

## Bridging the attachment transmission gap: The role of maternal mind-mindedness

Annie Bernier and Mary Dozier  
University of Delaware, Newark, USA

The intergenerational transmission of attachment patterns is one of the most reliable yet least understood findings of attachment research. The aim of this report was to examine the capacity of maternal mind-mindedness to account for the relation between adult attachment state of mind and infant attachment security. Sixty-four foster children (aged 6–30 months) participated with their foster mothers. The mother's tendency to use mental features in describing her child (mind-mindedness) was negatively related to the security of both maternal state of mind and infant attachment. Further, mind-mindedness accounted for the totality of the predictive power of state of mind on infant attachment. The results suggest that age-appropriate representations of the child may help explain intergenerational transmission, through their interplay with parental interactive behaviours.

Few findings in developmental psychology are as robust as the intergenerational transmission of attachment patterns. It has consistently been shown that the security of an infant's attachment relationship with a specific caregiver can reliably be predicted from the caregiver's "state of mind with respect to attachment" (Van IJzendoorn, 1995). The classic model proposed by attachment theory posits parental responsiveness as the linking mechanism: The caregiver's state of mind influences his or her sensitivity to the child's signals (Main, Kaplan, & Cassidy, 1985), which in turn affects the child's attachment security (Ainsworth, Blehar, Waters, & Wall, 1978). In an influential meta-analysis, Van IJzendoorn (1995) found that in fact, a fairly small proportion of the association between infant security and adult state of mind could be explained by sensitivity. Van IJzendoorn labeled the remaining common variance the "transmission gap", and invited attachment researchers to bridge it, notably by refining sensitivity measures. Several recent studies have taken up Van IJzendoorn's challenge and have refined the measurement of parental sensitivity considerably, yet have not been successful at bridging the transmission gap (e.g., Pederson, Gleason, Moran, & Bento, 1998; Raval et al., 2001).

In light of those findings, we propose that it is useful for the field of attachment to start looking at additional mechanisms likely to help bridge the transmission gap. In keeping with ideas from Meins and her colleagues (Meins, 1997, 1999; Meins, Fernyhough, Fradley, & Tuckey, 2001; Meins, Fernyhough, Russell, & Clark-Carter, 1998), we propose that the mother's mental representation of her child, more specifically her tendency to see him or her as an individual with an

autonomous mental life, may be related to both maternal attachment state of mind and infant attachment security. The aim of this report is to explore the capacity of maternal "mind-mindedness" (Meins, 1997) to reduce the transmission gap by accounting for the relation between adult state of mind and infant attachment security.

Seminal work by Mary Ainsworth and her colleagues (Ainsworth, 1967; Ainsworth et al., 1978; Ainsworth & Wittig, 1969) revealed that a key developmental task of infancy is the formation of a relationship with a primary caregiver. Ainsworth (1967) initially expected that all children show a pattern of seeking out their caregiver when distressed. Indeed, using her experimental Strange Situation procedure, she found that the babies of responsive, sensitive caregivers do seek out caregivers when distressed. These babies are said to be securely attached to their caregivers (Ainsworth et al., 1978). In contrast, babies of rejecting caregivers tend to turn away from them, whereas babies of inconsistent caregivers tend to respond to caregivers with angry resistance when distressed. These babies are said to have avoidant and resistant attachments, respectively (Ainsworth et al., 1978). Still other babies, those whose caregivers respond to them in either frightening or frightened ways, show a breakdown in strategy when they are distressed and in their caregivers' presence, displaying disoriented or disorganised behaviours (Main & Solomon, 1990). These infants are classified as having disorganised attachments.

Because early attachment has been found to play a primary role in later socio-emotional development (see Thompson, 1999, and Weinfeld, Sroufe, Egeland, & Carlson, 1999, for extensive reviews), attachment researchers have striven to

---

Correspondence should be addressed to Annie Bernier, Department of Psychology, University of Montreal, CP 6128 Succ. Centre-Ville, Montreal, QC, H3C 3J7, Canada;  
e-mail: [annie.bernier@umontreal.ca](mailto:annie.bernier@umontreal.ca).

Support for this research was provided by NIMH grants MH01782 and 52135 to the second author. We thank Anna Nutter, Shauna

Stepnowski, and several graduate students for their help in collecting data. Also, our appreciation to Gerri Robinson and Yvonne Gilchrist of Baltimore City Department of Social Services; and to Carlyse Giddins, Laura Miles, and Darlene Lantz of Delaware Department of Services for Children, Youth, and Their Families; and to case workers, foster families, birth families, and children at both agencies.

understand its antecedents. The strongest predictor of infant attachment found thus far is the caregiver's state of mind with respect to attachment (Van IJzendoorn, 1995). Attachment state of mind refers to the way in which adults process thoughts and feelings regarding their own attachment experiences, and is assessed through the use of the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1996). The AAI yields classification into one of four primary attachment classifications: autonomous, dismissing, preoccupied, or unresolved. An autonomous state of mind is indicated by a coherent and credible discourse regarding one's relationships with his or her parents, along with valuing of attachment. A dismissing state of mind is characterised by minimisation of the importance of attachment relationships, often accompanied by idealisation of the relationship with the parents and a striking lack of recall for attachment experiences. A preoccupied state of mind is indicated by current enmeshment in the relationship with the parents, as evidenced by the expression of current anger toward the parents or by a passive and confusing style of discourse. Finally, an unresolved state of mind is characterised by lapses in reasoning or discourse when recounting a loss or a trauma (Main & Goldwyn, 1998).

A most impressive finding of attachment research is the consistent power of the AAI to predict the quality of the attachment relationship between the respondent and his or her child. Autonomous adults tend to have babies who are securely attached to them, dismissing adults have babies who are avoidant, preoccupied adults have resistant babies, and adults showing unresolved attachment typically have babies showing a disorganised pattern of attachment (Van IJzendoorn, 1995). The strength of these associations is unusually high for the field of developmental psychology (Van IJzendoorn, 1995). This "intergenerational transmission" phenomenon also appears very robust: It has been observed in middle-class samples (e.g., Main et al., 1985), low SES samples (e.g., Bus & Van IJzendoorn, 1992), samples of adolescent mothers (Ward & Carlson, 1995), as well as in West-European, Japanese, and Middle-Eastern cultures (e.g., K.E. Grossmann & Grossmann, 1991; Kazui, Endo, Tanaka, Sakagami, & Suganuma, 2000; Sagi et al., 1997). Further, the concordance between infant and adult attachment does not decline when adult state of mind is assessed prior to the child's birth (e.g., Benoit & Parker, 1994; Fonagy, Steele, & Steele, 1991), indicating that the association is not due to the child's behaviour affecting the parent's discourse about childhood experiences.

