

Maternal Depression and the Quality of Early Attachment: An Examination of Infants, Preschoolers, and Their Mothers

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Relations between maternal depression and attachment security among 50 infant–mother and 54 preschool child–mother dyads were examined using the classification system of M. D. S. Ainsworth, M. C. Blehar, E. Waters, and S. Wall (1978) and M. Main and J. Solomon (1990) for infants and the Preschool Assessment of Attachment (P. M. Crittenden, 1992b) for preschoolers. Attachment insecurity was significantly associated with maternal depression among infants and preschoolers. Furthermore, children without unitary, coherent attachment strategies tended to have more chronically impaired mothers than did children with coherent, organized attachment strategies. Results stress the importance of severity–chronicity of parental illness in the study of depression and early attachment relations, and that differences between children with and without coherent, organized attachment strategies are as clinically informative as are differences between secure and insecure children.

Maternal depression is a potent risk factor in the development of childhood psychopathology (Downey & Coyne, 1990). Preschool- and school-age children of depressed mothers show elevated rates of both depressive and nondepressive psychiatric symptomatology compared with the children of nondepressed controls (see reviews by Downey & Coyne, 1990, and Gelfand & Teti, 1990), even when the severity of parental depressive symptomatology attenuates (Billings & Moos, 1985; Lee & Gotlib, 1991).

Genetic factors aside, theoretical mechanisms addressing the transmission of psychopathology from depressed parents to their children center on the parent–child relationship (Gelfand & Teti, 1990). The present study focuses on this relationship,

and in particular the attachment relationship between infant and preschool-age children and their depressed mothers. Early insecure attachment has been consistently associated with unresponsive, rejecting, and insensitive parenting (see Teti & Nakagawa, 1990, for a review), which may characterize depressed mothers. Compared with control women, depressed women's maternal behavior has been characterized as less responsive, more helpless, hostile, critical, alternatively disengaged or intrusive, disorganized and less active, avoidant of confrontation, and generally less competent with their children (Gelfand & Teti, 1990; Goodman, 1992).

Children of depressed mothers nevertheless display quite heterogeneous outcomes, and a major challenge to developmental researchers has been to elucidate the processes underlying this diversity. The nature of the attachments that develop between children and their mothers may be important in accounting for these individual differences in adjustment. In this study, we were specifically concerned with how the quality of infants' and preschoolers' attachments related to the severity of maternal depressive symptomatology during the period of attachment formation. Severity and chronicity of parental depressive symptoms appear to have considerably more explanatory power than parental diagnosis per se in accounting for the diversity in developmental outcomes of children of affectively disturbed parents (Keller et al., 1986; Sameroff, Seifer, & Zax, 1982). The present study examined the relation of specific attachment patterns in infants and preschoolers to the severity and chronicity of maternal depressive symptomatology, mothers' reports of stress in the parent–child subsystem, and the quality of maternal behavior with their children during the children's first 2 to 3 years of life.

To date, most studies relating maternal depression to early attachment have used the Strange Situation paradigm (Ainsworth,

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Blehar, Waters, & Wall, 1978), a 21–24-min laboratory procedure during which young children's behavior is examined during brief separations from and reunions with their mothers. Using this procedure with a comparatively low-risk, nondepressed sample, Ainsworth identified three basic infant attachment patterns—secure (Type B), insecure–avoidant (Type A), and insecure–ambivalent (Type C),—which Main and Solomon (1990) viewed as coherent, organized strategies used by infants to access their attachment figures in times of stress. This and later work found Type B attachment patterns to relate to empathic, sensitive parenting and Type A and Type C attachments to insensitive, unresponsive parenting (Teti & Nakagawa, 1990). Main and Solomon (1990) added a fourth category, disorganized–disoriented (Type D), to describe infants who lack a coherent strategy for accessing their attachment figures and who show confused, conflictual, or fearful behavior in the Strange Situation. Disorganized attachments have been found to be particularly prevalent among infants in environmentally high-risk samples characterized, for example, by very low income, child maltreatment, or parental alcoholic consumption (Carlson, Cicchetti, Barnett, & Braunwald, 1989; Cicchetti & Barnett, 1991; Lyons-Ruth, Connell, Grunebaum, & Botein, 1990; Lyons-Ruth, Connell, Zoll, & Stahl, 1987; Lyons-Ruth, Repacholi, McLeod, & Silva, 1991; Rodning, Beckwith, & Howard, 1991; Spieker & Booth, 1988) and may figure prominently in studies of attachment among infants of depressed parents, especially under conditions of prolonged and severe parental impairment. However, Main and Solomon suggested that attachment coding guidelines for identifying Types A, B, C, and D may be inappropriate beyond 21–22 months of age because of the social–cognitive sophistication of children by the end of the second year. Thus, they advised caution in applying their criteria for identifying the disorganized–disoriented children beyond 21 months of age, and at least two attachment coding systems have recently been developed that attempt to account for the more advanced social–cognitive skills of preschool-age children (Cassidy et al., 1991; Crittenden, 1992b).

Several studies, using infancy classification guidelines, have reported associations between maternal depression status and early attachment security, and also between more severe and chronic depression and disorganized attachment behavior. Campbell, Cohn, Meyers, Ross, and Flanagan (1993) found insecure attachments among infants to be associated with mothers whose postpartum depression lasted beyond the first 6 months after their infant's birth. Gaensbauer, Harmon, Cytryn, and McKnew (1984) reported an increasing trend toward insecure attachment from 12 to 18 months of age in a small sample ($n = 7$) of infants with at least one parent with bipolar depression. Similar relations were found by Radke-Yarrow, Cummings, Kuczynski, and Chapman (1985) using a modified Strange Situation procedure, and they also reported higher proportions of children of more severely impaired mothers classified as Type A/C, displaying a combination of avoidance and resistance during mother–child reunions. These children were classified before the advent of published criteria for identifying the disorganized–disoriented baby, but it is likely that at least some of these children would have satisfied the “combined avoidance and resistance” criterion of Main and Solomon's (1990) disorganized–disoriented category.¹ More recently, Lyons-Ruth et al.'s (1990) intervention study of low-income urban mothers

with caretaking difficulties found a significantly higher proportion of disorganized attachments among infants of depressed, untreated mothers than among infants in matched groups of depressed treated mothers and nondepressed controls.

Only two studies are currently available assessing relations between maternal depression and attachment security among preschoolers. In a follow-up study of their original 1985 sample (Radke-Yarrow et al., 1985), DeMulder and Radke-Yarrow (1991) recoded their modified Strange Situation data using infancy attachment classification guidelines for children under 30 months and the Cassidy–Marvin guidelines for children over 30 months, and they then combined infants and preschoolers into a single group before analyses. After recoding, there were significantly higher proportions of insecure attachments among children of depressed mothers diagnosed with bipolar disorder than among children of unipolar depressed and control mothers, and disorganized attachments were associated with the most adverse environments. However, this study did not report separate results for the under-30 and over-30-month-old subgroups. A subsequent report by Frankel, Maslin-Cole, and Harmon (1991), also using the Cassidy et al. (1991) procedure, found no relations between maternal depression and attachment security among 3-year-olds, although significantly higher levels of insecure attachments were found among children of mothers with more chronic, severe psychiatric impairment.

The present study examined security of child–mother attachment in two groups of child–mother dyads, one composed of depressed mothers who were in therapy at the time of recruitment, and the other composed of community-matched, nondepressed controls. We anticipated that many of the depressed mothers so recruited would likely be chronically depressed throughout their children's first and second years, thus enabling a test of relations between young children's attachment status and the chronicity–severity of maternal illness.

