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Reflective functioning in mothers with drug use disorders: Implications for dyadic interactions with infants and toddlers

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Abstract

In this study, we examined maternal reflective functioning as a bi-dimensional construct in a sample of 47 mothers with drug use disorders and caring for infants and toddlers. We first tested a two-factor solution with scale items from the *Parent Development Interview* and confirmed the presence of two related but distinct dimensions – self-mentalization and child-mentalization. We then tested predictions that (a) self-mentalization would be associated with overall quality of maternal caregiving and that (b) child-mentalization would be associated with (i) maternal contingent behavior and (ii) child communication. Results partially supported hypotheses (a) and (bii). Unexpectedly, self-mentalization alone was associated with maternal contingent behavior. Findings suggest that self-mentalization may be a critical first step in improving mother-child relations involving mothers with drug use disorders. Implications for theory and practice are discussed.

Keywords

Mother-child relations; Parent-child relations; Parenting; Substance Abuse

Introduction

Reflective functioning is a mental process thought to be invoked in the interpretation of human action (i.e., the attribution of personal meaning and intention to others' behavior). Perhaps because of its potential key role as a determinant of self-organization and affect regulation and its close correlation with impulse control, self-monitoring and self-agency, the human capacity for reflective functioning has recently received increased attention in developmental science (Jenkins & Williams, 2008; Pajulo, Suchman, Kalland, & Mayes, 2006; Schechter, Coots, Zeanah, Davies, Coates, et al., 2005; Slade, Grienberger, Bernbach, Levy, & Locker, 2005; for an in depth discussion, see Fonagy, Gergely, Jurist, & Target, 2002). From a relational perspective, reflective functioning is critical to an individual's ability to understand that emotions influence interactions (Fonagy et al., 2002). Mentalization, the act of thinking reflectively, is therefore critical to interpersonal functioning in that it ascribes meaning to underlying emotions and helps to clarify the cause and effect relations between those underlying emotions and interpersonal behavior.

Single-dimension RF and caregiving behavior

In studies with low- and high-risk parents, when measured as a single dimension using the Adult Attachment Interview (AAI; George, Kaplan & Main, 1985), reflective functioning has shown associations with maternal parenting behaviors (e.g., flexibility and responsiveness; Fonagy, Steele, Steele, Leigh, Kennedy, et al., 1995, Fonagy et al., 2002; Fonagy & Target, 1997) and with children's use of their mothers as a secure base when measured using the Parent Development Interview (PDI; Slade, Aber, Berger, Bresgi, & Kaplan, 2003; Grienemberger, Kelly, & Slade, 2005). Maternal RF during pregnancy (measured with the AAI) has also been found to predict infant attachment security at 12 months, children's theory of mind skills at 5 years, and children's scholastic self-esteem at 11 years (Steele & Steele, 2008). Low levels of maternal reflective functioning (measured with the PDI) have also shown associations with insensitive and emotionally unresponsive maternal behaviors (e.g., withdrawal, hostility and intrusiveness; Levy & Truman, 2002).

In several studies with substance abusing mothers, parental RF (measured with the PDI) has shown association with both caregiving behavior and child development. In one study with cocaine-using mothers, maternal RF mediated associations between maternal substance abuse and several indices of children's psychosocial development (e.g., attention, social skills, and withdrawal; Levy and Truman, 2002). Improvement in overall RF in response to a mentalization-based parenting intervention has also been associated with improvement in maternal caregiving behavior (e.g., sensitivity to cues, response to distress, social-emotional growth-fostering and cognitive growth fostering) and increased regulation in children between 24 and 36 months of age (see Suchman, Decoste, Castiglioni, Legow, & Mayes, 2008; Suchman, DeCoste, Castiglioni, McMahon, Rounsaville, & Mayes, 2009; Suchman, DeCoste, & Mayes, in press).

Dimensions of RF and their implications for parent-child relationships

Reflective functioning is thought to have a self-reflective and an interpersonal component that together provide an individual with a capacity to distinguish inner from outer reality, pretend from real modes of functioning, and intrapersonal mental and emotional processes from interpersonal communications (Fonagy et al., 2002). 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 meaning of emotions and behaviors based solely on nonverbal cues from infants (Slade, 2005, 2006). (Note: RF has also been described as having a *past* and *present* component when coded using the AAI, see Steele, Kaniuk, Hodges, Asquith, Hillman, & Steele, 2008)

There are several reasons for examining self-focused and other-focused dimensions of RF and their implications for parent - child relationships in clinical samples: First, the absence of capacity for self-mentalization – and its implications for self-organization, self-agency, impulse control and affect regulation – is at the core of many kinds of psychopathology, including Axis I (e.g., anxiety and depression) and Axis II (e.g., personality and relational problems) disorders (Fonagy et al., 2002). Women with histories of drug addiction who are parenting young children are particularly vulnerable to emotional dysregulation in their roles as parents (Kelley, 1992, 1998; Mayes & Truman, 2002). It is therefore plausible that a higher capacity for self-mentalization (i.e., the capacity to make sense of and modulate one's own difficult emotional states without becoming emotionally dysregulated) would be associated with the capacity to parent (e.g., showing positive emotions toward children during interactions and avoiding engagement in aversive, harsh, punitive, or other negative interactions toward the child).