The classic model proposed by attachment theory explains intergenerational transmission through parental responsiveness to the child's signals. Meta-analytic work demonstrates that state of mind is, indeed, a predictor of parental sensitivity (Van IJzendoorn, 1995), and that sensitivity predicts infant attachment security (De Wolff & Van IJzendoorn, 1997; Goldsmith & Alansky, 1987). However, in his meta-analysis, Van IJzendoorn reported that a fairly small proportion (23%) of the association between adult state of mind and infant attachment could be accounted for by sensitivity. Thus, even though the three elements of the model were related to one another, sensitivity did not appear to play a true mediating role in this meta-analytic review.

This very challenging finding has been attributed by many to the quality of parental sensitivity measures. It has been argued that the existing measures of sensitivity either (1) do not capture all relevant aspects of parent-child interactions likely to favour attachment security (Van IJzendoorn, 1995),

(2) tend to neglect attachment theory's emphasis on the child's experience of *distress* (Thompson, 1997), or (3) lack the extensiveness and ecological validity of Ainsworth's classic studies (De Wolff & Van IJzendoorn, 1997; Isabella, 1998; Pederson et al., 1998). In order to test the validity of these claims, De Wolff and Van IJzendoorn conducted a meta-analytic review examining the differential predictive powers of different types of sensitivity measures. They did not confirm their hypothesis that measures closely resembling those of Ainsworth's original studies yield stronger effect sizes. The authors consequently concluded that the *measurement* of sensitivity was not responsible for its somewhat disappointing capacity to predict attachment security, and suggested that "sensitivity has lost its privileged position as the only important causal factor [of attachment security]. A multidimensional approach of parenting antecedents should replace the search for the unique contribution of sensitivity" (p. 585).

Nevertheless, several recent studies have refined the measurement of parental responsiveness by making the assessments either more focused on episodes of distress in the child or by using more extensive, home-based procedures. A very promising instrument appears to be Pederson and Moran's (1995) Maternal Behavior Q-set, which shows more than twice as much predictive power of infant attachment as other observational procedures (Atkinson et al., 2000). Using this instrument, Pederson and colleagues (1998) found satisfying connections between state of mind, sensitivity, and security, yet came to a conclusion very similar to that of Van IJzendoorn (1995): Sensitivity, even when assessed through a very robust procedure, accounts for less than 25% of the influence of parental state of mind on infant attachment security. In an attempt to further challenge Van IJzendoorn's conclusion, Raval et al. (2001) used the Maternal Q-set (1) while taking into account infant behaviour's contribution to the developing attachment, and (2) while giving special consideration to sensitivity in the context of child's distress. The authors also used a continuous approach to attachment security, in addition to the usual categorical treatment. Still, their findings were remarkably similar to those of Van IJzendoorn and Pederson et al.: Sensitivity, even when assessed through a refined method, accounts for approximately 25% (continuous approach) to 36% (categorical approach) of the relation between adult and infant attachment.

Overall, then, although recent studies have improved the assessment of sensitivity, and have thus been more successful at predicting infant attachment, intergenerational transmission remains largely unexplained. This has led attachment researchers to speculate on other mechanisms that may account for the transmission. One mechanism often proposed is shared genetic characteristics (Atkinson et al., 2001; Pederson et al., 1998; Raval et al., 2001; Van IJzendoorn, 1995). Recent studies, however, provide compelling evidence that genetics are unlikely to account for the transmission gap. O'Connor and Croft (2001), using a refined twin design, found negligible genetic influences but significant environmental contributions to attachment security. They also reported that parent- or observer-reported temperament did not account for similarity or dissimilarity of attachment security within the twin pairs. Dozier, Stovall, Albus, and Bates (2001) found a rate of intergenerational transmission among foster care dyads similar to that typically observed in biologically intact dyads. Taken together, these two studies convincingly argue against a genetic mechanism of intergenerational transmission.

The field of attachment thus appears to be placed before a critical challenge, i.e., identifying the mechanisms responsible for one of its most important and credible findings, the intergenerational transmission of attachment patterns. In line with propositions by Pederson et al. (1998), Raval et al. (2001), and Van IJzendoorn (1995), we argue that although sensitivity is likely to play a key role in the development of attachment security, the effect of maternal state of mind on infant attachment must occur through paths other than sensitivity as currently assessed. A promising pathway appears to be parental discourse about the child. Studies that used interviews with mothers (Benn, 1986; Benoit, Parker, & Zeanah, 1997; Bretherton, Biringen, Ridgeway, Maslin, & Sherman, 1989) and fathers (Cox, Owen, Henderson, & Margand, 1992) about their child yielded some of the largest effect sizes in all attachment literature (Atkinson et al., 2000). The aspects of parental discourse that have been found to predict infant attachment are, however, strikingly diverse. It is therefore somewhat unclear what aspect of parental discourse is responsible for the prediction of attachment security.

Work by Elizabeth Meins and her colleagues (1998, 2001) has provided new insights into the notion of parental discourse about the child. Meins (1997) proposed the concept of "mind-mindedness", defined as parents' propensity to treat their child as an individual with an autonomous mind, evidenced by a tendency to use mental characteristics in describing the child. Meins proposed that according to Ainsworth's characterisation of sensitivity, a sensitive mother needs to be able not only to perceive the child's cues, but also to interpret them correctly, which requires an understanding of the child's mental state. Mind-mindedness is thus a prerequisite for sensitivity, and is expected to predict attachment security (Meins, 1997, 1999).

Meins et al. (1998) observed that mothers of children who had been securely attached to them at 12 months were indeed more likely to focus on mental characteristics when asked to describe their child at 3 years. The authors cautioned, however, that future research needed to test their underlying assumption that maternal mind-mindedness was stable during the preschool years in order to support their hypothesis that it is a *predictor* of attachment security. A subsequent study (Meins & Fernyhough, 1999) found moderate stability of mind-mindedness between 20 months and 3 years. However, the indices of mind-mindedness used at the two developmental periods were very different (mothers' assessment of the child's vocabulary vs. general description of his or her personality), and it is unclear to what extent they tapped the same concept.

