mortensen & Mastergeorge, 2014), this finding must be interpreted cautiously. Higher levels of pretreatment child PTSS (but not parent PTSS) were associated with a greater number of CPP sessions. Because this was an open treatment study, CPP was terminated when the parent and therapist agreed that the dyad had successfully completed treatment. Longer CPP treatment is typically delivered in response to greater safety concerns and more impaired child functioning.

There are two critical limitations to this study: all measures involved parental reports, and there was no comparison group. The former is a widespread research problem because it is difficult to obtain valid ratings of young children's symptoms without parent input—only 3 out of 17 studies of PTSS in parent–child dyads used an external reporter (teacher rating or clinician observation; Leen-Feldner et al., 2013). In the current study, it is possible that more symptomatic parents also rated their children as more symptomatic, which could have inflated estimates of the association between parent and child symptoms. Additional research is needed in which clinician, teacher, and/or behavioral observations are used to assess trauma symptoms in very young children. In regard to the lack of comparison group, it cannot be ruled out that PTSS in dyads decreased over time as a function of "regression to the mean." However, this possibility is diminished by findings of significantly greater CPP efficacy relative to comparison groups in five randomized studies by different teams of investigators. In addition, key factors known to relate to treatment outcomes (e.g., provider experience) predicted the magnitude of symptom reduction, increasing confidence that the decreases seen here were not merely related to time.

Despite these limitations, the current study has significant strengths that make specific contributions to the field. Randomized controlled trials of treatments for child exposure to trauma as well as many quasi-experimental and observational studies have been limited by relatively small sample sizes, wide ranges in child age, and/or lack of advanced statistical analytic methods, factors which increase the risk of results being influenced by measurement error or unassessed developmental differences. Further, the majority of trauma treatment research has focused on school-aged populations, neglecting the developmental period in which a parent is arguably most essential to a child's processing of traumatic experiences. The current investigation

included a large sample of primarily low-income ethnically diverse parent–child dyads and utilized latent difference score analyses to address measurement error and missing data. The present findings increase current understanding of the factors that contribute to improvement in the treatment of traumatic stress in young children and their parents.

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