Second, parental RF is especially critical during early childhood (e.g., infancy and toddler years), when behavioral cues are the child's primary means for communicating about mental states to the parent. Given that mentalizing for a child is the parent's special ability to recognize and accurately interpret the child's emotional cues, it is plausible that a higher capacity for child-mentalization would be associated with greater contingency in response to children's behavioral cues – especially cues that signal emotional distress. It is also plausible that a greater maternal capacity for child-mentalization will be associated with more clear and consistent expression of emotional cues on the part of the child.

Understanding the mechanisms of RF components and their implications for early dyadic interactions also has the potential to inform intervention development for at-risk mothers whose mentalization and caregiving capacities are often compromised. Moreover, the failure of many behaviorally-oriented parenting programs to improve parenting outcomes for substance using mothers and their young children (see Suchman, Mayes, Conti, Slade, & Rounsaville, 2004; Suchman, Pajulo, DeCoste, & Mayes, 2006) suggests a need for parenting research that examines internal (e.g., psychological) as well as external (e.g., behavioral) mechanisms of relating. It is conceivable, for example, that parenting therapy for substance using mothers may need to be a three-step process that focuses first on impairments in self-mentalization, second on interpersonal mentalization for the child, and third on maternal and child reciprocal behavior (see Suchman et al., 2008; 2009; in press).

Current study aims

The first aim of this investigation was to examine parental reflective functioning as a two-dimensional construct. Based on bimodal descriptions of cognitive mechanisms involved in mentalising (e.g., self-mentalizing and interpersonal-mentalizing components), particularly when a parent is mentalising for self and child, we expected to find two related but distinct dimensions of parental RF – one dimension representing the mother's ability to mentalize primarily about her own emotions and behaviors (self-mentalization) and the second dimension representing the mother's ability to mentalize primarily about the child's emotions and behaviors and about her interactions with the child (child-mentalization).

The second aim of this investigation was to examine whether the two predicted dimensions of RF – self-mentalization and child-mentalization - are respectively associated with the overall versus contingent maternal caregiving behavior during interactions with the child.

We hypothesized that:

- a. As self-mentalization increased, overall quality of maternal caregiving will also increase.
- b. As child-mentalization increases, increases would also be observed in:
 - i. quality of maternal contingent response to the child's behavioral cues, and
 - ii. children's communicative bids to the mother (e.g., frequency of clear behavioral cues and contingent responses to the mother).

Parent study – A randomized clinical pilot

Data for this investigation were collected during the baseline phase of a randomized clinical pilot study testing the preliminary efficacy of an attachment-based parenting intervention for mothers in substance use treatment and caring for children from birth to 36 months-of-age (see Suchman, DeCoste, Castiglioni, McMahon, Rounsaville, & Mayes, in press, and Suchman, DeCoste, McMahon, Rounsaville, & Mayes, in press for full reports of post-treatment and follow-up findings). Based on the principles of attachment, The Mothers and Toddlers Program

(MTP) aims to foster improved maternal sensitivity and responsiveness to child cues during mother-child interactions by directly targeting attachment deficits in the substance abusing mother. Specifically, The Mothers and Toddlers Program (MTP) targets improvement in maternal reflective functioning and maternal representations of the child. Improvement in these two central and related domains is expected to correspond to improvements in maternal recognition and sensitive response to the child's emotional distress and the capacity to foster the child's growing capacity for regulation.

Intervention description—*MTP* follows a developmental progression that begins with the formation of a therapeutic alliance. 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 leave treatment prematurely if she perceives the therapist as judgmental. It is therefore imperative that the therapist be attuned to the relationship and encourage the mother's efforts to openly discuss her concerns. The therapist also assists mothers with basic needs and solutions to parenting problems, when asked by the mother to do so, in order to demonstrate her willingness to be a helpful ally to the mother.

Next the therapist invites the mother to engage in a process of mentalizing about the everyday situations that she is finding particularly stressful. Mothers often arrive at the clinic affectively “charged” about a particular incident or event that took place during the week. The therapist maintains a mentalizing stance by speaking to the mother as though the situation and her reaction to it are best understood by focusing on the thoughts, wishes, intentions, and emotions underlying her response. For example, if a mother appears overwhelmed or frustrated by her relationship with a child welfare worker, the therapist focuses on this emotionally-charged issue, inviting the mother to make sense of her strong feelings and wishes about it. Engaging in mentalizing then helps restore the mother to a calm state that, in turn, allows the focus to shift to her child and to parenting.