The construct of mind-mindedness may be a very useful tool to clarify the concept of maternal representations of the child, and may thus help explain the intriguing predictive power of interview methodologies (Benn, 1986; Benoit et al., 1997; Bretherton et al., 1989; Cox et al., 1992; Main et al., 1985). A crucial but untested assumption, however, is that mind-mindedness assessed through interview is an *antecedent* of infant attachment security. The stability of mind-mindedness in the preschool years cannot be taken for granted, especially in light of studies that have found instability in maternal representations of the child (e.g., Fava Vizziello, Antonioli, Cocci, & Invernizzi, 1993). Furthermore, other studies found a rise during the second and third years of life in mothers' tendency to refer to their children's mental states when interacting with them (Beeghly, Bretherton, & Mervis, 1986; Dunn, Bretherton, & Munn, 1987), suggesting that they increasingly think of their child in more mind-oriented ways.

This shift in maternal representations could be an accurate perception of the child's level of functioning. Empirical research has shown that from the ages of 18-24 months on, infants show more observable signs of mental activity. Notably, this period coincides with a dramatic increase in children's vocabulary and in the ability to combine words into meaningful utterances (e.g., De Villiers & De Villiers, 1992; Goldfield & Reznick, 1990). Children also begin to talk about mental states around age 2, and to use verbs related to thought at around age 3 (Bretherton & Beeghly, 1982; Shatz, Wellman, & Silber, 1983). Another major development occurring around ages 18 to 24 months is the onset of symbolic play, considered by many as a core index of representational capacity (Bretherton, 1984) or cognitive maturity (McCune-Nicolich, 1981). The second year of life and the beginning of the third year see an increase in rate, duration, and sophistication of symbolic play (Brownell, 1988; Shore, 1986; Slade, 1987; Tamis-LeMonda & Bornstein, 1994).

It therefore appears that over the course of the second and third years of life, the child's mental activity becomes more easily observable. It seems likely that the co-occurrence of prolonged and sophisticated bouts of symbolic play and of more elaborate language might draw the involved parent's attention to the child's mental activity. In contrast, the child's activities during the earlier sensory-motor period are more likely to direct the observing parent into thinking of the child mostly in terms of his or her routines, physical attributes, and locomotive activities. Hence, although it is sensitive and age-appropriate to pay special attention to a child's mental attributes around his or her third birthday (as observed by Meins et al., 1998), it may not be so during the previous years. Focusing on the infant's mental life before the emergence of its behavioural signs might in fact be part of a larger picture of lack of attunement to the child's cues. An important finding in this regard was reported by Meins et al. (2001), who observed that it is the *appropriateness*, rather than the sheer quantity, of maternal references to the child's mental processes that is predictive of attachment security. A premature focus on mental activities may contribute to the development of an insecure attachment relationship to the extent that it interferes with a core aspect of sensitivity, i.e., correctly interpreting the child's cues. A parent who misinterprets the child's cues as indicators of sophisticated mental processes is unlikely to provide the child with an appropriate response that would soothe him or her.

Meins et al. (2001) proposed that mind-mindedness could help bridge the transmission gap. Mind-mindedness is expected to be a child-specific consequence of state of mind, and to influence the unfolding of the attachment relationship. The only study thus far that has examined the role of maternal representations as a mediator of the association between attachment state of mind and the mother-child relationship (Slade, Belsky, Aber, & Phelps, 1999) focused on maternal behaviours towards the child as the outcome variable, and was not successful at demonstrating a mediational effect. On the basis of findings by Meins et al. (1998), one might expect mind-mindedness to be positively related to attachment security. Because of the developmental course of language and symbolic play, however, it is possible that a focus on a very young (less than 30 months) child's mental characteristics is *negatively* related to attachment security. This study will therefore explore the magnitude and direction of the associations between foster mothers' attachment state of mind,

mothers' representations of their infant, and the security of the dyad's attachment relationship. It has already been observed that foster mothers' state of mind is predictive of foster infants' attachment security (Dozier et al., 2001). The goal of the present study is to examine whether this association is accounted for by the mother's representation of the child, as evidenced in her description of the child.

## Method

### Participants

Sixty-four foster infant-mother dyads participated in this study as part of a larger longitudinal study of children in foster care (Dozier et al., 2001). All 64 infants had been placed with their caregivers between birth and 19 months of age, with a mean age at placement of 6.4 months ( $SD = 5.4$ ). Forty-one of the children were boys and 23 girls. Most (67%) of the infants were African-American, with 16% European-American, 11% biracial, and 6% Hispanic. Similarly, most (63%) of the foster mothers were African-American, 35% European-American, and 2% Hispanic. Most (69%) of the dyads were ethnically matched. Case records indicated that children were placed in foster care for one or more of the following reasons: neglect (63%), parental substance abuse (26%), family instability (20%), abandonment (17%), inadequate housing (9%), parent incarcerated (9%), physical abuse (6.5%), and parental psychiatric disorder (2%). Forty-four of the children were in their first foster placement, 13 in their second, and 7 had been in more than two (ranging from three to five). Children were between 6 and 30 months old when mind-mindedness was assessed, and between 12 and 24 months old when they participated in the Strange Situation (see below for details). About half (53%) of the children participating in this study were included in the sample reported by Dozier et al. (2001).

Foster mothers ranged in age from 25 to 78, with a mean of 47 ( $SD = 12$ ). They had been foster mothers for 1 to 44 years ( $M = 9$ ). Foster mothers ranged in the number of foster children for whom they had cared from 1 to 100 ( $M = 18$ , *median* = 10). Family income for foster families averaged \$30,000, ranging from our lowest income category (less than \$10,000;  $n = 4$ ) to our second highest income category (\$60,000-\$100,000;  $n = 6$ ). Most (56%) of the foster mothers were married or living with a partner, and 44% were single, widowed, or divorced. Two of the foster mothers were biologically related to the foster infants (one aunt and one cousin).