In an attempt to use developmentally relevant attachment coding guidelines, the present study separately assessed depression–attachment relations for children under 21 months of age using infancy classification guidelines established by Ainsworth et al. (1978) and Main and Solomon (1990), and for children 21 months of age and older using a newly developed preschool attachment classification system, the Preschool Assessment of Attachment (PAA; Crittenden, 1992a, 1992b, 1992c). Although based on Ainsworth's original formulations, the PAA

¹ There has been disagreement regarding whether the A/C classification should be viewed as an organized attachment category, in which the mix of avoidance and resistance is strategic and predictable on the basis of an ongoing mother–infant exchange, or whether this pattern is evidence of disorganization, as suggested in Main and Solomon (1990). We followed Main and Solomon's scoring criteria for identifying D babies, which incorporate mixed avoidance and resistance within the D attachment category as one exemplar of conflictual, disorganized behavior vis-à-vis the attachment figure. Crittenden's (1992a) Preschool Attachment System (PAA), however, regards the A/C classification among preschoolers as a distinct, organized, strategic category that can be distinguished from nonstrategic attachment patterns. Additional research is needed to explore the equivalence or nonequivalence of the D and A/C attachment categories within the infancy and preschool periods of development.

takes into account preschool-age children's ability to engage in more developmentally complex forms of communication and negotiation. It identifies four basic preschool attachment strategies: *defended* (Type A, with subtypes inhibited, compulsively caregiving, and compulsively compliant), *secure* (Type B, with subtypes secure reserved, secure comfortable, and secure reactive), *coercive* (Type C, with subtypes threatening, disarming, punitive, and helpless), and *defended-coercive* (Type A/C). A fifth category, *anxious depressed* (Type AD), is a category that may be especially relevant to the preschoolers of depressed mothers in the present study because it is identified by a variety of depressivelike features such as sad or flat affect, lethargy, or panic on separation, embedded within a framework of nonstrategic behavior. Finally, *insecure other* (Type IO) describes children whose behavior does not fit into any of the A, B, C, or A/C patterns and who make use of inadequate or inappropriate use of one or more strategies in relating to the parent. Thus, AD and IO categories are conceptually analogous to Main and Solomon's (1990) D classification, as broadly conceived, in identifying children who do not evince prototypical, coherent strategies vis-à-vis their attachment figures. Crittenden's (1992a, 1992b, 1992c) conceptualization of attachment in the preschool years deemphasizes the notion of long-term disorganization and proposes that much preschool attachment behavior that might have been identified as disorganized using other systems (e.g., Cassidy et al., 1991) can be reliably placed into one of the several coherent, organized preschool strategies (i.e., defended, secure, coercive, or defended-coercive).

Although the PAA is newly developed, evidence for its construct validity is accruing rapidly. Crittenden (1993) found secure attachments to be associated with supportive home environments and warm fathers, whereas defended attachments were associated with neglect and emotional abuse. In addition, in Fagot's (1993) longitudinal study in which children were classified at 18 months using Ainsworth et al.'s (1978) infancy classification system and at 30 months using the PAA, changes from a secure strategy in infancy to a coercive strategy in preschool co-occurred with major transitions in parental relationships during that same time. Finally, Ziegenhain and Rauh (1993) found PAA attachment classifications of 21-month-olds to relate more predictably and reliably to the quality of maternal behavior assessed at 3 and 12 months of the children's age than did classifications at 21 months based on Ainsworth et al. (1978) and Main and Solomon (1990).

Predictions

1. It was predicted that maternal depression would relate to infants' and preschoolers' security status, with significantly higher percentages of insecure children having depressed mothers. In addition, we hypothesized that depressed mothers and mothers of insecure children would show impaired functioning compared with nondepressed mothers and mothers of secure children, as revealed by less optimal scores on self-report measures of parenting stress and on objective assessments of mother-child interaction.

2. We expected that disorganized attachments in infancy would be particularly associated with chronic and severe maternal impairment, as indexed by self-reported depression, parent-

ing stress, and objective ratings of mother-child interaction. Testing for differences between D and other groups of infants, in addition to testing for secure-insecure differences, underscores our belief that distinguishing between infants with and without organized attachment strategies may be just as fruitful and clinically informative as examining for differences between secure and insecure infants. Indeed, having an organized strategy for accessing an attachment figure, albeit an insecure one, is arguably more advantageous than lacking an organized strategy in terms of the degree to which infants are at risk for later psychopathology (Lyons-Ruth et al., 1991).

3. We also explored whether more chronic and severe maternal depression would be associated with classifications of anxious depressed (AD) and insecure other (IO) using the PAA system with the preschoolers. Because of the sadness, lethargy, listlessness, and panic on separation that describe AD children, and because both of these classifications are characterized by a lack of prototypical, coherent strategy use, AD and IO preschoolers, like D infants, may be at particularly high risk not simply in terms of the mother-child relationship but also for the development of psychopathology over the long term.

Method

Participants

One-hundred forty-nine mothers (91 depressed, 58 nondepressed) and their first-year, physically healthy infants were recruited to participate in an ongoing longitudinal investigation of maternal depression and child development. All of the depressed mothers were in therapy at recruitment, and all but 3 were referred to the project by their therapists, who reported that 85% to 90% of the mothers they approached agreed to participate. Therapists were notified of the project by the project coordinator, who met periodically with Salt Lake Valley Mental Health facilities across Salt Lake Valley (Utah) and with private therapists in a variety of other settings. Therapists were informed that the purpose of the project was to assist mothers in fostering good relationships with their young children. Therapists were asked to describe the project to any mother with unipolar depression with an infant in the first year and to ask if the mother wished to obtain more information about the project. Names of interested mothers were given to the project coordinator, who in turn contacted the mothers directly by telephone to provide additional details. Three depressed mothers, also in therapy, were recruited from newspaper advertisements. In an attempt to provide a rough group match on demographics, nondepressed control mothers and their infants were recruited from the same neighborhoods as the depressed mothers with the help of the Utah Department of Vital Statistics. Fifty-two of the 91 depressed mothers originally recruited were assigned to receive a home-based intervention program (involving 29 home visits by trained public health nurses) designed to improve maternal self-efficacy and mothering skills with their children (see Gelfand & Teti, 1989; Gelfand et al., 1993, for details about this program). The remaining 39 depressed mother-child dyads served as depressed controls.

Of the 149 families originally recruited, the present study is based on a subsample of 104 families (61 depressed mothers, 43 nondepressed mothers) for which both Time 1 and Time 2 data were collected. The final subsample was 95% White, 4% Hispanic, and 1% African American. Seventy-three percent of the mothers were Latter Day Saints, or LDS (Mormon). Mothers ranged in age at recruitment from 18.5 to 45.4 years ($M = 30.27$, $SD = 5.42$), and infants (60% male; 40% female) ranged from 3 to 13 months ($M = 7.16$ months, $SD = 2.74$).

Seventy-nine percent of the mothers had completed more than 12 years of schooling, and most (82%) of the mothers were married. Mothers with depression had been given a *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev. [DSM-III-R]; American Psychiatric Association, 1987) diagnosis of unipolar depression from their therapists (71% with major depression, 16% with dysthymia, and 13% with various adjustment disorders having depression as a major feature).² Mothers with bipolar affective illness, acting-out personality disorders, or substance abuse were excluded. At recruitment, depressed mothers had a mean Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) score of 22.75 ($SD = 10.73$), reflecting moderate-to-severe depressive symptomatology (Beck, Steer, & Garbin, 1988). Eighty-five percent of the depressed mothers reported being previously depressed, with the mean lengths of their previous and present depressive episodes to be 9.43 and 8.10 months, respectively. Forty-seven percent of the depressed mothers reported taking antidepressant medication. Mothers in the nondepressed group had a mean BDI score of 6.81 ($SD = 4.69$), reflecting a level of depressive symptomatology in the subclinical range (Beck et al., 1988).