Next, the intervention focuses on exploring mothers' internal working model of her child and their relationship, with particular attention to distorted or denied aspects of her mental representations. For example, if a mother is preoccupied about a single aspect of the child's personality (e.g., temper), the therapist will invite the mother to explore this perception in greater detail in order to clarify its origin and understand its limits. Similarly, if a mother seems unaware of some or all of her child's emotional responses (e.g., fear, worry, sadness, and so forth), the therapist will invite her to consider what these underlying emotions might be and why they are difficult to recognize. The goal is to identify ways that the mother either becomes emotionally disengaged from or cognitively distorts her child's emotional needs in ways that interfere with her ability to recognize her child's underlying emotional and relational needs. Usually, these patterns are not in the mother's awareness but gently asking about them brings them more clearly into the mother's view.

The fourth task of MTP involves inviting the mother to mentalize for the child. The therapist talks with 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. This step may start with the simple consideration of 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) and progress to considering how affective states influence 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?).

The therapist and mother also periodically view videotaped interactions of the mother and her child and the therapist invites the mother to make retrospective inferences about her own and her child's underlying wishes, intentions and emotions during the interaction. Because substance using mothers often lack information about children'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. Developmental guidance focuses on children's psychosocial capacities at different ages, children's emotional cues, their cognitive and emotional capacities at current and future stages of development.

Methods

Sample

All mothers were referred to the study by their primary substance use treatment clinicians at one of four substance use programs (three methadone clinics and one outpatient clinic) run by a non-profit organization in a small and ethnically-diverse northeastern city. Mothers were eligible for the study if they were enrolled in one of the treatment programs and caring for a child between birth and 36 months of age. Mothers were excluded from participating if they were in an acute state of crisis or severely cognitively impaired. In this three-year study, a total of 56 mothers met inclusion criteria and completed informed consent procedures. Forty seven mothers completed baseline assessments and were randomized to treatment. Demographic data for the sample are reported in Table 1.

Procedure

After completing informed consent procedures, mothers were scheduled for four subsequent visits to complete baseline assessments. Mothers were asked to choose one child between birth and 36 months of age to be the focus of the assessments during the study. During baseline visits, mothers completed a psychosocial evaluation, one interview coded for reflective functioning and one coded for mental representations of the child, a brief teaching interaction session with the focal infant/toddler, and two brief psychiatric questionnaires. Mothers were compensated between five dollars and fifteen dollars for each assessment visit and children received an age-appropriate toy after completing the teaching session.

Baseline assessments

Psychosocial evaluation—The psychosocial evaluation was used to characterize the treatment sample. Mothers completed the 1.5 hour structured interview conducted by a clinically-trained research assistant. During the interview, mothers were asked about family demographic information, developmental history, substance use and psychiatric history (including during pregnancy), family substance use and psychiatric history, medical history, legal involvement, employment history and reasons for seeking help with parenting.

Reflective functioning—The *Parent Development Interview – Revised* (PDI-R; Slade et al., 2003) was used to measure the mother's capacity for reflective functioning. The PDI is a 1.5 hour semi-structured interview that contains 17 questions designed to elicit the mother's narrative about her relationship with her child. Some questions ask the mother to describe times when she was personally challenged as a parent (e.g., times when the mother felt angry, guilty or needy). Other questions ask the mother to describe situations that were difficult for her child (e.g., times when the child was upset or needed attention or when mother and child were separated). Other questions ask the mother to describe different kinds of interactions with her child (e.g., times when she and her child were getting along, times when they were not getting along). The interview was generally designed to evoke mentalisation.

The PDI interview was digitally recorded and transcribed. Responses to each question were then rated on an 11-point scale representing the level of reflective functioning exhibited by the mother in her response. (These coding methods were originally developed by Fonagy and colleagues [1998] for use with the Adult Attachment Interview [George, Kaplan, & Main, 1984, 1985, 1996] and then adapted for use with the PDI by Slade and colleagues [2005]). A rating of one 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 three (most common in clinical populations, Allen et al., 2008) indicates a limited capacity to acknowledge mental states without any understanding of how mental states function.

The following is an example of a passage rated 3 (from this sample) in which the mother mentalizes about her own experience as a parent.

[Interviewer: Have you ever felt really guilty as a mother?] Yes, I feel guilty um...about...drinking instead of not drinking. I'm grateful that I stopped drinking before anything s—there's any kind of serious damage. I think that, ah, there was maybe, a two occasions on where, um, something bad could have happened. [The children] got into some things that they shouldn't have gotten into, and if they swallowed, they got into my bead drawer... Cause, I'm, I make jewelry and if they had swallowed something, and um, I wasn't aware of it, I, I uh, it could—could have been trouble. Um, I feel guilty that I um, am not financially stable. Um, those are about the two things I'm guilty—I feel guilty about. [Interviewer: And how do you handle those feelings?] Ah, well I'm currently going to school. So, I'm trying to change...that financial aspect by educating myself. And um, not drinking. And ah, I have a tendency to feel guilty over things that aren't even my control. So guilt is a big, is a big part of ah, I, a personality defect I have. I also pray. That's it. So I say, start saying prayers. I push it out of my mind.

