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ABSTRACT. *Objective:* To determine whether maternal violence-related posttraumatic stress disorder (PTSD), reflective functioning (RF), and/or quality of mental representations of her child predicts maternal behavior within a referred sample of mothers exposed to interpersonal violence and their children (aged 8–50 months).

Method: A total of 41 dyads completed 2 videotaped visits including measures of maternal mental representations and behavior. Results: Negative and distorted maternal mental representations predicted atypical behavior (Cohen's $d > 1.0$). Although maternal PTSD and RF impacted mental representations, no significant relationships were found between PTSD, RF, and overall atypical caregiving behavior. Severity of maternal PTSD was, however, positively correlated with the avoidant caregiving behavior subscale.

Conclusions: Maternal mental representations of her child are useful risk indicators that mark dysregulation of trauma-associated emotions in the caregiver.

KEYWORDS. Maternal behavior, mental representations, infancy, intergenerational transmission of trauma, PTSD

EMOTIONAL REGULATION: A CRITICAL FACTOR IN EARLY CHILDHOOD MENTAL HEALTH

Through infant–caregiver attachment, primary caregivers provide multiple, complex, and often “hidden” regulatory functions for the developing infant (Hofer, 1984). One form of regulation of critical importance to the child’s capacity to form healthy relationships with others and to learn in school settings is that of emotion regulation (Cassidy, 1994). The term *mutual regulation*, as first used by Tronick and Gianino (1986), refers to a bidirectional, albeit asymmetric, process of emotion regulation between the adult caregiver and the infant. One of the child’s developmental achievements is the internalization of these mutually regulating interactions by the fifth year of life (Fonagy, Gergely, Jurist, & Target, 2002).

We are interested in understanding the interplay of factors that disrupt and facilitate mutual regulation. It is known, for example, that maternal psychopathology (e.g., depression, Tronick & Gianino, 1986; or anxiety, Moore, Whaley, & Sigman, 2004) *disrupts* mutual regulation. Maternal history of attachment security, however, has been linked to maternal caregiving sensitivity, which is known to support repair of disrupted parent–infant

communication and thus *facilitate* mutual regulation of emotion (Lyons-Ruth, Bronfman, & Parsons, 1999).

MATERNAL TRAUMA-RELATED PSYCHOPATHOLOGY AS A RISK TO MUTUAL REGULATION

Multiple studies have shown the adverse effects of various forms of maternal anxiety and depression on mutual regulation of emotion and arousal with infants and young children (Cole, Barrett, & Zahn-Waxler, 1992; Moore et al., 2004). It is clear from these studies that maternal emotional presence to read the infant's cues and to respond effectively is curtailed by anxiety and depression. Yet few studies have focused specifically on *how* (i.e., in what specific ways) trauma-related psychopathology, which often involves posttraumatic stress disorder (PTSD) that is comorbid with depressive and dissociative symptomatology, would affect a mother's participation in mutual regulation of emotion and arousal during formative development in early childhood (Heim & Nemeroff, 2001; Simeon et al., 2007).

We believe that it is specifically PTSD related to interpersonal violent trauma as opposed to PTSD related to other forms of trauma (e.g., car accidents, natural disasters, or medical/surgical trauma) that would most impact the parenting of very young children. One reason we think this is that PTSD related to interpersonal violent trauma, specifically, is frequently both chronic and complex in subtype and, as such, often comorbid with major depressive disorder and dissociation (Briere, 2006; Sar, Akyuz, & Dogan, 2007; Shalev et al., 1998). Major depression, as previously mentioned, and pathological dissociation have also been shown to interfere with mutual emotion regulation during infancy and early childhood, thus compounding the disturbance within the mother-child relationship (Collin-Vezina, Cyr, Pauze, & McDuff, 2005; Weinberg, Olson, Beeghly, & Tronick, 2006). Both maternal depression and dissociation, like PTSD, contribute to noncontingent responsiveness to the child's affect, social bids, proximity seeking, and exploration. Depression has been noted to do this largely through maternal incongruence with the infant's positive affect, increased maternal irritability and negativity, and internal preoccupation (Weinberg et al., 2006). Maternal dissociation has also been noted to adversely affect caregiving through maternal inconsistency, unpredictability that poses difficulty for the infant's transitioning to and modulating within discrete mental states (Collin-Vezina et al., 2005; Putnam, 1997).

The latter places the child at significant risk of impairment in the development of integrated percepts of himself or herself and the caregiver(s), thus potentially affecting subsequent relationships—including those with that child's own children when that child becomes a parent (Putnam, 1997).

Another reason we think that it is PTSD related to interpersonal violence that would most adversely impact parenting is that we have also noted via our clinical observations the particular phenomenon in which intense displays of frustration, rage, terror, and despair by very young children with limited developmental capacity to regulate their emotion remind many mothers who have been victims of violence of their violent perpetrators' behavioral dyscontrol. As such, the young child triggers his or her mother's PTSD symptoms. For example, a mother with a history of physical assault who is hit by a toddler during a tantrum may not be able to place this experience in context of a caregiver-child relationship involving a toddler. PTSD with its implicit confusion of past and present can result in the mother feeling as if she is again a helpless victim with a violent perpetrator or vice versa. Clearly, such a perceived interpersonal threat by the very young child in distress can shift a mother's primary preoccupation with that young child's needs to that of her own individual survival: "Fight, flight, or freeze." This redirection of attention to self-preservation removes the mother from her very important focus on her child's cues, with a focus on self- rather than mutual-regulation of arousal and emotion, and thus greatly increases the risk for gross misinterpretation of her child's cues. Indeed, one study did find a moderate correlation between severity of self-reported maternal PTSD symptoms that were associated with maternal histories of maltreatment and hostile-intrusive caregiving behavior, the latter particularly associated with history of physical abuse (Lyons-Ruth & Block, 1996).

