

The Efficacy of Toddler–Parent Psychotherapy to Reorganize Attachment in the Young Offspring of Mothers With Major Depressive Disorder: A Randomized Preventive Trial

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The development of insecure attachment relationships in the offspring of mothers with major depressive disorder (MDD) may initiate a negative trajectory leading to future psychopathology. Therefore, the provision of theoretically guided interventions designed to promote secure attachment is of paramount importance. Mothers who had experienced MDD since their child's birth were recruited ($n = 130$) and randomized to toddler–parent psychotherapy (DI) or to a control group (DC). Nondepressed mothers with no current or history of major mental disorder and their toddlers also were recruited for a nondepressed comparison group (NC; $n = 68$). Children averaged 20.34 months of age at the initial assessment. Higher rates of insecure attachment were present in both the DI and the DC groups at baseline, relative to the NC group. At postintervention, at age 36 months, insecure attachment continued to predominate in the DC group. In contrast, the rate of secure attachment had increased substantially in the DI group and was higher than that for the DC and the NC groups. These results demonstrate the efficacy of toddler–parent psychotherapy in fostering secure attachment relationships in young children of depressed mothers.

Keywords: attachment, maternal depression, preventive intervention

Research coalesces to support the fact that young offspring of mothers with depressive disorders are at increased risk for the development of mental disorders (Birmaher et al., 1996; Cicchetti & Toth, 1998; Kovacs, 1989, 1996). Early difficulties in developing a secure attachment relationship in these children may be one factor that contributes to the emergence of future psychopathology (Cummings & Cicchetti, 1990). Therefore, the provision of a preventive intervention designed to promote attachment security among these offspring assumes both theoretical and clinical significance. In this article, we evaluate the efficacy of an attachment-theory-informed preventive intervention, toddler–parent psychotherapy (TPP; Cicchetti, Toth, & Rogosch, 1999; Lieberman, 1992), for fostering attachment security in the toddler offspring of mothers with a major depressive disorder (MDD).

Depression and Caregiving

There is considerable evidence that maternal depression is associated with impaired caregiving to offspring. In fact, the single most prominent mechanism to explain maladaptive development

in offspring of depressed mothers is not depression per se but inadequate parenting (Goodman & Gotlib, 2002). Mothers with MDD have been shown to be less sensitive parents, to exhibit greater negativity and less positive affect during mother–child interactions, and to be poor disciplinarians (cf. Cicchetti & Toth, 1995; Downey & Coyne, 1990; Gelfand & Teti, 1990; Lovejoy, Graczyk, O'Hare, & Neuman, 2000; Lyons-Ruth, Lyubchik, Wolfe, & Bronfman, 2002). Children of depressed mothers also have been shown to be at increased risk for the development of insecure attachment relationships, because they often have experienced maternal physical and psychological unavailability (Cummings & Cicchetti, 1990). Bowlby (1969, 1973, 1980) maintained that separation from the primary caregiver leads to anxiety for children. He argued that when children are confronted with periods of prolonged loss, including parental psychological unavailability, the development of a secure internal working model of the caregiver is impaired. In fact, insecure attachment during the early years of life has been consistently linked with unresponsive, insensitive, and rejecting caregiving (see DeWolff & van IJzendoorn, 1997, and Teti & Nakagawa, 1990, for reviews). Therefore, there is significant evidence to suggest that being reared by a depressed caregiver places children at risk for the development of insecure attachment relationships (Cicchetti et al., 1999; Coyl, Roggman, & Newland, 2002).

Depression and Attachment

Investigations have examined the quality of attachment relationships in the offspring of parents with a mood disorder (see, e.g., Cicchetti et al., 1999; DeMulder & Radke-Yarrow, 1991; Radke-Yarrow, Cummings, Kuczynski, & Chapman, 1985; Teti, Gel-

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fand, Messinger, & Isabella, 1995). Overall, associations have been found between maternal depression and higher rates of insecure attachment as well as between more severe and chronic depression and disorganized attachment (Campbell, Cohn, Meyers, Ross, & Flanagan, 1993; Goodman & Gotlib, 2002; Lyons-Ruth, Connell, Grunebaum, & Botein, 1990; Murray, 1992; Teti et al., 1995). Campbell et al. (1993) reported that insecure attachments were more prevalent in infants who had a mother with postpartum depression that exceeded the first 6 months of their baby's life. Similarly, Murray (1992) found that insecure attachment was more frequent among toddlers of postnatally depressed mothers than among toddlers of well mothers. Insecure attachment also has been shown to be associated with maternal depression in preschoolers, and mothers with more chronic depression have children who do not exhibit coherent attachment strategies (Teti et al., 1995).

It is important to note, however, that not all children of depressed parents develop insecure attachment relationships. DeMulder and Radke-Yarrow (1991) found that the rate of insecure attachment in children of mothers with unipolar depression did not differ from that of children with nondepressed mothers. Frankel, Maslin-Cole, and Harmon (1991) also reported that attachment security in 3-year-olds did not differ among children with depressed and well mothers. These conflicting results highlight the importance of considering issues related to sample characteristics and recruitment (e.g., community vs. treatment samples, chronic vs. postpartum-only depression, middle-income vs. impoverished samples).

In a meta-analytic review of 16 published investigations of the relationship between disorganized attachment and parental depression, van IJzendoorn, Schuengel, and Bakermans-Kranenburg (1999) found only a small and nonsignificant effect size of .06. When only samples meeting criteria for clinically diagnosed depression were examined, a significant but still small effect size was found (van IJzendoorn et al., 1999). Because this meta-analysis focused only on correlates of disorganized attachment and not on insecure attachment more broadly, the magnitude of the relation between parental depression and insecure attachment might have been underestimated.