Below is an excerpt from a passage rated 3 (also from this sample) in which the mother describes her child's behavior.

[Interviewer: Can you describe a time in the past week that you and your child really clicked?] I don't know. I guess like night time when she was sick the other night. You know she just was actually calm and relaxed for once. She's usually not the type of baby that will sit on your lap and she actually did that the other night. When normally she don't do that. She likes to say jump—if I hold her on the couch and we're watching TV, she'll try to literally climb up my shoulder to climb on to that, you know that back part of the couch. She loves to climb up there.

A rating of five (most common in non-clinical populations, Allen et al., 2008) indicates the presence of a rudimentary capacity for reflective functioning – or basic understanding of how mental states work together and influence behavior. A rating above five indicates increasingly elaborate and sophisticated understanding of how mental states function and influence behavior.

The following is an example of a passage rated 5 (from this sample) in which the mother mentalizes about her own experience as a parent.

[Interviewer: Do you ever get angry as a parent?] I think every mother gets angry at some point, of course. He takes tantrums at times and I get so mad, but I know that it's—it's gonna happen and it's common. I've talked to people now so I feel more reassured that it is something that's normal and it's not labeling me as a bad person. But I get angry. I wish that I had—can have control of every situation and I don't. So that—that sometime angers me.

Below is an excerpt from a passage rated 5 (also from this sample) in which the mother mentalizes about her child's behavior.

[Interviewer: Can you describe a time in the past week that you and your child really clicked?] There was something that happened, but I can't think of what exactly it was. I said something that was like a little bit goofy and she like looked at me and started laughing, and I didn't realize when I said it that she would actually get what I was saying. And I can't think of what it even was, but it was that kind of a moment when. You know. You, you--you know I had said something and I didn't think she was gonna get it, and she looked at me and she just started laughing, and you know it was kind of like a special little like--you know--inside joke and a feeling. I think it makes both of us feel like--you know--connected.

Transcriptions were coded by the third author (J.B.) who was trained to reliability by the first author (N.S.) and remained blind to treatment assignment and all other information about mother-child dyads during the study. To establish interrater reliability, the coder and N.S. independently rated thirteen transcripts and achieved good reliability ($ICC \geq .50$) on 12 items. For this study, only items that required reflection about self, child, and relationship were included; two items that required reflection about the subject's own parents were removed. The remaining ten items were retained and are shown in Table 2.

Caregiving behavior—The Nursing Child Assessment Satellite Training Teaching Scales (NCAST; 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. (Use of the NCAST with substance abusing and psychiatrically at-risk populations has been reported by Huebner (2002) and Jung, Short, Letourneau, & Andrews, 2007). 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 five minutes.

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 to reliability by the second author (C.D., a NCAST-certified instructor) and remained blind to treatment assignment and all other information about the mother-child dyads during the study.

Maternal caregiving behavior—The overall quality of maternal caregiving is rated during the teaching task on four behavioral dimensions – sensitivity to cues, response to distress, social-emotional growth fostering and cognitive growth fostering. The mother's contingent response to child behavioral cues is also coded for each of these four domains. (A response is considered contingent if it occurs within five seconds of the child's specified behavior). The *Sensitivity to Cues Subscale* is an 11-item scale measures the mother's capacity to ensure that her child is positioned in a physically safe manner that is conducive to interaction (e.g., head and trunk supported, within reach of materials, possible eye-contact with mother). The five contingency items on this scale measure the mother's ability to secure the child's attention, pause during exploration, praise efforts and improve positioning after unsuccessful attempts. The 11-item *Response to Distress Subscale* measures the mother's overall response to the child's disengagement cues (e.g., whether she avoids negative comments, yelling, rough handling, abrupt movements, slapping or hitting and attempts to soothe and redirect the child). The six contingency items on this scale measure the mother's ability to stop the teaching episode, make soothing or sympathetic verbalizations in a softer or higher tone of voice, use soothing non-verbal responses such as patting, touching, rocking or caressing, and divert the child's attention to a new task. The 11-item *Social-Emotional Growth Fostering Subscale* measures the mother's

capacity to engage in social interactions, play affectionately, and reinforce socially-desirable behaviors with the child. The three contingency items on this scale measure the mother's ability to respond affectionately to the child's signals of affection (e.g., smiles and vocalizations) without interrupting the child's vocalizations and broadly praise the child's social efforts). The 17-item *Cognitive Growth Fostering Subscale* measures the mother's capacity to provide developmentally-relevant communications about the task (e.g., describe task materials, use an explanations rather than imperatives, model the task). The six contingency items on this scale measure the mother's ability to respond to the child's on-task behaviors (e.g., pause during the child's efforts, praise improved efforts, verbally respond to child's vocalizations). In this study, total subscale scores and contingency subscale scores were used. National norms were available for total subscale scores and are reported, along with clinical cut-off scores, in Table 1. Clinical cut-off scores were calculated using normative data and guidelines provided by NCAST authors (Barnard & Eyres, 1979) and represent one standard deviation below the mean in a normative sample of mothers who completed high school.

