

Evaluating a home-based dyadic intervention:
Changes in postpartum depression, maternal perceptions, and mother-infant interactions

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The preparation of this manuscript was supported in part by grants from the Office of the Provost at Boston University and the Faculty Grant Program at the Lois and Samuel Silberman Fund, New York Community Trust.

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Under review: *Infant Mental Health Journal*

DRAFT: DO NOT CITE WITHOUT PERMISSION OF AUTHORS

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Abstract

Psychotherapeutic treatments that focus on improving the relational processes between mothers with postpartum depression and their infants, as well as the mother's individual therapeutic needs, have a great potential to positively impact the mother, her infant, and their relationship (Nylen, Moran, Franklin, & O'Hara, 2006). Utilizing pilot data from an evaluation of a home-based dyadic therapy for mothers with postpartum depression and their infants, this paper reports on a recent academic-community partnership study. The effectiveness of the intervention was examined, specifically regarding changes in mother's mood, parenting experience, and relationship with her infant. In addition, associations were examined among maternal self-report variables measuring change from pre to post-treatment in postpartum depression, psychological distress, and maternal perceptions of parenting and those variables measuring change in observer ratings of maternal-infant interactions. Results showed improvements in mothers' depression, distress, and perceptions of parenting as well as on many ratings of mother's interactions with their infants. However, only improvements in maternal perceptions of parenting, such as maternal self-esteem and parenting stress were associated with better mother-infant interactions. Importance of this research for the field of infant mental health as well as clinical implications are discussed.

Evaluating a home-based dyadic intervention:

Changes in postpartum depression, maternal perceptions, and mother-infant interactions

Identified as the most common complication of pregnancy and childbirth (Wisner, Parry, & Piontek, 2002) affecting nearly one in five new mothers (Gavin, et al., 2005), postpartum depression (PPD) is a serious disorder that has a host of negative consequences for women, children, and families (Goodman & Gotlib, 2002; Radke-Yarrow & Klimes-Dougan, 2002). Although both individual psychotherapy and psychotropic medications have been found effective for addressing symptoms of PPD (Cohen et al., 2001; Stuart & O'Hara, 1995), treatments that focus on improving the relational processes between mother and baby, as well as the mother's individual therapeutic needs, have a greater potential to positively impact the mother, the infant, and their relationship (Forman et al., 2007; Murray, Cooper, Wilson, & Romaniuk, 2003; Nysten, Moran, Franklin, & O'Hara, 2006).

Fortunately, the last 15 years have seen an increase in the development and availability of family-based interventions for infants at risk of relational disorders and/or compromised development where maternal depression is one of the presenting difficulties (Jacobs, Easterbrooks, Brady & Mistry, 2005; Heinicke et al., 1999; Slade et al., 2005). Scholars have called for more in-depth study of these interventions in order to understand the specific mechanisms that affect change (Nysten et al., 2006). Utilizing data from an evaluation of a multifaceted home-based dyadic therapy for mothers with postpartum depression and their infants, this paper reports on a recent study examining the effectiveness of the intervention specifically regarding changes in maternal mood, perceptions of the mothering experience, and the mother's relationship with her infant.

Postpartum Depression and Maternal-Infant Interactions

Similar to other forms of depression, women with PPD experience sadness, agitation, extreme fatigue, preoccupation, and suicidal ideation (Cooper et al., 2007). PPD may also be characterized by anxiety, mental confusion, cognitive distortions that impact maternal self-esteem and perceptions of infants, limited sense of self-efficacy with respect to parenting, and intense shame and guilt surrounding one's experience of depression (Beck & Indman, 2005; Kendall-Tackett, 2005). As the onset of PPD

frequently takes place shortly after the birth of a baby, a mother's ability to care for and connect with her very young infant is in imminent jeopardy.

Within the mother-infant relationship interaction is often strained. Infants are less likely to initiate or maintain interactions and mothers are less likely to demonstrate positive affect and sensitivity to their infant's needs or repair an interrupted interaction (Field, 2008). At times, problems are characterized by the presence of the mother's negative affective response to the infant, including aversion, rejection, anger, disengagement, and/or withdrawal (Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Depressed mothers often share feelings of inadequacy as parents (Beck, 2002) and have reported lower parenting self-efficacy (Teti & Gelfand, 1991), a problem that may underlie the interactional difficulties they have with their infants. Additionally, PPD is hypothesized to impair a mother's capacity for reflective functioning, namely, the ability to understand and process emotional and internal states in oneself and others (Fonagy, Target, Steele, & Steele, 1998), thereby negatively impacting her ability to relate to her infant based upon a recognition and understanding of her infant's internal experience (Slade et al., 2005). The infants of depressed mothers often display more withdrawn behavior, decreased activity level, greater fussiness, and fewer affectively positive facial expressions and vocalizations almost mirroring their mothers (Field, 2008; Weinberg & Tronick, 1998). Any number of these interactional difficulties could strain attachment processes, impair social-relational learning and development for the infant, and interfere with the infant's self-regulatory abilities (Brockington, 2004; Field, et al., 2007).

Psychotherapy Options

Of the available therapeutic treatments for at-risk parents and infants, some were developed to directly address maternal depression (Cooper, Murray, Wilson, & Romaniuk, 2003; O'Hara, Stuart, Gorman, & Wenzel, 2000); others focus on the caregiver infant relationship, but address depression if present (McDonough, 2004; Gelfand, Teti, Seiner, & Jameson, 1996; Slade et al., 2005). Very few were initiated as interventions to directly attend to a mother's psychotherapeutic needs regarding depression and/or anxiety and actively address maternal-infant interactions by working with the mother and baby in the sessions (Cramer, 1997; Lieberman, Silverman, & Pawl, 2000; Spielman, 2002). Through reviewing a

few of these models we are able to see the progression toward dyadic interventions where the mother's depression and her relationship with her infant are equal foci.

Interpersonal Therapy (IPT) is a manualized individual short-term psychotherapy specifically targeting depression and focusing on interpersonal relationships as a point of intervention (Stuart & O'Hara, 1995). Offered in clinic or home settings, IPT can last anywhere from eight to 16 sessions. The foci include approaches to treatment engagement and retention, communication analysis, role playing, behavioral activation, and case management (Beeber, Hoditch-Davis, Belyea, Funk, & Canuso, 2004; Grote, Swartz, & Zuckoff, 2008). O'Hara and colleagues (2000) tested an adaptation of IPT with women suffering from postpartum depression. The researchers hypothesized that alleviation of the mother's depression and addressing its impact on close interpersonal relationships would change her experience of parenting and interactions with her infant. Study mothers in the IPT treatment group felt less depressed, but did not experience decrease in parenting stress or improvements in interactions with their infants. Further, the infants themselves did not show changes in positive or negative emotionality. The researchers concluded that involvement of the infant was necessary in order to improve maternal-infant interactions (Forman et al., 2007).