Procedure

Time 1 assessments. After recruitment, a research assistant conducted a telephone interview with all of the depressed mothers to obtain information regarding their psychiatric history, use of medication, and current level of depression. Before implementation of the intervention program, mothers in all groups were then visited in their homes three times over a 1-month period by either one or two research assistants who were unaware of mothers' group status and all other maternal data. Each home visit lasted between 1.5 and 2 hr. Visitors established rapport with the mothers during the first visit with a semistructured interview that inquired about the mothers' recent pregnancy, labor, and delivery. During the three home visits, mothers completed questionnaires assessing demographic characteristics (including race, religion, marital status, maternal and child age, sex of child, educational attainment, employment status, and yearly family income), mothers' level of depression (BDI; Beck et al., 1961), and two subscales from the child domain of the Parenting Stress Index (PSI; Abidin, 1986). The two PSI subscales included Mother Reinforcement, which measured parenting stress about the degree to which mothers felt rewarded by their children, and Acceptance of Child, which tapped parenting stress relating to mothers' difficulty in accepting their children as they are. For each mother, scores from these two subscales were summed to create a child-focused parenting stress score, in which higher scores indicated higher feelings of stress. The BDI and PSI each have well-established psychometric credentials (Abidin, 1986; Beck et al., 1988).

On the second home visit at Time 1, maternal behavior was assessed in 10-min observations of feeding and free play with Shelcore Toys' "Infant Soft Play Set." In each of these observations, maternal behavior was rated on five 5-point Likert-type rating scales developed by Zoll, Lyons-Ruth, and Connell (1984). These scales, which were based on the work of Ainsworth et al. (1978) and Crittenden (1981), were chosen because of their relation to a "good mothering" construct and included *maternal sensitivity* (the ability to read and respond appropriately to child signals), *warmth* (affection toward the child), *flatness of affect* (degree of impassive, expressionless affect displayed in facial expressions and voice tone), and *disengagement* (disconnectedness from child in terms of body position, pacing, or control of interaction). Previously, Lyons-Ruth, Zoll, Connell, and Grunbaum (1986) reported that severity of maternal depression was predictably related to mothers' flatness of affect and intrusiveness during interactions with their infants, which supported the construct validity of the scales.

Interrater reliability for the maternal behavior rating scales was computed using Pearson and intraclass correlation statistics (Winer, Brown,

& Michels, 1991), based on 38 mother-child dyads. Pearson correlations among the two graduate trainers and undergraduate raters ranged from .77 to .80 ($M = .79$) for the four ratings of feeding interaction, and from .67 to .80 ($M = .72$) for the four ratings of free play. Because these eight scales collectively assessed mothers' overall behavioral competence with their babies and had high internal consistency (Cronbach's $\alpha = .91$ at Time 1 and .89 at Time 2), a composite measure of maternal behavior, *maternal behavioral competence*, was created by adjusting the ratings as needed so that higher scores reflected more competent, expressive, and affectionate mothering, and then summing the eight ratings for each mother. Interrater reliability on this composite was quite adequate (Pearson $r = .87$, intraclass $r = .74$), and thus maternal behavioral competence was used as the measure of mothers' behavior in analyses.

Time 2 assessments. Depressed intervention mothers received the intervention program during the year following completion of the Time 1 assessments. Approximately 13 months following recruitment, mothers and their children were again visited three times in their homes and were reassessed with the Time 1 questionnaire and observational measures. In addition, mothers brought their children to the university laboratory and were videotaped in the Strange Situation procedure (Ainsworth et al., 1978), a seven-episode procedure designed to assess the quality of children's attachment to their mothers by examining the child's behavior during separations from and reunions with the mother and a female stranger. Each episode of the Strange Situation procedure was 3 min in length, although separation episodes were curtailed if the child became obviously distressed.

All Strange Situation videotapes were scored by D.M.T., who was unaware of all maternal identifying data. Children under 21 months of age ($n = 50$) were classified by using criteria for secure (Type B, with four subtypes), insecure-avoidant (Type A, with two subtypes), and insecure-ambivalent (Type C, with two subtypes) categories set forth by Ainsworth et al. (1978), with appropriate modifications used for children 18 to 21 months of age (Schneider-Rosen, 1990), and with Main and Solomon's (1990) criteria for the disorganized-disoriented (Type D) category. Previous training on the D classification was provided to D.M.T. and his laboratory staff by Dante Cicchetti. Infants given D classifications were also given a best-fitting subclassification of A, B, C, A/C, or U (unclassifiable) following procedures outlined by Main and Solomon (1990). Secure, or Type B babies (with four subtypes), typically greet their mothers on reunions and show some proximity seeking and contact maintenance behavior with the mother with low levels of avoidance and anger. If distressed, Type B babies are typically consoled quickly on contact with mother and are able to move fluidly back into exploration, with periodic checks on the mothers' whereabouts. Attachment theorists maintain that such babies exhibit an appropriate balance between the attachment and exploratory behavioral systems and can use their mothers as a secure base from which to explore (Ainsworth et al., 1978; Sroufe & Waters, 1977). By contrast, avoidant, or Type A babies (with two subtypes), conspicuously avoid their mothers during reunions, by snubbing mothers, avoiding eye contact, and ignoring mothers' social bids. Ambivalent, or Type C babies (with two subtypes), display conspicuous anger toward their mothers during reunions, as exemplified by their inconsolability despite mothers' best attempts to

² Forty-nine percent of the depressed mothers in this study were referred by Salt Lake Valley Mental Health therapists, whose diagnoses were discussed and reviewed during full staff meetings, and were secondarily reviewed by the chief psychologist or psychiatrist at each facility. The remaining depressed mothers were referred by local social service and other mental health agencies or by private therapists. We believe the present sample of depressed mothers represents a typical outpatient sample of middle-class White depressed women with small children.

soothe them, rejections of mothers' offers of toys, and persistent pouting or whining. Disorganized–disoriented, or Type D babies, show behavior indicative of conflict, fear, and confusion in relation to their attachment figures and are identified by a variety of indexes including (from Main & Solomon, 1990, pp. 136–140) sequential or simultaneous display of contradictory behavior patterns; undirected, misdirected, incomplete, and interrupted movements and expressions; stereotypes, asymmetrical movements, mistimed movements, and anomalous postures; freezing, stilling, and slowed movements and expressions; and direct indexes of apprehension, disorganization, or disorientation. Interrater reliability on 24 mother–infant dyads was established between D.M.T. and another trained coder (again unaware of all mother–infant identifying data) from D.M.T.'s laboratory and was found to be adequate ($\kappa = .84$ on major category). Disagreements on classifications were resolved through discussions leading to consensus judgments.

Children 21 months of age and older ($n = 54$) were classified using the PAA system (Crittenden, 1992a). D.M.T. received training on the PAA system classification criteria from Pat Crittenden. Preschoolers in this sample were classified as secure (Type B, with subtypes reserved, comfortable, and reactive), defended (Type A, with subtypes inhibited, compulsively caregiving, and compulsively compliant), coercive (Type C, with subtypes threatening, disarming, punitive, and helpless), defended–coercive (Type A/C), anxious depressed (Type AD), or insecure other (Type IO). *Secure* children use a strategy that involves easy, intimate access to their attachment figures, characterized by the ability to directly express feelings, plans, and needs. Secure children share the responsibility of regulating their emotions with others, and they can openly negotiate plans for separations and reunions with their attachment figures. *Defended* children, by contrast, organize their behavior so as to access their attachment figure with a low probability of emotional involvement and confrontation. Thus, defended children minimize emotional displays toward their attachment figures, focusing a great deal on toy play and exploration rather than on the mother–child relationship, and they take most of the responsibility for managing their emotions. Separations are typically not negotiated between defended children and their attachment figures. *Coercive* children use an overall strategy of maintaining access to their attachment figures through threatening, angry, or feigned helpless behavior, which serves to coerce attachment figures to strive continually to meet their children's needs. As a result, coercive children are preoccupied with problems in the relationship, giving little time for them or their attachment figures to relax and attend to other things. Separations may not be negotiated, or if they are, they are typically left unresolved. *Defended–coercive* children are so identified by a blend of defended and coercive strategies, which may be merged or alternating, during the Strange Situation procedure. *Anxious depressed* was used for children who combined inappropriately deployed strategies with sad affect; extreme lethargy or listlessness; helplessness, continued crying in the presence of the attachment figure; or sheer panic (not anger) during separation. Finally, *insecure other* was a category used to identify children who did not fit into any of the defended, secure, coercive, defended–coercive, or anxious depressed behavior patterns and whose strategy use was either mistimed or inappropriately deployed (i.e., no coherency or organization to their behavior could be discerned). Interrater reliability on the A, B, C, A/C, AD, and IO categories between D.M.T. and Pat Crittenden on 22 mother–child dyads was adequate ($\kappa = .86$).