### Measures

*Adult Attachment Interview (AAI).* The AAI (George et al., 1996) is a semistructured interview designed to assess caregivers' state of mind with regard to attachment. In the interview, foster mothers were asked to describe their relationships with their parents when they were young, to instantiate descriptions with specific memories, to recall incidences of distress, and to conceptualise relationship influences. The time required to administer the interview ranged from 45 to 90 minutes. When possible, foster parents were administered the AAI when the study child was first placed in their care. For 18 of the foster mothers, it had been conducted when a previous child from the larger research project was in their care.

Therefore, AAIs were administered between 33 months prior to the study child's placement and 18 months following the placement. The median time of administration was 2.9 months following the placement, with a mean of 3.4, and standard deviation of 11.0. In that the stability of state of mind classifications is high (Bakermans-Kranenburg & Van IJzendoorn, 1993), differences in timing of administration were not considered important.

Using the Main and Goldwyn (1998) system, individuals are classified as autonomous with regard to attachment, dismissing of attachment, preoccupied with attachment, or unresolved with respect to a loss or a trauma. Individuals classified as unresolved are also assigned a secondary best-fitting classification. Classifications in the AAI are stable over periods ranging from 1 to 15 months, are independent of interviewer, and show excellent discriminant and predictive validity (Bakermans-Kranenburg & Van IJzendoorn, 1993; Benoit & Parker, 1994; Crowell et al., 1996; Fonagy et al., 1991; Sagi, Van IJzendoorn, Scharf, Koren-Kame, Joels, & Mayselless, 1994).

Interviews were audiotaped and transcribed by professional transcriptionists. Five raters, who had all passed the reliability test with Main and Hesse, coded the transcripts using Main and Goldwyn's classification system (1998). A random set of 22 AAIs was double coded, with agreement on these interviews of 90.9% ( $\kappa = .82$ ) for 3-way classification, and 81.8% ( $\kappa = .72$ ) for 4-way classification. Given that reliability for unresolved status was lower than for other categories, all interviews were double coded for unresolved status, and disagreements conferenced. Coders were blind to child attachment classification and to other information regarding the participants.

*Strange Situation.* The Strange Situation (Ainsworth et al., 1978) is a laboratory procedure designed to stress the infant, allowing assessment of the child's reliance on the caregiver when he or she is distressed. The infant is separated from the caregiver on two occasions and then reunited, with attachment behaviours coded during the reunion episodes. Infants are classified as secure if they seek out whatever contact is needed and are calmed readily by their caregiver. Infants are classified as avoidant if they turn away from their caregiver when distressed. Infants are classified as resistant if they show an angry resistance to caregivers. Infants are also rated on disorganisation, which is coded when the infant's strategy for dealing with distress breaks down in the caregiver's presence, or when the infant appears to lack a strategy for dealing with distress. Children classified as disorganised are also given a secondary secure, avoidant, or resistant classification.

Three coders, blind to other study data, coded the Strange Situations. All three had passed reliability tests by Sroufe and Carlson for classifying organised and disorganised strategies. A random set of 12 Strange Situations was double coded, with agreement of 100% ( $\kappa = 1.00$ ) for major category, and 83% ( $\kappa = .73$ ) when the disorganised category was included. Given the lower reliability for the disorganised classification, all videotapes with indications of disorganised behaviour were double coded and disagreements resolved by conference with a third coder.

Children participated in the Strange Situation between the ages of 12 and 24 months ( $M = 16.5$ ,  $SD = 3.5$ ). They had been in the care of their current foster parents for between 3 and 21 months ( $M = 10.2$ ,  $SD = 5.8$ ) at the time it was

conducted. Although the Strange Situation was originally developed for use with babies between the ages of 12 and 18 months, it was subsequently observed that 2-year-old babies behave very similarly to their younger counterparts in the Strange Situation, making it an appropriate tool for babies up to 24 months old at least (Ainsworth et al., 1978, p. 199). The procedure has been used in several investigations with babies older than 18 months (e.g., Teti, Gelfand, Messinger, & Isabella, 1995; Thompson, Lamb, & Estes, 1982; Valenzuela, 1990), including those up to 24 months of age (Crittenden, 1988; Dozier et al., 2001; Teti & Ablard, 1989). We included 14 children between 20 and 24 months of age in this investigation, and examined whether age at the time of the Strange Situation was related to attachment security (see preliminary analyses).

*This Is My Baby interview (TIMB).* The TIMB (Bates & Dozier, in press) is a semistructured interview generally lasting 5 to 15 minutes. It is conducted with foster mothers who have cared for one specific foster child continuously for at least 2 months. The interview consists of six basic questions relating to the mother-child relationship, designed to assess whether the mother thinks of the child as her own, or whether she views the child as more of a visitor or source of income. The coding system usually consists of three scales: Acceptance, Commitment, and Awareness of Influence, but these are not used in this study.

In order to assess maternal mind-mindedness, the present study used only the first question of the TIMB: "Could you describe (child's name) for me, what he (or she) is like?" All attributes given by the mother to describe the child were placed into one of four mutually exclusive categories, following guidelines provided by Meins et al. (1998). The category of interest for this study is "mental attribute", consisting of any reference to the child's mental life: will, mind, imagination, interest, intellect, or metacognition. Any comments relating to desires, wishes, and emotions are included as well. The total number of descriptors provided by the mother was also computed, in order to obtain a proportional score of mental attributes volunteered. This score is aimed at controlling for different levels of verbosity in mothers (Meins et al., 1998).

The first author coded all TIMBs. A random set of 16 was also coded by an independent, second coder. Both coders were blind to attachment classifications of child and mother, and to other information regarding the participants. Inter-rater agreement for the assignment of a comment to the mental attribute category was  $\kappa = .84$ . The correlation between the two coders' scores for the proportional number of mental attributes was  $r = .85$ . This proportional score was used as the index of mind-mindedness.

Children in the present study were between 6 and 30 months old ( $M = 18.3$ ,  $SD = 6.0$ ) when the TIMB was conducted, with only six children older than 25 months. The TIMB was conducted between 2 and 24 months of the child's placement ( $M = 12.0$ ,  $SD = 6.9$ ). For 72% of the children ( $n = 46$ ), it was conducted prior to or within 3 months of the Strange Situation. The median time of administration was on the same day as the Strange Situation, with a mean of 1.7 months after, and a standard deviation of 4.8 months. Based on the above literature on behavioural signs of mental life appearing after 24 months of age, we also ran the main analyses with only those 58 children for whom the TIMB was conducted during their first 25 months of life.