At a similar time, Gelfand and colleagues (1996) tested an intervention for clinically depressed mothers and attempted to address the mother-infant relationship by using nurses as home-visitors. Similar to the Nurse Family Partnership model (Olds et al., 2002) the interveners provided the mothers with information about infant development and instructed them in effective parenting techniques with the goals of improving maternal sensitivity, acceptance of the infant, and increased maternal self-efficacy. Twenty-nine visits were completed over a period of approximately 17 months. Most program participants were simultaneously receiving individual therapy and somewhat less than half were on psychotropic medication. Mothers in the treatment group demonstrated an alleviation of severity of depression symptoms between pre and post-intervention as well as a reduction in daily hassles. No improvements were noted in attachment security or infant cognitive functioning; however mothers who were less depressed felt more competent as parents and perceived their infants in a more positive light. Effects of

the intervention were most robust for the mothers themselves, even though the nurses focused on the maternal-infant relationship. It is possible that the limitations of this program center on the need for dual strategies within a single treatment, one focused on the mother's mood, parenting perceptions, and parenting history and the other on her current ability to relate to her infant.

In light of these findings, Slade and colleagues (2005) developed Minding the Baby (MTB) an intervention for mothers and infants at high risk due to a mother's young age and trauma history. Although many of the mothers in the program are depressed, MTB was not specifically developed for postpartum depression. For up to two years, clinical social workers and nurse practitioners alternately visit the mothers and infants at home working with them in a variety of ways to develop mothers' reflective capacities—to be able to keep her baby in mind. In order to enhance mother-infant connections, one of the techniques a therapist might use is encouraging simple caregiving activities and face-to-face interactions. This adaptation from evidence-based nurse home visitor models (Olds et al., 2002) and infant-parent psychotherapy (Lieberman et al., 2000) is aimed at addressing relationship disruptions stemming from mothers' early trauma and derailed attachment history. Preliminary research findings show that mothers' mental health indices improved over the first year of the intervention, their reflective capacities improved by the second year, and more of the toddlers who had been in the treatment group were classified as securely attached (A. Slade, personal communication, March 1, 2009). Although MTB offers some of the best practices developed in the infant-parent field, the labor intensiveness and length of treatment are not necessary for all populations or easily replicated by many community agencies.

The Early Connections Program

The psychotherapeutic treatment that is the focus of this study, Early Connections (Spielman, 2002), is not yet manualized, but the guidelines use many premises of the programs described above. It is offered as a flexible home-based short term renewable model addressing the crisis that postpartum depression presents for a mother, infant, and family. Early Connections is aimed at decreasing postpartum depression and mitigating its impact on the mother-infant relationship by using best practices from infant mental health theory and tested interventions (Fraiberg, 1980; Lieberman et al., 2000; Slade et al., 2005).

The clinician most often works with the mother and baby together, but she can also meet with the mother alone or the parenting couple and baby. When the mother has twins, the clinician addresses the specific concerns of parenting multiples. Treatment can begin immediately after birth, thus jump-starting the relationship between a depressed and frightened mother and her newborn baby. Clinicians conduct on average 12-16 weekly visits with mothers and infants. Given the intervention's flexibility, mothers can negotiate longer or shorter treatments depending on their therapeutic needs. The home-based nature of the program offers mothers easy access to treatment and provides a natural context for observing caregiving and interaction. Major goals include improving the mother's mood, decreasing anxious preoccupations with her infant, increasing attunement to her infant's needs, modifying negative perceptions of her infant, increasing pleasurable interactions, and developing confidence in her parenting abilities (Paris, Spielman, & Bolton, 2009).

Early Connections clinicians come from all mental health disciplines and are specialty-trained in perinatal and infant/parent mental health; supervision is provided in a group setting every other week for two hours. The clinicians use psychotherapeutic techniques such as supportive listening, alliance building, shared observing, encouraging emotional expression, exploring historical events relevant for parenting, and highlighting mother-baby interactions, among others. Together mother and clinician develop an understanding of the mother's mood states and the causes and triggers for her depressive symptoms. For example, depressed mothers often struggle with deep feelings of self-doubt regarding their maternal competence. Early Connections clinicians highlight observations of maternal strength and help build new areas of competence, thereby mitigating some depressive mood and symptoms.

In the treatment, dialogue moves back and forth between the mother's past and her present relationship with her infant, always keeping in mind the baby's social-emotional communications and needs. The infant is present whenever possible. Observing and attending to an infant's behaviors and communicative signals offer the clinician the opportunity to link the mother's feelings, concerns, beliefs, and past experiences with the infant's behaviors and the mother's responses in the here and now of the session. Understanding the meaning the mother is making of her baby's presence and needs provides the

clinician an opening to question distortions and build reflective capacities. Highlighting in-vivo moments in treatment allows the therapist to raise the mother's awareness of the relational aspects between herself and the infant, promote insight into instances of transference between mother and infant, increase the mother's sensitivity to her infant's affective states, and focus attention on the infant in the present (Cramer, 1997; Paris, Spielman, & Bolton, 2009; Slade et al., 2005); all serve to enhance the quality of their developing relationship. Enlarging the mother's self-care capacities through exercise or personal health practices and her network of support by referring to groups and building social skills are additional program components that counter isolation and depression.

The Present Study

This study was part of an academic-community partnership aimed at researching innovative clinical practices based in real world mental health agency settings. Supervisors at the community agency and academic researchers worked collaboratively over a 2-year period to develop a research study that would further the infant-parent psychotherapy field and address clinicians' questions regarding the impact of their specific intervention. The following broad research questions were developed given prior studies on dyadic treatments and anecdotal evidence from clinician reports: 1) Will mothers significantly improve on self-report ratings of depression, psychological distress, parenting stress, and maternal self-esteem after Early Connections treatment; 2) Will maternal-infant interactions improve after Early Connections treatment, and if so in which domains? 3) If mothers improve on self-report ratings of depression and psychological distress, will those changes be associated with improvements in interactions with her baby; and 4) If mothers' perceptions of parenting improve (i.e. parenting stress and maternal self-esteem) will those changes be associated with improvements in maternal-infant interactions?

Method

Population and Procedure

In order to obtain a broad assessment of maternal functioning, participants completed self-report questionnaires which included four measures, administered prior to and upon ending treatment, as well as three months after treatment was completed. Most mothers additionally participated in pre and post-

treatment video-taped sessions with their infants and in a semi-structured post-treatment interview. In the present study data from pre and post-treatment self-report measures and observer ratings of maternal-infant interactions were examined to assess improvements in the mother's mood, perceptions of self efficacy with regard to parenting, perceptions of her infant and their relationship, and maternal-infant interactions. As a pilot study, no comparison group was available.