Attrition analyses. A series of analyses (chi-square and one-way analyses of variance [ANOVAs]) comparing the 45 families who dropped out of the study (30 from the depressed groups and 15 from the nondepressed control group) with the 104 families who remained revealed no relations between attrition and group status ($p = .13$), race ($p = .18$), sex of child ($p = .68$), age of child ($p = .28$), number of hours mothers worked outside the home ($p = .59$), yearly family income ($p = .25$), mothers' BDI scores ($p = .43$), parenting stress scores ($p = .37$),

and objective ratings of maternal behavioral competence ($p = .80$). In addition, depressed mothers who dropped out and depressed mothers who remained did not differ in type of diagnosis provided by therapists, whether or not the women were previously depressed, the length of their previous and present episodes of depression, and whether or not they were on antidepressant medication. However, mothers who dropped out from the study were more likely to be single (33% vs. 18%), $\chi^2(1, N = 149) = 4.05, p = .04$; non-LDS (Mormon; 73% vs. 54%), $\chi^2(1, N = 149) = 4.95, p = .026$; younger (25.87 years vs. 30.29 years), $F(1, 147) = 22.575, p < .001$; and less likely to have finished high school (30.2% vs. 8.6%), $\chi^2(5, N = 149) = 10.97, p = .052$, than were mothers who remained in the study.

Results³

Preliminary Analyses

Chi-square analyses and one-way ANOVAs with contrasts were conducted to examine for differences in demographics among the three mother–child groups in the final subsample. Results of these analyses are presented in Table 1. No differences among the three groups were found in racial composition ($p = .31$), religion ($p = .54$), sex of child ($p = .27$), number of hours mothers worked outside the home ($p = .28$), and maternal age ($p = .98$). In addition, no differences were found between the two depressed groups at recruitment in diagnoses provided by therapists ($p = .68$), medication status ($p = .20$), years of education ($p = .75$), family income ($p = .64$), marital status ($p = .82$), BDI scores ($p = .92$), whether or not mothers were previously depressed ($p = .25$), the length of their previous ($p = .31$) and present ($p = .46$) depressive episode, and child age ($p = .87$). The two depressed groups were thus quite comparable on both demographic and psychiatric data at recruitment. In addition, no differences between the depressed intervention and depressed control groups were found in the proportion of secure attachments among the infants (10% vs. 25% secure; $p = .33$) and the preschoolers (14% vs. 10% secure; $p = .74$). Finally, a Group (depressed intervention, depressed control) \times Time (Time 1, Time 2) multivariate analysis of variance on BDI, parenting stress, and behavioral competence scores revealed no multivariate main effect of group, $F(3, 55) = 1.96, p = .13$, and no multivariate interaction effect of Group \times Time, $F(3, 55) = 1.85, p = .15$, although the multivariate main effect of time was significant, $F(3, 55) = 5.51, p = .002$. Univariate F s revealed that BDI scores decreased significantly

³ Because the sample was heavily skewed with LDS (Mormon) families, preliminary analyses were conducted to determine if mothers' LDS affiliation related to security of infant attachment, maternal depressive symptomatology, maternal behavior with their children, parenting stress, and demographics, which would justify using religion as a covariate in analyses. A2 (LDS status: LDS, non-LDS) \times 4 (attachment classification: Types A, B, C, and D or AD-A/C-IO) chi-square analyses was not significant, and 2 (LDS status: LDS, non-LDS) \times 2 (time: Time 1, Time 2) ANOVAs on BDI, maternal competence, and parenting stress revealed no significant main effect of LDS status, nor were any LDS Status \times Time interactions significant. Additional one-way ANOVAs and chi-square analyses revealed no LDS–non-LDS differences in maternal education, family income, employment status, maternal age, and marital status. Thus, LDS and non-LDS mothers were combined for analyses.

Table 1
Mothers' Demographic Characteristics by Group at Recruitment

Variable	Group		
	Depressed		Nondepressed (<i>n</i> = 43)
	Intervention (<i>n</i> = 31)	Control (<i>n</i> = 30)	
Race			
White	30 (97)	28 (93)	42 (98)
Hispanic		2 (7)	1 (2)
African American	1 (3)		
Religion			
LDS (Mormon)	26 (84)	18 (60)	33 (77)
Catholic	1 (3)	2 (7)	3 (7)
Protestant	1 (3)	1 (3)	2 (5)
Jewish			1 (2)
None or other	3 (10)	9 (30)	4 (9)
Marital status			
Single	8 (26)	7 (23)	4 (9) ^a
Married/living with partner	23 (74)	23 (77)	39 (91)
Sex of baby			
Female	15 (48)	9 (30)	20 (47)
Male	16 (52)	21 (70)	23 (53)
Employment status			
Unemployed	22 (71)	16 (54)	27 (63)
≤35 hr/week	7 (23)	7 (23)	12 (28)
≥35 hr/week	2 (6)	7 (23)	4 (9)
Educational attainment			
<i>M</i>	3.74	3.90	4.28 ^a
<i>SD</i>	1.00	1.03	0.83
Maternal age (years)			
<i>M</i>	30.14	30.28	30.41
<i>SD</i>	6.01	5.81	4.86
Infant age (months)			
<i>M</i>	6.13	6.23	8.55 ^b
<i>SD</i>	2.87	2.91	1.86
Yearly family income			
<i>M</i>	\$19,356	\$21,841	\$34,655 ^b
<i>SD</i>	\$24,641	\$17,029	\$18,965
BDI score			
<i>M</i>	22.61	22.90	6.81 ^b
<i>SD</i>	11.21	10.40	4.69
Therapists' diagnosis			
Major depression	23 (74)	20 (67)	
Dysthymia	5 (16)	5 (17)	
Adjustment disorder with depression	3 (10)	5 (17)	
Previously been depressed	28 (90)	24 (79)	
Length of previous depression (months)			
<i>M</i>	10.58	8.22	
<i>SD</i>	8.57	7.02	
Length of current depression (months)			
<i>M</i>	8.64	7.48	
<i>SD</i>	5.85	6.05	
On medication	12 (39)	16 (53)	

Note. Numbers in parentheses are percentages. Mothers' educational attainment was coded on a 6-point scale: 1 = 1st through 8th grade, 2 = 9th through 12th grade, 3 = completed high school, 4 = vocational school/some college, 5 = college graduate, 6 = graduate/professional school. LDS = Latter Day Saints; BDI = Beck Depression Inventory.

^a Significantly different from depressed mothers, $p < .05$. ^b Significantly different from depressed mothers, $p < .001$.

over time, $F(1, 57) = 13.44$, $p = .001$, whereas no differences across time were observed in parenting stress ($p = .22$) and maternal behavioral competence scores ($p = .40$). Thus, the two depressed groups were combined for analyses.