Child behavior—Child behavior with the mother was assessed using the child scales from the NCAST Teaching Scales. Two subscales assess the child's communication with the mother. The 10-item *Clarity of Cues Subscale* measures skill and clarity (versus ambiguity and confusion) with which the child's cues are sent to the mother (e.g., widened eyes, intensity of motor activity, recognizable arm movements, directed movements). No items on this scale represent contingent response to the mother. The 13-item *Responsiveness to Caregiver Subscale* measures the child's responsiveness to the caregiver cues (e.g., attempts to establish eye contact, vocalizations, smiles, or disengagement cues in response to caregiver verbalizations and gestures). All items except for one on this scale represent contingency of the child's behavior. National norms were available for both child scale scores and clinical cut-off scores are reported in Table 1. Clinical cut-off scores were calculated using normative child data and guidelines provided by NCAST authors (Barnes et al., 1979).

Maternal psychiatric symptoms

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 four-point scale. The BDI yields a total score for depression ranging from zero to sixty-three: scores between 13 and 19 indicate mild depression with scores above 29 indicating clinical 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, 90-item, four-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). *T* scores above 60 on the GSI indicate risk for a clinical disorder.

Data analysis

Test of RF dimensions—To test for the presence of two RF dimensions (e.g., self-focused and child-focused RF), we entered all 10 PDI item scores in a principle components factor analysis and used a Scree-Test (Cattell, 1965) to determine the point where eigenvalues leveled off. Next, using an orthogonal Varimax rotation, we examined factor loadings for each variable.

Test of behavioral correlates of self-focused and child-focused RF—To identify potential confounding factors, Pearson *r* bivariate correlations were conducted to test for significant correlations between child (e.g., child age and gender) and maternal factors (e.g., education, drug use, and depression), respectively, and constructs of interest (e.g., reflective

functioning, caregiving behavior and child behavior). Significant correlates of constructs of interest were held constant in subsequent analyses.

To test associations between maternal caregiving behavior (overall quality and contingency) and child communication, respectively, with the self- and child-focused RF, we ran separate standard linear regression analyses for each dimension of caregiving and child behavior. In each standard regression analysis, significant potential confounds, self-focused RF and child-focused RF were entered simultaneously in order to determine unique variance accounted for by each.

Results

RF Dimensions

Results of the Scree-Test (Cattell, 1965) confirmed that a two-factor solution was the best fit for the model. Results of the orthogonal Varimax rotation (see Table 2) showed substantive loadings (e.g., $\geq .49$) of self-focused RF items on Factor 1 and child-focused RF items on Factor 2. Cronbach's alpha for the four self-focused items was .57 and the six child-focused items was .69. 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).

Behavioral correlates of self-focused and child-focused RF

Covariates—As child age increased, maternal child-focused RF ($r = .29$, $p < .05$) and contingent cognitive growth fostering increased and overall response to child's distress decreased (see Table 3). Mothers were more likely to foster cognitive growth in their daughters than their sons. Maternal education was negatively correlated with maternal depression ($r = -.31$, $p < .05$) but was not correlated with self- or child-focused mentalisation ($r = .01$, $p = .93$; $r = .02$, $p = .90$) or with any caregiving behavior [r magnitude range between .02 ($p = .88$) and $-.25$ ($p = .09$)]. Maternal depression level at baseline was positively correlated with self-focused RF ($r = .41$, $p < .01$) and marginally with child-focused RF ($r = .25$, $p < .10$) but not with caregiving behavior.

Self-focused RF and overall caregiving quality—As predicted (see Table 3), after controlling for child age, child gender and maternal depression, maternal self-focused RF was found to be significantly associated with overall scores for sensitivity to cues, social-emotional growth fostering and cognitive growth fostering. Beta weights indicate that, as self-focused RF increased, scores on all three overall caregiving indices also increased. Contrary to expectations, self-focused RF was not significantly associated with overall response to distress. . And, notably, maternal depression had a weak positive link to sensitivity, and a more substantial negative link to social-emotional growth fostering.

Child-focused RF, maternal contingency and child behavior—Contrary to predictions (Table 3), child-focused mentalising was not associated with maternal contingent behavior in any of the caregiving behavior dimensions. Child-focused mentalising was marginally associated with clarity of child cues (Table 4) but not the child's contingent response to the caregiver.

Unexpected findings—Contrary to expectations (see Table 3), self-mentalization was significantly associated with contingent cognitive growth fostering and marginally associated with contingent sensitivity to cues and response to distress. Beta weights indicate that, as self-mentalizing increased, scores for contingent cognitive growth fostering and sensitivities to cues increased while scores for contingent response to distress decreased.