Sample. Twenty-five mother-infant dyads who were enrolled in the Early Connections program participated in all aspects of the study (including three sets of twins). Two additional mothers only completed pre and post-treatment self-report questionnaires. Participants were mostly first time mothers who were referred to the Early Connections program by community providers (e.g. physicians, nurses, or social workers) due to depression, isolation, and extreme difficulties in parenting infants. On average, the babies were 17 weeks old, although approximately half were less than 3 months. All 60 mothers with biological infants who enrolled in Early Connections between June of 2005 and July of 2007 were invited to participate in the research study by the intake clinician at the agency. She briefly explained the study and asked the mothers if they would agree to be contacted by research staff; a research assistant from the university then called those who consented in order to explain the project and ask women to participate. If a mother agreed, the same research assistant met with her at home to obtain informed consent for study participation, in accordance with protocol approved by the University Institutional Review Board, and to begin the data collection process. Approximately 53% of all mothers enrolled in Early Connections during this two year period agreed to participate in the research study (N=32). Although we consider this an acceptable enrollment rate given the population, we recognize the serious challenges of engaging women with severe postpartum depression in a voluntary research study. Additionally, staff members were understandably protective of their clients. The participation rate increased over time as the clinicians became more comfortable with the research procedures. No significant differences were noted between research participants and non-participants with respect to age, level of education for mother or father, number of children, age of infant at intake, and level of postpartum depression at intake.

Data collection. During the initial visit with the research assistant described above, mothers

completed a pre-treatment self-report questionnaire packet comprised of demographic questions and three standardized measures including the Brief Symptom Inventory (Derogatis, 1993), the Parenting Stress Index- Short Form (Abidin, 1995), and the Maternal Self-Report Inventory-Short Form (Shea & Tronick, 1988). Two 5-minute video-taped segments of interactions between the mother and infant were also completed at this time by the majority of participants. The same procedure was followed for data collection immediately after treatment termination, typically with the same research assistant. Additionally upon intervention enrollment and completion, Early Connections program staff collected demographic data and administered the Postpartum Depression Screening Scale (Beck & Gable, 2000; described below) to all mothers; with participants' consent, this information was shared with the university researchers for inclusion in the research protocol.

Video-taping in the home, by the trained research assistant, consisted of 1) a 5-minute developmentally appropriate structured task-oriented segment such as asking the parent to guide the infant in following a rattle, and 2) a 5-minute unstructured interaction period, during which time the mothers were instructed to interact with their babies as they normally would without the use of any toys or other props. The video-taped interactions were coded individually by two trained research assistants, distinct from the RA who collected the data, using the Coding Interactive Behavior manual (CIB; Feldman, 1998). Additionally, coders discussed each video with an expert in infant development to reach consensus on items where any disagreements in ratings had occurred. Cronbach alpha reliability scores ranged between .67 and .99 for all but three of the video segments; nevertheless consensus scores were used in data analysis.

Measures

Maternal mood and psychological functioning. The Postpartum Depression Screening Scale (PDSS, Beck & Gable, 2000) was used to assess mothers' postpartum psychiatric difficulties. This multi-dimensional scale is a 35-item standardized measure designed to screen for clinical levels of postpartum depression. Items are scored on a 5-point scale, ranging from strongly disagree to strongly agree. In addition to yielding a total score, this measure also comprises 7 subscales, measuring sleeping / eating

disturbances, anxiety / insecurity, emotional lability, mental confusion, loss of self, guilt / shame, and suicidal thoughts. Total scores for the measure can range from 35-175, with scores ≥ 60 indicating significant levels of postpartum depression and scores ≥ 80 indicating a positive screen for major postpartum depression. The PDSS has good internal reliability, content, and construct validity (Beck & Gable, 2000).

The Brief Symptom Inventory (BSI) is a short (53-item) version of the Symptom Checklist-90-R (Derogatis, 1975), designed to assess a range of psychological symptoms tapping emotional, somatic, and interpersonal dimensions of distress. Items are scored on a 5-point scale ranging from strongly disagree to strongly agree, with total possible scores ranging from 0-212. This scale is comprised of three global indices to measure psychological distress, as well as nine subscales assessing somatization, obsessive-compulsive symptoms (questions which largely tap into disturbances in cognitive functioning), interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. On the BSI, higher scores indicate greater psychological distress experienced by the respondent on each of the corresponding subscales as well as on the global indices of distress. The BSI has been used with a wide range of populations, and is known to have good reliability and validity (Derogatis, 1993).

Maternal perceptions. The Maternal Self-Report Inventory-Short Form (MSI-SF) (Shea & Tronick, 1988) was used to examine participants' self-esteem and self-perceptions related to motherhood. This 26-item scale is derived from the longer 100-item Maternal Self-Report Inventory, which has previously been used to evaluate maternal postpartum functioning (Weinberg et al., 2001). In addition to yielding a total score, the MSI-SF also yields scores on five separate domains which assess a mother's perceptions of her caretaking abilities, her general ability and preparedness for her role as a mother, her acceptance of her baby, her expectations that she will have a positive relationship with her baby, and her feelings concerning labor and delivery. Higher scores indicate more positive perceptions and higher maternal self-esteem on each of these dimensions. Total scores can range from 26-130. Among non-depressed mothers, a mean score on the MSI-SF is approximately 105 (Weinberg, personal

communication, November 16, 2007). The MSI has good concurrent, internal, and external validity and test-retest reliability (Shea & Tronick, 1988).

The Parenting Stress Index-Short Form (PSI-SF) (Abidin, 1995) is a 36-item measure used to assess stress related to parenting and maternal perceptions of infants/children. In addition to a total score, this measure also contains subscales to measure distress associated with parenting and being a parent (Parental Distress), perceptions that the child does not meet the parent's expectations or that the interactions between parent and child are not reinforcing to the parent (Parent-Child Dysfunctional Interaction), and perceptions that the child's behavior is difficult to manage (Difficult Child). On this scale, a total score ≥ 90 indicates clinically significant levels of stress related to parenting, for which professional assistance is recommended. Although no study has directly assessed the validity of the short form, the full-length PSI has been used in many studies and has good internal and external validity (Abidin, 1995).

Coding of mother-infant interactions. Mother-infant video-taped interactions were coded using a modified version of the Coding Interactive Behavior (CIB) manual (Feldman, 1998). This measure is comprised of 42 items each rated on a 5-point scale which are then aggregated into several composite scales. Higher scores indicate more evidence of the dimension being coded, regardless of whether this dimension represents ideal mother-infant interactions. Medium or moderate scores (approximately 3 on the 5-point scale) typically indicate presence of the behavior/dimension approximately 50% of the time. The CIB has been validated with healthy and at risk populations, as described by its author (Feldman 1998, 2003, 2007). In the present study, 26 items from the original manual relevant to this population and the age of the infants were used. Individual items aggregated into composites previously developed by Feldman (2003) that measured (a) maternal sensitivity and responsiveness (acknowledging, imitating, elaborating, parent gaze, positive affect, vocal appropriateness, appropriate range of affect, consistency of style, and resourcefulness), (b) maternal intrusiveness (physical manipulation/forcing and overriding-intrusiveness), (c) infant initiation and involvement (vocalization and initiation), (d) infant positive affect (child positive affect and peak affective involvement/alertness), (e) infant negative affect (child negative

emotionality/fussiness and fatigue), and (f) dyadic reciprocity (dyadic reciprocity, adaptive-regulation, and fluency), during both task-oriented and unstructured interactions.