Subsequent analyses were undertaken to identify covariates in statistical analyses. Neither child gender nor child age was used as covariates because (a) classification systems to assess attachment security were already selected on the basis of age

appropriateness; (b) chi-square analyses revealed no associations between child gender and security of infants' or preschoolers' attachments; (c) although significant depressed–nondepressed group differences were found in children's ages at Time 1 (see Table 1), these differences disappeared at Time 2 ($p = .60$; depressed group $M = 20.28$ months, $SD = 4.64$, range = 12–31 months; nondepressed group $M = 20.72$ months, $SD = 3.45$, range = 11–28 months); (d) one-way ANOVAs and Pearson correlations found no relations of child gender and age to mothers' BDI scores, maternal behavioral competence, and parenting stress at either Time 1 or Time 2.

Additional analyses revealed no associations between security of attachment for either infants or preschoolers and maternal education, family income, and mothers' marital status. However, Pearson correlations indicated that educational level and family income were inversely related to parenting stress at Time 1 ($r_s = -.24$ and $-.20$, $p_s < .05$) and Time 2 ($r_s = -.28$ and $-.28$, $p_s < .05$) and to BDI scores at Time 2 ($r = -.31$, $p < .01$ and $r = -.30$, $p < .01$). In addition, mothers with lower education and incomes were rated lower on maternal behavioral competence at Time 1 ($r_s = .24$ and $.20$, $p_s < .05$) and Time 2 ($r_s = .23$ and $.23$, $p_s < .05$). Although mothers' marital status did not relate to BDI, parenting stress, and maternal behavioral competence scores at Time 1, mothers without partners had significantly higher BDI scores ($p = .007$) and lower maternal behavioral competence scores ($p < .001$) than did mothers with partners at Time 2. In addition, despite attempts to match depressed and nondepressed groups on demographic variables through community matching, depressed mothers were found to have lower educational levels ($p = .016$) and yearly family incomes ($p = .001$) than did nondepressed mothers and were more likely to be unmarried ($p = .047$). We thus considered it appropriate to use maternal education, family income, and marital status as covariates in subsequent analyses.

Depressed–Nondepressed Group Differences

We conducted a multivariate, repeated measures analysis of covariance (ANCOVA) to assess group (depressed, nondepressed), time (Time 1, Time 2), and Group \times Time differences in the dependent variables of BDI, maternal behavioral competence, and parenting stress scores. Maternal education, family income, and marital status were used as covariates. These results are presented in Table 2. There was a multivariate effect of group status, Wilks's lambda, $F(3, 87) = 17.70$, $p < .001$, with univariate F s significant for BDI scores ($p < .001$) and parenting stress scores ($p = .001$) and marginally significant for maternal behavioral competence scores ($p = .08$). As predicted, all group mean differences favored the nondepressed group mothers (see Table 2). This analysis also revealed a multivariate effect of time, Wilks's lambda, $F(3, 87) = 3.06$, $p = .032$, with a significant univariate F for BDI ($p = .01$) indicating that BDI scores decreased significantly from Time 1 to Time 2 for all participants. Finally, a significant multivariate Group \times Time interaction emerged in this analysis, Wilks's lambda $F(3, 87) = 2.69$, $p = .05$, with a significant univariate Group \times Time interaction for BDI scores ($p = .023$). Analyses of simple effects, with maternal education, income, and marital status covaried, indicated that decreases in BDI scores over time were characteristic of depressed mothers, $F(1, 89) = 11.36$, $p < .001$, but not nondepressed

mothers, $F(1, 89) = .07$, *n.s.* This was not surprising, given that nondepressed mothers' BDI scores at Time 1 were already in the subclinical range, according to criteria set forth by Beck et al. (1988), and floor effects limited the amount of decrease possible. We also note here that depressed women's BDI scores ($M = 22.88$) indicated moderate-to-severe depression at Time 1 (Beck et al., 1988), and although depressed women's BDI scores showed statistically significant decreases from Time 1 to Time 2, the depressed group mean (17.31) remained at the high end of the mild-to-moderate depression range at Time 2 (Beck et al., 1988). These numbers suggest that many of the depressed women in the present sample were at least moderately depressed, with some being moderately to severely depressed, in the interim between Time 1 and Time 2 observations.

Before analysis of attachment data, subtypes of infant and preschool attachment classifications were collapsed into their major attachment classifications (e.g., threatening, disarming, punitive, and helpless subtypes were combined into one *coercive* group; A1 and A2 infants were combined into one *avoidant* group) because of very small numbers of children that precluded meaningful comparisons among subtypes. Table 3 presents the frequencies and proportions of the infancy and PAA attachment classifications in the depressed and nondepressed groups. There were 9 preschoolers classified as AD, 1 as IO, and 1 as A/C. Before analyses, these 11 children were combined (preschool attachment group AD-A/C-IO) with the conceptual rationale that AD, IO, and A/C preschoolers as a group lacked a unitary strategy for accessing their attachment figures. A 2×4 chi-square analysis (Depression Group \times Child Attachment Classification), conducted to assess the hypothesis that children of depressed mothers would be more predisposed toward insecure attachment than would children of nondepressed mothers, revealed significant associations in both age groups, $\chi^2(3, N = 50) = 12.92$, $p = .005$, for infants; $\chi^2(3, N = 54) = 8.92$, $p = .03$, for preschoolers (see Table 3). Whereas 70% and 44% of the infants and preschoolers, respectively, in the nondepressed group were securely attached, only 20% of the infants and 13% of the preschoolers in the depressed group were designated secure. The finding of 70% securely attached infants in the nondepressed group is consistent with a variety of studies of low-risk infant samples reporting approximately two thirds of the infants to be secure (Teti & Nakagawa, 1990). There are as yet no published data on the normative proportions of different preschool attachment classifications using the PAA system, although Crittenden (1993) has recently found approximately equivalent proportions (30%–35%) of defended, secure, and coercive classifications in a low-risk sample. With the exception of defended preschoolers, the proportion of each insecure attachment classification was lower in the nondepressed group than in the depressed group. Disorganized infants were singularly more predominant in the depressed group than in the nondepressed group (40% vs. 10%). Of the 12 disorganized infants in the depressed group, 7 were classified D-A/C, 1 D-A, 1 D-B, 2 D-C, and 1 D-U. Both disorganized infants in the nondepressed group were classified D-A/C. Preschoolers with AD, A/C, or IO classifications (i.e., the AD-A/C-IO group) were also more predominant in the depressed group (29% vs. 8.7%). Of the 2 AD-A/C-IO children identified in the nondepressed group, one was designated AD, the other IO. The mother of the AD child

Table 2
Mean Scores (Unadjusted for Covariates) on Depressive Symptoms, Parenting Stress, and Behavioral Competence for Depressed and Nondepressed Mothers

Variable	Group status			
	Depressed		Nondepressed ^a	
	Time 1	Time 2	Time 1	Time 2
BDI ^b	22.88 (10.77)	17.31 ^c (10.95)	7.06 (4.57)	6.61 (4.33)
Parenting stress ^d	24.66 (7.99)	25.79 (8.82)	19.39 (4.57)	19.72 (4.77)
Maternal behavioral competence ^e	30.10 (6.05)	31.21 (5.08)	33.79 (5.30)	33.39 (4.77)

Note. Numbers in parentheses are standard deviations. BDI = Beck Depression Inventory.

^a Nondepressed mothers had significantly lower BDI and parenting stress scores ($ps < .001$) than did depressed mothers. The group difference in behavioral competence approached significance ($p = .08$).

^b Beck Depression Inventory (Beck et al., 1961). Higher scores indicate greater frequency and intensity of depressive symptomatology. ^c Time 2 significantly different from Time 1 scores ($p < .001$). ^d Sum of the Mother Reinforcement and Acceptance of Child subscales from the infant domain of the Parenting Stress Index (Abidin, 1986). Higher scores indicate greater parenting stress. ^e Sum of the scores on maternal behavior scales of Maternal Sensitivity, Warmth, Flatness of Affect, and Disengagement (Zoll et al., 1984). Higher scores indicate more competent mothering.

had a Time 1 BDI score of 7, but this mother refused any home visits from project staff at Time 2, and thus no additional information regarding BDI, parenting stress, or maternal competence data could be gathered from her at Time 2.⁴

A hierarchical logistic regression analyses was then conducted on the combined group of infants and preschoolers to ensure that the depressed–nondepressed group differences in infants' and preschoolers attachment security were not due to depressed–nondepressed group differences in maternal education, family income, and marital status reported earlier. This analysis used a dichoto-

mous security variable (secure vs. insecure) as the dependent variable and entered into the equation maternal education, family income, and marital status, followed by a dichotomous group status variable (depressed vs. nondepressed). Prediction of security was significantly improved by the addition of group status after the entry of maternal education, income, and marital status into the equation, $\chi^2(1, N = 104) = 14.22$, Wald statistic ($df = 1$) = 12.83, $ps < .001$. Thus, depressed–nondepressed group status related significantly to children's attachment security even after all relevant covariates were statistically controlled.

Differences Among Infant Attachment Groups in Maternal Functioning

We conducted additional analyses to examine relations between infant attachment classifications and maternal BDI, par-

Table 3
Number and Percentage of Infants and Preschoolers in the Various Attachment Groups in Depressed and Nondepressed Groups

Age group/ classification	Group status	
	Depressed	Nondepressed ^a
Infants		
Avoidant (A)	5 (16.7)	2 (10)
Secure (B)	6 (20)	14 (70)
Ambivalent (C)	7 (23.3)	2 (10)
Disorganized (D)	12 (40)	2 (10)
Preschoolers		
Defended (A)	6 (19.4)	6 (26.1)
Secure (B)	4 (12.9)	10 (43.5)
Coercive (C)	12 (38.7)	5 (21.7)
AD-A/C-IO	9 (29.0)	2 (8.7)

Note. Values in parentheses are percentages. AD-A/C-IO is a combined group of anxious depressed (AD), defended–coercive (A/C), and insecure other (IO) preschoolers. Of the 9 AD-A/C-IO preschoolers in the depressed group, 8 were classified as AD, 1 as A/C. Of the 2 AD-A/C-IO preschoolers in the nondepressed group, 1 was classified as AD, 1 as IO.

^a The nondepressed group was different from the depressed group: $\chi^2(3, N = 50) = 12.92$, $p = .005$, for infants; $\chi^2(3, N = 54) = 8.92$, $p = .03$, for preschoolers.

⁴ In an earlier version of this article, attachment classifications had been obtained on the full sample (regardless of child age) using the traditional Ainsworth et al. (1978) A, B, C system, with A/C added for children showing a mixed avoidance–resistance pattern on reunions. Eighty-eight child–mother dyads (54 depressed, 34 nondepressed) constituted this earlier sample. From this earlier classification effort, 37% of the children in the depressed sample had been classified as B (vs. 20% of the infants and 13% of the preschoolers in the present study), 26% A (vs. 20% of the infants and 19% of the preschoolers in the present study), 24% C (vs. 23% of the infants and 39% of the preschoolers in the present study), and 13% A/C (vs. 0% of the infants and 3% of the preschoolers in the present study). In the nondepressed group, 79% had been classified as B (vs. 70% of the infants and 44% of the preschoolers in the present study), 12% A (vs. 10% of the infants and 26% of the preschoolers in the present study), 3% C (vs. 10% of the infants and 22% of the preschoolers in the present study), and 6% A/C (vs. 0% of the infants and 0% of the preschoolers in the present study). Thus, in comparison with the original classifications, incorporating the D classification (and dropping A/C) for the infants and using the PAA for children 21 months and older effectively identified fewer secure and more insecure children of depressed mothers in the present study, regardless of child age. Reclassifying had little effect on the overall percentages of secure and insecure classifications among infants in the nondepressed

Table 4

Mean Maternal Depressive Symptoms (Beck Depression Inventory; BDI), Parenting Stress (Parenting Stress Index; PSI), and Behavioral Competence (Unadjusted for Covariates) in Relation to Children's Attachment Status

Attachment status	BDI		PSI		Behavioral competence	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
Infant attachment						
Avoidant (A)	17.8 (16.3)	15.7 (16.0)	24.1 (8.8)	25.9 (10.1)	34.4 (4.0)	29.7 ^a (6.5)
Secure (B) ^b	10.9 (10.8)	8.5 (7.8)	21.3 (6.2)	19.8 (6.0)	35.8 (3.1)	35.1 (3.1)
Ambivalent (C)	17.0 (12.0)	12.3 (9.1)	24.0 (7.6)	25.0 (10.0)	28.6 (6.0)	30.6 (5.2)
Disorganized (D) ^c	19.9 (9.0)	19.3 (11.8)	23.5 (7.5)	24.4 (7.9)	28.1 (6.1)	31.4 ^a (4.8)
Preschool attachment						
Defended (A)	12.1 (11.3)	9.1 (8.0)	19.2 (4.6)	23.7 ^a (5.5)	31.1 (5.9)	30.1 (5.2)
Secure (B) ^d	16.2 (13.4)	12.8 (8.5)	20.9 (6.5)	21.5 (5.4)	32.9 (6.6)	34.2 (3.6)
Coercive (C)	16.1 (8.8)	10.3 (9.2)	21.6 (7.2)	19.5 (5.0)	32.2 (5.1)	32.9 (4.2)
AD-A/C-IO ^e	25.8 (12.0)	17.9 (12.1)	29.9 (8.0)	32.7 ^a (10.8)	27.1 (6.3)	27.9 (6.2)

Note. Numbers in parentheses are standard deviations. AD-A/C-IO is a combined group of anxious depressed (AD), defended-coercive (A/C), and insecure other (IO) preschoolers.

^a Significantly different from Time 1 scores ($ps < .05$). ^b BDI, PSI, and behavioral competence different from all other groups combined ($ps = .05$, $.10$, and $.005$). ^c BDI and behavioral competence different from secure group ($ps = .02$ and $.002$). ^d PSI, behavioral competence different from all other groups combined ($ps = .13$ and $.12$). ^e PSI and behavioral competence different from secure group ($ps = .001$ and $.027$). BDI, PSI, and behavioral competence different from defended and coercive groups combined ($ps < .05$, $.001$, and $.05$).

enting stress, and maternal behavioral competence scores. Depressed and nondepressed groups were combined for these analyses to make use of the full range of BDI, parenting stress, and maternal behavioral competence scores in assessing attachment-related differences. Infant Attachment Group (avoidant, secure, ambivalent, and disorganized) \times Time (Time 1, Time 2) ANCOVAs were performed separately on BDI, parenting stress, and behavioral competence scores, again using maternal education, family income, and marital status as covariates. In this instance, the choice of conducting separate univariate ANCOVAs on each dependent variable, rather than a single multivariate analysis of covariance on all three dependent variables, was made to preserve statistical power. Included in these analyses were three a priori contrasts, consistent with hypotheses, that compared the secure infant group with all other groups combined, the disorganized infant group with the secure group, and the disorganized group with the avoidant and ambivalent groups combined. These analyses are presented in Table 4.

Analysis of BDI scores revealed no main effects of infant attachment status or time, nor was the interaction of Attachment Group \times Time significant. However, the contrast between the secure group and the combined insecure groups indicated that mothers of secure infants reported significantly less depressive symptomatology than did mothers of insecure infants, $F(1, 43) = 3.96$, $p = .05$. Contrasts also indicated that mothers of disorganized infants reported significantly more depressive symptomatology than did mothers of secure infants, $F(1, 43) = 5.62$, $p = .02$. The contrast between mothers in the disorganized infant group and mothers in the avoidant and ambivalent infant groups combined was not significant, although group mean differences were in the direction predicted.

Infant attachment status, time, and the Attachment Status \times Time interaction was not related significantly to parenting stress, nor were any contrasts significant. Analysis of maternal behavioral competence, however, revealed a significant main effect of infant attachment status, $F(3, 40) = 4.17$, $p = .012$. Contrasts indicated that mothers of secure infants were rated as significantly more competent in their behavior with their infants than were mothers of insecure infants, $F(1, 40) = 8.70$, $p = .005$. In addition, mothers of disorganized infants were rated significantly less competent in their interactions than were mothers of secure infants, $F(1, 40) = 11.06$, $p = .002$. The contrast between mothers of disorganized infants and mothers of avoidant and ambivalent infants combined was not significant. There was also a significant Infant Attachment Status \times Time interaction, $F(3, 40) = 5.38$, $p = .003$. Simple effects analyses found that mothers of avoidant infants decreased significantly from Time 1 to Time 2 in behavioral competence to levels that were more consistent with those of the other insecure groups, $F(1, 40) = 5.66$, $p < .01$, whereas mothers of disorganized infants became significantly more competent over time, $F(1, 40) = 10.57$, $p < .01$. However, the mothers of disorganized infants did not equal the mothers of secure infants in behavioral competence at Time 2. No time differences in behavioral competence were found for mothers of secure infants and mothers of ambivalent infants (see Table 4).

Differences Among Preschool Attachment Groups in Maternal Functioning

We conducted additional univariate ANCOVAs to examine attachment status correlates of preschool-age children. Attachment Status (defended, secure, coercive, and AD-A/C-IO) \times Time (Time 1, Time 2) ANCOVAs were again conducted on each dependent variable separately to maintain statistical power. Maternal education, income, and marital status again were used as covariates. These analyses included three a priori

group; however, there was a shift toward finding more insecure classifications (and fewer secure classifications) among preschoolers in the nondepressed group with the PAA.

contrasts, based on hypotheses, which compared the secure group with the insecure groups combined, the AD-A/C-IO group with the secure group, and the AD-A/C-IO group with the defended and the coercive groups combined. Results of these analyses are also presented in Table 4.

Analyses of BDI scores revealed a main effect of time, $F(1, 43) = 8.28, p = .006$, indicating that mothers of preschoolers reported significantly less depressive symptoms at Time 2 than at Time 1. Neither the main effect of attachment status nor the interaction of Attachment Status \times Time was significant. However, contrasts indicated that mothers of AD-A/C-IO children had significantly higher BDI scores than did mothers of avoidant and ambivalent children combined, $F(1, 43) = 3.96, p = .05$. The contrast between the secure group and all insecure groups combined was not significant, nor was the contrast between the AD-A/C-IO group and the secure group. Visual inspection of group means, however, indicates that the mothers of AD-A/C-IO children had nonsignificantly higher BDI scores than did mothers in the remaining three groups.

Several findings emerged in analyses of parenting stress, including a main effect of attachment status, $F(3, 43) = 5.96, p = .002$, with a priori contrasts indicating that mothers of AD-A/C-IO preschoolers reported significantly more parenting stress than did mothers of secure preschoolers, $F(1, 43) = 12.26, p = .001$, and mothers of defended and coercive groups combined, $F(1, 43) = 17.00, p < .001$. Also obtained in this analysis was a significant Attachment Status \times Time interaction, $F(3, 43) = 3.72, p = .018$. Analyses of simple effects indicated that parenting stress scores of mothers of defended and AD-A/C-IO children increased significantly over time, $F(1, 43) = 7.78, p < .01$ and $F(1, 43) = 6.61, p < .05$, respectively, but did not change in mothers in the secure and coercive attachment groups.

Finally, analyses of maternal behavioral competence revealed no main effects of attachment status or time, although the main effect of attachment status approached significance, $F(3, 40) = 2.19, p = .10$, nor was the Attachment Status \times Time interaction significant. However, a priori contrasts indicated that mothers of AD-A/C-IO children were rated as significantly less competent in interacting with their children than were mothers of secure children, $F(1, 40) = 5.30, p = .027$, and mothers of avoidant and ambivalent children combined, $F(1, 40) = 4.06, p = .05$.

These analyses indicate that mothers of children during infancy and the toddler-preschool periods who lacked unitary, coherent attachment strategies were more likely at both time points to report higher levels of depressive symptomatology and parenting stress, and to be rated by blind observers as less competent in interactions with their children, than were mothers of children with coherent attachment strategies. Furthermore, mothers of secure children were less likely at both time points to be functionally impaired, in terms of depressive symptomatology and parenting stress, and to be rated as significantly more competent during mother-child interaction than were mothers of children in the insecure groups.

Discussion

Consistent with hypotheses, the present study found maternal depression to be significantly associated with attachment

security in both the infant and preschool-age groups, thus supporting and extending previous work linking maternal depression to insecure attachment in young children as assessed by traditional infancy assessment guidelines (Gaensbauer et al., 1984; Lyons-Ruth et al., 1990; Radke-Yarrow et al., 1985). General support was also found for the prediction that, in both infant and preschool groups, mothers of secure children would be the highest functioning, whereas mothers of children lacking unitary, coherent attachment strategies would be the most chronically and severely impaired. Although Attachment Group \times Time interactions revealed some Time 1–Time 2 differences in maternal behavioral competence scores of mothers of avoidant and disorganized infants, and in parenting stress scores of mothers of defended and AD-A/C-IO preschoolers, these time-related differences did not obscure the point that the differences found in maternal functioning among attachment groups in the present study were chronic and pervasive across time. We note further that no Attachment Group \times Time interactions were found for mothers' BDI and parenting stress scores in the infant subgroup, nor for mothers' BDI and behavioral competence scores in the preschooler subgroup. These findings collectively emphasize that relations between maternal depression and attachment security in young children must take into account issues of severity and chronicity of maternal impairment during the children's early years. This study is also one of the first to establish links between maternal depression and attachment insecurity among preschoolers, using the newly developed Preschool Assessment of Attachment (Crittenden, 1992a, 1992b). Finally, the present study found maternal depression to be significantly associated with parenting stress and objective ratings of maternal behavioral competence, thus supporting earlier work linking maternal depression to qualitative aspects of parenting (see reviews by Gelfand & Teti, 1990; Goodman, 1992).

The percentages of insecure attachment among depressed mothers' infants (80%) and preschoolers (87%) in this study are somewhat higher than those reported in earlier studies of relations between maternal depression and children's attachments (e.g., 55% insecure in Radke-Yarrow et al. [1985]; 56% insecure in Campbell et al.'s [1993] group of chronically depressed mothers; 60% insecure in Frankel et al.'s [1991] group of mothers experiencing both episodic and intermitted depression [double depression]). The higher rate in our study is likely due to differences in recruiting strategies for participants. The other studies cited involved screening for depression mothers who responded to newspaper or other advertisements, but the present study recruited mothers who were in therapy. The mothers in the present study were not only highly depressed at recruitment (with BDI scores in the moderate-to-severe range) but had sought out psychotherapeutic intervention because their depressive symptomatology was sufficiently severe to disrupt their lives. It is quite likely, then, that the present study's mother-child dyads were at higher risk than those in earlier studies in terms of both the severity and chronicity of maternal depression from Time 1 to Time 2. The moderate-to-severe depressive symptomatology among the depressed mothers in this study would also explain the high percentages of D infants (40%) and AD-A/C-IO preschoolers (29%) in the depressed compared with the nondepressed group (10% and 9%,

respectively). Indeed, although the finding of 40% D infants in the depressed group is somewhat higher than the approximately 22% reported by DeMulder and Radke-Yarrow (1991) in their unipolar depressed sample, it is consistent with percentages of D infants in high-risk samples (e.g., approximately 46% in DeMulder and Radke-Yarrow's [1991] subsample of bipolar mothers; 60% in Lyons-Ruth et al.'s [1990] depressed subsample of a group of low-income urban mothers at risk for caretaking difficulties; 51% in Carlson et al.'s [1989] low-income maltreated sample), reinforcing the point that the depressed mother-infant dyads in the present study comprised a bona fide high-risk group. We also note that the 10% D infants in the nondepressed control group is consistent with the 13% D infants found by Main and Solomon (1990) in their low-risk, middle-class sample.

Even with this group of at least moderately clinically depressed women, the chronicity and severity of maternal functioning still related to individual differences in infants' and preschoolers' attachment status in ways that were consistent with hypotheses. Secure infants and preschoolers had mothers at both time points who were likely to be less psychiatrically impaired, parentally stressed, and more behaviorally competent than did insecure infants and preschoolers, which corroborates the original findings of Ainsworth et al. (1978) and a host of other investigators (see Teti & Nakagawa, 1990). Furthermore, mothers of children without unitary, coherent strategies (i.e., mothers of D infants and mothers of preschoolers with AD, A/C, or IO classifications) were more likely at both time points to report the highest levels of depressive symptomatology and parenting stress and to be rated most poorly in behavioral competence. These results are consistent with attachment theory and research, which indicates that young children are predisposed to secure attachments under conditions of sensitive, competent parenting, but to insecure attachments when parenting is compromised (Teti & Nakagawa, 1990). These findings also support the premise that both infant and preschool-age children who lack unitary, coherent attachment strategies may be at higher risk for psychopathology than are children with unitary, coherent strategies, even if these strategies are considered insecure. We regard the association of AD preschoolers with chronic and severe maternal depression to be clinically informative, because the AD category describes behavior patterns (e.g., sadness, lethargy, extreme panic) that mirror those seen in depressive disorders (DSM-III-R; American Psychiatric Association, 1987). The AD classification as identified during the preschool years may thus be an important high-risk marker for depressive psychopathology in later life, although additional follow-up study is needed to test this hypothesis.

The comparison of behavioral competence between mothers of secure preschoolers and mothers in the combined insecure preschool attachment groups was not significant ($p = .12$), in contrast to the comparison between the AD-A/C-IO and secure groups ($p = .027$). The rating scales comprising the maternal behavioral competence composite in the present study (sensitivity, warmth, flatness of affect, and disengagement) were clearly sufficient to detect group differences in maternal behavioral competence when very large differences in the quality of maternal behavior were evident (e.g., between mothers of secure preschoolers and mothers of AD-A/C-IO children) but

may not have been adequate to detect more subtle differences that may have existed between mothers of secure children and mothers of defended and coercive children. In part, this highlights the increased complexity of the parent-child relationship that characterizes the preschool years, which is captured by the richness and diversity of attachment patterns (three defended, three secure, four coercive subtypes, including AC, AD, and IO identified by the PAA). This complexity may not have been adequately tapped by the maternal behavioral rating scales used in this study. For example, coercive children as a group cut across threatening, disarming, punitive, and helpless subgroups, each of which might be expected to relate to different maternal behaviors during observational probes such as those used in the present study. Through processes of modeling, imitation, and negative reinforcement, threatening (C1) and punitive (C3) coercive patterns in preschoolers might be associated with similar blatantly coercive behavioral patterns in parents (Patterson, 1982), thus leading to a low behavioral competence rating. By contrast, disarming (C2) patterns might be linked with parental coyness and "cutesy" behavior that may not be serving the best interests of the child but, by itself, may not have been viewed as particularly problematic by a behavior coder using the present study's behavior rating scales. Thus, when C1, C2, and C3 preschoolers were combined into a single coercive group, differences in maternal behavior between mothers of secure children and mothers of coercive children may have been obscured. Unfortunately, very small sample sizes, and thus very low statistical power, precluded any meaningful comparisons among the many PAA attachment subgroups in the present study. It is recommended that researchers interested in assessing preschool attachment-related differences in parenting behavior use conceptualizations of mother-child interaction (e.g., Crittenden's [personal communication, February 4, 1994] revised Care Index) and sample sizes that do justice to the multidimensionality and diversity of parent-child behavioral patterns during the preschool years.

In comparison with the infant classifications in the present study, lower proportions of Type B and higher proportions of Types C and A were found among the preschoolers, regardless of maternal depression status. Using the PAA with a low-risk U.S. sample, Crittenden (1993) found equivalent proportions of Types A, B, and C preschoolers (30%–35% of each), which contrasts with the prototypical 20%, 65%, and 15% of Types A, B, and C, respectively, reported in low-risk infant samples using Ainsworth et al.'s (1978) infant attachment coding guidelines (Teti & Nakagawa, 1990). Crittenden (personal communication, July 7, 1993) proposed that some secure children as infants may be predisposed to develop coercive strategies as preschoolers with the development of language and the social-cognitive competencies needed to influence and control parents in order to achieve goals. In support of this hypothesis, Fagot (1993) documented longitudinal increases in C classifications, from 10% in infancy (18 months) using infancy classification guidelines to 36% in the preschool period (30 months) with the PAA. Shifts from being secure in infancy to defended in the preschool years may also occur in response to the inability of some parents to adapt successfully to the increased demands placed by preschoolers on the parent-child subsystem (Crittenden, personal communication, July 7, 1993). In other

words, some parents who were "good enough" to foster security in their children as infants may predispose the development of defended strategies in the preschool years by becoming more intrusive or rejecting as their children mature and as the need for limit-setting increases. Clearly needed is additional longitudinal research, targeting both low- and high-risk populations, that examines how attachments in infancy evolve into preschool attachments as designated by the PAA, with concomitant assessments of stability and change in the linguistic and social-cognitive skills of children and in qualitative aspects of the parent-child subsystem. Attachment is a dynamic system affected by changes in the growing child's caregiving environment. Additional information is needed regarding the nature and impact of changes in the family as the young child develops.

There are several limitations of the present study that need to be addressed. First, the sample was almost exclusively White, and thus caution is required in generalizing the present findings to other racial/ethnic groups. Second, external validity issues are raised by the fact that the majority of the sample was LDS (Mormon), although analyses did not reveal significant differences between LDS and non-LDS participants on any of the dependent measures and maternal demographic variables. Third, attrition analyses suggest that the present findings may not be generalizable to young, single, and less-educated mothers, who were more likely to have dropped from the study between Time 1 and Time 2. Fourth, diagnoses on the depressed mothers were obtained from their therapists and were not independently checked and verified by project staff. Although we feel that the depressed mothers in this study represent a typical outpatient sample of depressed mothers with small children, the lack of reliable diagnostic information renders comparisons between the depressed mothers in this and other studies difficult. Finally, the present study is exclusively correlational, and thus causal pathways among variables cannot be definitively established. Indeed, it is conceivable that maternal functioning is as much a product of children's adjustment as it is a cause. We are nevertheless encouraged by the fact that the findings of the present study build on those of earlier work and were consistent with predictions.

Of course, building a knowledge base regarding the longitudinal effects of parental depression (as well as other manifestations of parental dysfunction) on early attachment is predicated on the use of developmentally relevant and theoretically defensible attachment coding systems. The construct validity of the infancy attachment classification system (Ainsworth et al., 1989; Main & Solomon, 1990) has been amply demonstrated for children in their second year (see reviews by Bretherton, 1985; Teti & Nakagawa, 1990). However, the infancy attachment system becomes less appropriate for children much beyond 21 months of age, when attachment strategies develop greater complexity with the advent of enhanced social-cognitive abilities. The PAA appears to be a conceptually rich system for the identification of attachment strategies in the preschool years and merits further study. Follow-up work is currently under way to assess the stability and change of children's attachment classifications in the present sample over a longer time than that assessed in this article, and to determine any parent-child correlates thereof. More generally, further study is needed to identify the processes by which children of depressed moth-

ers develop insecure attachments that lack prototypically organized strategies, and the processes by which such attachments might render children more vulnerable to less favorable outcomes (in particular childhood depression) than do insecure attachments that preserve coherency and organization.

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