Discussion

The overall aim of this study was to examine maternal capacity for reflective functioning as a two-dimensional construct that has implications for mother-child interactions in a clinical sample during the first three years of life.

Two dimensions of reflective functioning

The first goal was to test for empirical evidence of two related but distinct dimensions – self-mentalization (i.e., mentalization about one's own wishes, intentions and emotions and their influence on mother-child interactions) and a child-mentalization (i.e., mentalisation about the child's wishes, intentions and emotions and their influence on mother-child interactions). Results of factor analyses confirmed the presence of two robust dimensions – self-mentalization and child-mentalization, as predicted. Interestingly, self-mentalization turned out to be significantly correlated with maternal depression, suggesting a possible ruminative or self-absorbent component of self-mentalization.

The second goal was to examine the implications of these two dimensions for mothers' and children's respective behavior during interactions. Findings related to the second goal are discussed in detail below.

Maternal self-mentalization, child-mentalization and caregiving behavior

As mothers' capacity to make sense of their own difficult emotions in the parenting role increased, they were more likely to ensure their children's safety, socially engage with their children, maximize opportunities for interaction, play affectionately with their children and communicate more about the teaching task in developmentally-relevant ways during the interaction session. Contrary to predictions, mothers' capacity to recognize and make sense of their children's underlying emotions, wishes and intentions was not associated with their contingent response during interaction sessions to their children's alertness, explorations, efforts to learn, smiles, vocalizations, or bids for comfort. Instead, the mothers' contingent response to their children's behaviors was more likely to occur when mothers had stronger capacities for self-mentalization.

It is possible that this finding was caused by a more restricted range in child-mentalization versus self-mentalization scores (e.g., 3.00 versus 3.75). This finding may also be explained by a fuller interpretation of the two dimensions of RF. For mothers who have used drugs to modulate emotional states, the task of self-mentalization – which involves ascribing meaning to underlying emotional states that might otherwise be dysregulating – may be especially important for interacting with children. In other words, for women who are in the early stages of recovery from addiction, the capacity to mentalize about negative personal affect and its impact on their children may have a stronger influence on their parenting than the capacity to mentalize about their children's affect and its impact on themselves. Self-mentalization also requires greater emotional vulnerability than mentalising for others. The PDI items loading on the self-mentalization dimension ask the respondent to reflect about painful or difficult emotions (e.g., anger, guilt, neediness) – a process that Allen and colleagues (2008) have characterized as requiring deliberate, explicit, and conscious analysis. Self-mentalization may therefore be the more difficult but more important RF dimension for substance using mothers to master in order to improve relationships with their children.

The PDI items loading on the child-RF dimension also do not ask the mother to reflect directly on her own difficult personal emotions but rather on situations and events that she may experience as more remote and perhaps less emotionally-salient (e.g., mother-child interactions

and child behavior). Allen and colleagues (2008) have suggested that reflective functioning in these instances is more automatic, implicit, and unconscious.

Mentalising for children may also involve emotional vulnerability and be especially challenging for mothers with substance use disorders. However, it may be that the emotional salience for these mothers in mentalizing for the child is mostly indicative of an activation of their own internal attachment system triggered by their children's behavior.

Puzzling findings for response to distress

Given that parental reflective functioning is critical to emotional regulation for the mother and the child, it was especially surprising to find that maternal capacity for self-mentalization was not related to mothers' overall response to the child's distress (e.g., efforts to soothe the child and avoid negative comments, yelling, rough handling, abrupt movements, slapping and hitting). It was even more surprising to learn that mothers with higher capacities for self-mentalization were marginally less likely to contingently soothe and redirect their children when they became disengaged from the task.

It may be that, of all the caregiving dimensions, responding to the child's distress is most likely to activate the mother's attachment needs. Of the scores on the four overall caregiving dimensions, only scores for overall response to distress were below the clinical cut-off (Table 1). Mothers who score higher on self-reflection may be working harder than mothers who score lower to manage their internal distress and may therefore become distracted or preoccupied with their own discomfort and consequently make fewer efforts to soothe their children.

Child-mentalization and child behavior

As expected, children whose mothers had higher child-mentalization scores signaled clear behavioral cues to their mothers more frequently, but this association was only marginally significant. Mothers' child-mentalization was not related to the children's contingent efforts to engage the mother. Although tentative, this finding suggests that child-mentalization may play a distinct role in promoting the elicitation of clear cues in the children of substance abusing mothers. It may be that the child experiences the mother's capacity to mentalise for him as a prompt to express cues directly and that the absence of child-mentalization in the mother results in more vague and confusing cues.

Child age and child-focused RF

The positive correlation between child age and child-focused RF suggests that mentalisation for toddlers and preschoolers – who have a broader repertoire of cues for communicating mental states than do infants – may come more easily to mothers than mentalising for their infants (Allen et al., 2008). The continuing development of mentalisation-based interventions for mothers of infants is especially important because of the potential challenges of mentalising for infants in the first years of life (see Fonagy et al., 2002).