Attachment insecurity in offspring of mood-disordered parents also possesses implications for future child development. If parental depression interferes with the formation of a secure attachment relationship with the infant, then the infant will be at increased risk for negative developmental outcomes (Weinfield, Sroufe, Egeland, & Carlson, 1999). For example, relations between insecure attachment and later behavior problems have been found (Easterbrooks, Davidson, & Chazan, 1993; Lyons-Ruth, 1992). Children with a depressed mother also have been shown to evidence emotional dysregulation, aggression, noncompliance, attention deficits, low self-esteem, negative peer relations, and depressed mood (Cicchetti & Toth, 1995, 1998; Downey & Coyne, 1990; Gelfand & Teti, 1990). Of note are the higher rates of psychiatric and psychological problems in the offspring of depressed caregivers (Beardslee, Bemporad, Keller, & Klerman, 1983; Weissman et al., 1987; Weissman, Warner, Wickramaratne, Moreau, & Olfson, 1997). Given the increased risk of future maladaptation and psychopathology in offspring of depressed caregivers as well as evidence that early attachment insecurity may contribute to these difficulties, it becomes important to determine how to prevent these negative developmental trajectories.

Preventive Interventions for Insecure Attachment

Although initially attachment theory was more firmly grounded in developmental research than in clinical applications, in recent years the relevance of this body of work for the development of interventions has been much more widely appreciated (Cicchetti & Toth, 2006; Oppenheim, 2004). Because offspring of depressed caregivers are at increased risk for the development of insecure attachment relationships, the importation of research on attachment into the development and evaluation of preventive interventions for this population is particularly salient. Moreover, because even infants with secure attachment relationships may develop insecure attachments over time (Thompson, 1998), preventive interventions for young offspring of depressed caregivers emerge as an important avenue to pursue. Although depressed women may receive therapeutic interventions that involve pharmacological treatments, individual psychotherapy, or both, it is less likely that such interventions consider the woman as a mother and also address the relationship that is forming between mother and child. Disregard for this evolving relationship may result in an increased risk for the emergence of an insecure attachment relationship and associated developmental maladaptations for the child.

A number of interventions for offspring of depressed mothers have been developed and evaluated (Cicchetti et al., 1999; Cooper & Murray, 1997; Field et al., 2000; Gelfand, Teti, Seiner, & Jameson, 1996). Field et al. (1996) explored the effects of massage therapy versus a rocking control in 1- to 3-month-old infants of depressed adolescent mothers. Infants assigned to the massage group were found to be more likely to sleep following the intervention; gained more weight; and evidenced improvement on measures of emotionality, sociability, and soothability dimensions of temperament as well as on physiological indicators of lowered stress. Investigations also have found that teaching mothers to interact with or to touch their infants may yield improved parenting as well as lead to infants' increased engagement with their environment (Malphurs et al., 1996; Pelaez-Nogueras, Field, Hosain, & Pickens, 1996).

Few investigations, however, have been found to be effective in promoting secure attachment. Gelfand et al. (1996) found that a home-based intervention designed to improve maternal self-efficacy was not effective in improving attachment security in offspring. Similarly, in comparing four intervention strategies (one involving an attachment-theory-guided psychodynamic psychotherapy), Cooper and Murray (1997) found that all treatment groups evidenced fewer relationship difficulties with their children following intervention but that improvements in the security of attachment were not evident. Although the approaches were not developed specifically for offspring of depressed mothers but rather were designed for clinically referred infants, N. J. Cohen, Lojkasek, Muir, Muir, and Parker (2002) compared two forms of psychotherapy, one involving the more traditional infant-parent psychotherapy and the other involving an infant-led psychotherapy in which the behavior of the infant assumed an important role. The results of these interventions were quite promising in reducing infant symptoms and parenting stress and improving infant-mother interaction. Decreased maternal depression, improved infant cognitive development and emotion regulation, and increased infant-mother attachment security were observed posttreatment only in the infant-led psychotherapy (N. J. Cohen et al., 2002).

Although the results are encouraging, lack of random assignment, the absence of a comparison group, and a relatively small sample size limit their generalizability.

In a recent meta-analysis of the effectiveness of interventions for preventing infant disorganized attachment, the authors concluded that disorganized attachments may be modifiable as a function of sensitivity-focused interventions (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2005). Although this review was not focused on maternal depression as a risk factor for disorganized attachment, a number of its conclusions are relevant. First, effective interventions were initiated after the infant's age of 6 months. Second, sensitivity-focused interventions appeared to be more effective than were interventions with a broader focus. Third, interventions that targeted infants at risk were more effective than were those directed at parents at risk. Finally, samples with a higher percentage of disorganization in the control group were more successful in preventing disorganization. This latter finding suggests that a relatively higher percentage of disorganization in the control group may make it easier for the intervention to be effective, as it prevents a floor effect from dampening intervention effectiveness.

To our knowledge, the only attachment-theory-informed intervention shown to foster secure attachment in offspring of mothers with MDD to date has been the preventive intervention provided by Cicchetti et al. (1999). The current investigation includes those mother-toddler dyads as well as 55 additional dyads. Cicchetti et al. (1999) found that TPP (Lieberman, 1992) increased attachment security in offspring of depressed mothers. In fact, offspring who received the intervention demonstrated rates of attachment security comparable to those seen in offspring of well mothers. These results are noteworthy in being the first to suggest that attachment security is malleable and that it may be modified through the provision of an attachment-theory-informed intervention. In the prior investigation, which was an intervention evaluation, the maternal report attachment Q-sort (AQS) methodology was used as the outcome measure. Although the AQS been shown to relate to attachment classifications derived from the Strange Situation (Ainsworth, Blehar, Waters, & Wall, 1978; see Vaughn & Waters, 1990) as well as to parenting quality (Teti, Nakagawa, Das, & Wirth, 1991), it is not considered to be the gold standard of the field. In fact, in a recent meta-analysis, the authors concluded that the observer AQS but not the self-report AQS was a valid measure of attachment (van IJzendoorn, Vereijken, Bakermans-Kranenburg, & Riksen-Walraven, 2004). Therefore, further examination of the efficacy of the preventive intervention in fostering attachment security as assessed by the Strange Situation is warranted.

The investigation is guided by the following hypotheses:

1. At baseline, offspring of depressed mothers will evidence higher rates of insecure attachment than will offspring of well mothers.
2. The provision of TPP will result in increased attachment security in the depressed intervention (DI) group; increased attachment security is not expected to occur in the depressed control (DC) group.