Data Analysis

A limited number of analyses were conducted focused on our main research questions. Although correlational analyses among dosage, maternal mood, perception, and mother-infant interaction variables would be important in this type of study given that associations are likely, multivariate models were not viable given the small sample size. Hence, univariate analyses were conducted first to assess demographic information, including level of depression and length of intervention. Second, bivariate analyses were conducted to examine change between pre and post-treatment scores. Third, paired sample t-tests were used to compare differences on measures of mothers' depressed mood (PDSS), psychological distress (BSI), maternal self-esteem (MSI), perceptions of parenting (PSI), and observer ratings of mother-infant interactions (CIB). Finally, raw change scores were computed for all the above measures from pre to post-treatment. Partial correlations, with baby age entered as a control variable, were computed among change variables representing mother's mood and perception with change in maternal-infant interaction. Mothers of twins were analyzed with both of their infants in measures of the mother-child relationship. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) v.16.0.

Results

Demographics for this sample of women are reported in Table 1. At program enrollment, participating mothers were on average 33-years old and infants' average developmental age was 17 weeks, after correcting for prematurity. The vast majority of mothers was married and most of them were of Caucasian descent (75%), with the remainder identifying as Black, Latino, Asian or biracial. More than half of the participants had college or graduate level educations and seventy-five percent were employed prior to the birth of their infant. Most of the women worked in professional positions, but many were stay-at-home mothers, students, or paraprofessionals. This sample included some representation from across the socio-economic class spectrum with 18% of women reporting family incomes of less than \$50,000 per year and half reporting family incomes of \$50-\$100,000 per year.

Participants represent the range of clients served by the Early Connections program who reside in urban and suburban communities.

On average, the mothers in this sample participated in treatment for 16 sessions. Approximately half of the women were either taking or had just begun taking antidepressant medication when they enrolled in Early Connections, but it is not known how many continued medications over the course of treatment. Almost two-thirds of the women reported having had a history of depression, and approximately half had received prior treatment.

-- Insert Table 1 about here --

Changes in Maternal Mood and Perception

Maternal depression and mood symptoms. Our first research question in part sought to determine whether mothers experienced improvements in postpartum depression and overall mood from pre to post-treatment. To answer this question, paired t-tests were computed to analyze whether there were differences between mothers' self-reported mood before and after treatment. Results are reported in Table 2. At pre-treatment, mothers reported high levels of postpartum depression, measured by the PDSS, and overall psychological distress, measured by the BSI. At post-treatment, most mothers reported significantly lower PDSS scores, with a mean score falling below the cut-off point for clinical levels of postpartum depression. A small percentage of mothers remained in the clinically depressed range. Findings from paired t-tests also showed that the mothers had statistically significant reductions on all PDSS subscales including sleeping/eating disturbances, anxiety, emotional lability, mental confusion, loss of self, guilt/shame, and suicidal thoughts. After treatment, mothers also reported significantly less psychological distress, measured by the BSI Global Severity Index, as well as significantly fewer symptoms in BSI subscales such as depression, anxiety, and obsessive-compulsive tendencies.

Maternal perceptions. Paired t-tests were again computed to answer the second half of our first research question regarding mothers' change in their perceptions of maternal self-esteem and parenting stress from pre to post-treatment. At pre-treatment participants reported lower levels of maternal self-esteem than typical non-depressed mothers, and clinically significant levels of parenting stress. At post-

treatment, mothers were experiencing significantly less stress related to parenting as measured by the total score on the PSI (with the majority of the sample dropping below the clinically significant cutoff). Most were less distressed in their roles as parents, perceived their infants to be significantly less difficult than they had at pre-treatment, and perceived there to be significantly less dysfunction in their relationships with their infants. Further, mothers reported higher overall maternal self-esteem than they had at pre-treatment, experienced themselves to be significantly more capable in their caretaking abilities, generally felt more prepared to parent, were significantly more accepting of their infants, and held more positive expectations about their relationships with their infants.

-- Insert Table 2 about here --

Changes in Mother-Infant Interactions

To answer our second research question as to how mother-infant interactions changed from pre to post-treatment, paired t-tests were computed to compare observer ratings of video-taped interactions using the Coding Interactive Behavior scale (Table 3). During pre-treatment video-taped interactions, mothers exhibited sensitivity and responsivity to their infants' signals some of the time (approximately 50%), but overlooked other signals and missed opportunities to respond sensitively during both structured and unstructured interactions. Approximately half of the time mothers demonstrated parental intrusiveness in both types of interactions by disrupting the child's ongoing behavior or re-directing his/her attention to parent-led activities through vocalization, noise, gaze, or physical manipulation. As a dyadic system, mothers and infants demonstrated an ability to mutually adapt to and respond to each other's signals some of the time, showing moments of synchrony and rhythm in their interactions with each other, but not consistently throughout the observations.

Results indicated that at post-treatment, mothers were significantly more sensitive and responsive to their infants' signals and needs during unstructured interactions. Given that women began treatment showing medium levels of sensitivity and responsivity with their infants despite their high levels of depression, there was a small increment of change. While mothers were also more sensitive and responsive during structured interactions at post-treatment compared to pre-treatment, this change only

approached significance. No statistically significant differences were found with respect to mothers' levels of intrusive behavior or with respect to dyadic reciprocity during parent-child interactions between the pre and post-treatment time periods.

Paired t-tests were also used to compare differences in infants during mother-infant interactions at pre and post-treatment. During structured exchanges pre-treatment, infants showed occasional bouts of positive affect, one or two instances of negative emotion and fatigue, and sometimes initiated mutual activities verbally or non-verbally. During unstructured interactions infants demonstrated slightly less positive affect than above, slightly more negative affect and fatigue, and initiated activities with their mother at the same frequency. At post-treatment, infants were more relaxed and attentive, smiled, and made positive vocalizations more frequently and consistently during both structured and unstructured interactions than they had at pre-treatment. Infants also demonstrated significantly more social interactions and initiated more attempts to engage with the mother during both structured and unstructured interactions than they had at pre-treatment. No significant differences were found with respect to infants' levels of fatigue, crying, and other negative emotion between pre and post-treatment during either structured or unstructured interactions.

-- Insert Table 3 about here --

Relationships between Changes in Mood, Perception, and Mother-Infant Interactions

Lastly, we sought to understand how changes in maternal mood and perceptions were related to observer-rated changes in mother-infant interactions between pre and post-treatment (Table 4). To answer this question, we first calculated raw change scores on the mothers' self-report and observer-rated variables where significant differences had been found. Given our small sample size and the flexible nature of the CIB measure, we combined the two infant composites where significant differences had been found into a single measure capturing infant positive affect, initiation, and involvement during mother-infant interactions and utilized this more robust composite to examine relationships between changes in maternal mood and perception with observed changes in infants. For this new combined infant composite, Chronbach alphas for all coded video segments ranged from .74 to .92, suggesting that

these composites could be appropriately combined. We then examined partial correlations (controlling for infant age) between variables representing change in mother's mood and perceptions with change in maternal-infant interaction.