Implications for intervention

Findings here tentatively suggest that, for mothers with substance use problems, mentalisation-based parenting interventions may call for a 3-step developmental process. The first step would involve fostering a better capacity for deliberate, explicit, and conscious self-mentalization about difficult personal emotions. This capacity seems particularly critical in promoting the capacity to create interactions in which mothers are emotionally available and contingently responsive to their children. The second step would involve fostering a better capacity to mentalise for the child. This capacity may be important to promoting the child's clear communication of cues to the mother and may ultimately promote the child's use of the mother

as a secure base. The third step (which is where many behavioral skills-building parenting programs begin) would involve providing mothers with information and guidance about their children's development and suggesting behavioral strategies for responding to specific parenting dilemmas.

In the recently completed randomized pilot involving the 47 mothers whose baseline data were analyzed for this study, mothers enrolled in *MTP* showed marked improvement in self-mentalization (but not child-mentalization) at post-treatment and follow-up which corresponded to improvement in caregiving behavior (see Suchman, DeCoste, Castiglioni, et al., in press; Suchman, DeCoste, McMahon et al., in press). In other words, at the end of treatment, *MTP* mothers were better able to make sense of their own negative affect and its impact on their children than comparison mothers (but no different in their ability to recognize their child's negative affect and its impact on themselves). For mothers with substance abuse problems, targeting self-mentalization in interventions may be particularly critical for fostering improvement in maternal caregiving behavior because self-mentalization may help stabilize the mother's dysregulated affect that is common in mothers with substance use problems and may be triggered during stressful parenting situations. The absence of improvement in child-mentalization suggests that the intervention may need to be extended to incorporate more focus on child-mentalization (therapist adherence ratings in the *MTP* condition showed that the strongest focus was on self-mentalization).

Caveats and future work

This study has several methodological limitations. First, the items comprising the two dimensions of RF – self-mentalization and child-mentalization – also differ in the degree to which they call for explicit mentalisation; more questions on the self-mentalization scale ask specifically about difficult emotions. Thus, a methodological confound involving the two scales makes it impossible to separate the self- vs. child-dichotomy from the demand vs. permit dichotomy. Thus, findings of this investigation must be considered preliminary and further investigation of the self- vs. child- dichotomy in which demand and permit questions are balanced is warranted.

The sample size is small and represents a self-selected group of mothers who were already enrolled in treatment for their substance use and seeking help with their parenting. The sample size may limit the power of the analyses to detect small and moderate effects. Future replication of these analyses with larger samples will be important. Mothers with substance use disorders who have not enrolled in treatment and are not seeking help with parenting may reflect about and interact with their children differently. Also, without having comparable data from a non-clinical sample, it is hard to know in what ways the mechanisms of RF and caregiving identified in this study are unique to the population of substance using mothers.

Finally, the cross-sectional nature of the data precludes interpretations about causation. Although RF is thought to drive behavior, it may be that certain behaviors reinforce better RF or that RF and behavior are mutually influential.

Limitations notwithstanding, the preliminary findings reported here have several implications for future research. First, the results highlight the importance of recognizing parental reflective functioning (measured in the PDI) as a complex, multidimensional construct (as proposed by Fonagy et al., 2002 and Allen et al., 2008). The measurement of RF to date has largely been limited to one single dimensional scale. There is a need for further research that examines the multiple dimensions of RF (e.g., implicit versus explicit, automatic versus deliberate, self-mentalization versus child-mentalization) that have been theoretically proposed.

There is also a need for research with substance using mothers that examines the relation between RF, maternal behavior and child behavior when the child's attachment needs are activated (e.g., the Strange Situation Paradigm). It may be maternal contingent behavior during interactions that markedly stress the attachment system will be more strongly associated with child-mentalization.

With regard to parenting interventions for substance using and other psychiatrically at-risk mothers, it may be that effective interventions (ones that ultimately strengthen the attachment system) will be those that foster explicit mentalising about difficult emotions first and then target mentalization about the child and the caregiving relationship. With the development of more refined measures of RF, future intervention research can track the development of RF (using the PDI) over the course of interventions to determine the optimal developmental progression of intervention delivery. Preliminary findings from mentalisation-based interventions for at-risk mothers have shown preliminary promise for improving quality of caregiving and child developmental outcomes (Hoffman, Marvin, Cooper, & Powell, 2006; Pajulo, Suchman, Kalland, Sinkkonen, Helenius, & Mayes, 2008; Suchman et al., 2009; Sadler, Slade, & Mayes, 2006; Toth, Slade, Sadler, Miller, & Ueng-McHale, 2009; Rogosch, Manly, & Cicchetti, 2006). Closer examination of the mechanisms of RF and caregiving with more refined instruments is likely to contribute to the progress of intervention development by clarifying how these complex and important aspects of parent-child relationships work.