Method

Participants

Mothers with a history of MDD were recruited for an investigation of the effects of maternal depression on child development and for an evaluation study of the efficacy of a preventive intervention for depressed mothers and their toddlers. Mothers ($n = 130$) who had experienced a major depressive episode at some time since their child's birth were targeted for participation. Additionally, a sample of nondepressed mothers ($n = 68$) with no current or history of major mental disorder and their toddlers also was recruited for comparison purposes. The children, on average, were 20.34 months of age ($SD = 2.50$) at the time of initial assessment; mothers ranged in age from 21 to 41 years ($M = 31.68$, $SD = 4.68$).

Participant recruitment. Families who were not of low socioeconomic status were recruited to minimize co-occurring risk factors that may accompany maternal depression (Coyne & Downey, 1991). In particular, participating families could not be reliant on public assistance, and parents were required to have at least a high school education. Because this is one of the first investigations designed to target toddler insecure attachment in mothers with MDD, minimization of other risk factors was determined to be important to increase the likelihood of detecting intervention effects. A community sample of mothers with a history of MDD was recruited through referrals from mental health professionals and through notices placed in newspapers and community publications, in medical offices, and on community bulletin boards.

In addition to having a child approximately 20 months of age, diagnostic inclusion criteria for mothers in the depressed group required mothers to meet *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev.; *DSM-III-R*; American Psychiatric Association, 1987) criteria for major depression occurring at some time since the birth of the mother's child; depression status was determined by administration of the Diagnostic Interview Schedule (DIS-III-R). Mothers who met criteria for bipolar disorder were not retained. The depressed mothers also needed to be willing to accept random assignment to either the intervention or the nonintervention group following completion of baseline assessments. Among the 202 mothers who were recruited for depression, 72 did not meet diagnostic inclusion criteria. For the remaining 130 mothers, who met diagnostic criteria, a randomized blocks procedure based on family demographic characteristics was conducted by the project coordinator and used to randomly assign mothers to the DI ($n = 66$) and the DC ($n = 64$) groups progressively over the recruitment phase. Research staff working with the participating families were kept unaware of group status over the course of the study.

For the nondepressed control (NC) group, we recruited mothers directly by contacting families who lived in the vicinity of the residences of the depressed mothers. We obtained names of potential families with a toddler-age child from birth records. In addition to not including low socioeconomic status families, we screened mothers in the NC group for the presence of current or past major psychiatric disorder using the DIS-III-R, as described in the *Measures* section. Among the 89 mothers recruited for the NC group, 21 were excluded because of the presence of a prior or current psychiatric disorder. The remaining mothers, who did not have a current or past history of major psychiatric disorder, were retained in the NC group ($n = 68$).

The mothers in the depressed groups were comparable on a number of features of their mental health history. In terms of the recency of MDD, 34.8% (DI) and 43.8% (DC) met diagnostic criteria for MDD within the past month, whereas 71.2% (DI) and 78.1% (DC) met criteria within the past 6 months. For the majority of mothers, the onset of the first episode of MDD was prior to the child's birth (69.7% of DI mothers, 71.9% of DC mothers), and the time since the onset also did not differ between groups, with onset averaging 7.92 and 9.38 years prior for mothers in the DI and DC groups, respectively. Few mothers in the sample (DI, $n = 4$; DC, $n = 1$) had only been depressed during the postpartum period. Comorbidity

with other Axis I disorders in the past year was common at the time of baseline assessments; 59.1% of the DI mothers and 71.9% of DC mothers had at least one comorbid disorder. For example, 53.8% of mothers in the depressed groups had an anxiety disorder, 11.5% had bulimia, and 9.2% had an alcohol disorder. All group contrasts on the respective diagnostic variables discussed above were nonsignificant.

The participants in the three groups were comparable on a range of demographic characteristics. Given the inclusion requirement that participants not be of low socioeconomic status, 72.7% of the families were in the two highest levels of social status on the basis of Hollingshead's (1975) criteria, and the majority of mothers in the sample (54.5%) were college graduates. The sample was composed of mothers who were predominantly of European American race/ethnicity (92.9%). Most of the mothers were married (87.9%); however, given the marital difficulties and instability associated with depression (Coyne & Downey, 1991), more mothers in the DI group (15.2%) and the DC group (20.3%) were not currently married, as compared with the NC group (1.5%), $\chi^2(2, N = 198) = 11.84, p < .01$. However, marital status was not significantly related to attachment classification at baseline or at follow-up. The gender of the children in the sample was comparable across groups, with approximately equal numbers of boys (52.8%) and girls (47.2%).

Participant retention. From the original sample of 198, some participant loss occurred by the time of the follow-up assessments, when children were 36 months of age. As a result of moving out of the area or discontinuing participation prior to completion of the age 3 assessments, 8 mother-child dyads were lost from the DI group, 8 from the DC group, and 4 from the NC group. Additionally, the follow-up Strange Situations from 2 DC dyads and 1 NC dyad could not be coded because of technical difficulties. Finally, 12 mothers who had been assigned to the DI group either declined to engage in the preventive intervention or discontinued their participation early. Accordingly, the group sizes for the remaining cases who completed the postintervention assessments were as follows: DI, $n = 46$; DC, $n = 54$; and NC, $n = 63$.

To determine whether differential attrition had occurred, we compared the 163 dyads who had completed postintervention follow-up assessments with the 35 who did not, using 2 (complete or incomplete) \times 3 (group) analyses of variance and chi-square tests. No significant differences due to completion status were found for baseline maternal depression scores or for demographic characteristics of the participants, including maternal age, education, family socioeconomic status, and marital status. Similarly, no completion status effects were found for child gender or baseline attachment classification. Among the depressed mothers, those who were retained in the DI and DC groups and those who were lost to follow-up did not differ significantly in terms of the recency of MDD, onset, severity, or comorbidity. Thus, no evidence of selection bias in the retained sample was found.

Mothers in the DI and the DC groups were not restricted from being involved in other mental health treatment during the course of the study. In fact, 75.5% of the mothers in the DI group and 67.3% of mothers in the DC group had been involved in mental health treatment at some time since their child's birth. Moreover, during the time between baseline and follow-up assessments, 46.7% of the DI and 44.2% of the DC mothers received some form of intervention, including individual psychotherapy (34.0%), marital therapy (11.3%), group therapy (5.2%), and family therapy (2.1%). All group contrasts on these variables were nonsignificant. Although mothers in the DI and DC groups might have received antidepressants, receipt of medication was not systematically monitored.

Procedure

Baseline and follow-up assessments. Approval for the conduct of this research was obtained from the University of Rochester Institutional Review Board. After expressing interest in participating in the investigation, all mothers were approached individually by a research assistant and given the informed consent document to read and, if agreeable, to sign. During

baseline assessments conducted in 1992 to 1995, families participated in a series of home- and laboratory-based assessment sessions. During an initial home-based session, mothers were administered the DIS-III-R (Robins et al., 1985) and completed the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and a demographics interview. In a subsequent laboratory session, mothers and toddlers participated in the Strange Situation (Ainsworth et al., 1978). Subsequently, when children were 36 months of age and when the DI group had completed the preventive intervention, mothers again completed the DIS-III-R, the BDI, and a demographics interview, during the years 1993 to 1996. Mothers and children also again participated in the Strange Situation, conducted during a laboratory-based session.

Preventive intervention. The goal of the preventive intervention approach was to optimize the quality of the mother-child relationship in women who had experienced an MDD at some time since the birth of their child. It is important to note that the intervention was not directed toward the amelioration of maternal depression but rather toward the promotion of toddler attachment security. The intervention, referred to as TPP, is derived from the work of Fraiberg, Adelson, and Shapiro (1975), who detailed the pernicious influences that an unresolved parental past can exert on the evolving mother-child relationship. Lieberman, Weston, and Pawl (1991) implemented this model of intervention with a sample of Latina immigrant mothers and their infants, and in the current investigation, the theoretical underpinnings and techniques of this approach (Lieberman, 1992) guided the implementation of TPP as a preventive intervention for depressed mothers and their toddlers. All therapists used an intervention manual that specified the principles and procedures for the TPP implementation.

The structure of TPP is unique in that mothers and their toddlers are seen in conjoint therapy sessions. Through joint observation of the mother and the child, opportunities arise to observe the influence of maternal representations on the character of interactions between mother and child. Therapists must attend to both the interactional and the representational levels as they are manifested in the dyadic therapy sessions. Not only are maternal representations that have evolved from the mother's relationship history viewed as affecting the character of the interactions between her and her child, but also interactions and toddler behaviors evoke maternal representations that influence the mother's reactions to the toddler and her experience of self. Ordinary behaviors between a mother and toddler during therapy sessions are regarded as behavioral manifestations of relationship themes. Through the use of observation and empathic comments, the therapist works toward assisting the mother in recognizing how she experiences and perceives her infant and herself, thereby allowing for correction of distorted perceptions and alterations in how the toddler and the self are experienced. The therapist also attends to the nature of the interactions that occur between the mother and the toddler, the mother and the therapist, and the therapist and the toddler. Interactions in one relationship pair tend to elicit parallel interactions in other relationship pairs, and attention to this parallel process in interactions across relationships and the influence of representations on these interactions provides templates for modifying maternal representations as they are enacted behaviorally in the mother-child relationship.

In the course of this intervention, TPP is designed to provide the mother with a corrective emotional experience in the context of the relationship with the therapist. Through empathy, respect, concern, accommodation, and positive regard, the mother and child are provided with a context in which new experiences of self in relation to others—and, for the mother, in relation to the toddler—can be internalized. If mothers have a generalized negative representational model of self and relationships, then a therapeutic goal is to help them to use more specific representations with regard to various relationship partners, including the toddler. Evolving positive representations of the therapist can be contrasted with maternal representations of self in relation to parents. As the mother is able to reconstruct representations of self in relation to others through the therapeutic rela-

tionship, she also is able to reconstruct and internalize new representations of herself in relation to her child.

Through highlighting, clarifying, and restructuring the dynamic balance between representational and interactional contributions to the quality of the mother-child relationship, improvement in the quality of maternal and child relationship capacities emerges. Moreover, the reorganization of maternal representations of self and of self in relation to others provides a framework for ongoing optimization of mother-child relationship functioning. Therapeutic change thus occurs through expansion of maternal understanding of the effects of prior relationships on current feelings and interactions. Through the development of more positive representational models of self and of self in relation to others, improvements in maternal sensitivity, responsivity, and attunement to the child are found to increase.

In the current investigation, TPP was initiated after the completion of baseline research assessments and the randomization to the DI group. The length of the intervention period averaged 58.19 weeks ($SD = 10.00$) and ranged from 42 to 79 weeks. The mean number of intervention sessions conducted was 45.24 ($SD = 11.16$, range = 30-75). The quality of the implementation of TPP was monitored through weekly individual supervision, weekly group presentations and discussions of videotaped therapy sessions, and monthly monitoring of videotaped sessions for each case. An adherence checklist was used, and any deviations from the standard intervention were immediately addressed with the therapist's supervisor. These procedures ensured the fidelity of the implementation of TPP.

Measures

DIS-III-R (Robins et al., 1985). The DIS-III-R is a structured psychiatric interview designed to assess diagnostic criteria for Axis I disorders of the *DSM-III-R* (American Psychiatric Association, 1987). The interview consists of a series of modules that probe the history of symptoms for different categories of *DSM-III-R* Axis I disorders. Questions are answered on a yes/no basis, which reduces the need for interviewer interpretation. As a result, sensitive clinical judgments are not required, and trained nonprofessional interviewers can conduct the interviews. The DIS-III-R allows for the determination of 49 *DSM-III-R* diagnoses. Diagnoses are generated by computer algorithms, which thereby precludes the need for interrater reliability.

BDI (Beck et al., 1961). The BDI is a 21-item, extensively used self-report measure of current affective, cognitive, motivational, and physiological symptoms of depression. Each item consists of four self-evaluative statements, scored from 0 to 3, with 3 indicating the most intense symptom severity. The BDI correlates with psychiatric ratings of depression in both psychiatric and student samples (Beck, Steer, & Garbin, 1988). Test-retest reliabilities from .48 to .86 among psychiatric patients and from .60 to .83 among nonpsychiatric participants have been reported (Beck et al., 1988). Cutoff scores for different levels of depression severity have been established (0-9: none or minimal, 10-18: mild to moderate, 19-29: moderate to severe, and 30-63: severe; Beck et al., 1988). In the current sample, internal consistencies were .92 and .91 at baseline and follow-up, respectively.

Strange Situation (Ainsworth et al., 1978). During the baseline assessments, the standard Strange Situation was conducted with mothers and toddlers to assess the toddler's attachment organization. Two independent raters each coded all of the videotapes of the individual Strange Situation sessions, and raters were unaware of the diagnostic and group status of individual mother-child dyads. The first coder (Dante Cicchetti) was trained and obtained reliability in Ainsworth Strange Situation coding by Alan Sroufe and Everett Waters and in coding of the disorganized attachment style (D) by Mary Main. The second coder (Fred A. Rogosch) was trained by and obtained reliability with the first coder. Agreement on the Strange Situation classifications for the current sample was 90%. During the course of coding, conferencing occurred when either coder believed the observed videotape was unclear or complex (19% of sessions). Ainsworth et al.'s (1978) criteria for the insecure-avoidant (A), secure (B), and

insecure-resistant (C) classifications were used and supplemented by a developmental systems approach for children ages 18 to 24 months (see code in Gersten, Coster, Schneider-Rosen, Carlson, & Cicchetti, 1986). D classifications were based on the Main and Solomon (1990) criteria.

During the follow-up postintervention assessments at age 3, the standard Strange Situation was again conducted. Coding of all of the videotaped sessions was completed by two independent raters, following the same approach discussed above. Because the follow-up videotapes were coded several years after the coding of baseline sessions, the coders were not aware of the original classifications; they also did not have knowledge of diagnostic or group status. The guidelines from the MacArthur coding system (Cassidy & Marvin, 1992) were used in deriving the attachment classifications. The first coder (Dante Cicchetti) was trained to reliability on the MacArthur system by Robert Marvin; the second coder (Fred A. Rogosch) was trained by and obtained reliability with the first coder. To serve as a further check on reliability, 20% of the postintervention Strange Situation tapes were coded by an individual who had no prior involvement with the investigation (Jody Todd Manly, trained by Ellen Moss). Agreement was 94%. In addition to the B, A, and C classifications, children classified as insecure-controlling, insecure-disorganized, and insecure-other were included in an overarching D classification.

Results

Group Differences in Preintervention Attachment Classification

Substantial differences in attachment classification were found among the DI, DC, and NC groups on the basis of the preintervention Strange Situation assessments, $\chi^2(6, N = 198) = 29.00$, $p < .001$. Table 1 displays the percentage of children in each group with respective attachment classifications. On the basis of the overall classifications, more specific contrasts were conducted. In particular, the percentages of children classified as secure and as insecure were determined for each group, and significant group differences were observed, $\chi^2(2, N = 198) = 28.05$, $p < .001$. As compared with the NC group, in which 55.9% of the children were classified as secure, significantly fewer children were classified as secure in the DI group (16.7%), $\chi^2(1, N = 134) = 22.21$, $p < .001$; and in the DC group (21.9%), $\chi^2(1, N = 132) = 15.97$, $p < .001$.

Table 1
Distribution of Pre- and Postintervention Strange Situation Attachment Classifications by Treatment Group

Attachment classification	Group					
	Depressed intervention		Depressed control		Nondepressed control	
	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>
Preintervention						
Total		66		64		68
Avoidant	36.4	24	28.1	18	19.1	13
Secure	16.7	11	21.9	14	55.9	38
Resistant	9.1	6	9.4	6	5.9	4
Disorganized	37.9	25	40.6	26	19.1	13
Postintervention						
Total		46		54		63
Avoidant	17.4	8	35.2	19	25.4	16
Secure	67.4	31	16.7	9	47.6	30
Resistant	4.3	2	7.4	4	6.3	4
Disorganized	10.9	5	40.7	22	20.6	13

The rate of secure attachment did not differ significantly between the DI and the DC groups, $\chi^2(1, N = 130) = 0.57$. Thus, low rates of secure attachment organization predominated in the two depressed groups, and, as a result of randomization to treatment condition, the rate of insecure attachment was equivalent for these groups.

Given the low percentage of children classified as resistant across the three study groups, no significant differences among the groups were observed for the presence versus absence of Type C attachment classifications. In contrast, a somewhat higher percentage of children in the DI group (36.4%) was classified as avoidant, as compared with the NC group (19.1%), $\chi^2(1, N = 134) = 4.98$, $p < .05$, whereas the DI group did not differ from the DC group (28.1%), $\chi^2(1, N = 130) = 1.01$, *ns*, and the DC and NC groups also did not differ, $\chi^2(1, N = 132) = 1.49$, *ns*. More consistent group differences were found for disorganized attachment classifications, and the rate of disorganized attachment differed significantly among the groups, $\chi^2(2, N = 198) = 8.37$, $p < .015$. Pairwise group comparisons indicated that the DI group (37.9%) and the DC group (40.6%) did not differ in their respective rates of disorganized attachment, $\chi^2(1, N = 130) = 0.10$, *ns*. However, both groups had significantly higher rates of disorganized attachment than the NC group (19.1%), $\chi^2(1, N = 134) = 5.80$, $p < .02$, and $\chi^2(1, N = 132) = 7.33$, $p < .01$, respectively.

When the cases included in the analyses were restricted to children who completed both the preintervention and the postintervention Strange Situation assessments, the same pattern of findings emerged as was observed with the full sample. Furthermore, within each of the three groups, no significant differences were found in the preintervention distribution of attachment classifications for children who completed the postintervention Strange Situation assessments and those who did not. Thus, the retained sample was not biased in terms of baseline attachment classifications.

Group Differences in Postintervention Attachment Classification

The distribution of postintervention attachment classifications is presented in Table 1. Within the Type D category, children classified as disorganized, insecure–other, and controlling were combined. The overall distributions of postintervention attachment classifications differed significantly among the groups, $\chi^2(6, N = 163) = 28.48$, $p < .001$. However, the pattern of group differences had changed markedly. That is, whereas the DC group continued to differ significantly from the NC group, $\chi^2(3, N = 117) = 13.27$, $p < .004$, at postintervention, the DI and the DC groups were now significantly different, $\chi^2(3, N = 100) = 27.49$, $p < .001$, and the DI group no longer differed significantly from the NC group, $\chi^2(3, N = 109) = 4.36$.

The pattern of secure versus insecure classification at postintervention had shifted in accord with the predicted effects of the preventive intervention. Overall, the three groups differed in the rate of secure attachment, $\chi^2(2, N = 163) = 27.00$, $p < .001$. In particular, the rate of secure attachment in the DC group (16.7%) continued to be substantially lower than the rate of security in the NC group (47.6%), $\chi^2(1, N = 117) = 12.54$, $p < .001$. However, at postintervention, the percentage of secure attachments in the DI group (67.4%) was significantly higher than the percentage in the

DC group, $\chi^2(1, N = 100) = 26.63$, $p < .001$, as well as the percentage in the NC group, $\chi^2(1, N = 109) = 4.22$, $p < .04$. We evaluated the critical difference between the DI and DC groups in terms of the strength of the intervention effect by calculating the effect size, h (J. Cohen, 1988), for the difference in proportions of secure attachment at postintervention in the DI and DC groups. The effect size was 1.084, indicating a large treatment effect associated with the intervention.

In terms of group differences for the postintervention distributions of insecure attachment classifications, the rates of avoidant and resistant attachment classifications did not differ among the groups. However, significant differences were observed for disorganized attachment classifications, $\chi^2(3, N = 163) = 12.82$, $p < .002$. Pairwise contrasts indicated that the percentage of disorganized attachment in the DI group (10.9%) at postintervention did not differ from the percentage in the NC group (20.9%), $\chi^2(1, N = 109) = 1.84$, *ns*, but was significantly lower than the percentage in the DC group (40.7%), $\chi^2(1, N = 100) = 11.25$, $p < .001$. Additionally, the rate of disorganized attachment was significantly higher in the DC group than in the NC group, $\chi^2(1, N = 117) = 5.61$, $p < .02$. Thus, for the DI group, disorganized attachment had decreased to rates comparable to those in the NC group and was significantly lower than that observed in the DC group in the absence of the preventive intervention.

Patterns of within-individual stability and change in attachment security also were examined. On the basis of pre- and postintervention Strange Situation classifications, the following four groups were designated: stable secure, insecure to secure, secure to insecure, and stable insecure. The distribution of cases across these stability and change categories differed significantly among the groups, $\chi^2(6, N = 163) = 59.60$, $p < .001$ (see Table 2).

To demonstrate the efficacy of the intervention, the pattern of change from insecure to secure is of primary importance. Overall, comparison of the groups on the percentage of cases who did or did not change from insecure to secure indicated a substantial group difference, $\chi^2(3, N = 163) = 35.30$, $p < .001$. Group contrasts indicated that the rate of change from insecure to secure was significantly higher for the DI group (54.3%), as compared with the DC group (7.4%), $\chi^2(1, N = 100) = 26.58$, $p < .001$, as well as compared with the NC group (14.3%), $\chi^2(1, N = 109) = 19.88$, $p < .001$. The DC and the NC groups did not differ significantly, $\chi^2(1, N = 117) = 1.39$. Thus, a distinguishing

Table 2
Pre- to Postintervention Stability and Change in Secure Versus Insecure Attachment Classification

Stability/change pattern	Group					
	Depressed intervention		Depressed control		Nondepressed control	
	(n = 46)		(n = 54)		(n = 63)	
	%	n	%	n	%	n
Stable secure	13.0	6	9.3	5	33.3	21
Insecure to secure	54.3	25	7.4	4	14.3	9
Secure to insecure	0.0	0	11.1	6	20.6	13
Stable insecure	32.6	15	72.2	22	31.7	13

feature of the DI group was the extent to which attachment organizations changed from insecure to secure. In terms of the effect size, the greater degree of change from insecure to secure attachment in the DI group relative to the DC group constituted a large effect size ($h = 1.11$).

In contrast to the DI group, the predominant feature of the DC group was the stability of insecure attachment; 72.2% of the children in this group were classified as insecure at both the pre- and the postintervention assessments. This pattern was observed significantly more often in the DC group than in the DI group (32.6%), $\chi^2(1, N = 100) = 15.69, p < .001$, and than in the NC group (31.7%), $\chi^2(1, N = 117) = 19.06, p < .001$. Thus, in the absence of intervention, stable insecure attachments were most characteristic of the DC group.

Patterns of stability and change also were examined for children who were classified as disorganized at baseline. In particular, patterns of stable disorganized attachment, change to another insecure classification, and change to secure attachment were determined, and the three study groups were contrasted (see Table 3). Significant group differences in the rates of these patterns were observed, $\chi^2(4, N = 55) = 14.34, p < .01$, and these differences were a result of significant variation between the DI and the DC groups. In the DI group, 58.8% of the children classified as disorganized prior to the intervention changed to secure following the intervention, as compared with 8.0% of the DC group. Furthermore, stability of disorganized attachment classification was more prevalent in the DC group (56.0%) than in the DI group (11.8%). Thus, not only for insecure attachment generally but also for disorganized attachment specifically, the intervention contributed to significantly greater rates of change to secure attachment in the DI group, whereas stability of disorganized attachment was more likely in the DC group.

Effects of Subsequent Maternal Depression, Depression Features, and Other Treatment on Stability and Change in Attachment

We further examined the potential for subsequent episodes of maternal depression to influence the efficacy of the preventive intervention. First, we examined whether participation in TPP influenced the likelihood of mothers experiencing a depressive episode between the initial and follow-up assessments. On the basis of the follow-up DIS-III-R interview, 30.4% of the DI group mothers and 35.2% of the DC group mothers had experienced a subsequent depressive episode, and these rates of further depres-

sion were not significantly different, $\chi^2(1, N = 100) = 0.25$. Similarly, although the level of BDI depressive symptoms at follow-up had decreased for both groups, the BDI symptoms for the DI ($M = 10.39, SD = 8.99$) and the DC groups ($M = 9.94, SD = 7.85$) at follow-up did not differ, $t(98) = 0.63, ns$. Although we did not observe intervention effects on maternal depression status and symptom severity, we considered the potential moderating role of mothers having had a subsequent depressive episode on the efficacy of the intervention. Accordingly, within the DI group and the DC group, dyads in which the mother had and had not experienced a subsequent depressive episode were contrasted on the rates of becoming secure, maintaining an insecure attachment, and maintaining a disorganized attachment. Within both the DI and the DC groups, none of these contrasts were significant. Similarly, the recency of MDD at baseline, comorbidity, and onset prior to the child’s birth did not influence attachment outcomes. Thus, recurring maternal depression did not affect the efficacy of the preventive intervention within the DI group; the children’s attachment organization improved irrespective of further maternal depression. Similarly, subsequent maternal depression did not exacerbate the insecure attachment outcomes in the DC group. Moreover, other features of maternal depression and mental health did not account for attachment differences in the two groups.

Whether depressed mothers who received treatment in addition to the TPP intervention for the DI group influenced attachment outcomes also was evaluated. With the DI and the DC groups, involvement in other psychotherapeutic interventions during the period from baseline to follow-up did not significantly influence the observed patterns of becoming secure, maintaining an insecure attachment, or maintaining a disorganized attachment in the respective groups. Accordingly, additional treatment did not appear to influence the observed attachment outcomes differentially.

Discussion

Consistent with our hypotheses, maternal depression was found to be related to insecure attachment relationships in offspring. Prior to the initiation of the intervention, offspring in the DI and DC groups both had higher rates of attachment insecurity than did offspring in the NC group, and insecurity did not differ between the DI and DC groups. Rates of disorganized attachment were similarly elevated in the DI and DC groups as compared with the NC group.

Following the completion of the TPP intervention, offspring in the DI group evidenced increased attachment security compared

Table 3
Stability and Change in Attachment Classification for Children Classified as Disorganized at Preintervention (n = 55)

Stability/change pattern	DI		DC		NC		Contrast	$\chi^2(2)$
	%	n	%	n	%	n		
Stable disorganized	11.8	2	56.0	14	38.5	5	DI vs. DC	14.48***
Change to other insecure	29.4	5	36.0	9	30.8	4	DI vs. NC	3.50
Change to secure	58.8	10	8.0	2	30.8	4	DC vs. NC	3.40

Note. DI = depressed intervention; DC = depressed control; NC = nondepressed control.
*** $p < .001$.

with offspring in both the DC and the NC groups. Thus, offspring with depressed mothers who participated in TPP actually had more secure attachment relationships than did offspring of well mothers. Moreover, although differences in avoidant and resistant attachments were not evident across groups, differences did emerge with respect to disorganized attachment, with the DI and NC groups having lower levels of disorganized attachment than offspring in the DC group. Important differences also emerged when we examined changes in attachment security. Offspring in the DI group evidenced significantly higher rates of change from insecure to secure than did offspring in either the DC or the NC groups. It is important to note that the highest rate of stable insecure attachment was found for offspring in the DC group.

Taken in tandem, these results compellingly demonstrate the efficacy of TPP in fostering secure attachment relationships in offspring of depressed mothers. The stability of insecure attachments in offspring in the DC group underscores the importance of providing preventive intervention to this high-risk group. Moreover, the ability to modify disorganized attachment is particularly important in view of concerns that this is the most detrimental form of insecure attachment with respect to future adaptation (Lyons-Ruth et al., 2002). In fact, the efficacy of TPP in modifying disorganized attachment is consistent with findings that treating parental depression is insufficient to improve parenting behaviors (Teti et al., 1995; Weinberg & Tronick, 1998). Rather, in addition to treatment of the symptoms of depression, the relationship between parent and child also must be a focus of intervention (Lyons-Ruth, Wolfe, & Lyubchik, 2000).

Because TPP is one of the first interventions for offspring of depressed mothers that has been shown to promote secure attachment as well as to modify disorganized attachments to secure attachments, it becomes important to examine details of the intervention that might have contributed to its success. First, given that the intervention was designed as an efficacy study, co-occurring risk factors were minimized. Despite the presence of an MDD, all mothers had fewer stressors than is typical in the general population of depressed women with young children. The majority of women were married, well educated, and financially comfortable. The presence of fewer risk factors enabled therapists to focus on the implementation of TPP in the absence of crisis situations that would require departure from the therapeutic protocol. Thus, the efficacy of the current preventive intervention when compared with prior investigations also may be a function of sample characteristics. This reasoning is consistent with that contained in an edited volume by Berlin, Ziv, Amaya-Jackson, and Greenberg (2005) on enhancing early attachments. Because co-occurring risk factors were minimized, therapists were able to focus on the mother-child relationship without needing to attend to issues associated with poverty, substance abuse, or domestic violence. When populations have more extreme needs beyond maternal depression, a more multifaceted and less focused intervention is likely to be necessary. Therefore, a "purer" dose of attachment-focused intervention may account for the positive results attained in the current investigation.

Second, all therapists received extensive training and supervision, the intervention was manualized, and the fidelity of the intervention was monitored closely. As this intervention becomes exported to community settings, it will be important to identify modifications that may be necessary to maintain effectiveness

while addressing increases in contextual risk factors. Finally, the flexibility in the delivery of intervention that is inherent in TPP might have contributed to its efficacy. Emerging research is demonstrating that disorganized child attachment and the parent-child interactions associated with disorganization may be present in at least two subgroups of parenting, one involving hostile, intrusive, frightened, or frightening behaviors and the other being characterized by withdrawn, inhibited interactions (Lyons-Ruth et al., 2002). Although TPP was manualized, it enabled therapists to closely observe parent-child interaction and to incorporate knowledge of interactional difficulties into the delivery of the intervention.

It is interesting that additional episodes of maternal depression did not moderate the effects of the intervention. It may be that mothers became increasingly able to cope with depressive episodes and that the quality of their caregiving was not adversely affected as a function of recurrent depression. However, the fact that further depressive episodes also were not related to attachment security in the DC group mitigates against this explanation. These results also could suggest that it is not the timing of maternal depression at this stage of child development per se that influences attachment but rather the larger issue of parent-child relationship problems that exist for mothers with a history of depression, regardless of whether symptoms are present.

The fact that the preventive intervention did not alleviate maternal depression also warrants discussion. As noted previously, the preventive intervention was not designed to address depression, and mothers were free to seek treatment for their depression. Therefore, the lack of impact of TPP on maternal depression is not surprising. Moreover, these results are somewhat consistent with research that has found that adults with earned secure attachment organizations are not protected from the experience of inward distress and symptomatology, even though their children are indistinguishable from those of continuous secure adults (Cowan, Cowan, Cohn, & Pearson, 1996).

Because co-occurring risk factors were minimized, the generalizability of these results to higher risk samples cannot be assumed. A number of other limitations also must be acknowledged. Although a significant amount of attrition occurred during the course of the investigation, it is important to recognize that this was largely a self-referred sample and that, therefore, motivation to participate was not enhanced or encouraged by any external service providers. Because only a single form of intervention was provided, it also is not possible to conclusively prove that the outcomes were specific to an attachment-theory-informed mode of intervention. However, two investigations with maltreated populations provide some perspective on this issue. In a study of the efficacy of two models of intervention, one consistent with TPP and one more psychoeducational in nature, Cicchetti, Rogosch, and Toth (2006) found that both were effective in promoting secure attachment in infants. Conversely, however, in a similar two-intervention design with preschool-aged children, only the attachment-theory-informed intervention was found to foster positive representations of self and of caregivers (Toth, Maughan, Manly, Spagnola, & Cicchetti, 2002). Thus, it may be that the theoretical underpinnings of the intervention become increasingly important as children become older and more likely to generalize their internal working models to other relationships. In contrast to the assumption that "sensitive" periods exist during infancy

whereby the attachment relationship becomes less amenable to change, the results of Toth et al. (2002) suggest that, at least during the preschool years, the mother–child relationship remains open to reorganizations when intervention is directed at the relationship. This remains an important area that requires further investigation.

Remaining questions involve identifying processes that contribute to the efficacy of the intervention. In addition to establishing that an intervention has attained its goals, delineating how an intervention works and for whom it is most effective constitutes a second step in understanding the intervention change process. Identifying the mediators and moderators of intervention efficacy (Hinshaw, 2002) is important for a full appreciation of how TPP promotes secure attachment reorganization. However, mediators and moderators of the efficacy of TPP have yet to be identified. Mediators of intervention efficacy involve processes that change as a result of an intervention and explain treatment group differences. In the current investigation, given the evidence of the role of parenting for attachment organization regardless of parental depression, improvement in mother–child interaction emerges as an important potential mediator. Coded observations of mother–child interaction independent of the Strange Situation are not currently available, and future research to examine this possibility is warranted. Although we did not find evidence of recurrent maternal depression as a moderator of intervention efficacy, other potential moderators should be considered. For example, the role of fathers may be important. To date, paternal depression, as well as the role of fathers in mitigating against or contributing to the effects of maternal depression on offspring, has received far too little attention (Phares, 1992, 1996). This is an important area that deserves investigation and that also may provide promising avenues for the development of preventive interventions as well as for understanding intervention efficacy. In addition, it is important for future investigations to examine the relation between attachment security and other child outcome variables.

The current investigation contributes to the body of research that highlights the pernicious effects that parental depression can exert on early attachment relationships. It also provides compelling evidence regarding the malleability of attachment insecurity and demonstrates that even disorganized attachments can be modified to secure attachments as a function of the provision of intervention. Because far too few interventions for depressed women consider the needs of infants and toddlers, the current investigation also possesses important social policy implications. It is unacceptable to treat only the diagnosed depression of a parent without considering the impact of parental depression on offspring. It is equally problematic to wait until significant behavioral or emotional problems emerge in children to initiate intervention. Rather, as a society we must become increasingly proactive in preventing psychopathology prior to its emergence.

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New Editors Appointed, 2008–2013

The Publications and Communications Board of the American Psychological Association announces the appointment of six new editors for 6-year terms beginning in 2008. As of January 1, 2007, manuscripts should be directed as follows:

- *Behavioral Neuroscience* (www.apa.org/journals/bne), **Ann E. Kelley, PhD**, Department of Psychiatry, University of Wisconsin–Madison Medical School, 6001 Research Park Boulevard, Madison, WI 53719.
- *Journal of Experimental Psychology: Applied* (www.apa.org/journals/xap), **Wendy A. Rogers, PhD**, School of Psychology, Georgia Institute of Technology, 654 Cherry Street, Atlanta, GA 30332-0170.
- *Journal of Experimental Psychology: General* (www.apa.org/journals/xge), **Fernanda Ferreira, PhD**, The School of Philosophy Psychology and Language Sciences, The University of Edinburgh, 7 George Square, Edinburgh EH8 9JZ, United Kingdom.
- *Neuropsychology* (www.apa.org/journals/neu), **Stephen M. Rao, PhD**, Division of Neuropsychology, Medical School of Wisconsin, 8701 West Watertown Plank Road, Medical Education Building, Room M4530, Milwaukee, WI 53226.
- *Psychological Methods* (www.apa.org/journals/met), **Scott E. Maxwell, PhD**, Department of Psychology, University of Notre Dame, Notre Dame, IN 46556.
- *Psychology and Aging* (www.apa.org/journals/pag), **Fredda Blanchard-Fields, PhD**, School of Psychology, Georgia Institute of Technology, 654 Cherry Street, Atlanta, GA 30332-0170.

Electronic manuscript submission. As of January 1, 2007, manuscripts should be submitted electronically via the journal's Manuscript Submission Portal (see the Web site listed above with each journal title).

Manuscript submission patterns make the precise date of completion of the 2007 volumes uncertain. Current editors, John F. Disterhoft, PhD, Phillip L. Ackerman, PhD, D. Stephen Lindsay, PhD, James T. Becker, PhD, Stephen G. West, PhD, and Rose T. Zacks, PhD, respectively, will receive and consider manuscripts through December 31, 2006. Should 2007 volumes be completed before that date, manuscripts will be redirected to the new editors for consideration in 2008 volumes.