Despite the significant reductions in postpartum depression and overall psychological distress, no significant relationships were found between changes in maternal mood and either maternal sensitivity and responsivity or infant positive affect, initiation, and involvement during either structured or unstructured interactions. However, significant relationships were found between improvements in mothers' perceptions of the parenting experience and changes in mother-infant interactions. Specifically, mothers who perceived greater improvement in overall maternal self-esteem and their caretaking abilities from pre to post-treatment also experienced greater improvement in their ability to be more responsive and sensitive during both structured and unstructured interactions with their infants. Further, mothers who felt more acceptance of their babies also demonstrated greater improvement in their ability to be more sensitive and responsive during unstructured interactions. Increases in mothers' expectations of having good relationships with their infants and perceptions of themselves as being prepared for mothering were also marginally related to improvements in mothers' sensitivity and responsivity during unstructured interactions. Finally, mothers who experienced greater decreases in overall parenting stress also demonstrated marginal improvements in their sensitivity and responsivity to their infants during unstructured interactions.

Infants of mothers who experienced more improvements in overall maternal self-esteem and perceptions of their own caretaking ability, showed greater improvements in positive affect, initiation, and involvement in unstructured interactions from pre to post-treatment. The same was true for infants with mothers who were more accepting of them and had greater expectations of having a positive mother-baby relationship. During both types of interactions with their mothers, infants who became more positive affectively and initiated more activities and involvements were associated with mothers who saw less dysfunction in the relationship with them; during unstructured interactions the more involved infants had mothers who had a greater decrease in overall parenting stress.

--Insert Table 4 about here--

Discussion

This study aimed to examine the effectiveness of a home-based dyadic therapy for mothers with postpartum depression and their infants. Results showed improvements on mothers' self-report of depression, psychological distress, and maternal perceptions of the parenting experience as well as on many observer ratings of maternal infant interactions. Given that a community-academic partnership produced this study, our questions focused both on advancing the infant mental health field and best practices for home-based services conducted by agency or mental health centers addressing early relationships between mothers and infants.

We view our findings as support for the idea that postpartum depression is a relationship disorder (Cramer, 1997). Both mothers and infants are engaged in the process; mothers by being less sensitive and responsive and infants by less involvement and positive affect in interactions. If the disorder is based in the relationship, it makes sense to treat the mother-infant dyad in order to improve the mother's depression as well as mother-infant interactions (Gelfand et al., 1996; Heinicke et al., 1999; Nylén et al., 2006).

Maternal-infant interactions were studied in two segments, structured and unstructured. While videotaping mothers and infants we witnessed the anxiety producing nature of this type of task for women with PPD. Taping sessions were generally stressful, but when mothers were asked to participate in unstructured interactions with their infants, particularly pre-treatment, they appeared to be notably apprehensive and often asked how much time was left during the taping session. Nevertheless, observers rated the structured and unstructured interactions similarly, with no major differences noted. When we assessed the relationship between change in maternal perceptions of parenting and change in mother-infant interactions, improvements in the former seemed to be associated with improvements in the latter at a greater rate in unstructured video segments. We can speculate that after treatment mothers who felt more confident in their parenting role, more accepting of their babies, and assessed their relationships with them as more positive were able to be somewhat more relaxed and attuned in their unstructured

interactions. In turn, the babies showed more positive affect and were more involved in interactions with their mothers regardless of their age.

The initial findings of improvement in both maternal depressed mood and perceptions of the parenting experience extend the existing literature that has emerged over the past 15 years regarding effectiveness of home-based interventions for mothers and infants (Cohen et al., 1999; Olds et al, 2002; Paris & Dubus, 2005;). The specific location of the treatment program is particularly salient. As the importance of translational research has grown, replication of findings from studies that were originally conducted in controlled settings is of utmost importance. The field must know if evidence-informed treatments are able to be transported to real world community and home-based settings where they impact the majority of people.

Additionally, the findings presented here add to the growing consensus in the literature on best treatments for mothers with postpartum depression. To improve outcomes for infants of depressed mothers and for the mother-infant relationship, treatments need to focus beyond maternal mood to include direct targeting of the mothering experience and the interaction of mothers and infants (Nylen et al, 2006). Preliminary qualitative findings from the larger study, based on interviews with participating mothers, underlined the importance of the dyadic maternal-infant focus for the self-esteem of the mothers and for their parenting abilities. Participants perceived that in treatment they learned how to be more attuned mothers and subsequently felt more confident in their parenting role and optimistic about their child's growth and development. Zeanah and colleagues (1997) highlight the importance of understanding the relationship between the external behavioral components of a caregiver-infant relationship and the internal subjective experience and addressing them both. This study supports the above idea by offering evidence that positive changes in maternal-infant interactive behavior were related to elements of a woman's sense of self-esteem and confidence as a mother and her perceptions of the parenting experience. Although some have found that a decrease in a mother's depressive mood alone through the use of medication can impact maternal-infant interactions (Goodman, Broth, Hall & Stowe, 2008), many studies lead to the conclusion that dyadic treatment must directly address depressive mood and the

mother-infant relationship (Forman et al., 2007; Lieberman, Silverman, & Pawl, 2000; Nylén et al., 2006; Slade et al., 2005) in order to change mother-infant behaviors.

Clinical Implications

The treatment studied here, Early Connections, has two major goals—reduction of postpartum depression and improvement in the emotional health of the mother-infant relationship. The results suggest significant progress in meeting both aims. More significantly however, they imply that achieving the second, and arguably more important, goal cannot be attained through the first alone. Given the seemingly independent effects of treatment on depression and maternal self-esteem, in order to support healthy early relationships between depressed mothers and babies, programs need to address directly the obstacles to a mother feeling competent and attuned in caring for her baby (Cramer, 1997; Lieberman et al., 2000; Forman et al., 2007).

The presence of the baby in the intervention is a basic first step in this direction. The baby's behaviors and simple presence provide a powerful stimulus and opportunity for in-vivo focus on maternal feelings, doubts, meaning-making and responsivity. Shared observing of the baby and curiosity about the mother's ideas and emotions offer the clinician a way to bring the complexities of early mother-baby relating to the forefront of the treatment. Supporting the mother's capacities for understanding and responding sensitively to the baby's signals and needs builds her sense of competence which in turn promotes interactive capabilities (Paris, Spielman, & Bolton, 2009; Spielman, 2002). The findings of the current study lend support to this clinical approach that is central to the Early Connections program.

While these results highlight the need for dual strategies in working with women with postpartum depression, they are not able to address the clinical and contextual challenges in meeting these goals. Discussions among clinicians working in Early Connections, as well as those in other dyadic treatment programs, often center on questions related to managing the tensions between these two needs. How is it possible to balance the focus on mother's needs for attention to her mood and symptoms with a focus on her relationship with her baby and her experience of herself as a mother? When a mother is preoccupied

with her own dysregulated feeling state, how is it possible to bring in the baby without leaving her feeling misunderstood or abandoned?

For many of the mothers seen in Early Connections, like most mothers struggling with postpartum depression, their needs for emotional support and for being heard have been long unmet. This chronic neglect may now be exacerbated by the primacy of the baby's needs for care. The longing these mothers have for undivided listening from a clinician can be palpable in a way that challenges the clinician's ability to make space for the baby in the mother's mind and in the treatment. Naming this tension and the understanding of its meaning by saying something like "it's hard for us to attend to the baby right now when you have so much on your mind you want to share with me", can be a step towards balancing the competing needs. In some cases, clinicians have structured the work to include separate individual sessions for the mother or dividing time within the session. Clinicians in Early Connections are sensitive to the cultural context of mothering and the costs of the expectation that mothers need to subordinate their needs to those of their children at all times. Acknowledging the complex relationship for mothers between self-care and other-care can be an important piece of the therapeutic work.

The findings of the current study have implications for training as well. While many clinicians see themselves as competent to treat postpartum depression, those who do so with a sole focus on relieving the mother's depressive symptoms are at risk of failing to address the significant implications of postpartum depression for the child and family. However, learning to treat relationships, especially in the case where one partner in the relationship is a pre-verbal baby, is not within the curriculum of most mental health training programs. Increasing opportunities for specialized training in dyadic work would begin to address the current gaps.

Limitations

This study has a number of limitations. The sample represents primarily educated middle class women who were referred to a community program relatively soon after the birth of their infants. Most women do not have access to home-based services for postpartum depression in their communities, particularly those who live in poverty. Some may find it harder to accept services due to cost, stigma, or

cultural beliefs about mental illness and motherhood (Abrams & Dornig, 2007)

Approximately half of the study participants had started on anti-depressant medications simultaneous to beginning the Early Connections program. The vast majority reported that they were not experiencing improved mood at the pre-treatment assessment, and our data support this. Unfortunately, we did not have access to data documenting the use of medications over the course of the treatment, but we do know that some women continued and others stopped. More detailed information about use of medication and the coordination of treatments would aid our understanding of treatment effectiveness, specifically with regard to mothers' mood.

As important as academic-community research partnerships are, designing studies that meet the needs of both partners is a significant challenge and presents some limitations to classically rigorous research designs. Although this pilot study included a small sample size and offered no control data which restricted our ability to make causal inferences about the treatment program's effectiveness, the findings remain important in the context of the larger field of infant mental health and in the arena of real world practice.

Directions for Future Research

Given the study findings and limitations, future research with a larger sample size would provide enough power for analyses that offer greater depth and complexity regarding the processes of treatment, mechanisms of change, and treatment effectiveness. Specifically, multivariate models should be developed with both change in mother's mood and perceptions of parenting as independent factors impacting the mother-infant relationship. Additional interventions, such as use of medications, and length of treatment should be closely monitored and/or controlled. If feasible, a randomized clinical trial comparing equivalent sessions of home-based dyadic mother-infant treatment with typical office or clinic-based individual psychotherapy for postpartum depression would offer the best information to tease out the benefits of each approach for the mother, the infant, and the mother-infant relationship.

References

- Abidin, R.R. (1995). *Parenting Stress Index: Professional Manual* (3rd ed.). Lutz, FL: Psychological Assessment Resources.
- Abrams LS, Dornig K (2007) Bridging the gap: Barriers to service use among low-income women with postpartum depression. UCLA, Department of Social Welfare, School of Public Affairs. Available via UCLA. http://www.spa.ucla.edu/sw/webfiles/Barriers_to_Service_Use_Among_Low-Income_Women_with_PPD_and_PPD_Toolkit.pdf. Accessed 1 Nov 2008.
- Beck, C.T. (2002). Postpartum depression: A metasynthesis. *Qualitative Health Research*, *12*, 453-472.
- Beck, C.T., & Gable, R.K. (2000). Postpartum depression screening scale: Development and psychometric testing. *Nursing Research*, *5*, 272-282.
- Beck, C.T., & Indman, P. (2005). The many faces of postpartum depression. *Journal of Obstetrics, Gynecologic, & Neonatal Nursing*, *34*, 569-572.
- Beeber, L. S., Holdith-Davis, D., Belyea, M. J., & Funk, S. G. (2004). In-home intervention for depressive symptoms with low-income mothers of infants and toddlers in the United States. *Health Care for Women International*, *25*, (561-580).
- Brockington, I.F. (2004). Postpartum psychiatric disorders. *Lancet*, *363*, 303-310.
- Cohen, N. J., Muir, E., Lojkasek, M., Muir, R., Parker, C. J., Barwick, M. B., & Brown, M. (1999). Watch, wait, and wonder: Testing the effectiveness of a new approach to mother-infant psychotherapy. *Infant Mental Health Journal*, *20*(4), 429-451
- Cohen, L. S., Viguera, A. C., Bouffard, S. M., Nonacs, R. M., Morabito, C., Collins, M. H., & Ablon, J. S. (2001). Venlafaxine in the treatment of postpartum depression. *Journal of Clinical Psychiatry*, *62*, 592-596.
- Cooper, C., Jones, L., Dunn, E., Forty, L., Haque, S., Oyebode, F., Craddock, N., & Jones, I. (2007). Clinical presentation of postnatal and non-postnatal depressive episodes. *Psychological Medicine*, *37*, 1273-1280.

- Cooper, P. J., Murray, L., Wilson, A., & Romaniuk, J. (2003). Controlled trial of the short- and long-term effect of psychological treatment of post-partum depression I. Impact on maternal mood. *The British Journal of Psychiatry, 182*: 412-419
- Cramer, B. (1997). Psychodynamic perspectives on the treatment of postpartum depression. In Murray, L., & Cooper, P. J. (Eds.) *Postpartum depression and child development*. New York: Guilford Press
- Derogatis, L.R. (1993). *The Brief Symptom Inventory (BSI): Administration, scoring and procedures manual* (4th ed.). Minneapolis, MN: National Computer Systems.
- Derogatis, L.R. (1975). *The Brief Symptom Inventory*. Baltimore, MD: Clinical Psychometric Research.
- Feldman, R. (1998). *Coding Interactive Behavior (CIB)* (Unpublished manuscript). Bar-Ilan University, Israel.
- Feldman, R. (2003). Testing a family intervention hypothesis: the contribution of mother-infant skin-to-skin contact (kangaroo care) to family interaction, proximity, and touch. *Journal of Family Psychology, 17*, 94-107.
- Feldman, R. (2007). Maternal versus child risk and the development of parent-child and family relationships in five high-risk populations. *Development and Psychopathology, 19*, 293-312.
- Field, T. (2008). Problems in infancy. In M. Herson, A.M. Gross (Ed.), *Handbook of clinical psychology: Children and Adolescents Volume II* (pp. 966-1011). Hoboken, NJ: John Wiley.
- Field, T., Hernandez-Reif, M., Diego, M., Feijo, L., Vera, Y., Gil K., & Sanders, C. (2007). Still-face and separation effects on depressed mother-infant interactions. *Infant Mental Health Journal, 28*, 314-323.
- Fonagy, P., Target, M., Steele, H., & Steele, M. (1998). *Reflective Functioning Manual, Version 5.0, for Application to adult attachment interviews*. London: University College London.
- Forman, D.R., O'Hara, M., Stuart, S., Gorman, L.L., Larsen, K.E. & Coy, K.C. (2007). Effective treatment for postpartum depression is not sufficient to improve the developing mother-child relationship. *Development and Psychopathology, 19*, 585-602.

- Fraiberg, S. (1980). *Clinical studies in infant mental health: The first year of life*. New York: Basic Books.
- Gavin, N. I., Gaynes, B. N., Lohr, K. N., Meltzer-Brody, S., Gartlehner, G., & Swinson, T. (2005). Perinatal depression: A systematic review of prevalence and incidence. *Obstetrics and Gynecology, 106*, 1071-1083.
- Gelfand, D. M., Teti, D. M., Jameson, P. B., & Seiner, S. A. (1996). Helping mothers fight depression: Evaluation of a home-based intervention program for depressed mother and their infants. *Journal of Clinical Child Psychology, 25*, 405-422.
- Goodman, S.H., & Gotlib, I.H. (2002). *Children of depressed parents: Mechanisms of risk and implications for treatment*. Washington, D.C.: American Psychological Association.
- Goodman, S. H., Broth, M. R., Hall, C. M., & Stowe, Z. N. (2008). Treatment of postpartum depression in mothers: Secondary benefits to the infants. *Infant Mental Health Journal, 29*(5), 492-513.
- Grote, N. K., Swartz, H. A., & Zuckoff, A. (2008). Enhancing Interpersonal Psychotherapy for mothers and expectant mothers on low incomes: Adaptations and addition. *Journal of Contemporary Psychotherapy, 38*, 23-33.
- Heinicke, C. M., Finemen, N. R., Ruth, G., Techia, S. L., Guthrie, D., & Rodning, C. (1999). Relationship-based intervention with at-risk mothers: Outcome in the first year of life. *Infant Mental Health Journal, 20*(4), 349-374.
- Jacobs, R., Easterbrooks, M. A., Brady, A. & Mistry, J. (2005). *Healthy Families Massachusetts final evaluation report*. Retrieved March 1, 2006 <http://ase.tufts.edu/mhfe/reports/FinalEvalReport.pdf>.
- Kendall-Tackett, K.A. (2005). *Depression in new mothers: Causes, consequences, and treatment alternatives*. New York: Haworth Press.
- Lieberman, A. F., Silverman, R., & Pawl, J. (2000). Infant.-parent psychotherapy: Core concepts and current approaches. In Zeanah, C. H. (Ed.) *Handbook of infant mental health*, pp. 472-484. New York: Guilford Press.

- Lovejoy, M. C., Graczyk, P. A., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: A meta-Analytic review. *Clinical Psychology Review, 20*(5), 561-592.
- McDonough, S.C. (2004). Interaction Guidance: Promoting and nurturing the care giving relationship. In Sameroff, A.J., McDonough, S.C., Rosenblum, K.L. (Eds.) *Treating parent-infant relationship problems* (pp. 79-96). New York: Guilford.
- Murray, L., Cooper, P. J., Wilson, A., & Romaniuk, H. (2003). Controlled trial of the short- and long-term effect of psychological treatment of post-partum depression 2. Impact on the mother-child relationship and child outcome. *British Journal of Psychiatry, 182*, 420-427.
- Nylen, K.J., Moran, T.E., Franklin, C.L., & O'Hara, M. (2006). Maternal depression: A review of relevant treatment approaches for mothers and infants. *Infant Mental Health Journal, 27*, 327-343.
- O'Hara M. W., Stuart, S., Gorman, L. L., Wenzel, A. (2000). Efficacy of interpersonal psychotherapy for postpartum depression. *Archives of General Psychiatry, 57*, 1039-1043.
- Olds, D.L., Robinson, J., O'Brien, R., Luckey, D.W., Pettitt, L., Henderson, C., Ng, R., & et al. (2002). Home visiting by paraprofessionals and by nurses: A randomized, control trial. *Pediatrics, 110*, 486-496.
- Paris, R., Spielman, E., Bolton, R.E. (2009). Mother-infant psychotherapy: Examining the therapeutic process of change. *Infant Mental Health Journal 30*(3) 301-319.
- Paris, R., & Dubus, N. (2005). Staying connected while nurturing an infant: A challenge of new motherhood. *Family Relations, 54*, 72-83.
- Radke-Yarrow, M., & Klimes-Dougan, M. (2002). Parental depression and offspring disorders: A developmental perspective. In S.H. Goodman & I.H. Gotlib (Eds). *Children of depressed parents: Mechanism of risk and implications for treatment* (pp. 155-173). Washington, D.C.: American Psychological Association.
- Shea, E., & Tronick, E.Z. (1988). The Maternal Self-Report Inventory: A research and clinical instrument for assessing maternal self-esteem. *Theory and Research in Behavioral Pediatrics, 4*, 101-141.

- Slade, A., Sadler, L., De Dios-Kenn, C., Webb, D., Currier-Ezepchick, J., & Mayes, L. (2005). Minding the baby: A reflective parenting program. *The Psychoanalytic Study of the Child*, 60, 74-100.
- Spielman, E. (2002). Early Connections: Mother-infant psychotherapy in support of perinatal mental health. *Zero to Three*, 22, 26-30.
- Stuart, S. & O'Hara, M. W. (1995). Interpersonal psychotherapy for postpartum depression. *Journal of Psychotherapy Practice and Research*, 4(1), 18-29.
- Teti, D. M. & Gelfand, D. M. (1991). Behavioral competence among mothers of infants in the first year: The mediational role of maternal self-efficacy. *Child Development*, 62, 918-929.
- Weinberg, M.K., Tronick, E.Z. Beeghly, M., Olson, K.L., Kernan, H., & Riley, J.M. (2001). Subsyndromal depressive symptoms and major depression in postpartum women. *American Journal of Orthopsychiatry*, 71, 87-97.
- Weinberg, M.K., & Tronick, E.Z. (1998). Emotional characteristics of infants associated with maternal depression and anxiety. *Pediatrics*, 102, 1298-1304.
- Wisner, K.L., Parry, B.L., & Piontek, C.M. (2002). Postpartum depression. *The New England Journal of Medicine*, 347, 194-199.
- Zeanah, C. H., Boris, N. W., Heller, S. S., Hinshaw-Fuselier, S., Larrieu, J. A., Lewis, M., Palomino, R., Rovaris, M., & Valliere, J. ((1997). Relationship assessment in infant mental health. *Infant Mental Health Journal*, 18(2), 182-197.

Table 1. Descriptive Characteristics of Mothers

	Sample (N=24)	
	%	n
Race		
Caucasian	75.0	18
Black	4.2	1
Asian	12.5	3
Latina	4.2	1
Bi-Racial	4.2	1
Annual Family Income		
\$0-\$24,999	13.6	3
\$25,000-\$49,999	4.5	1
\$50,000-\$74,999	36.4	8
\$75,000-\$99,999	13.6	3
\$100,000 +	31.8	7
Marital Status		
Married / Partnered	91.7	22
Single / Never Married	8.3	2
Education		
Some College	20.8	5
College Degree	12.5	3
Graduate Degree	66.7	16
Employment Prior to Birth		
Yes	75.0	18
No	25.0	6

(Table Continues)

Sample (N=24)		
	%	<u>n</u>
Vocation		
Professional	58.3	14
Paraprofessional	8.3	2
Student	8.3	2
Homemaker	25.0	6
First-time Mother		
Yes	70.8	17
No	29.2	7
History of Depression		
Yes	60.9	14
No	39.1	9
Medication for PPD at Intake		
Yes	54.2	13
No	45.8	11
	<u>Mean (SD)</u>	Range
Age of Baby at Intake ^a	16.88 (15.83)	1-63 weeks
Age of Mom at Intake	32.96 (5.61)	23-43 years
Number of Sessions	16.33 (11.50)	3-53 sessions

^a Baby age is corrected for prematurity.

Table 2. Differences in Mood, Perceptions, and Mother-Infant Interactions from Pre to Post-Treatment.

	Pre-Treatment	Post-Treatment	t
	Mean (SD)	Mean (SD)	
Maternal Mood			
Postpartum Depression Screening Scale			
Sleeping / Eating Problems	16.21 (6.61)	9.54 (5.10)	3.77***
Anxiety / Insecurity	17.13 (3.95)	10.42 (3.79)	5.35***
Emotional Lability	18.25 (3.66)	10.63 (4.16)	6.53***
Mental Confusion	18.29 (3.70)	9.13 (3.76)	6.85***
Loss of Self	18.00 (3.58)	8.88 (4.62)	6.53***
Guilt / Shame	17.83 (5.26)	11.21 (4.92)	4.43***
Suicidal Thoughts	12.38 (5.87)	6.75 (3.19)	4.21***
Total Score	116.71 (25.52)	66.71 (22.51)	5.79***
Brief Symptom Inventory			
Depression Subscale	11.42 (6.83)	5.88 (6.44)	3.23**
Anxiety Subscale	8.08 (5.92)	4.71 (4.52)	2.51*
Psychoticism Subscale	6.13 (4.03)	3.42 (4.11)	2.91**
Obsessive-Compulsive Subscale	11.92 (5.36)	8.33 (5.39)	2.68**
Hostility Subscale	7.54 (4.42)	4.75 (3.85)	3.43**
Phobic Anxiety Subscale	3.67 (3.52)	2.00 (3.44)	2.15*
Paranoid Ideation Subscale	5.21 (4.42)	3.29 (4.55)	1.76 ^t
Somatization Subscale	6.92 (5.33)	3.79 (6.51)	2.13*
Interpersonal-Sensitivity Subscale	7.71 (4.61)	4.42 (3.86)	3.88***
Global Severity Index	1.43 (0.75)	0.84 (0.73)	3.35**

(Table Continues)

Maternal Perceptions			
Maternal Self Report Inventory			
General Ability and Preparedness for Mothering	27.00 (7.03)	32.88 (4.63)	-4.64***
Caretaking Ability	19.08 (6.30)	23.79 (4.21)	-4.89***
Acceptance of Baby	10.17 (2.94)	12.04 (3.03)	-3.21**
Expected Positive Relationship w/ Baby	15.96 (5.24)	19.38 (3.80)	-3.47**
Total Score	85.29 (21.50)	101.58 (14.16)	-4.71***
Parenting Stress Index			
Parental Distress	38.38 (8.54)	30.88 (7.63)	3.92***
Difficult Child	32.28 (11.93)	25.63 (9.69)	2.97**
Parent-Child Dysfunctional Interactions	27.38 (9.61)	18.29 (4.85)	5.59***
Total Score	98.13 (25.42)	74.79 (17.59)	4.91***

^t p < 0.10, * p ≤ 0.05, ** p ≤ 0.01, *** p ≤ 0.001; N=24

Table 3. Differences in Mother-Infant Interactions between Pre and Post-Treatment.

	Pre-Treatment	Post-Treatment	t
	Mean (SD)	Mean (SD)	
Maternal Sensitivity and Responsivity			
Structured Interactions	3.76 (0.66)	4.07 (0.69)	-1.93 [†]
Unstructured Interactions	3.81 (0.58)	4.16 (0.56)	-2.29*
Parent Intrusiveness			
Structured Interactions	3.20 (0.95)	3.26 (1.02)	-0.34
Unstructured Interactions	3.32 (0.75)	3.48 (0.77)	-0.80
Infant Positive Affect			
Structured Interactions	3.04 (1.14)	3.72 (0.84)	-2.78**
Unstructured Interactions	2.70 (1.31)	3.98 (0.87)	-4.29***
Infant Negative Emotionality			
Structured Interactions	1.80 (0.92)	1.42 (0.64)	1.53
Unstructured Interactions	2.17 (1.05)	1.74 (1.00)	1.38
Infant Initiation and Involvement			
Structured Interactions	2.85 (0.89)	3.70 (1.00)	-3.57**
Unstructured Interactions	2.85 (1.06)	3.82 (0.83)	-4.38***
Dyadic Reciprocity			
Structured Interactions	3.61 (1.10)	4.00 (0.96)	-1.40
Unstructured Interactions	3.71 (0.71)	3.92 (1.02)	-0.89

[†] p < 0.10, * p ≤ 0.05, ** p ≤ 0.01, *** p ≤ 0.001; N=25

Table 4. Partial Correlations between Changes in Maternal Mood and Perceptions and Changes in Mother-Infant Interactions from Pre to Post-treatment.

	Mother-Infant Interactions			
	Maternal Sensitivity & Responsivity		Infant Positive Affect and Involvement	
	St.	Unst.	St.	Unst.
	Maternal Mood			
Postpartum Depression Screening Scale Total Score	.07	-.09	.20	-.28
Brief Symptom Inventory Global Severity Index	-.01	-.04	.18	-.02
Maternal Perceptions				
Maternal Self-Report Inventory				
General Ability and Preparedness for Mothering	.24	.32 ^t	-.003	.24
Caretaking Ability	.45**	.44*	.22	.42*
Acceptance of Baby	.26	.41*	.28 ^t	.45**
Expected Positive Relationship w/ Baby	.15	.32 ^t	.16	.34*
Total Score	.36*	.42*	.17	.36*
Parenting Stress Index				
Parent Distress	-.18	-.26	.00	-.26
Difficult Child	-.23	-.18	-.02	-.13
Parent-Child Dysfunctional Interactions	-.25	-.25	-.41*	-.52**
Total Score	-.27	-.28 ^t	-.14	-.34*

^tp < 0.10, * p ≤ 0.05, ** p ≤ 0.01; N=25; Note. Baby age entered as control variable.