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Table 1Sample characteristics ($N = 47$)

Demographic data	Mean (SD)	
Mother's age	30.13 (6.54)	
Years of maternal education	12.34 (1.32)	
Number of children	2.09 (1.27)	
Child age (months)	17.68 (13.82)	
Marital status	Percent	
Never married	48.9	
Cohabitating	19.1	
Married	6.4	
Separated or divorced	25.5	
Race / Ethnicity		
Caucasian	70.2	
African American	21.3	
Hispanic origin	8.5	
Unemployed	80.9	
DCF-Involved	59.6	
Male child	51.1	
Psychiatric data		
Primary Substance	Percent	
Opiate	72.3	
Cocaine	12.8	
Alcohol	6.4	
Cannabis	8.5	
Methadone-maintained	68.1	
Used an substance during baseline month	24.4	
	Mean (SD)	Clinical cut-off ^{a,b}
Depression (BDI)	15.91 (9.29)	29.00
Global Psychiatric Distress (BSI)	59.99 (11.02)	63.00
Reflective functioning (RF)		
Self-focused RF	3.15 (.76)	3.00
Child-focused RF	3.36 (.62)	3.00
Maternal caregiving behavior (NCAST)		
Sensitivity to Cues	8.50 (1.39)	7.54
Contingent Sensitivity to Cues	4.39 (.79)	-
Response to Distress	8.04 (1.23)	8.26
Contingent Response to Distress	3.45 (1.04)	-
Social-Emotional Growth Fostering	7.25 (1.65)	7.16
Contingent Social-Emotional Growth Fostering	1.59 (.87)	-
Cognitive Growth Fostering	12.10 (2.04)	9.12
Contingent Cognitive Growth Fostering	3.77 (1.49)	-

Demographic data	Mean (SD)	
<i>Child behavior (NCAST)</i>		
Clarity of Cues	8.98 (1.01)	6.50
Responsiveness to Caregiver	10.22 (1.84)	4.29

^a Italicized scores represent *T-scores*

^b One SD below the mean in a normative sample of high school educated mothers

Table 2Results of factor analysis^a for coded for reflective functioning ($N = 47$)

Item	Factor Loading ^b	
	F ₁	F ₂
<i>Mentalisation re: self</i>		
How has having child changed you?	.69	-.01
Have you ever felt needy as a parent?	.73	-.04
Have you ever felt angry as a parent?	.66	.22
What gives you the most pain or difficulty as a parent?	.49	.29
<i>Mentalisation re: child</i>		
Has your child ever felt rejected?	.10	.71
Tell me about a recent time when you and your child really weren't clicking.	.26	.67
Tell me about a recent time when you and your child really clicked.	.00	.59
Describe a recent time when you and your child were separated.	-.17	.56
Tell me about a recent time when your child was very upset.	.19	.61
Describe a recent time when your child needed your attention	.07	.54

^aTwo-factor solution, Varimax rotation.^bFactor loadings $\geq .40$ were considered to be high.

Table 3

Results of standard linear regressions testing unique variance in maternal caregiving behavior accounted for by mentalisation involving self versus mentalisations involving child (N = 47)

	Sensitivity to Cues			Response to Distress			Social-Emotional Growth			Cognitive Growth						
	Total		Contingent	Total		Contingent	Total		Contingent	Total		Contingent				
	R ^{2a}	β	b	R ^{2a}	β	b	R ^{2a}	β	b	R ^{2a}	β	b	R ^{2a}	β	b	
Child age	.03	.17	.01	.08	.08*	-.30*	.05	-.24	.02	-.15	.00	.07	.04	.20	.06 [†]	.26 [†]
Child gender	.03	.16	.01	-.13	.00	.00	.00	-.01	.02	-.16	.00	-.07	.12 ^a	-.36 ^a	.04	-.22
Maternal depression	.02	-.16	.02	.16	.03	-.20	.00	-.03	.01	-.11	.04	-.24	.01	.10	.00	.03
Self-focused RF	.10*	.37*	.07 [†]	.31 [†]	.00	.01	.06 [†]	-.28 [†]	.08*	.33*	.05	.27	.08*	.34*	.10*	.37*
Child-focused RF	.01	-.08	.00	-.07	.02	-.18	.00	-.01	.05	.25	.05	.25	.00	-.02	.00	.06

^aUnique R²

^bStandardized beta weights

[†]*p* < .10

^{*}*p* < .05

^{**}*p* < .01, ^{***}*p* < .001 (two-tailed)

Table 4

Results of standard linear regressions testing for unique variance in child behavior accounted for by mentalisations involving self versus mentalisations involving child.

	Clarity of Cues		Response to Caregiver	
	R^{2a}	β^b	R^{2a}	β^b
Child age	.02	.15	.01	.09
Child gender	.00	-.03	.00	.05
Maternal depression	.02	.16	.03	.21
RF: re self	.01	-.09	.00	.01
RF: re child	.06	.28 [†]	.01	.11

^aUnique R^2

^bStandardized beta weights

[†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed)