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THE MOTHERS AND TODDLERS PROGRAM, AN ATTACHMENT-BASED PARENTING INTERVENTION FOR SUBSTANCE-USING WOMEN: RESULTS AT 6-WEEK FOLLOW-UP IN A RANDOMIZED CLINICAL PILOT

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Abstract

Previously, we reported posttreatment findings from a randomized pilot study testing a new attachment-based parenting intervention for mothers enrolled in substance-use treatment and caring for children ages birth to 3 years (N.E. Suchman, C. DeCoste, N. Castiglioni, T. McMahon, B. Rounsaville, & L. Mayes, 2010). *The Mothers and Toddlers Program* (MTP) is a 12-session, weekly individual parenting therapy that aims to enhance maternal capacity for reflective functioning and soften harsh and distorted mental representations of parenting. In a randomized pilot study, 47 mothers who were enrolled in outpatient substance-abuse treatment and caring for children between birth and 3 years of age were randomized to the MTP versus the Parent Education Program (PE), a comparison intervention that provided individual case management and developmental guidance. At the end of treatment, mothers in the MTP condition demonstrated better reflective functioning, representation quality, and caregiving behavior than did mothers in the PE condition. In this investigation, we examined whether the benefits of MTP at posttreatment were sustained at the 6-week follow-up. Recently, we also identified two components of parental reflective functioning: (a) a self-focused component representing the parent's capacity to mentalize about strong personal emotions (e.g., anger, guilt, or pain) and their impact on the child and (b) a child-focused component representing the parent's capacity to mentalize about the child's emotions and their impact on the mother (N. Suchman, C. DeCoste, D. Leigh, & J. Borelli, 2010). In this study, we reexamined posttreatment outcomes using these two related, but distinct, constructs.

Although not all mothers who seek treatment for their substance abuse have difficulties parenting their children, as a group, substance-abusing women are twice as likely as are non-substance-abusing women to lose custody of their children because of child neglect (U.S. Department of Health and Human Services, 1999). Over the last 20 years, research has shown that although some mothers who use illicit substances are able to provide home environments and parenting that support their children's development, mothers with substance-use disorders are at greater risk for maladaptive parenting practices than are mothers who do not have substance-use problems (Mayes & Truman, 2002). Problematic maternal behaviors have been observed during children's first 3 years of life, including patterns of poor attachment, attunement, involvement, responsiveness, adaptability, and structure juxtaposed with heightened physical activity, provocation, and intrusiveness (Burns, Chethik, Burns, & Clark, 1997; Hans, Bernstein, & Henson, 1999; Rodning,

Beckwith, & Howard, 1991). Studies reporting substance-abusing mothers' perspectives about parenting have indicated a limited understanding of basic child development issues and ambivalent feelings about having and keeping children (Mayes & Truman, 2002; Murphy & Rosenbaum, 1999).

PARENTING INTERVENTIONS FOR SUBSTANCE-ABUSING WOMEN

Only a handful of studies to date have reported findings from clinical trials evaluating interventions for substance-abusing parents of children under 5 years of age (e.g., Black & Nair, 1994; Catalano, Gaine, Fleming, Haggerty, & Johnson, 1999; Ernst, Grant, Streissguth, & Sampson, 1999; Huebner, 2002; Schuler, Nair, & Black, 2002). Intervention approaches have ranged in focus from behavioral skills training to advocacy for needed services to education about early child development. Although the findings have generally indicated improvement in parental factors (e.g., substance use, psychiatric distress and knowledge of parenting), very few have shown improvement in parent-child dyadic interactions or in child adjustment (for reviews, see Kerwin, 2005; Suchman, Pajulo, DeCoste, & Mayes, 2006). The majority of parent training programs developed for substance-abusing parents focus on teaching parents strategies for managing children's challenging behaviors (e.g., tantrums and noncompliance) without addressing the underlying and often tenuous emotional quality of the parent-child relationship. Given that women with substance-use disorders often have developmental histories characterized by poor attachment relationships and exposure to trauma with their own early caregivers (Luthar & Walsh, 1995; Najavitz, 2009), it may be that parenting interventions first must address attachment-related issues of the parent and in the parent-child dyad before directly targeting behavioral parenting skills. Without first improving a parent's capacity to recognize and respond sensitively to children's emotional cues, interventions that foster behavior management skills may do little to strengthen the parent-child relationship.

AN ATTACHMENT PERSPECTIVE ON PARENTING

Attachment research has suggested that maternal insensitivity and unresponsiveness to child emotional cues is often a function of the caregiver's own unmet attachment needs stemming from the caregiver's own experience with early caregivers. Stored memories or psychological "representations" of these early caregiving experiences are thought to become the prototype for newly formed relationships, including the next generation of caregiving relationships, guiding the new mother's expectations of herself and her child and strongly influencing the mother's parenting behavior (for further discussion, see Suchman, Mayes, Conti, Slade, & Rounsaville, 2004). For parents whose attachment experiences involved abusive or neglectful caregiving and concomitant exposure to trauma, these enduring memories are often characterized by distortion and denial that are thought to help protect the mother against psychological fear and pain. However, these defensive strategies also may prevent the mother from recognizing and responding sensitively to her own child's emotional signals, particularly signals of distress (e.g., crying, clinging, hitting, or running away). Instead, emotional cues signaled by the child are likely to trigger the mother's own unresolved experiences of trauma and loss, increasing her emotional distress and disequilibrium, and resulting in her avoidance of the stressful stimulus (Suchman & Mayes, 2009). As early parenthood evokes a mother's memories of early caregivers and traumas, these enduring memories often surface and become more accessible to awareness and intervention.

REFLECTIVE FUNCTIONING: THE LINK BETWEEN PARENTAL REPRESENTATION AND ATTACHMENT PATTERNS

Closely related to inflexible and harsh mental representations of others is the compromised ability to mentalize about the intentions and emotions underlying the behaviors of oneself and others (e.g., the child). Fonagy, Target, Steele, and Steele (1998) suggested that this capacity to understand how intentions and emotions influence behavior [i.e., reflective functioning (RF)] is the mechanism by which maternal representations influence attachment patterns in the mother–child relationship. Mothers who have balanced and flexible representations of their children are thought to be more likely to make accurate inferences about their children's underlying emotional states, which in turn helps their children stay emotionally regulated and form secure attachments with the mother (Fonagy, Gergely, Jurist, & Target, 2002). Mothers who have inflexible and distorted representations are thought to be less able to make accurate inferences about their children's underlying emotions and therefore may be less able to assist their children in regulating emotion and forming a secure attachment. If the mother's experience of the child's emotional distress also activates painful early memories and experiences, a mother also may have difficulty holding the child's emotions in mind or using them to make sense of the child's experience and behavior (for further discussion, see Suchman et al., 2004).

RF is thought to have a self-reflective and an interpersonal component that together provide an individual with a well-developed capacity to distinguish inner from outer reality and intrapersonal mental and emotional processes from interpersonal communications (Fonagy et al., 2002). Parental RF involves separate mentalizing processes for the self and the child (Slade, Bernbach, Grienberger, Levy, & Locker, 2005; Slade, 2005). Mentalizing for infants and toddlers also often involves adopting a developmental perspective about the child's growing capacities (e.g., cognitive, verbal, and motor abilities) and drawing inferences about the meaning of emotions and behaviors based solely on nonverbal cues from infants.

MATERNAL ATTACHMENT DEFICITS AND RF IN SUBSTANCE-USING MOTHERS

Substance-abusing mothers have often reported experiencing a high level of psychological distress in the parenting role that is, in turn, associated with compromised parenting (e.g., parental aggression, parental neglect, poor limit setting, poor communication, low involvement, failure to foster autonomy; see Harmer, Sanderson, & Mertin, 1999; Kelley, 1992, 1998; Suchman & Luthar, 2001).

Adult attachment deficits, which are closely related to difficulties with emotional distress, may partially explain difficulties regulating emotional distress in the parenting role (Fonagy et al., 2002). Research on parenting in mothers with substance-use disorders has shown that they often have enduring, impoverished perceptions of early caregivers as uncaring and intrusive and have very limited capacities for mentalizing (see Levy & Truman, 2002; Suchman, DeCoste, Castiglioni, Legow, & Mayes, 2008; Suchman, McMahon, Slade, & Luthar, 2005; Suchman, McMahon, Zhang, Mayes, & Luthar, 2006). These maternal attachment deficits have been shown to influence many aspects of maternal functioning (e.g., drug-abuse severity, psychological-maladjustment severity, expectations for social support), which in turn influence many aspects of parental functioning (e.g., parental aggression, parental neglect, adaptive parenting, family adaptability, and child placement out of home; see Suchman et al., 2005; Suchman, McMahon, et al., 2006).

Recent evidence also has suggested that the self-reflective component of parental RF may have a stronger role in the quality of caregiving behavior of substance-abusing mothers than was previously thought. In a recent study, this investigative team found that the self-reflective component of RF was more strongly associated than was the child-focused component with caregiving interactions of substance-using mothers with their young children (see Suchman, DeCoste, Leigh, & Borelli, 2010).

CHRONIC DRUG USE AND NEUROBIOLOGICAL HEDONIC REWARD SYSTEMS

Mothers with histories of chronic drug use are especially vulnerable to experiencing stress and to relapse as a result of heightened stress (Sinha, 2001). Chronic substance use alters neurobiological hedonic reward systems that ordinarily assist with adaptation to stress. Ordinarily, for adults with no history of chronic drug use, the neurotransmitter dopamine is released during ordinary stressful situations (e.g., caring for a distressed child), reducing negative emotions and increasing pleasure, thus allowing the individual to manage the stress. The continuing presence of addictive substances drastically reduces this dopaminergic response to stress, leaving the addicted adult highly vulnerable to negative emotions and an absence of pleasure or reward. In this way, caring for a distressed child may be experienced by the addicted parent as extremely stressful and intolerable, and leads to an avoidant or overcontrolling response to the child and also to relapse. Likewise, the presence of RF may help counteract the effects of chronic drugs on self-regulatory systems and help make stressful parenting situations more tolerable.

THE MOTHERS AND TODDLERS PROGRAM INTERVENTION

The Mothers and Toddlers Program (MTP) is a 12-week, individual psychotherapy intervention that was designed for delivery onsite at the substance-abuse clinic where mothers are enrolled in standard outpatient-treatment services. Mothers are eligible to participate if they are actively engaged in substance-use treatment, caring for a child between birth and 3 years of age, and express concern about a parenting problem. Mothers meet weekly with their individual MTP clinician for 1 hr onsite at the outpatient clinic. Prior to the first therapy session, mothers complete a baseline assessment that includes measures of RF, a working model of the child, psychiatric symptoms, and substance use. Mothers and children also complete a brief, videotaped, structured interaction assessment of maternal sensitivity and responsiveness to child cues and child responsiveness and clarity of communication with the mother (In the randomized pilot, these assessment procedures were used for both treatment conditions.)

Developmental Progression

The MTP follows a developmental progression based on the theoretical mechanisms of attachment. The developmental “chain of events” begins in the early sessions with a focus on building a strong therapeutic alliance in which the mother experiences herself as valued and appreciated by the therapist and comes to view the therapist as a reliable source of assistance and support. During an introductory meeting, the therapist explains that the purpose of the program is to support the mother in her role as parent so that her parenting experience can be more pleasurable and less stressful. The therapist explains his or her role to help the mother cope with the everyday stresses of parenting and develop a clearer understanding of how these stresses impact her relationship with her child. The therapist also explains the limitations of his or her availability and that mothers may contact the program staff between sessions for additional assistance (i.e., crisis management). The therapist briefly explains that the program is grounded in attachment theory and introduces

the central tenets that (a) how we parent is strongly influenced by what we are thinking and how we are feeling in the parenting role and that (b) our children's behavior is best understood by thinking about the thoughts, emotions, and intentions that are driving their behavior.

Strong social mores against substance abuse, particularly regarding women who are caring for children, can make it especially difficult for a mother to trust the therapist's intentions, increasing the likelihood that the mother will prematurely leave treatment if she perceives the therapist as judgmental. It is therefore imperative that the therapist be attuned to the relationship and encourages the mother's efforts to openly discuss her concerns. The therapist assists the mother with basic needs and offers solutions to parenting problems, when asked to do so by the mother, to demonstrate willingness to be a helpful ally. The circumstances of mothers' everyday lives (e.g., availability of housing, supplies, transportation, and financial support) can be quite unstable at times, and mothers often arrive at the clinic in the midst of a crisis. The therapist offers to assist the mother to manage and/or cope with the crisis as a means to promote the secure alliance. Establishing a secure relationship is a prerequisite to later therapeutic work (Pawl & Lieberman, 1997).

The central therapeutic work always begins where the mother is, psychologically. If the mother believes herself to be in the midst of a crisis, the therapist helps her to address the crisis and also encourages her to engage in the process of mentalizing about the event. For example, if a mother appears overwhelmed or frustrated by her relationship with her child welfare worker, the therapist might first assist her in sorting out the facts of the situation and then invite her to make sense of her strong feelings and wishes about it. In this way, mentalization is used as a tool to restore the mother's sense of calmness before the focus shifts to her relationship with her child. Throughout each session, the therapist works to maintain a mentalizing stance toward the mother. In other words, she works hard to convey to the mother that her situation (particular her own behavior and the behavior of others) is best understood if she tries to make sense of the thoughts, wishes, intentions, and emotions underlying her own and others' behavior (Fonagy et al., 2002). The therapist also reflects with the mother about how her own representations of herself and others (e.g., self-attributions) help her manage uncomfortable feelings and/or unwanted actions. This exploration of representations encourages mothers to reflect on opportunities for personal change and a new understanding of personal needs and patterns of behavior. For example, if a mother says "I am a bad mother—I don't know how to take care of my baby," the therapist might ask her if this attribution helps her preempt the criticism of others or helps her make sense of an overwhelming sense of guilt.

When focusing on the mother's behavior, mentalization first involves simple consideration of the mother's affective states (e.g., What was it like for you when your partner refused to help you with childcare?). It then progress to considering how the mother's affective states influence her behavior (e.g., Do you think your frustration with your partner might have made it harder to get to work on time?) or relationships (e.g., Do you think your partner might have sensed your frustration and become even more hostile?) or how affective states work (e.g., you were smiling and laughing just then but I'm wondering if you are really feeling more frustrated.).

Mothers may, at times, resist the invitation to think about underlying mental states, wondering aloud about the usefulness of focusing on thoughts rather than on actions. In such instances, the therapist follows the mother's lead, but also will attempt to revisit the value of mentalization as a tool for managing stress.

If and when the mother is no longer preoccupied with a specific crisis or event and is able to focus on her relationship with her child, the therapist will shift the focus of the discussion and ask the mother to consider the impact of the situation on the child (or simply ask how things have been going between the mother and child in the past week). This shift marks the transition to the therapeutic work of exploring maternal representations of the child and their relationship and inviting the mother to mentalize about her child's behavior and about their relationship.

The purpose of exploring the mother's internal working model of her child and their relationship is to identify distorted or denied aspects of her mental representations and promote a shift toward greater emotional balance, sensitivity, and flexibility in the representations. For example, if a mother is preoccupied about a single aspect of the child's personality (e.g., temper or stubbornness), the therapist will invite her to explore this perception in greater detail to understand its meaning to the mother, its origins, and its limits. Similarly, if a mother seems to have limited awareness of her child's emotional experiences (e.g., fear, worry, shame, or sadness), the therapist will invite her to consider what these underlying emotions might be and why they are difficult to recognize. The goal here is to support the mother in becoming more emotionally engaged and more fully aware of her child's emotional experiences and needs.

In exploring the mother's representations of the child and in discussing the child's interactions with the mother, the therapist adopts a mentalizing stance similar to the stance he or she adopts for exploring the mother's behavior. That is, he or she speaks to the mother about the child as though the best way to understand the child's behavior is by considering the intentions, wishes, and emotions that may be driving the child's behavior (Fonagy et al., 2002). When focusing on the child's behavior, this approach initially involves simple consideration of the child's affective states (e.g., How do you think he might have felt when you told him he couldn't come with you to the store?). It then progresses to considering how the child's affective states influence his behavior (e.g., Do you think he was crying because he wanted more time with you?) or relationships (e.g., I wonder if he sensed your frustration and then became overwhelmed), or how affective states work (e.g., He was smiling, but do you think he might have actually been disguising the fact that he was pretty scared?).

A number of techniques are used to aid the therapist in bringing the child's emotional needs to the mother's attention. First, the therapist and mother together view videotaped interactions of the mother and child engaged in structured teaching sessions and free play. During these viewings, the therapist invites the mother to make retrospective inferences about her own and her child's underlying wishes, intentions, and emotions. The therapist also preselects specific moments in the interaction when the mother and child were emotionally in sync (or out of sync) with one another to review with the mother and encourages the mother to reflect about her own or her child's respective state of mind during those moments. This process helps to reinforce the separateness of minds and experience and the distinction between intrapersonal and interpersonal reality (Fonagy et al., 2002).

Second, because substance-using mothers often lack information about their child's developmental capacities at different ages, the therapist provides timely developmental guidance to aid the mother's understanding and anticipation of the child's behavior. That is, as it becomes apparent that the mother lacks specific information about her child's attachment needs, emotional cues, or psychosocial or cognitive capacities, the therapist will provide guidance that is relevant to the specific situation.

Finally, there are often opportunities for the therapist to observe the mother and child together before or after therapy sessions. Mothers will often bring their young infants into

the therapy session with them or bring their toddlers to the clinic daycare. The infant's presence provides an opportunity for the therapist to mentalize or “speak for the child” in the mother's presence, suggesting to the mother what the child might be thinking or feeling at a given moment (e.g., “Mommy, where did you go? I was worried you wouldn't come back.” “Mommy, who is this strange lady who wants to play with me?” “Mommy, I'm not interested in this activity anymore. These toys over here are much more interesting.”)

Ideally, each mother enrolled in the MTP completes each stage of therapy. In actuality, given the 12-session limit, this is not always possible. For some mothers, particularly those with long-standing interpersonal difficulties that make it difficult to trust treatment providers, engage fully in therapy, or focus on the child, treatment throughout the 12 sessions may focus solely on establishing a secure therapeutic alliance and supporting the mother's growing capacity for self-regulation. In these instances, the mother–child relationship is still expected to incur some, albeit more modest, benefit. The manual serves as a road map for the overall approach and progression through stages and provides guidance about specific strategies and techniques. Nonetheless, each mother's course of treatment is, inevitably, unique.

AIMS OF THE CURRENT STUDY

Previously Reported Findings

Previously, we (Suchman, DeCoste, Castiglioni, et al., 2010) reported preliminary findings on posttreatment outcomes from a randomized pilot study testing the preliminary efficacy of the MTP for mothers enrolled in treatment for substance use and caring for children between birth and 3 years of age. The 12-session intervention—the MTP—proved to be acceptable and feasible as an adjunct intervention to outpatient substance-abuse treatment. At the end of 12 sessions, mothers who received the MTP intervention demonstrated higher overall levels of RF, more sensitivity and coherence in their representations of their children, more responsiveness during interactions with their children, and less psychiatric distress. Mothers in both groups showed marked reduction in relapse rates. However, there were no group differences in overall quality of representations or children's interactions with their mothers.

In this study, there were two aims:

- To determine if the benefits of the MTP at posttreatment were sustained at the 6-week follow-up.

We expected that at the end of the 6-week follow-up, MTP mothers would continue to show higher levels of RF, responsiveness to their children during interactions, and lower levels of psychiatric distress in comparison with mothers in the Parent Education Program (PE), a comparison intervention that provides individual case management and developmental guidance.

- To test self-focused and child-focused dimensions of RF.

Previously, we examined maternal RF as a single construct outcome (Suchman, DeCoste, Castiglioni, et al., 2010). Subsequently, we discovered two discreet components: a self-focused and a child-focused component (Suchman, DeCoste, Leigh, et al., 2010). The self-focused component involved the mother's interpretation of her own difficult emotions (e.g., anger and guilt) and how they affected her child. The child-focused component involved the mother's interpretation of the child's difficult moments (e.g., times when the child was upset or demanding attention) or the dyad's difficult moments (e.g., times when she and child were not clicking). Given the importance of first fostering emotional

regulation in the mother, we expected that the MTP would be especially effective for improving self-focused RF.

METHOD

Overview

Mothers receiving treatment for substance abuse at a large, urban, outpatient clinic in New Haven, CT were randomized to the MTP versus the PE, a comparison intervention that provided individual case management and pamphlets containing information on common problems with caring for infants and toddlers. Both interventions involved weekly 1-hr meetings with an individual therapist (MTP) or counselor (PE) in conjunction with standard care at the clinics where mothers were enrolled in outpatient treatment for their substance use. Primary targeted outcomes included (a) maternal capacity for mentalization (i.e., RF) and (b) quality of maternal representations of the child. Secondary targeted outcomes included (a) maternal caregiving and (b) child communication during mother–child interactions, and (c) maternal psychiatric distress and relapse to substance use.

Recruitment, Informed Consent, and Randomization

All mothers enrolled in outpatient substance-use treatment and caring for a child between birth and 36 months of age were eligible to participate. Mothers were recruited via clinician referrals, research staff visits to clinic groups and medication lines, and self-referral. Mothers were screened for eligibility upon first contact with the research coordinator, who also confirmed eligibility with the mother's clinician. Mothers who were actively suicidal, homicidal, severely cognitively impaired, disengaged from their substance-use treatment, or not fluent in English were excluded from participating. Eligible mothers were scheduled to meet with the research coordinator during the same week to complete informed consent procedures. During consent procedures, mothers were informed that after completing a baseline assessment, they would be randomly assigned to one of two parenting programs designed to assist them in managing parenting stress. Mothers were asked permission to access their clinic attendance records and urine toxicology results over the course of the study. A certificate of confidentiality was obtained to protect the confidentiality of all research records.

Sample

Of 56 mothers who consented to participate, 47 completed baseline measures and were randomized to 12 individual sessions (23 MTP, 24 PE). Demographic characteristics of the sample are reported in Table 1. Because occupational status of women and adults with substance-use disorders is not a reliable indicator of socioeconomic status due to fluctuations in employment (for a discussion, see Hoff-Ginsberg & Tardif, 1995; Suchman & Luthar, 2001), education level was used as a proxy for socioeconomic status. There were no significant group differences (MTP vs. PE) at baseline on any demographic characteristic except for marital status; more mothers in the PE condition were single.

During the first 2 years of the study, mothers in both conditions who were on track to complete the 12 sessions were given the option to receive 12 additional sessions (for a total of 24) of their assigned treatment. Mothers who opted to complete 12 sessions completed assessments at Week 12 (posttreatment) and again at Week 18 (6-week follow up). Mothers who opted for 24 sessions completed assessments at Weeks 12 (midtreatment), Week 24 (posttreatment), and Week 30 (6-week follow-up). Of the 47 randomized mothers, 37 (16 MTP, 21 PE) opted to complete 12 sessions, and 10 (7 MTP, 3 PE) opted to complete 24 sessions. A preliminary comparison of the 12- versus 24-week cohorts on all major outcomes (e.g., RF, representation quality, and caregiving behavior) yielded similar results.

For example, in both cohorts, the MTP mothers showed advantages over the PE mothers in RF represented by moderate-to-large effects at posttreatment that were sustained at follow-up. Data from all 47 mothers were therefore combined by time point (e.g., baseline, posttreatment, and follow-up) and examined together.

Mothers' attendance in treatment provided by the study and by the clinic (e.g., for psychiatric services, individual and group counseling, and case management) were documented separately, beginning at the time of consent and continuing for 30 weeks. MTP mothers attended 72%, and PE mothers attended 78% of their scheduled treatment sessions in the study, $t = 1.67$, $p = .10$. MTP mothers attended 82%, and PE mothers attended 86% of their scheduled treatment sessions in the clinic, $t = 1.53$, $p = .13$.

MTP Therapist Training

MTP therapists were selected based on their clinical experience working with similar populations and their willingness and capability to adopt a reflective stance with the patients. Four therapists provided MTP treatment for the study: two master's-level and two doctoral-level clinicians. Therapists received extensive training in the treatment model prior to the study and weekly supervision throughout the duration of the study from the Principal Investigator (N.S.). The MTP clinical team met bimonthly with a co-investigator (last author) specializing in infant development to review tapes of mother-child interactions. MTP therapists also completed treatment fidelity scales after each session and received ongoing feedback on treatment fidelity ratings conducted by independent raters.

The PE

The comparison intervention, the PE, was designed to match the MTP on time spent with the counselor, formation of a secure alliance, and maternal expectations for a parenting intervention. Mothers received assistance in managing basic needs (e.g., food, clothing, shelter, medical and psychiatric care), finding services (e.g., medical and pediatric care, childcare and child guidance services, housing assistance, transportation, vocational counseling and training), solving problems of everyday living (e.g., organization and planning, managing conflicts with partner, family, drug counselor, and Department of Children and Families worker), and developmental guidance in the form of educational pamphlets on common parenting dilemmas. Mothers were allowed to choose a pamphlet each week on a parenting topic of their choice. Pamphlets were written explicitly for this study and focused on topics of particular concern to mothers caring for infants and toddlers. Infant topics included soothing a crying baby, managing bedtime routines, and establishing routines and rituals. Toddler topics included helping toddlers dress, managing bedtime battles, managing difficult behavior in public, and setting limits without using punishment. The pamphlets provided behavioral guidance and did not contain information about children's underlying mental states or emotional needs. The pamphlets targeted readers at a Grade 5 reading level and were limited to two to three pages in length.

The PE was conducted by two master's-level members of the research team who met weekly with N.S. for case supervision. PE counselors also completed treatment fidelity scales after each session and received ongoing feedback on treatment fidelity ratings conducted by independent raters to insure that their counseling techniques did not overlap with unique MTP components (for further details on treatment fidelity methods and findings, see Suchman, DeCoste, Castiglioni, et al., 2010).

Outpatient Substance-Use Treatment

The MTP and the PE were conducted onsite at a large, urban, substance-abuse treatment clinic where mothers enrolled in the study received outpatient substance-abuse treatment. As

part of their ongoing substance-use treatment, mothers had access to group cognitive-behavioral therapy, psychiatric services, substance-replacement therapy (e.g., methadone, naltrexone, and antabuse), medical care, vocational counseling, childcare, transportation to the clinic, and ongoing assistance with basic needs (e.g., housing, education, food, childcare, legal aid, state and city welfare, and other entitlements). Treatment at the outpatient clinic was paid for by patients' individual insurance or by the patients themselves (with payments based on a sliding fee scale).

Assessments and Measures

Psychosocial evaluation—The psychosocial evaluation was used to characterize the treatment sample at baseline. Mothers completed the $\frac{1}{2}$ -hr structured interview conducted by a clinically trained research assistant during the baseline visit. During the interview, mothers were asked about family demographic information, developmental and medical history, personal and family substance use and psychiatric history, employment history, legal involvement, and reasons for seeking help with parenting. Information from this interview was used to establish primary substance-use diagnoses and to identify baseline demographic and psychosocial characteristics of the sample.

RF—The *Parent Development Interview* (PDI; Slade, Aber, Berger, Bresgi, & Kaplan, 2002) was used to measure the mother's capacity to mentalize about her own and her child's behavior. The PDI is a 1-hr, semistructured interview that contains 17 questions designed to elicit the mother's narrative about commonly occurring, emotionally challenging aspects of parenting (e.g., times when parent and her child were not getting along, when parent felt angry, needy, or guilty as a parent, or when parent felt child needed attention) that typically pull for mentalization. The interviewer uses specific probes when asking the mother to consider her own and her child's internal experiences during these interactions and how these internal experiences might have affected the child.

The PDI was digitally recorded and transcribed. Transcripts were coded by a PhD psychologist who was trained to reliability (e.g., interclass correlation = .50 on 15 independently rated protocols) by the PI and remained blind to treatment assignment and all other information about mother-child dyads. Responses to each question were rated on a 10-point scale representing level of RF exhibited by the mother.¹ A rating of 1 indicates a complete absence of any recognition of mental states (i.e., events are described solely in terms of behavior and individuals solely in terms of global personality traits). A rating of 3 indicates a limited capacity to acknowledge mental states without any understanding of how mental states function. A rating of 5 indicates the presence of a rudimentary capacity for RF, or basic understanding of how mental states work together and influence behavior. A rating above 5 indicates increasingly elaborate and sophisticated understanding of how mental states function and influence behavior. The mean score for the 17 items was used to measure the mother's overall RF. The highest and lowest RF levels achieved during each interview also were examined.

Two dimensions of RF (e.g., self-reflective and child-focused) were derived previously (see Suchman, DeCoste, Leigh, et al., 2010) by selecting individual items for which interrater reliability was adequate (interclass correlations = .50) and entering these item scores into a principle components factor analysis, using a scree test (Cattell, 1965a, 1965b) to determine the point where eigenvalues leveled off. Next, using an orthogonal varimax rotation, factor

¹These coding methods were originally developed by Fonagy et al. (1998) for use with the Adult Attachment Interview (Main & Goldwyn, 1995) and then adapted for use with the PDI by Slade et al. (2002).

loadings for each variable were examined. Results of the scree test confirmed that a two-factor solution was the best fit for the model. Results of the orthogonal varimax rotation showed substantive loadings (e.g., .49) of four self-reflective items on Factor 1 (e.g., times that parent felt needy, angry, or pained as a parent) and six child-focused items on Factor 2 (e.g., times when mother and child were separated or not clicking, or times when child was upset or needed attention). The Pearson r correlation coefficient for the two factors was .34 ($p < .01$, one-tailed), indicating that the constructs are related, but distinct (i.e., not multicollinear).

Mental representations of the child—The *Working Model of the Child Interview* (WMCI; Zeanah & Benoit, 1993) was used to assess the quality of the mother's

representations of the child and the caregiving relationship. The WMCI is a $\frac{1}{2}$ hr, semistructured interview designed to elicit a narrative description of the mother's perceptions of her child and their relationship. The WMCI is intended for use with parents of children ages birth to 5 years. The interview included inquiries about the parent's perceptions of the child's distinctive characteristics and characteristics of the caregiver's relationship with the child, particularly during times when the child's attachment needs are likely to be activated (e.g., recent times when the child is upset, physically or emotionally hurt, exhibiting difficult behaviors, or separated from the mother). The interview was conducted by a clinically trained research assistant who used specific probes (e.g., When is the last time that happened?) to insure that the narrative was adequate for coding.

The interview was digitally recorded and then coded by a PhD psychologist who was trained to reliability by the PI (interclass correlations = .50 for items on 21 independently rated protocols) and was blind to treatment assignments and all other information and assessments about mother–child dyads. The three-part classification system ordinarily used with this instrument (Zeanah & Benoit, 1993) did not have sufficient sensitivity to detect small, but meaningful, shifts in representational quality. The rater was therefore trained by the P.I. to reliably code five qualitative subscales rated on a 5-point scale (1 = *not at all*, 3 = *moderate*, 5 = *extreme*) that together represent the most important representational qualities (Zeanah & Benoit, 1993). These characteristics include: *Openness* (acceptance and flexibility in expectations for the child over time), *Richness* (degree of elaboration about the child's unique characteristics), *Coherence* (clarity and credibility of narrative), *Caregiving Sensitivity* (recognition and responsiveness to child's emotional distress), *Acceptance* (acknowledgement of parental role and responsibility and child's dependence on parent for safety and care), and *Involvement* (emotional investment vs. indifference toward the relationship). On the five subscales, a score of 3 is considered to represent average representational quality, scores of 1 and 2 are considered to represent clinical risk, and scores of 4 and 5 are considered to represent optimal quality.

Caregiving behavior—The Nursing Child Assessment Satellite Training (NCAST) Teaching Scales (Barnard & Eyres, 1979) were used to measure maternal caregiving behavior with the child. The NCAST is a widely used, standardized, 73-binary-item tool used to observe and rate quality of caregiver–child interactions with children ages birth to 36 months. Mothers are asked to choose one task to teach the child (e.g., stringing beads, drawing shapes, grouping blocks by color, etc.) from a list of tasks that are organized in increasing order of difficulty. The teaching session lasts 5 min.

The teaching sessions were digitally recorded using two remotely controlled cameras that captured close-up and wide-angle views of mother and child on a split screen. The sessions were coded by a certified NCAST rater who was trained according to NCAST requirements to 90% reliability by the Project Director (a NCAST-certified instructor) and remained blind

to treatment assignment and all other information about the mother–child dyads. Maternal behavior during the teaching task was coded on four behavioral dimensions measured by the 11-item Sensitivity to Cues subscale (ability to accurately read cues given by the child), the 11-item Response to Distress subscale (ability to recognize and alleviate the child's distress), the 11-item Social-Emotional Growth Fostering subscale (ability to affectionately initiate play and social interactions and provide appropriate social reinforcement), and the 17-item Cognitive Growth Fostering subscale (ability to provide stimulation which is just above the child's current level of understanding). The Total Caregiver Score (TCS) equals the sum of the four subscale scores. Each of the four maternal subscales contains a subset of items that are coded based on the contingency of the mother's response to the child (e.g., whether the mother's response to the child occurs within 5 s of the child's cue). The Total Caregiver Contingency Score (TCCS) represents the sum of the 20 items from the four subscales that involve the caregiver's contingent response to child cues. Normative scores for the TCS and the TCCS based on data from mothers with a similar education background (e.g., high-school completion) (Barnard & Eyres, 1979) are provided in Table 1. The NCAST authors (Barnard & Eyres, 1979, p. 141) suggest that any subscale or composite score falling at least 1 *SD* below its respective normative score is considered low or “worrisome.”

Child behavior—Child behavior with the mother was assessed using the 10-item Clarity of Cues subscale (the skill and clarity with which the child sends cues to the mother) and the 13-item Responsiveness to Caregiver subscale (the child's ability to read and respond to the mother's cues) from the NCAST Teaching Scales. The Child Total Score (CTS) represents the sum of the Clarity of Cues and Responsiveness to Caregiver subscales. The Response to Caregiver subscale contains 12 items that are coded based on the contingency of the child's response to the mother (e.g., whether the child's response occurs within 5 s of the mother's cue). The Child Contingency Score (CCS) represents the sum of these 12 contingent items. Normative scores for the CTS and CCS based on data from children whose mothers have a similar education background are provided in Table 1. As with the maternal scores, any child subscale or composite score falling at least 1 *SD* below its respective normative mean is considered low or “worrisome.”

Maternal psychiatric symptoms—Although maternal psychiatric symptoms were not a primary targeted outcome, group differences (MTP vs. PE) in depression and global psychiatric distress were examined to identify possible indirect treatment effects. The *Beck Depression Inventory* (BDI; Beck, Steer, & Brown, 1996) was used to assess maternal symptoms of depression. The BDI is a widely used, 21-item questionnaire rated on a 4-point scale. The BDI yields a total score for depression ranging from 0 to 63; scores between 13 and 19 indicate mild depression; scores between 20 and 28 indicate moderate levels of depression, and scores between 29 and 63 indicate severe levels of depression (Beck et al., 1996). The BDI has very good psychometric properties that have been well-documented, including high internal consistency and construct validity (Beck et al., 1996). The *Brief Symptom Inventory* (BSI; Derogatis, 1993) was used to assess maternal global psychiatric distress. The BSI is a standardized, widely used, 53-item, 5-point, self-report measure of psychopathology. The composite Global Severity Index (GSI) measures current overall symptomatology across multiple domains and has demonstrated good reliability and validity (Derogatis, 1993). On the GSI, *t* scores above 60 indicate risk for a clinical disorder.

Maternal drug use—Although maternal drug use was not a primary targeted outcome for this study, we examined group differences (MTP vs. PE) in substance use to identify possible indirect treatment effects. Maternal substance use was monitored weekly using results from weekly urine toxicology screens testing for presence of opiate, cocaine, and cannabis metabolites in urine samples collected at the outpatient clinic. For each month of

the mother's participation in the study, a mother received a score of "0" if no drug metabolites were present in any of her urine toxicology screens during that month or a score of "1" if one or more of her urine toxicology screens tested positive for a drug metabolite during that month.

Data Analysis

MTP versus PE comparisons—Analyses of covariance were conducted to test for group differences (MTP vs. PE) in outcomes at the end of treatment and at follow-up. In all analyses, data from the full intention-to-treat sample of 47 were used, and covariates included marital status (e.g., single vs. not single), baseline score, child age, and child gender. Because there were no group differences for any other demographic variable or treatment services received, no other covariates were entered in subsequent analyses. Because the sample was small (e.g., 47 subjects) and did not provide sufficient power to detect statistical differences, effect size (d) was computed using estimated means and pooled standard deviations (computed using *SEM*) to identify potentially meaningful results. Following guidelines from Cohen (1988), medium effects where $d > .20$ were considered to be meaningful.

RESULTS

Primary Outcomes

Maternal RF—As shown in Table 2, mothers who were randomized to the MTP showed a higher level of self-focused RF at posttreatment, in comparison with mothers randomized to the PE ($d > .50$). This benefit was sustained at the 6-week follow-up ($d > .20$), although the magnitude of the effect was smaller. There were no group differences in child-focused RF at posttreatment or follow-up.

Maternal representations of the child—Although there were no group differences in overall quality of maternal representations of the child at posttreatment, mothers in the MTP condition scored higher on representation quality at follow up than did PE mothers ($d > .20$).

Secondary Outcomes

Maternal caregiving behavior—At posttreatment (see Table 2 and Figure 1), mothers in the MTP condition received higher Total and Contingency Scores for caregiving behavior during the teaching session than did mothers in the PE condition (Total Score: $d > .20$; Contingency Score: $d > .50$). Group differences in caregiving behavior were sustained at follow-up, when the magnitude of the effect for Total Score increased from medium to large (Total Score: $d > .50$; Contingency Score: $d > .50$).

Child behavior—At posttreatment (see Table 2 and Figure 2), children of MTP mothers had higher Total Scores for communication with their mothers than did children of PE mothers ($d > .20$); this effect increased in magnitude at follow-up ($d > .50$). Figure 2 shows a baseline to follow-up trend toward increased communication in children of MTP mothers and a trend toward decreased communication in children of PE mothers. There were no group differences in children's Contingency Score at posttreatment, but a delayed effect favoring MTP children was evident at follow-up ($d > .20$).

Maternal psychiatric symptoms—At posttreatment, mothers in the MTP condition reported fewer symptoms of depression ($d > .20$) and psychiatric distress ($d > .20$) than did mothers in the PE condition. At follow-up, effects for depression were not sustained, and PE mothers showed lower levels of psychiatric distress ($d > .20$) than did MTP mothers.

Maternal substance use—There were no group differences in substance use at posttreatment or follow-up. Mothers in both conditions showed reductions in their drug use at posttreatment ($d > .20$ for MTP and PE mothers), and these improvements were sustained at follow-up ($d > .50$ for MTP and PE mothers).

DISCUSSION

Previously (Suchman, DeCoste, Castiglioni, et al., 2010), we reported posttreatment results from a randomized pilot study testing the preliminary efficacy of an attachment-based parenting intervention for mothers enrolled in treatment for substance use and caring for children between birth and 3 years of age. The 12-session intervention, the MTP, proved to be acceptable and feasible for mothers in an outpatient treatment setting and showed preliminary promise for improving maternal RF, some aspects of representation, and caregiving behavior. Preliminary support also was found for proposed mechanisms of change in the MTP treatment model. In this study, we examined outcomes at the 6-week follow-up to determine whether benefits at posttreatment had been sustained. We also reexamined RF as a two-dimensional outcome that includes a self-focused and child-focused components. Findings are discussed next.

Maternal RF

In comparison with mothers in the PE condition, mothers in the MTP condition had improved at the end of 12 sessions in self-focused RF, the capacity to mentalize about one's own difficult emotions and their impact on the child. Clinically, the scores indicate that at baseline, mothers in both conditions had little ability to understand how their own emotions and intentions influenced their own behavior or their relationship with their children. At the end of treatment, mothers in the MTP condition (but not the PE condition) were showing movement toward having this capacity, although its full manifestation is not considered evident until an overall score of 5 is achieved.

There were no real improvements in either condition in child-focused RF, the capacity to mentalize about the child's emotions and their impact on the parent. Clinically, the scores indicate that mothers in both conditions were able to recognize simple emotions and intentions in their children, but had very limited capacities to understand how their children's emotions were impacting behavior or the mother-child relationship.

Taken together, these findings are consistent with the strong emphasis in the MTP intervention on assisting mothers to make sense of, and thereby regulate, their own affect in the parenting role prior to focusing on the child's affective states. They also are consistent with previously reported treatment fidelity scores showing that larger portions of the MTP therapy were devoted to affect regulation (63%) and mentalizing for the mother (42%) versus mentalizing for the child (39%) (see Suchman, DeCoste, Castiglioni, et al., 2010). The strong emphasis on self-focused RF during the MTP intervention reflects a common dilemma in treating parents with substance-use disorders, who often arrive at treatment already preoccupied by personal concerns and crises and have difficulty sustaining a focus on the child or the parent-child relationship (Suchman, Pajulo, et al., 2006). It also may be emotionally overwhelming for mothers with substance-use disorders to focus early in treatment for prolonged periods of time on emotional aspects of their children and the parent-child relationship because doing so activates the mothers' own intolerable or overwhelming attachment needs.

Nonetheless, previous findings (see Suchman, DeCoste, Leigh, et al., 2010) have shown that in this sample, self-focused RF (compared with child-focused RF) is a stronger predictor of maternal caregiving behavior during structured teaching sessions. In this study, mothers

showed sustained improvements in self-focused RF *and* caregiving behavior. Taken together, these results seem to suggest that interventions for substance-using mothers targeting their capacity to make sense of—and regulate—their own strong negative emotions may be an important first step in promoting their abilities to interact effectively and contingently with their young children—a capacity that has been highly resistant to change in previous intervention trials (for a review, see Suchman, Pajulo, et al., 2006).

The absence of improvement in child-focused RF is concerning, and suggests the need for further intervention research. For example, it may be feasible to follow the successful completion of the MTP with a dyadic intervention component that focuses more directly on the mother–child interactions in the therapy. Having developed a better capacity to reflect upon and regulate her own strong emotions, the mother may be more prepared to engage in and benefit from treatment where attention stays focused on her child's emotional needs.

Representation quality

Although there were no group differences in overall representation quality at the end of 12 sessions, at the 6-week follow-up, mothers in the MTP condition scored higher on representation quality than did mothers in the PE condition. Clinically, the scores indicate that at baseline, mothers in both conditions were showing some (but not extreme) distortion and/or denial about some characteristics of their children and the parent–child relationship. After 12 sessions, mothers in the MTP condition had shown progress toward more balanced and accurate representations of their children, although fully accurate and balanced representations are not considered evident until an overall score of 3 is achieved. At the 6-week follow-up, MTP mothers had sustained their improvement whereas PE mothers' showed a small decline. These findings suggest that participation in the MTP may have accounted for small improvements in representations. Although somewhat encouraging, these findings underscore the enduring nature of mental representations. It will be important to further investigate treatment components (e.g., therapeutic alliance, improvement in RF, time spent exploring representations) that are especially salient change mechanisms for improving representational quality. It also will be useful to examine whether mental representations continue to improve after longer periods of consolidation.

Caregiving behavior

Based on the MTP intervention model, caregiving was considered a secondary outcome that was expected to improve in conjunction with improvements in RF and representation quality. After 12 sessions, mothers in the MTP condition showed Total and Contingent Caregiving Behavior Scores that were increasing toward the NCAST norm (Figure 1) and higher than were scores of PE mothers. At follow-up, the magnitude of effects representing group differences was the same for Total Contingency and larger for Total Score, although scores for each group were lower at follow-up than they were at posttreatment. Taken together, these results support the theoretical supposition (on which the treatment model is based) that directly targeting improvement in caregiver RF and mental representations of the child can lead to indirect benefits for parenting behavior. Previous randomized trials testing behavioral and psychoeducational parenting interventions for substance-using mothers of young children have not generally shown marked improvement in directly targeted caregiving behaviors (e.g., Black et al., 1994; Huebner, 2002; Schuler et al., 2002; Schuler, Nair, Black, & Kettinger, 2000; for a review, see Suchman, Pajulo, et al., 2006).

Child behavior

Based on the MTP intervention model, child behavior was considered a tertiary outcome that was expected to change in conjunction with improvements in maternal caregiving behavior. At the end of 12 sessions, children of MTP mothers were communicating more

frequently with their mothers (e.g., expressing cues more clearly and making bids to engage their mothers) than were children of PE mothers, and this trend was continuing at the 6-week follow up. At the 6-week follow-up, children of MTP mothers also were responding to their mothers more contingently than were children of PE mothers. Considered together with findings on maternal caregiving behavior, these results are consistent with the premise of attachment theory that improvements in caregiver sensitivity and responsiveness to child cues correspond to increased bids for attention or comfort from the child. These findings also suggest that the MTP has the potential to improve dyadic adjustment (e.g., improve reciprocity between the mother's sensitive and responsive caregiving and child's behavioral cues) where previous behavioral and psychoeducational interventions have fallen short. It is puzzling, though, that child behavior for both groups at all three time points remained well above the NCAST norms (see Figure 2). Future evaluation of the MTP will involve a broader scope of child assessments, including measures of child attachment classification and regulatory functioning during novel situations to clarify its implications for child behavioral and emotional adjustment.

Psychiatric symptoms

Although maternal psychiatric symptoms were not directly targeted in the MTP intervention, indirect effects on depression and psychiatric distress were examined because of the intervention's potential impact on cognitive distortions and emotional regulatory processes. Patterns in these findings were mixed and less clear. At posttreatment, MTP mothers were reporting fewer symptoms whereas at follow-up, PE mothers were reporting less depression (but not less psychiatric distress). It may be that changes in the psychiatric treatment or medications for PE mothers (in comparison with MTP mothers) during the follow-up period that were not documented for the study led to greater reduction in depression among PE mothers. In addition, mean BDI scores for mothers in both groups corresponded to mild levels of depression (i.e., <19) across all time points whereas mean scores for global distress on the BSI fell near the clinical cutoff ($T = 60$) across all time points. It may be that psychiatric status already had improved and stabilized in response to the substance-abuse treatment received prior to the mother's enrollment in the study. Given that a majority of mothers in both conditions were receiving daily methadone treatment, it also is possible that the sedating qualities of methadone helped contribute to the relatively low levels of psychiatric distress in both groups.

Substance abuse

Although maternal substance use was not directly targeted in the MTP intervention, possible indirect effects of the MTP on substance use were examined given the implications of mentalization for emotional regulation and stress reduction (see Fonagy et al., 2002; Sinha, 2001). Mothers in both groups showed notable improvement in substance use over time, with a small percentage of mothers in each group (MTP: 7%, PE: 6%) showing a positive urine toxicology screen during the month of follow-up. Similar to psychiatric symptoms, it is very possible that mothers' concurrent enrollment in substance-use treatment helped to promote abstinence and prevent relapse in both groups.

LIMITATIONS

This study has several limitations that affect generalizability. First, the study sample was most representative of mothers with drug-abuse problems (primarily opiates and cocaine) who are in their mid-30s, Caucasian, high-school-educated, unemployed, and have moderate involvement in the child welfare system. Caution is therefore warranted in generalizing these findings to populations of mothers who might be at even higher risk for parenting

problems (e.g., adolescent and young adult mothers from ethnic minority backgrounds who have less education and more involvement with the child welfare system).

CONCLUSIONS

Historically, behavioral parenting programs for mothers with substance-use disorders caring for young children have met with limited success for improving maternal caregiving and dyadic adjustment. We expect that these treatment failures occur, in part, because behaviorally oriented programs do not address underlying attachment and emotional deficits of the parent and/or child. What the collective findings from this study do suggest is that (a) abstinence alone does not lead to improvement in caregiving, (b) exploration of emotional aspects of self and relationship do not seem to interfere with (and may promote) prolonged abstinence, (c) it is feasible to provide attachment-based interventions for mothers who are actively enrolled in substance-use treatment and caring for young children, and (d) that *incremental* improvement in RF, representation quality, and dyadic adjustment (e.g., caregiving behavior and child communication) can be detected at 12 weeks and sustained at the 6-week follow-up.

The next step in this research will be a formal randomized clinical trial to test the efficacy of the MTP using additional constructs and measures of child adjustment [e.g., the Strange Situation procedure (Ainsworth, Blehar, Waters, & Wall, 1978; Cassidy & Marvin, 1992) to measure attachment status and the Curiosity Box Paradigm (Mayes, Carter, & Stubbe, 1993) coded with the Coding Interactive Behavior scales (Feldman, 1998) to measure child regulatory functioning in another context of uncertainty. In addition, the new randomized trial will involve a longer 14-week follow-up period. The new trial also will involve a larger sample that will allow for a test of significant change within the MTP group (pre to post) in addition to between groups.

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REFERENCES

- Ainsworth, MDS.; Blehar, MC.; Waters, E.; Wall, S. Patterns of attachment: A psychological study of the strange situation. Erlbaum; Hillsdale, NJ: 1978.
- Barnard, KE.; Eyres, SJ., editors. Child health assessment: Part 2. The first year of life. U.S. Government Printing Office; Washington, DC: 1979. DHEW Publication No. HRA 79-25
- Beck, AT.; Steer, RA.; Brown, GK. Beck Depression Inventory Manual. 2nd ed.. Psychological Corporation; New York: 1996.
- Black MM, Nair P. Parenting and early development among children of drug-abusing women: Effects of home intervention. *Pediatrics*. 1994; 94:440–448. [PubMed: 7936850]
- Burns KA, Chethik L, Burns WJ, Clark R. The early relationship of drug abusing mothers and their infants: An assessment at eight to twelve months of age. *Journal of Clinical Psychology*. 1997; 53:279–287. [PubMed: 9075056]
- Cassidy, J.; Marvin, RS.; the MacArthur Attachment Working Group. Attachment organization in preschool children: Coding guidelines. 4th ed.. University of Virginia; 1992. Unpublished manuscript
- Catalano RF, Gainey RR, Fleming CB, Haggerty KP, Johnson NO. An experimental intervention with families of substance abusers: One-year follow-up of the focus on families project. *Addiction*. 1999; 94:241–254. [PubMed: 10396792]

- Cattell RB. Factor analysis: An introduction to essentials I. The purpose and underlying models. *Biometrics*. 1965a; 21:190–215.
- Cattell RB. Factor analysis: An introduction to essentials II. The role of factor analysis in research. *Biometrics*. 1965b; 21:404–435.
- Cohen, J. Statistical power analysis for the behavioral sciences. 2nd ed.. Erlbaum; Hillsdale, NJ: 1988.
- Derogatis, LR. Brief Symptom Inventory: Administration, scoring, and procedures manual. 3rd ed.. National Computer Systems; Minneapolis, MN: 1993.
- Ernst CC, Grant TM, Streissguth AP, Sampson PD. Intervention with high-risk alcohol and drug-abusing mothers: II. Three-year findings from the Seattle Model of Paraprofessional Advocacy. *Journal of Community Psychology*. 1999; 27:19–38.
- Feldman, R. Coding Interactive Behavior (CIB) manual. Bar-Ilan University; Ramat Gan, Israel: 1998. Unpublished manual
- Fonagy, P.; Gergely, G.; Jurist, E.; Target, M. Affect regulation, mentalization, and the development of the self. Other Press LLC; New York: 2002.
- Fonagy, P.; Target, P.; Steele, H.; Steele, M. Reflective functioning manual. Version 5. University College London; 1998. Unpublished manuscript
- Hans LL, Bernstein VJ, Henson LG. The role of psychopathology in the parenting of drug-dependent women. *Development & Psychopathology*. 1999; 11:957–977. [PubMed: 10624734]
- Harmer ALM, Sanderson J, Mertin P. Influence of negative childhood experiences on psychological functioning, social support, and parenting for mothers recovering from addiction. *Child Abuse and Neglect*. 1999; 23:421–433. [PubMed: 10348379]
- Hoff-Ginsberg, E.; Tardif, T. Socioeconomic status and parenting. In: Bornstein, MH., editor. *Handbook of parenting: Vol. 2. Biology and ecology of parenting*. Lawrence Erlbaum Associates, Inc; Mahwah, NJ: 1995. p. 161-188.
- Huebner CE. Evaluation of a clinic-based parent education program to reduce the risk of infant and toddler maltreatment. *Public Health Nursing*. 2002; 19:377–389. [PubMed: 12182697]
- Kelley SJ. Parenting stress and child maltreatment in drug-exposed children. *Child Abuse and Neglect*. 1992; 16:317–328. [PubMed: 1617467]
- Kelley SJ. Stress and coping behaviors of substance-abusing mothers. *Journal of the Society of Pediatric Nurses*. 1998; 3:103–110. [PubMed: 9743924]
- Kerwin ML. Collaboration between child welfare and substance-abuse fields: Combined treatment programs for mothers. *Journal of Pediatric Psychology*. 2005; 30:581–597. [PubMed: 16166247]
- Levy, DW.; Truman, S. Reflective functioning as mediator between drug use, parenting stress, and child behavior. Paper presented at the annual meeting of the College on Problems of Drug Dependence; Quebec City, Quebec. Jun. 2002
- Luthar SS, Walsh KG. Treatment needs of drug-addicted mothers: Integrated parenting psychotherapy interventions. *Journal of Substance Abuse Treatment*. 1995; 12:341–348. [PubMed: 8583517]
- Main, M.; Goldwyn, R. Adult attachment classification system. In: Main, M., editor. *Behavior and the development of representational models of attachment: Five methods of assessment*. Cambridge University Press; Cambridge: 1995.
- Mayes, L.; Truman, S. Substance abuse and parenting. In: Bornstein, M., editor. *Handbook of parenting: Vol. 4. Social conditions and applied parenting*. 2nd ed.. Erlbaum; Mahwah, NJ: 2002. p. 329-359.
- Mayes LC, Carter AS, Stubbe D. Individual differences in exploratory behavior in the second year of life. *Infant Behavior & Development*. 1993; 16:269–284.
- Murphy, S.; Rosenbaum, M. Pregnant women on drugs: Combating stereotypes and stigma. Rutgers University Press; New Brunswick, NJ: 1999.
- Najavitz LM. Psychotherapies for trauma and substance abuse in women: Review and policy implications. *Trauma, Violence, and Abuse*. 2009; 10:290–298.
- Pawl, JH.; Lieberman, AF. Infant-parent psychotherapy. In: Greenspan, S.; Wieder, S.; Osofsky, J., editors. *Handbook of child and adolescent psychiatry*. Wiley; New York: 1997. p. 339-351.
- Rodning C, Beckwith L, Howard J. Quality of attachment and home environments in children prenatally exposed to PCP and cocaine. *Development & Psychopathology*. 1991; 3:351–366.

- Schuler ME, Nair P, Black MM. Ongoing maternal drug use, parenting attitudes, and a home intervention: Effects on mother-child interaction at 18 months. *Journal of Developmental and Behavioral Pediatrics*. 2002; 23:87–95. [PubMed: 11943970]
- Schuler ME, Nair P, Black MM, Kettinger L. Mother-infant interaction: Effects of a home intervention and ongoing maternal drug use. *Journal of Clinical Child Psychology*. 2000; 29:424–431. [PubMed: 10969426]
- Sinha R. How does stress increase risk of drug abuse and relapse? *Psychopharmacology*. 2001; 158:343–359. [PubMed: 11797055]
- Slade A. Parental reflective functioning: An introduction. *Attachment and Human Development*. 2005; 7:269–281. [PubMed: 16210239]
- Slade, A.; Aber, J.L.; Berger, B.; Bresgi, I.; Kaplan, M. The Parent Development Interview-Revised. Yale Child Study Center; 2002. Unpublished manuscript
- Slade, A.; Bernbach, E.; Grienberger, J.; Levy, D.; Locker, A. Addendum to Reflective Functioning Scoring Manual for use with the Parent Development Interview. Yale Child Study Center; 2005. Unpublished manuscript
- Suchman N, DeCoste C, Leigh D, Borelli J. Reflective functioning in mothers with drug use disorders: Implications for dyadic interactions with infants and toddlers. *Attachment and Human Development*. 2010; 12:567–585. [PubMed: 20931415]
- Suchman, N.; Mayes, L. Breaking the cycle: Reflective functioning and maladaptive attachment cycles of drug-addicted mothers and their infants. Invited poster presentation for the biennial meeting of the Society for Research in Child Development; Denver, CO. Apr. 2009
- Suchman NE, DeCoste C, Castiglioni N, Legow N, Mayes L. The Mothers and Toddlers Program: Preliminary findings from an attachment-based parenting intervention for substance abusing mothers. *Psychoanalytic Psychology*. 2008; 25:499–517. [PubMed: 20057923]
- Suchman NE, DeCoste C, Castiglioni N, McMahon T, Rounsaville B, Mayes L. The Mothers and Toddlers Program, an attachment-based parenting intervention for substance using women: Preliminary results from a randomized clinical pilot. *Attachment and Human Development*. 2010; 12:483–504. [PubMed: 20730641]
- Suchman NE, Luthar SS. The mediating role of parenting stress in methadone-maintained mothers' parenting. *Parenting: Science and Practice*. 2001; 1:285–315.
- Suchman NE, Mayes L, Conti J, Slade A, Rounsaville B. Rethinking parenting interventions for drug dependent mothers: From behavior management to fostering emotional bonds. *Journal of Substance Abuse Treatment*. 2004; 27:179–185. [PubMed: 15501370]
- Suchman NE, McMahon T, Zhang H, Mayes L, Luthar S. Drug dependent mothers and disruptions in child custody: An attachment perspective. *Journal of Substance Abuse Treatment*. 2006; 30:197–204. [PubMed: 16616163]
- Suchman NE, McMahon TJ, Slade A, Luthar SS. How early bonding, depression, illicit drug use, and perceived support work together to influence drug-dependent mothers' caregiving. *American Journal of Orthopsychiatry*. 2005; 75:431–445. [PubMed: 16060738]
- Suchman NE, Pajulo M, DeCoste C, Mayes LC. Parenting interventions for drug dependent mothers and their young children: The case for an attachment-based approach. *Family Relations*. 2006; 55:211–226. [PubMed: 17417669]
- U.S. Department of Health and Human Services. Blending perspectives and building common ground: A report to Congress On Substance Abuse and Child Protection. U.S. Government Printing Office; Washington, DC: 1999.
- Zeanah CH, Benoit D. Clinical applications of a parent perception interview in infant mental health. *Infant Psychiatry*. 1993; 3:539–554.

Figure 1.
Maternal caregiving behavior, Total Score.

Figure 2.
Child behavior, Total Score.

TABLE 1

Sample Characteristics (N = 47)

Demographic characteristics	MTP (n = 23) M (SD)	PE (n = 24) M (SD)	t
Mother's age	31.43 (6.46)	28.88 (6.50)	-1.35
Education (years)	12.13 (1.18)	12.54 (1.44)	1.07
No. of children	2.30 (1.52)	1.88 (.95)	-1.17
Child age (months)	18.74 (16.94)	16.67 (10.27)	-.51
Lifetime trauma exposure ^a	3.22 (1.86)	3.67 (2.14)	.77
			χ^2
Minority	.22	.38	1.40
Single	.43	.83	8.08**
Unemployed	.87	.75	1.08
Methadone-medicated	.71	.65	.17
DCF-Involved	.61	.58	.03
Child gender (male)	.61	.42	1.73
Primary Substance-Use Disorder			χ^2
Opiate	.74	.71	5.48
Cocaine	.13	.21	
Alcohol	.13	0	
Cannabis	0	.08	
Baseline scores		Normative Score	
Reflective Functioning (PDI)	5.00		
Mom RF	3.23 (.73)	3.07 (.79)	
Child RF	3.45 (.68)	3.28 (.56)	
Quality of Representations (WMCI)	2.71 (.38)	2.77 (.52)	3.00
Caregiving Behavior (NCAST)			
Total Score	35.82 (3.76)	36.04 (4.45)	40.69 (6.85)
Total Contingency	13.23 (2.54)	13.17 (2.79)	16.09 (3.64)
Child Behavior (NCAST)			
Total Score	19.55 (2.50)	18.88 (2.72)	15.44 (4.29)
Total Contingency	9.50 (1.67)	8.96 (1.99)	6.76 (2.95)
Psychiatric Symptoms			Clinical Cutoff
Depression (BDI)	14.96 (9.44)	16.83 (9.24)	19.00
Global Distress (BSI)	58.35 (11.02)	61.54 (11.02)	60.00
PTSD Symptoms (PsyEval) ^b	2.32 (1.49)	2.38 (1.31)	n/a
Substance Use ^c			
	.36 (.38)	.35 (.41)	

MTP = The Mothers and Toddlers Program; PE = Parent Education Program; DCF = Department of Children and Families; RF = reflective functioning; PDI = Parent Development Interview; WMCI = Working Model of the Child Interview; NCAST = Nursing Child Assessment Satellite Training; BDI = Beck Depression Inventory; BSI = Brief Symptom Inventory; PTSD = posttraumatic stress disorder.

^aTotal number of trauma exposure types (e.g., miscarriage, sudden loss, physical and sexual trauma).

^bTotal number of PTSD symptoms endorsed during the Psychosocial Evaluation with a maximum possible of four (e.g., intrusive thoughts, feelings and nightmares; avoidant behaviors; derealization or depersonalization; and hypervigilance).

^cMean proportion of positive urine toxicology screens conducted during the baseline month.

^{**}
 $p < .01$ (two-tailed).

TABLE 2

Results of Analyses of Covariance Controlling for Baseline Scores, Marital Status, Child Age, and Child Gender

	Estimated <i>M</i> (<i>SD</i>)			
	MTP (<i>n</i> = 23)		PE (<i>n</i> = 24)	
	Post	Follow-Up	Post	Follow-Up
Reflective Functioning (PDI)				
MomRF	3.59 (.65) **	3.47 (.59) *	3.08 (.65)	3.09 (.59)
Child RF	3.47 (.54)	3.45 (.39)	3.47 (.54)	3.37 (.39)
Quality of Representations (WMCI)	2.86 (.40)	2.86 (.32) *	2.78 (.40)	2.71 (.32)
Caregiving Behavior (NCAST)				
Total Score	37.79 (3.45) *	37.06 (3.39) **	35.75 (3.44)	34.61 (3.38)
Total Contingency	14.60 (1.93) **	13.62 (1.73) **	13.01 (1.93)	12.14 (1.73)
Child Behavior (NCAST)				
Total Score	19.74 (2.44) *	20.16 (2.12) **	18.78 (2.43)	18.66 (2.12)
Total Contingency	9.47 (1.57)	9.61 (1.48) *	9.16 (1.56)	9.11 (1.47)
Psychiatric Symptoms				
Depression (BDI)	13.57 (7.30) *	14.37 (6.66)	16.01 (7.28)	12.14 (6.65) *
Global Distress (BSI) ^a	58.86 (6.72) *	58.41 (6.71)	58.29 (6.71)	58.29 (6.71)
Substance Use ^b	.20 (.36)	.07 (.22)	.22 (.36)	.06 (.22)

PDI = Parent Development Interview; RF = reflective functioning; WMCI = Working Model of the Child Interview; NCAST = Nursing Child Assessment Satellite Training; BDI = Beck Depression Inventory; BSI = Brief Symptom Interview.

^a Italicized scores represent T-scores.

^b Mean proportion of positive urine toxicology screens during month of assessment.

[†] small effect ($d > .15$),

* moderate effect ($d > .20$),

** large effect ($d > .50$),

*** very large effect ($d > .80$) (^b).