In cases of maternal violence-related PTSD, these repeated *acts of attentional redirection* amplify the sense of helplessness and distress in the child. Helplessness and distress in the child, in turn, often leads the mother to further defend herself from her own feelings of helplessness and to distance herself emotionally and/or physically from the child, rather than providing contingent comfort, emotional containment, and protection. The resulting defensive, self-protective maternal response (i.e., "atypical maternal behavior") to her child's distress in the face of her PTSD can be measured via behavioral observation in the lab (Lyons-Ruth et al., 1999).

Lyons-Ruth et al. (1999) extended Main and Hesse's (1990) observations of parental "frightening" and "frightened" behavior among parents

of toddlers who displayed disorganized attachment behavior upon reunion following separation during the Strange Situation Paradigm. These parental behaviors were significantly associated both with maternal trauma history and with child insecure, disorganized attachment behavior (Lyons-Ruth & Block, 1996; Main & Hesse, 1990). Lyons-Ruth et al. described additional “atypical” caregiver behaviors that were posited as also being significantly associated with maternal trauma history and child disorganized attachment behavior; these included *affective communication errors* (i.e., maternal affective incongruence with child affect, particularly during child distress), *caregiver disorientation* (i.e., noncontingent, odd parental behavior that is frequently associated with dissociation), and *role reversal* (i.e., the parent assumes a childlike stance and/or submits to the child-as-authority). The measure that developed out of Lyons-Ruth et al.’s operationalized criteria for coding these behaviors as well as Main and Hesse’s original frightening (renamed *hostile/intrusive*) and frightened (renamed *avoidant/withdrawn*) parental behaviors is described further below (see “Measures”).

Women who have PTSD due solely to non-interpersonal causes (e.g., car accidents or natural disasters) would be less likely than victims of interpersonal trauma to display these types of atypical caregiving behaviors (Bryant, Mayou, Wiggs, Ehlers, & Stores, 2004; Kilic, Ozguven, & Sayil, 2003). This is because these behaviors are essentially thought to be related to impairment in social information processing directly relating to the caregiver’s adverse interpersonal experiences that leads the traumatized caregiver to feel “threatened” by her own young child’s behavior and mental states (Elwood, Williams, Olatunji, & Lohr, 2007; Schechter, 2003). We thus hypothesize not only that severity of maternal PTSD will be associated with nonbalanced, and particularly distorted, mental representations as we have already demonstrated (Schechter et al., 2005), but that *nonbalanced, distorted maternal mental representations and greater severity of maternal PTSD will also be significantly associated with atypical maternal behavior in the lab.*

Following in the tradition of the Adult Attachment Interview (George, Kaplan, & Main, 1985), which measures retrospectively the quality of adult mental representations of that adult’s own caregiver(s) with respect to attachment, we developed two measures that measure the adult-as-parent’s mental representations of his or her own child: the Parent Development Interview (PDI; Aber, Slade, Berger, Bresgi, & Kaplan, 1993) and the Working Model of the Child Interview (WMCI; Zeanah, Benoit, & Smyke, 1995–2000; Zeanah, Larrieu, Heller, & Valliere, 2000). Because

of its history of application to high-risk samples, we chose the WMCI for this study. Coding of the WMCI results in an overall clinical classification of maternal mental representations of her child as either balanced or one of two “nonbalanced” categories: disengaged and distorted (Zeanah et al., 1995–2000).

Narratives classified as “balanced” include both positive and negative characteristics of the child’s personality or the caregiver’s relationship with the child. They convey a sense of the caregiver as deeply involved in the relationship with the child, as recognizing and valuing the child’s individuality, as empathically appreciating the child’s subjective experience, and as valuing the child and the relationship with the child. The mental representations are open to change and accommodate new information about the child and parenting. They also convey at least moderately rich details about the child and the caregiving experience (Zeanah et al., 2000).

Nonbalanced, “disengaged” mental representations are characterized by pervasive emotional distance or indifference toward the child. The topic of the child or caregiver’s relationship with the child may be approached at a cognitive level and be remote from feelings and emotions. The significance or impact of parenting remains either emotionally unintegrated or dismissed as unimportant and noninfluential on the development of the child or the relationship with the parent (Benoit, Parker, & Zeanah, 1997).

Nonbalanced, “distorted” maternal mental representations are characterized by distortion of the mother’s mental representation of her child and/or relationship with the child. The distortion may take one or more of the following forms: devaluing or excessively negative, self-referential, or role-reversed. Parents with distorted mental representations convey an impression of unrealistic expectations of their child, attribute malevolent intents to the child, or are grossly insensitive to the young child. Descriptions of the child may be highly incoherent in the sense of being confused, contradictory, or bizarre. Maternal narrative may indicate that she is preoccupied by angry affect or distracted by a particular aspect of her child that precludes an integrated representation. Her narrative may reflect that she is confused, anxious, or overwhelmed by the infant or self-involved. Much feeling is expressed about the child, but these emotions lack modulation and contextual meaning.

We hypothesize that maternal PTSD will be associated specifically with the distorted classification by virtue of this lack of modulation of negative affect and the maternal projection of power, threat, or otherwise

developmentally inappropriate attributes onto the very young child. In the current coding scheme (Zeanah et al., 1995–2000), if elements of both disengaged and distorted classifications are present, the coder is instructed to rate the narrative as distorted. The distorted classification would correspond both to the “preoccupied” (i.e., preoccupied with past attachment relationships, with a predominant affect of anger and/or fear, yet consistent and organized as a strategy) and “unresolved” (i.e., characterized by a lack of a consistent, organized narrative strategy, thus often contradictory and confused/confusing) classifications on the Adult Attachment Interview (George et al., 1985). We think also that maternal PTSD and distorted mental representations of the child will be particularly disorganizing to maternal interactive behavior.

REFLECTIVE FUNCTIONING (RF) AS A FACILITATOR OF MUTUAL REGULATION?

An important and measurable indicator of a history of maternal attachment security and subsequent caregiving sensitivity is that of maternal RF (Grienberger, Kelly, & Slade, 2005). *Maternal RF* is the capacity to infer mental states in her child and in herself. Maternal RF has been found to predict infant attachment security (Fonagy et al., 2002), which in turn is related to prosocial behavior, successful academic functioning, and decreased anxiety (Lyons-Ruth et al., 1999). The capacity of the caregiver to consider and to contextualize her own thoughts and feelings as well as those of her child, and then to respond from a developmentally informed vantage point to her child’s cues, is fundamentally supportive of emotional regulation (Fonagy et al., 2002).

We therefore wondered whether RF might counteract at least the dysregulating effects of maternal traumatization at the behavioral level. Indeed, although effects of maternal psychopathology were not taken into account, Grienberger et al. (2005) showed that RF predicted greater caregiving sensitivity *as marked by less atypical maternal behavior* within a nonreferred lower middle-class sample. One goal of the present study was, therefore, to replicate and extend their findings and to explore the potential link between maternal PTSD, RF as an indicator of maternal attachment security, and maternal caregiving behavior within a violence-exposed sample.

Because we have already shown that maternal RF and severity of PTSD are associated with nonbalanced, distorted mental representations

(Schechter et al., 2005), in the present study we wanted to test the hypothesis that *lower levels of maternal RF will be significantly associated with atypical maternal behavior.*

METHOD

Participants

Permission to conduct the study was obtained from the institutional review board at the Columbia University Medical Center Department of Psychiatry. Between January 2000 and December 2001, all biological mothers ($N = 66$) and their children who were registered or presented for evaluation in the Infant-Family Service, a hospital-based mental health clinic for very young children (aged 0–5 years) and their families, were offered the opportunity to participate in the study. They were told that the purpose of the study was to understand what “made life more versus less stressful for mothers of very young children in the community.”

Families were referred to this clinical service by medical and mental health professionals, day care centers, and community social service agencies who had concerns about potential for child abuse, neglect, or family violence. Entry criteria included a complaint by the mother or others involving concern about potential or actual violence or disruptive behavior in self, child, or other household member. Maternal diagnosis of PTSD was not an inclusion criterion. Women with active psychotic symptoms, who were substance abusers, or who were not the primary caregiver of their child for most of that child’s life were excluded. Further exclusion and inclusion criteria have been described in a previous paper (Schechter et al., 2005). Mothers and children (aged 8–50 months) had to be physically and developmentally able and well enough to participate in a 20- to 30-min interactive play paradigm as determined by clinician assessment and clinical records.

Of those 66 contacted, 21 (32%) refused to participate, did not follow up in the clinic prior to signing informed consent, or were found to meet exclusion criteria. The other 45 mothers signed the consent form, out of which 1 caregiver disclosed that she was not the biological mother and 1 mother dropped out. The 43 remaining participant mothers shared in common a chief complaint involving violent, aggressive, or disruptive behavior of their preschool-age child or of another household member. Forty-one (95%) stated that they had had

exposure to interpersonal violent trauma themselves in childhood and/or adulthood (physical and/or sexual abuse and/or domestic violence during childhood, and/or physical and/or sexual assault in adulthood). The history of prior interpersonal violent trauma in the lives of the remaining two mothers proved inconclusive, such that they were excluded from this study, leaving a remaining sample size of 41. Study participants were mothers ranging in age from 18 to 45 years, with a mean age of 29 years; their children were aged 8 to 50 months, with a mean age of 32 months.

Maternal life event measures used to select the sample included the Life Events Checklist (Johnson & McCutcheon, 1980) and the Brief Physical and Sexual Abuse Questionnaire (BPSAQ; Marshall et al., 1998). Both of these measures are described below. To be included in the study, a mother needed to have stated that she had had at least one experience of physical or sexual assault and/or family violence exposure at any point in her life on either or both of these two measures.

As many as 24 out of 41 mothers (59%) stated that their child was one of the three greatest stresses in their lives. Although mothers' clinical concerns were most often child related, approximately one fourth of cases presented with primary concerns about parental mental health, trauma, or severe stress.

In all, 28 mothers (68%) were on public assistance, 22 (54%) had less than a high school education, and 27 (67%) were single with children who did not have consistent, predictable contact with their biological fathers. The sample was 88% Hispanic, largely of Dominican origin, most of whom were immigrants (61%); 12% were African American. As the community surrounding the hospital is heavily Caribbean-Hispanic, participants were introduced to the study, given informed consent, and interviewed in either English or Spanish according to their preference. All research staff members were fluent in English and Spanish.

Measures

Trauma measures. A standard Demographic and Treatment History Questionnaire, consisting of 33 closed- and open-ended items, was developed for use in this study (Schechter et al., 2005). Several items probed for mental health treatment history for any reason and in any form (i.e., counseling; brief or long-term individual, family, or group psychotherapy; medication; day program; emergency room; inpatient hospitalization; substance abuse rehabilitation program).

The Life Events Checklist (Johnson & McCutcheon, 1980) is a 17-item checklist covering a range of potentially traumatogenic events from natural disasters to accidents, sudden losses to combat and interpersonal violent events. The BPSAQ (Marshall et al., 1998) was used in order to quantify the severity of maternal violent trauma history (Schechter et al., 2005). The measure has shown reliability in predicting clinician-rated PTSD in two separate studies (Marshall et al., 1998; Schechter et al., 2005).

As described in Schechter et al. (2005), violence-related PTSD was assessed by the clinician using the Structured Clinical Interview for the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; SCID) PTSD Module with Chronology of Life Events (First, Spitzer, Gibbon, & Williams, 1995) in addition to the Posttraumatic Symptom Checklist—Short Version (PCL-S; Weathers et al., 1996), a self-report checklist for symptoms within the month prior to assessment. A participant was said to meet criteria for PTSD if (a) *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) criteria were met on the SCID using symptom counts: at least one Reexperiencing symptom, three Avoidance symptoms, and two Hyperarousal symptoms, plus duration and demonstrated impairment; and (b) the overall PCL-S score was 45 or greater within the month prior to assessment.

Severity of PTSD was measured by counting the number of symptoms endorsed on both the SCID PTSD Module and the PCL-S. Symptom count, having been shown to be a valid marker of severity of PTSD in previous studies (Marshall et al., 2001), was used so as to be able to render comparable clinician-rated symptoms (SCID) and self-reported symptoms (PCL-S) because the SCID does not include a measure of symptom severity. The correlation of symptom count to symptom severity on the PCL-S was robust ($r = .88, p < .001$).

Maternal mental representations. The WMCI (Zeanah et al., 1995–2000) is a 1-hr semistructured interview that assesses caregivers' mental representations of their children's personality and their relationship with their children. It has been used with parents from pregnancy through child age of 5 years. All questionnaires and interviews including the WMCI were translated into Caribbean Spanish and back-translated. For the purposes of coding maternal perception, the interviews were videotaped and then rated along fifteen 5-point rating scales that included both content and qualitative dimensions, the latter encompassing formal organizational characteristics of the maternal narratives. The scale scores in addition to clinical impression informed the coding of the overall classification as either balanced or one of two nonbalanced categories (disengaged and distorted) as described above (Zeanah et al., 1995–2000).

In this study, both the primary coder (postdoctoral level clinician and researcher at an independent institution) and second expert coder (the primary author of the instrument) were naïve to the history of the participants. Scoring followed from viewings of the videotape, which is the current standard method for coding the WMCI (Rosenblum, Zeanah, McDonough, & Muzik, 2004). The second coder coded a randomly selected 10 tapes out of the 41 for interrater reliability on the overall classification of balanced, disengaged, or distorted ($\kappa = 1$).

Maternal RF. Maternal RF was measured as described in Schechter et al. (2005), by coding narrative responses to the WMCI using the Reflective Functioning Scale by Fonagy et al. (1995) as adapted by Dr. Arietta Slade (Slade et al., 2005).

In consultation with Dr. Slade, we applied the parental RF coding system to the WMCI. WMCI item content was not altered, but additional probes or “demand questions” to elicit thinking about mental states were included to render the coding condition comparable to that of the PDI (see Grienberger et al., 2005). For example, after the WMCI item “What of your child’s behavior is most difficult for you to manage?,” which is followed by the question “Why do you think that he does that?,” we added the probe “What do you think was going on in his mind?” An example of a response consistent with low RF was the following mother’s response to that probe: “I don’t know. He’s just like his father.” By contrast, the following mother’s response was consistent with high RF: “I can’t be sure . . . but I think that he feels scared when I leave and so he holds on to me and cries. That makes me feel so guilty that I have trouble leaving.”

To code the WMCI items with responses to preexisting or added demand questions for RF, a coauthor of the RF coding system for the PDI transcribed and coded 20 to 30 min of videotaped WMCI responses to four items (i.e., WMCI Items 4, 5, 7, and 11). These particular items were selected from the WMCI because they probed for the mother’s thinking about her child’s thoughts, feelings, and intentions rather than for descriptions (i.e., content items). The RF coder, who was different from the two coders who coded mental representations on the WMCI, was naïve to any information about the mother–child dyads except for the child’s age. Although adaptation of the Fonagy et al. (1995) coding scheme by Slade et al. (2005) for use with the selected set of WMCI items was not validated against the existing version of the PDI (Aber et al., 1993), the approach taken in the present study is common practice in research that involves labor-intensive coding of narrative and observational measures. Moreover, the primary RF coder, himself a coauthor of the adaptation of the RF coding

scheme used to code parental mental representation measures (Grienenberger et al., 2005), and Dr. Slade, the primary author of the coding scheme, established reliability on the RF coding of the WMCI version that was used in this study prior to the primary coder's proceeding to code RF for the whole sample.

Observed caregiving behavior (laboratory measure). Lyons-Ruth et al. (1999) developed the Atypical Maternal Behavior Instrument for Assessment and Classification, or AMBIANCE, a measure of atypical maternal behavior measured in a structured laboratory setting. The AMBIANCE measures five dimensions of caregiving behavior described earlier in this paper: affective communication errors, avoidance/withdrawal, disorientation, hostility/intrusiveness, and role reversal. These caregiving behaviors as measured by the AMBIANCE were significantly associated with insecure, disorganized attachment classification of children in the Strange Situation (Goldberg, Benoit, Blokland, & Madigan, 2003). For a similar sample of low-income mothers, level of "disrupted affective communication," or overall AMBIANCE score, was found to be highly reliable among raters (intraclass correlation coefficient [ICC] = 0.93), as was the categorical "disrupted" versus "nondisrupted" measure ($\kappa = 0.73$).

In this study, both the criterion coder and reliability coder were naïve to any information about the participants beyond the age of the child. Scoring followed from multiple viewings of the videotape that took into account verbalizations by the caregiver and child, which is the current standard method for coding the AMBIANCE. The second coder coded a randomly selected 5 tapes out of the 41 for interrater reliability (ICC = 1 overall continuous score; ICC = .74 and .76 for respective dimensions of withdrawal and hostile–intrusiveness/negativity). The coders coded approximately 20 min of videotape: both a 10-min segment of free play plus two separation–reunion segments.

They coded maternal behavior in these segments continuously along five dimensions: affective communication (i.e., contradictory signaling to child and inappropriate responding to child cues), role/boundary confusion (i.e., role reversal, treating child as sexual or spousal partner), disorientation (i.e., appears confused or frightened by child, appears generally disorganized or disoriented), hostile–intrusiveness/negativity (i.e., physically intrusive or frightening, verbally intrusive or frightening, inappropriately attributes negative feelings or motivation to child, exerts control with objects), and withdrawal (i.e., avoidant, creates physical distance from child, uses words to distance self from child, contradicts cues suggesting proximity seeking). These five dimensions plus clinical

impression informed the overall score on a 7-point scale with 1 being *least atypical* and 7 being *most atypical*. The frequency of events meeting criteria for each of the subscales was additionally tabulated by the primary coder only and entered into the database for additional qualitative comparisons.

Procedures

The protocol consisted of two 2-hr videotaped visits. During the initial visit, following a clinical and treatment history interview, mothers were administered an abbreviated version of the WMCI that included Items 2, 3, 4, 5, 6, 7, and 11. Following the WMCI, the Life Events Questionnaire, the BPSAQ, and the SCID PTSD Module were administered. During the second visit, approximately 1 to 2 weeks later, mothers and children were observed (a) playing together as they would at home using a range of toys provided (10 min), (b) separating and reuniting, (c) cleaning up the play area, and (d) engaging in a challenging structured activity such as building a tower (toddlers) or doing a puzzle (preschoolers). The AMBIANCE was coded from the videotaped observations of this laboratory observation procedure.

Data analysis. Analysis of variance followed by Cohen's d (unadjusted) and multiple linear regression models (adjusted) were estimated to test differences for maternal behavior as measured by the AMBIANCE among the three WMCI categories. Adequacy of the models was judged by R -square. Analyses were done to test our a priori hypotheses to single out the Distorted category from the other two categories. The AMBIANCE was regressed on WMCI and pertinent demographic factors: maternal and child age, number of years of maternal education, household income, and history of mental health treatment for any reason and of any variety. These particular demographic variables were selected because of the concern that these particular variables might influence quality of maternal mental representations and/or behavior.

Sample characteristics demonstrated risk and high morbidity. All 41 mothers stated on the BPSAQ that they had had exposure to interpersonal violent trauma themselves in childhood (i.e., prior to age 16) as victim and/or witness. In addition, 29 of the 41 mothers (71%) stated that they had experienced violent trauma also during adulthood (i.e., after age 16). Trauma severity score was derived from the BPSAQ: Out of a possible score range of 0 to 38, the sample range was 3 to 32 ($M = 15.6$, $SD = 7.3$). This mean score suggested that half of the sample had

experienced two or more forms of maltreatment during childhood (Schechter et al., 2005).

There were additional risk indicators during their adult years: Fifteen mothers (37%) filed for restraining orders during their adult life and a similar number (16, or 39%) had a history of investigation by child protective services. Sixteen (39%) disclosed their own history of violent behavior, whereas 14 (34%) disclosed a history of suicide attempts. Despite this high level of risk and expected psychiatric morbidity, only 14 of the 41 mothers (34%) had ever been in psychotherapy of any kind prior to the study.

According to the PCL-S and SCID PTSD Module, the rate of current PTSD related to interpersonal violent trauma only was 44%. Using the PCL-S as a continuous measure, we found that, out of a possible range of 17 to 85, the range in the sample was 17 to 82 ($M = 36$, $SD = 17$). It has been shown that 94% of individuals with PCL-S scores greater than 44 are in the diagnostic range (Ventureyra, Yao, Cottraux, Note, & de Mey-Guillard, 2002). Scoring the PCL-S by number of symptoms endorsed, we found that, out of a possible range of 0 to 17, the range in the sample was 0 to 17 ($M = 9$, $SD = 5.4$).

The rate of lifetime PTSD according to the SCID PTSD Module was 90% ($n = 37/41$), with the remaining 10% ($n = 4/41$) suffering from clinically significant subthreshold symptoms. These rates would be unusually high were it not for the fact that the sample consisted of parents and young children referred for concerns related to violence and maltreatment risk. Out of a possible range of 0 to 17, the sample range for lifetime PTSD severity as marked by the number of endorsed symptoms was 8 to 15 ($M = 13$, $SD = 2.4$).

RF varied in a relatively narrow range. Although the possible score range was 0 to 9, the sample range was 0 to 5 ($M = 3.3$, $SD = 1.3$). This mean of 3 suggests that on the average, mothers in this sample were generally able to label affects in their children and/or themselves (e.g., "My child had a tantrum. He was angry," which would receive an item score of 3; vs. "My child had a tantrum. He is an evil one," which would receive an item score of 1). Yet mothers with overall RF of 3 would not show evidence of being able to regularly link affects as motivations for action in self or other (e.g., item score of 5: "He was angry that I took his toy away and so he had a tantrum") or to mental states in other (e.g., item score of 7: "He saw that I was anxious and rushed. When I turned away to go out, he threw an angry tantrum to get me perhaps to turn back to him again.").

RESULTS

Background Variables

Via logistic regression, we first examined five possible demographic factors that could influence maternal mental representations on the WMCI: maternal age, child age, child gender, maternal education, and maternal history of prior mental health treatment (individual, group, family, or parent/child, with or without medication). Each was unrelated to the WMCI category.

The same five demographic factors were considered via multiple linear regression with respect to maternal behavior in terms of the AMBIANCE scores. Whereas maternal age, child age, child gender, and maternal education were unrelated to AMBIANCE scores, history of mental health treatment (i.e., any encounter with mental health professionals involving three or more outpatient visits or an inpatient admission) was significantly associated with lower AMBIANCE scores. The mean AMBIANCE score for mothers with no history of mental health treatment was 5.44 ($SD = 0.96$), and with a history of mental health treatment, 4.56 ($SD = 1.58$), $F(1, 39) = 4.42$, $p = .04$.

Main Hypotheses

To address the hypothesis that nonbalanced, particularly distorted maternal mental representations would be associated with atypical maternal behavior, we performed an analysis of variance that compared the mean level of atypical maternal behavior for mothers across nonbalanced and balanced WMCI classifications. We found a significant relationship ($p \leq .05$), as shown in greater detail in Table 1.

The analysis depicted in Table 1 was preceded by examining frequencies and distributions of the WMCI and the AMBIANCE: For maternal perception based on WMCI classifications, 7 (17%) mothers were in the balanced category and 34 (83%) in the nonbalanced category. Among mothers in the nonbalanced category, 10 (24%) were classified as disengaged and 24 (59%) were classified as distorted.

On the AMBIANCE, 30 out of 41 (76%) scored 5 or higher, indicating the categorical status of disrupted communication. The mean for the sample was 4.9 ($SD = 1.43$), range = 6, minimum = 1 (two mothers), maximum = 7 (one mother).

Analyses of variance as depicted in Table 1 showed that the WMCI classification was associated with significant differences in the mean degree to which mothers displayed atypical maternal behavior on the

TABLE 1. AMBIANCE and WMCI classification.

WMCI Classification	AMBIANCE		
	<i>N</i>	<i>M</i>	<i>SD</i>
Balanced	7	3.71	1.98
Disengaged	10	4.80	1.62
Distorted	24	5.15	1.18
All WMCI Groups	41	4.90	1.43
ANOVA for AMBIANCE			
	<i>df</i>	<i>F</i>	<i>p</i>
All WMCI Groups	2, 38	3.81	0.03
ANOVA for AMBIANCE Contrasting WMCI Classification			
	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
Balanced–Nonbalanced (i.e., Balanced vs. Distorted + Disengaged)	2.36 (<i>df</i> = 38)	.02	1.01
Distorted–Balanced	2.75 (<i>df</i> = 39)	.009	1.20
Disengaged–Distorted	–0.98 (<i>df</i> = 39)	.34	–0.37
Balanced–Disengaged	–1.65 (<i>df</i> = 39)	.11	–0.81

Notes: AMBIANCE = Atypical Maternal Behavior Instrument for Assessment and Classification; WMCI = Working Model of the Child Interview; ANOVA = analysis of variance.

AMBIANCE. These mean differences were at the threshold of the disrupted versus nondisrupted maternal behavior cutoff (score of 4 and below vs. 5 and above) on the AMBIANCE.

Both nonbalanced classifications on the WMCI had significantly higher mean AMBIANCE scores than the balanced classifications. Balanced versus nonbalanced (i.e., distorted and disengaged) classification groups had significant differences in their caregiving behavior, with large effect sizes (Cohen's *d*). These significant differences were accounted for by the relationship of the balanced classification to the distorted one. Of note, there was no significant difference between the disengaged classification and the distorted one, or the balanced one, at this level of analysis.

Post hoc analyses showed additionally that, when looking at the dimensional subscales of the AMBIANCE across this sample exposed to interpersonal violence, the mean frequency of hostile–intrusiveness/negativity

was significantly higher among mothers with the distorted WMCI classification than among mothers with either balanced or disengaged WMCI classifications, $F(1, 40) = 7.10, p = .01$. Similarly, the mean frequency of disorientation/frightened behavior was higher at a trend level of significance, $F(1,40) = 3.80, p = .06$, among the distorted WMCI classification group than either the disengaged or the balanced groups.

A linear regression model was applied to determine the predictive value of WMCI classification with respect to AMBIANCE overall scores. As depicted in Table 2, results showed that balanced perception accounted for 16% of the variance in AMBIANCE scores. Adjusting for maternal treatment history as a dichotomous independent variable did not significantly impact the multiple regression model. Moreover, adjusting for maternal PTSD and/or the degree of interpersonal violent trauma exposure did not significantly impact the model.

When we tested that the remaining two hypotheses that (a) lower levels of maternal RF and (b) greater maternal PTSD severity would be associated with greater atypical maternal behavior, we found no significant relationships between either of these variables and the level of disrupted communication on the AMBIANCE ($p > .4$).

That being said, we did find that as much as 76% of the overall clinical sample manifested atypical maternal behavior in the disrupted affective communication range (greater than or equal to 5 on an overall scale of disrupted communication ranging from 1 to 7), indicating the need for a non-PTSD control group. The possible score range and the sample range were 1 to 7 ($M = 4.83, SD = 1.43$). The mean frequencies of behaviors across the five subscales were as follows: affective communication = 15.71 ($SD = 13.43$), role/boundary confusion = 14.88 ($SD = 13.78$), disorientation = -6.02 ($SD = 6.84$), hostile-intrusiveness/negativity = 20.43 ($SD = 13.36$), withdrawal = 20.43 ($SD = 1.06$). The frequency of withdrawal (i.e., avoidant

TABLE 2. AMBIANCE as predicted by maternal balanced WMCI with and without adjustment for treatment history.

Variable	R^2	F	Significance	β	Significance
Balanced WMCI Only	0.16	7.40	.01	0.40	.01
Balanced WMCI Adjusted for Treatment History	0.20	4.60	.02	0.36	.02

Notes: AMBIANCE = Atypical Maternal Behavior Instrument for Assessment and Classification; WMCI = Working Model of the Child Interview.

maternal behaviors) on the AMBIANCE subscales was positively correlated with the number of maternal PTSD symptoms ($r = .37; p = .04$). The other four subscales (i.e., affective communication errors, role/boundary confusion, disorientation, and intrusiveness) were not significantly associated with maternal PTSD.

DISCUSSION

We found that nonbalanced maternal mental representations on the WMCI were significantly associated with more atypical, noncontingent maternal behavior as measured by the AMBIANCE. Mothers classified as having distorted mental representations on the WMCI had significantly higher levels of atypical behavior than those mothers with balanced mental representations, as was hypothesized. The quality of maternal behavior associated with those distorted mental representations was noted as primarily hostile–intrusive/negative or frightening and, to a lesser degree, frightened. Given the relationship between maternal distorted, negative mental representations, and atypical maternal behavior, we can also revisit the previous findings and understand that the degree of maternal avoidance of the child’s proximity seeking (i.e., mother appearing withdrawn and inhibited on reunion) that was moderately correlated with the severity of maternal PTSD may be seen as another aspect of frightened behavior on the part of the caregiver (Lyons-Ruth et al., 1999). These characteristics of the clinical sample reported here are consistent with intergenerational transmission of interpersonal violent trauma to which the mothers had been exposed.

The results of this study thus suggest that a mother’s mental representations of her child may well exert a regulatory effect on her interactive behavior with her child. As we have shown, greater severity of maternal PTSD related to interpersonal violence is associated with distorted maternal mental representations, and greater RF is associated with balanced and integrated maternal mental representations of her child (Schechter et al., 2005). It is thus possible that maternal mental representations of her child may mediate the effect of proximal “hidden regulators” of maternal behavior (Hofer, 1984).

Within the nonbalanced category, the difference between mothers classified as having distorted versus disengaged mental representations with respect to levels of atypical maternal behavior was not statistically significant at this level of analysis. That being said, because post hoc analyses suggested that the intrusiveness and withdrawal AMBIANCE subscales

were associated uniquely with the distorted classification at a trend level of analysis, the absence of significant findings with respect to the overall score may represent a limitation of power in this study.

We did not find an association between maternal RF and atypical maternal behavior within this uncontrolled referred sample of violence-exposed mothers and young children. These results differ from those of Grienenberger et al. (2005), who did find such a connection within a nonreferred population. It is possible that the limited range of RF in our clinical sample prevented us from replicating those findings. It is also possible that, although maternal RF is associated with balanced mental representations (Schechter et al., 2005), which may be, as we explored in this present study, associated with more sensitive caregiving behavior, maternal RF is not directly correlated with the quality of maternal behavior in clinical samples in which there is significant psychopathology. Given these various possibilities, we are now reexamining this question with a nonreferred control group.

Similarly, we did not find a direct correlation between the number of maternal PTSD symptoms as a marker for severity and the degree of atypical maternal behavior. That being said, the fact that 76% of mothers with clinically significant PTSD symptoms and a reduced range of RF scored in the disruptive communication range of the AMBIANCE (i.e., score ≥ 5) and showed a predominance of intrusive type behaviors is arguably consistent with Lyons-Ruth and Block's (1996) findings regarding hostile-intrusive maternal behavior among maltreated mothers and Grienenberger et al.'s (2005) findings regarding RF. This study extends previous work in this area by studying maternal withdrawal (i.e., fearful/avoidant maternal behavior) and its significant association to severity of maternal PTSD.

The more severe and symptomatic the mother's PTSD, the more likely she was to maintain a physical and/or psychological distance from her young child. We have hypothesized that this may be due to the traumatized mother's need to protect herself from further psychophysiologic dysregulation in the presence of her child's distress, particularly during separation-reunion. Although in our previous paper (Schechter et al., 2005) we demonstrated that low maternal RF and high severity of maternal PTSD were significantly associated with nonbalanced maternal mental representations of her child, we found no zero-order relationship between maternal RF, maternal PTSD severity, and atypical maternal behavior. Maternal RF as well as maternal PTSD severity were orthogonal to each other, yet each was highly intercorrelated with maternal mental representations (Schechter et al., 2005). This intercorrelation in addition to low variability for these two

independent variables (i.e., maternal RF and PTSD) may well have limited our ability to test the second hypothesis with this referred sample.

Additional Limitations of This Study

The most significant limitation of this study is the absence of a non-PTSD control group. We think that our negative findings with respect to the relationship of PTSD severity and of level of RF to atypical maternal behavior are likely due to this lack of a control group (Schechter et al., 2005). Similarly, although such a high percentage (83%) of unbalanced WMCI classifications is consistent with other violence-exposed samples, such as that in the study noted above (Huth-Bocks, Theran, & Bogat, 2004), the results presented in our paper warrant replication with a control group. Despite these limitations, the traumatized sample studied was representative of the clinical cohort that we treat as clinicians at our inner city medical center. And from the clinician's point of view, the systematic understanding of the referred sample through the research described in this paper has proven useful to staff on our Infant-Family Service (see "Clinical Implications").

Another methodological limitation of this study concerns the use of the abbreviated WMCI with RF probes added to code RF as opposed to the PDI, for which the RF coding scheme (Fonagy et al., 1995) had been adapted by Slade et al. (2005; Grienberger et al., 2005). Further research is needed to define the optimal amount of narrative text needed for a valid rating of parental RF. Although the strong relationship of RF and balanced mental representations on the WMCI in this study support the validity of the RF coding, it may be that the amount of maternal narrative coded in this inner city sample would not be sufficient in another sample, thereby limiting the generalizability of the findings.

Further research involving both a non-violence-exposed and a non-PTSD sample from the same inner city community is clearly needed to replicate the findings described in this paper and, as mentioned, is now underway. Similarly, because only mothers were included in this study, further studies involving fathers as well as caregivers drawn from other immigrant groups, cultures, regions, and social status are needed.

CLINICAL IMPLICATIONS

First of all, this paper supports the clinician's active assessment and treatment of the sequelae of parental exposure to interpersonal violent

trauma. Second, this paper has empirically demonstrated that the distorted maternal mental representations that were found in the large majority of a traumatized sample of mothers are significantly related to those mothers' atypical behavior with their young children. Two clinical implications of this study are, therefore, that nonbalanced, and in particular distorted, maternal mental representations may be useful risk indicators (a) in assessment of parent-child relationships cross-sectionally and (b) in the assessment of change with intervention that targets caregiving behavior. All clinicians regardless of their discipline should routinely listen carefully to how parents talk about their children and their relationship with their children. Specifically, highly negative, markedly ambivalent, contradictory, or age-inappropriate descriptors—whether devaluing or idealizing of a parent's children and/or his or her relationship with them—should be noted and explored in greater depth. These types of descriptors may well represent red flags that mark a significantly disturbed parent-child relationship that could benefit from dyadic intervention and/or require investigation by a child protective agency or protection by a victims' services agency (e.g., domestic violence shelter or special victims unit of the police department) in the interest of maintaining the child's and primary caregiver's safety.

Open-ended demand questions in the course of assessment, such as "Tell me about your child . . . what is he or she like?" or "Tell me a story that captures the essence of your relationship with your child," similar to items found in the WMCI, can be very clinically useful. In listening to the caregiver's responses, the clinician is advised to note what of the caregiver's narrative response is coherent versus incoherent, as well as to observe the caregiver's emotional communication in terms of congruence, level of arousal, and positive versus negative affective valence in telling the story. Again, incoherence and affective incongruence may represent signs of significant disturbance in the child-parent relationship. Questions about what the caregiver is reminded of when she looks at her child or sees a particular behavior enacted by her child can also be quite telling and can provide a bridge to hearing important, but otherwise avoided, history of the caregiver's caregivers and about other aspects of her interpersonal world.

Finally, we would like to emphasize that the research presented in this paper is preliminary and has not yet been replicated with a control group. Therefore, we do not recommend that the methods employed in this research paper be applied to assess parenting capacity in the clinical setting, especially in the absence of an experienced early childhood mental health specialist. Moreover, a caregiver's history of victimization,

complex PTSD, and significant attachment disturbance(s) in her own life should not lead the clinician to assume anything about that particular caregiver's capacity to parent her child. Knowledge of such a history by the clinician should rather lead the clinician during the assessment and treatment to support an empathic, reflective, and, when appropriate, positive regard for what that caregiver is able to do to foster her child's relationship with her and that child's healthy development in spite of any adversity that the caregiver may have experienced.

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