## Results

### *Preliminary analyses*

Slightly more than half (54.7%) of the foster mothers were coded as having primary classifications of autonomous state of mind, with 25% classified as dismissing and 20.3% classified as unresolved (the only two mothers with a preoccupied classification had a primary unresolved classification). Of the mothers with unresolved states of mind, 69% had secondary autonomous classifications and 31% had secondary nonautonomous classifications. Most of the children were classified as either secure (45%) or disorganised (45%) in the Strange Situation. An additional 7% were classified as resistant, and 3% as avoidant. Of the children classified as disorganised, 46% had secondary secure classifications and 54% had secondary insecure classifications.

The concordance between maternal and infant attachment classifications was reported in Dozier et al. (2001) at the category level (2-way, 3-way, and 4-way) with a sample composed of approximately half of the infants participating in the present study. Even though some previous studies have used a dichotomous (secure/insecure, autonomous/nonautonomous) approach in testing mediational models through path analyses, such a design is unsatisfying for two reasons. First, as outlined by Atkinson et al. (2001), a path analysis model such as that used by Pederson et al. (1998) and Van IJzendoorn (1995) does not *test* a mediation effect: It *assumes* that the middle variable plays a mediating role, and that the independent variable is responsible for all the variance explained by the mediator. In contrast, statistical principles clearly specify a set of conditions that need to be met before mediation can be demonstrated (Baron & Kenny, 1986; Judd & Kenny, 1981). Second, linear regression analysis (necessary for either path analyses or Baron and Kenny's method of mediation testing) is not an appropriate way of handling discrete variables, which should be treated using a log-linear model such as logistic regression (Cohen & Cohen, 1983; Tabachnick & Fidell, 1989).

The present study consequently followed the guidelines provided by Baron and Kenny (1986) and Judd and Kenny (1981) to test the mediation hypothesis, which required the use of continuous attachment variables. The choice of a continuous variable most likely to capture the core of the foster mothers' attachment state of mind was fairly straightforward: Both theoretical claims (Main & Goldwyn, 1998) and meta-analytic work (Van IJzendoorn, 1995) suggest that the coherence of discourse in the AAI reflects the core of attachment state of mind, as it is the single most powerful predictor of infant attachment security. Coherence in the AAI (theoretical range = 1 to 9) was therefore used as an indicator of the autonomy (vs. nonautonomy) of foster mothers' attachment state of mind.

Ainsworth's coding system for the Strange Situation does not provide a parallel single best indicator of attachment security; security is rather indicated by the overall scale pattern. Some attempts at scaling infant attachment security have, however, been made. One of the best known systems is that of Richters, Waters, and Vaughn (1988), which is limited in not taking indices of attachment disorganisation into account. As insecurity appears to take the form of disorganisation among foster infants (82% of the infants not classified as secure in the present study were classified as disorganised, similar to data

reported in Dozier et al., 2001), using the Richters et al. system would result in the loss of a great deal of information. Another security scale is that developed by Main et al. (1985) and subsequently used by Cox et al. (1992) and Raval et al. (2001). This scale ranged from 0 (least secure) to 5 (most secure) where D/A, D/C = 0; D/B = 1; A, C = 2; B/A, B/C, B/D = 3; B1, B2, B4 = 4; B3 = 5. This security scale has been shown to relate to both maternal state of mind and maternal sensitivity in theoretically consistent ways (Raval et al., 2001). It was therefore used in this study as an indicator of foster infants' attachment security.

The three main variables showed satisfying variance. Scores on the coherence scale ranged from 2 to 8 with a mean of 4.9 ( $SD = 1.6$ ), the security score ranged from 0 to 5 with a mean of 2.3 ( $SD = 1.1$ ), and the proportional number of mental comments ranged from 0 to .88, with a mean of .23 ( $SD = .23$ ). We examined whether demographic variables (infant's gender, ethnicity, number of prior placements, age at Strange Situation, age at TIMB, age when placed with this foster mother, mother's age, ethnicity, education, income, marital status, years of experience as a foster mother, and total number of foster children cared for) were associated with any of the main variables (coherence of discourse in the AAI, mind-mindedness and attachment security). Mind-mindedness and attachment security were not related to any of the demographic variables. Coherence of discourse, however, was negatively related to foster mothers' age ( $r = -.30, p < .05$ ) and to years of experience as a foster mother ( $r = -.25, p < .05$ ), and positively associated with years of formal education ( $r = .26, p < .05$ ). Foster mother's age and years of experience were interrelated:  $r = .51, p < .001$ . Foster mother's age, experience, and education were therefore partialled out from the coherence score, and the residual coherence score was used in all further analyses.

### Main analyses

We have argued that the findings showing a positive relation between infant attachment security and maternal mind-mindedness at age 3 years (Meins et al., 1998) needed to be interpreted with caution because maternal descriptions of the children may become increasingly more mind-oriented as the child grows, especially in sensitive and attuned mothers. If this is so, mind-mindedness should be positively correlated with the child's age, especially in autonomous mothers. Our data tend to support this hypothesis. Mind-mindedness is positively although nonsignificantly related to the child's age ( $r = .21$ ), and this association is clearer in autonomous mothers ( $r = .36, p < .05$ ) whereas it tends to be negative in nonautonomous mothers ( $r = -.17, n.s.$ ). These results thus raise the possibility

**Table 1**

*Pearson's correlation coefficients between coherence, attachment security, and mind-mindedness*

	<i>Attachment security</i>	<i>Mind-mindedness</i>
For whole sample		
Coherence-AAI	.37**	-.29*
Attachment security		-.36**
If TIMB before 25 months		
Coherence-AAI	.37**	-.33*
Attachment security		-.35**

\* $p < .05$ ; \*\* $p < .01$ .

that attachment security and mind-mindedness may not be positively related in this very young sample.

Table 1 (top) presents the simple correlations (Pearson's) between coherence, attachment security, and mind-mindedness for the whole sample. The coefficients suggest that coherence and security are moderately and positively inter-related, whereas they are both negatively related to mind-mindedness. We also computed correlations among only those children with whom the TIMB had been conducted during their first 25 months of life (bottom of Table 1). The results were very similar, with the negative association between coherence and mind-mindedness increasing slightly.

To test the hypothesis that mind-mindedness *accounts* for the observed positive association between coherence and infant security, we used the model proposed by Baron and Kenny (1986) and Judd and Kenny (1981). According to this model, mediation is established only if four conditions are met: (1) the independent variable affects the dependent variable; (2) the independent variable affects the mediator; (3) the mediator affects the dependent variable after the effect of the independent variable on the dependent variable is taken into account; and (4) the effect of the independent variable on the dependent variable is reduced when the effect of the mediator on the dependent variable is accounted for.

Attachment security was first regressed on coherence (Condition 1). Then, mind-mindedness was regressed on coherence (Condition 2). Finally, attachment security was regressed on coherence and mind-mindedness to evaluate the third and fourth conditions of mediation. Those three regression equations are presented in Table 2. The first equation revealed that coherence accounted for 13.6% of the variance of attachment security ( $\beta = .37, p < .01$ ), thus substantiating the first condition for mediation. The second equation indicated that 9.8% of the variance in mind-mindedness was accounted for by coherence ( $\beta = -.29, p < .05$ ;

**Table 2**

*Regression analyses testing the mediating role of mind-mindedness in the relation between coherence and attachment security*

<i>Predicted variable</i>	<i>Variables in the equation</i>	<i>R<sup>2</sup> total</i>	<i>β</i>
1. Security	Coherence	13.6%	.37**
2. Mind-mindedness	Coherence	9.8%	-.29*
3. Security	Coherence & mind-mindedness	15.2%	
	Coherence		.06
	Mind-mindedness		-.34*

\* $p < .05$ ; \*\* $p < .01$ .

second condition). The third equation showed that coherence and mind-mindedness specifically accounted for 15.2% of the variance in attachment security. While mind-mindedness was a significant predictor of security ( $\beta = -.34, p < .05$ ) when coherence was taken into account (Condition 3), coherence was not related to security ( $\beta = .06, n.s.$ ) when mind-mindedness was accounted for (Condition 4). The data thus met the requirements for a complete mediation. These results suggest that the predictive power of coherence in the AAI with regards to infant attachment security is explained (negatively) by mind-mindedness. Because the pattern of correlations between these three variables is the same for the whole sample as it is for only those children who were younger than 25 months when mind-mindedness was assessed (Table 1), the mediation analyses were not re-run with this subsample only.

To rule out the hypothesis that the mediational pattern found is due to a reciprocal relation between mind-mindedness and attachment security, the design was reversed to test whether security could mediate the link between coherence and mind-mindedness. The results clearly showed that the relation between coherence and mind-mindedness was not accounted for by security; while coherence had the same predictive power on mind-mindedness when entered concurrently with security as it did when entered as the sole predictor (second equation presented above), security was virtually unrelated to mind-mindedness when entered simultaneously with coherence ( $\beta = .07, n.s.$ ). Hence, the association between coherence and mind-mindedness is not a consequence of the child's attachment security.

To ensure that the results were specific to mind-mindedness rather than to general characteristics of maternal discourse about the child, a subset of 38 TIMBs were also coded on the three dimensions that the TIMB was originally designed to assess (Awareness of Influence, Commitment, and Acceptance). These three subscales were unrelated to attachment security and to coherence in the AAI (all  $r$ s ranging from .01 to .09), thus ruling out the hypothesis that our results are due to some underlying commonalities between security, coherence, and a general way of talking about the child in an interview situation.

## Discussion

The aim of this paper was to examine whether maternal representations of the child mediated the association between maternal attachment state of mind and infant attachment security. We found that foster mothers' tendency to describe their child in an age-appropriate way, i.e., not focusing on the child's mental attributes before they are likely to be displayed behaviourally (through language and symbolic play for instance), was related to both coherence in the AAI and security in the Strange Situation. Further, maternal descriptions accounted for the totality of the predictive power of state of mind on infant attachment. Although partial mediations, where the mediating variable accounts for a *portion* of the variance explained by the independent variable, are somewhat common, complete mediations like that found here are rare in the social sciences (Baron & Kenny, 1986). The findings are thus striking, suggesting that the predictive power of the AAI with regards to infant attachment could be captured entirely through a very simple operationalisation of maternal representations of the child.

The negative relation found between mind-mindedness and attachment security may at first glance appear to be in sharp contrast to findings by Meins and colleagues (1998). However, a subsequent study (Meins et al., 2001) sheds further light on the nature of mind-mindedness by showing that it is the appropriateness and accuracy of a mother's references to the child's mental processes, not their sheer presence or number, that predict security. This finding, in conjunction with the literature on language development and symbolic play, suggests that our results should be interpreted in light of the young age of the participating children; it may be inaccurate to understand an infant of less than 30 months mostly in terms of his or her mental processes. Hence, when mothers describe young children largely in terms of mental attributes, it may be a reflection of a more general lack of attunement to the child's signals that is likely to impede the development of a secure attachment relationship.

It is critical to understand that coherence in the AAI and representations of the child were not found to be equivalent or interchangeable predictors of infant attachment. Whereas age-appropriate descriptions of the child totally capture the portion of infant attachment that is predicted by AAI coherence, the converse is not true. Hence, although the correlation between the two could conceivably be attributed to shared method variance because of the common interview format, maternal discourse about the child can be thought of as a more proximal predictor of attachment security than state of mind. Yet state of mind and maternal representations are not independent predictors, as a recent reanalysis of transmission data suggests would be the case for state of mind and sensitivity (Atkinson et al., 2001). Our results suggest that state of mind and representations of the child are rather organised in a true mediating pattern predicting infant attachment. Clearly, then, the tendency to describe the child in age-appropriate terms holds important promise to help bridge the transmission gap. Yet it seems somewhat unlikely that such a simple measure as the proportional number of mental attributes volunteered in describing the child is actually the factor that attachment researchers have been looking for to account for the intergenerational transmission of attachment. We believe that the parental determinants of attachment security, just like attachment itself, are likely to be an "organizational construct" (Sroufe & Waters, 1977). It is useful to think of maternal representations as one element of a multidimensional network of parental influences on the child's attachment security, interacting with one another in complex ways to shape the attachment relationship.

In contrast to attachment state of mind, maternal representations are child specific and therefore closer to the actual relationship with the child than a parent's account of his or her own childhood experiences. Still, maternal representations of the child are not interactive and therefore are probably not an immediate direct influence on the child's developing bond with the mother. For the concept of maternal representations to be useful, we need to uncover how such ideas about the child are communicated to him or her through real-life interactions. Given the well-documented influence of parental sensitivity on infant attachment, one promising pathway to explore is the interplay between parents' representations of their child and their levels of sensitivity when interacting with him or her. Although maternal representations have been shown to relate to parenting behaviours (Slade et al., 1999), the interplay between the two in shaping the attachment relationship is as

yet unknown. Meins (1997, 1999) suggested a first possibility: That mind-mindedness is a prerequisite for sensitivity. Converted back to our results with young children, this implies a mediational model wherein age-appropriate representations of the child are a necessary (although probably insufficient) condition for sensitivity. Another possibility is that optimal sensitivity can only occur in conjunction with certain types or levels of representations of the child (moderating model). Another different hypothesis is that sensitivity and representations of the child make independent contributions to attachment security, having orthogonal, additive, or compensatory effects on the child.

The interplay between sensitivity and representations of the child could be conceptualised in yet another light. Perhaps the extent and form of their interaction depend on maternal or infant characteristics such as attachment state of mind and temperament. As proposed by Belsky (1999), there is reason to believe that different babies are differentially reactive to rearing influences, according to their inborn features. Taking the argument one step further, one might argue that some babies may easily develop a secure attachment given either reasonable degrees of parental sensitivity or an adequate understanding of their current level of functioning by their parents, whereas some others may require interactions with parents who are both responsive to their episodes of distress and well aware of their current level of functioning. Along the same lines, although some parents showing high levels of coherence, insight, and valuing of attachment in the AAI may easily provide sensitive responses to their child regardless of the age-appropriateness of their representations of the child, for some others an accurate intellectual understanding of the child's developmental level may be a prerequisite for the display of sensitive responses.

If it were to be found that sensitivity and representations of the child have independent rather than related contributions to the child's attachment security, one would need to search for other parental interactive behaviours that could explain how parental representations are communicated to the child. One interesting path to explore pertains to concepts related to Ainsworth's (1969) scale of cooperation, such as the quality of the parent as a play partner or a "teacher", fostering the child's exploration attempts through appropriate scaffolding, for example. Longitudinal data have highlighted the role of such dimensions of father-child interactions as a predictor of later attachment representations in the child (K. Grossmann, Grossmann, Fremmer-Bombik, Kindler, Scheuerer-Engelisch, & Zimmermann, in press). These aspects of parent-child interactions also appear somewhat more likely than sensitivity to distress to be under the direct influence of parents' understanding of their child's current level of functioning.

A lingering question pertains to the mechanisms responsible for the transmission of an unresolved state of mind in the parent to a disorganised attachment pattern in the child. There is growing evidence that maternal frightening or frightened behaviours toward the child are associated with both unresolved states of mind and disorganised attachments (see Lyons-Ruth & Jacobvitz, 1999, for a review). Frightening or frightened behaviours may thus help explain the unresolved-disorganised transmission. An intriguing issue is the potential role of parental representations of the child in such a transmission process. Because frightening or frightened behaviours are presumed to be the result of momentary lapses in the parent's thought process, similar to brief dissociative episodes,

it is unlikely that the parent's mental representation of the child plays a critical role in the occurrence of such behaviours. One might argue, however, that such lapses in thought processes may at times occur while the parent is describing the child in an interview situation, thus colouring the descriptions volunteered. Yet it should be kept in mind that lapses in thought processes are presumed to be activated by certain triggers, such as questions regarding a loss or a trauma in the AAI, or the child's display of emotional distress. It is therefore unclear whether a brief interview about the child's personality can trigger such lapses. To clarify this question, future research should look for the presence of bizarre descriptors or unusual speech patterns (e.g., prolonged silences in the middle of a sentence) in interviews about the child, and examine whether such occurrences are more frequent in unresolved-disorganised dyads.

Overall, it appears sensible to interpret our findings of a negative relation between the number of mind-related descriptors and attachment security as a reflection of the critical role played by age-appropriate representations of the child in the formation of a secure attachment relationship. Although the exact interactive mechanisms involved have yet to be understood, it is intuitively compelling that assuming a range of mental processes not yet fully developed in the child may reflect a more general lack of attunement to the child, likely to impede harmonious interactions that would foster the development of a secure attachment bond. It is less intuitive, however, why we found a similar negative relation between mind-related comments and coherence in the AAI. Meins et al. (2001) made a compelling case that autonomous adults, who show a clear tendency to invoke other people's mental states to explain their behaviours, should also be more focused on their child's mental processes. Again, the age-appropriateness of this focus is probably the key: Autonomous mothers could be more likely to invoke their child's mental processes when these are indeed a salient part of the child's everyday functioning, rather than very early on. This is supported by our data showing a rise in mind-related comments among autonomous mothers as the age of the children increases. Coherence in the AAI would therefore be negatively related to mind-mindedness in this sample because all our participating children are younger than 30 months, an age where behavioural signs of mental activity become more salient. Coherence in the AAI would thus be associated with age-appropriate representations of the child.

Conversely, low levels of coherence in the AAI, mainly attributable to dismissing and unresolved features (because no foster mothers were classified as primarily preoccupied), are related to high proportional levels of mental descriptors of the child, even in this very young sample. One might speculate that this is an indication that dismissing and unresolved mothers tend to project themselves onto the child, seeing him or her as a little adult instead of being sensitive to current level of functioning. Ainsworth (1969) describes a similar pattern: "The highly interfering mother has no respect for her baby as a separate, active and autonomous person ... [Her] baby continues to be a narcissistic extension of herself ..." Nonautonomous mothers might thus have more difficulty seeing their child as a separate person, seeing him or her rather as a smaller version of themselves. They might thereby assume similar mental processes in the baby to those they have themselves. This difficulty seeing the child as a unique person is in fact precisely what Meins (1997, 1999) described as a lack of mind-mindedness. It is thus reasonable to say that the age-

appropriateness of the description of the child is a key element of mind-mindedness, whose manifestations should change as the child grows older. Hence, in order to keep the essence of the concept of mind-mindedness, one would need to adapt its assessment to the age of the children under study.

Our results are specific to mind-mindedness rather than to other characteristics of parental discourse about the child. Whereas mind-mindedness was related to both security and autonomy, the three other subscales assessed by the TIMB (Awareness of Influence, Commitment, and Acceptance) were unrelated to either security or coherence. It is therefore the mother's accurate understanding of her child's developmental level, rather than a general way of talking about the child with, for instance, warmth or enthusiasm, that ensues from her state of mind and predicts the quality of the developing attachment relationship. This argues against shared method variance being responsible for the association between mind-mindedness and the AAI.

Most importantly, these results have implications for intervention efforts. If indeed the predictive power of parental state of mind on child security can be captured through maternal representations of the child, then interventions should attempt to help parents develop an age-appropriate understanding of their child's level of functioning. Given that attachment state of mind is not only very stable (e.g., Steele & Steele, 1994) but also resistant to intervention efforts (Korfmacher, Adam, Ogawa, & Egeland, 1997), the possibility of targeting a more malleable construct provides attachment researchers and interveners with a new opportunity to foster the development of secure attachment bonds. In line with other researchers (e.g., Lieberman, 1999), we thus propose that an educational approach aimed at helping parents understand their child as a distinct and autonomous person holds promise for intervention efforts.

This study presents some methodological limitations that call for a careful interpretation of the results while suggesting avenues for future research. First and foremost, given the concurrent nature of our design, it would be premature to state that mind-mindedness is a predictor or even an antecedent of attachment security. There was a wide range of children's ages when the TIMB was conducted, and in some cases the TIMB was conducted following the administration of the Strange Situation. Our results thus only suggest that mind-mindedness and attachment security tend to (negatively) covary together in parent-child dyads. As mentioned previously, there are several ways to conceptualise the interplay between mind-mindedness and attachment security, not all of which imply a direct causal relation. Clearly, prospective designs will contribute to shed further light on this issue, and it will be particularly useful to include assessments of sensitivity and of other parental interactive behaviours to understand the specific real-life conditions under which parental mind-mindedness has an impact on the child.

A heuristically useful yet unproven assumption that we have made is that the negative relations between coherence and security on the one hand, and the proportion of mind-related comments on the other hand, are explained by accuracy. A lower proportion of such statements is proposed to reflect greater accuracy and therefore greater attunement to the child's developmental level. Because our participating children were very young, we make the assumption that a vast majority did not yet show obvious signs of mental activity, be it through language or symbolic play or other, and that it is therefore

inaccurate to invoke a high proportion of mental processes in describing them. Assuming accuracy to carry the predictive power of mind-mindedness on attachment security is in line with previous findings from Meins et al. (2001). Yet, our design clearly lacks a means of correlating the mothers' descriptions with objective external evaluations of the child's current functioning. It is critical that future research use observational tools or external reports to assess the degree of accuracy of mothers' descriptions of their child. Finally, although there is no a priori reason to believe that mind-mindedness would play a different role in the process of intergenerational transmission among foster care dyads, it will be important to replicate our findings with biologically intact dyads.

This study has highlighted the role of maternal age-appropriate representations of the child in the intergenerational transmission of attachment patterns. Although the interactive processes through which such representations are communicated to the child have yet to be identified, mind-mindedness appears to have the potential to provide one more brick to bridge the transmission gap. We believe that it constitutes one element of an "organisational construct" accounting for intergenerational transmission, along with parental sensitivity and other internal and interactive factors that careful prospective designs will continue to uncover in future studies.

Manuscript received November 2001  
Revised manuscript received June 2002

## References

- Ainsworth, M.D. (1967). *Infancy in Uganda: Infant care and the growth of love*. Baltimore, MD: John Hopkins University Press.
- Ainsworth, M.D. (1969). *Cooperation vs. Interference Scale*. Unpublished manuscript.
- Ainsworth, M.D., Blehar, M.C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the Strange Situation*. Hillsdale, NJ: Lawrence Erlbaum Associates Inc.
- Ainsworth, M.D., & Wittig, B.A. (1969). Attachment and the exploratory behavior of one-year-olds in a strange situation. In B.M. Foss (Ed.), *Determinants of infant behavior, Vol. 4*. London: Methuen.
- Atkinson, L., Goldberg, S., Raval, V., Pederson, D.R., Benoit, D., Moran, G., Poulton, L., Myhal, N., Zwiers, M., & Gleason, K.E. (2001). *On the relation between maternal state of mind and sensitivity in the prediction of infant attachment security*. Manuscript submitted for publication.
- Atkinson, L., Paglia, A., Coolbear, J., Niccols, A., Poulton, L., Leung, E., & Chisholm, V.C. (2000). L'évaluation de la sensibilité maternelle dans le contexte de la sécurité d'attachement: Une méta-analyse [Assessing maternal sensitivity in the context of attachment security: A meta-analysis]. In G. M. Tarabulsy, S. Larose, D. R. Pederson, & G. Moran (Eds.), *Attachement et développement: Le rôle des premières relations dans le développement humain*. [Attachment and development: The role of first relationships in human development] (pp. 27–56). Sainte Foy, Canada: Presses de l'Université du Québec.
- Bakermans-Kranenburg, M.J., & Van IJzendoorn, M.H. (1993). A psychometric study of the Adult Attachment Interview: Reliability and discriminant validity. *Developmental Psychology*, 29, 870–879.
- Baron, R.M. & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182.
- Bates, B., & Dozier, M. (in press). The importance of foster mothers' investment in the child. *Infant Mental Health Journal*.
- Beeghly, M., Bretherton, I., & Mervis, C. (1986). Mothers' internal state language to toddlers: The socialisation of psychological understanding. *British Journal of Developmental Psychology*, 4, 247–260.
- Belsky, J. (1999). Modern evolutionary theory and patterns of attachment. In J. Cassidy & P.R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 141–161). New York: Guilford Press.
- Benn, R. K. (1986). Factors promoting secure attachment relationships between employed mothers and their sons. *Child Development*, 57, 1224–1231.

- Benoit, D., & Parker, K.C.H. (1994). Stability and transmission of attachment across three generations. *Child Development, 65*, 1444-1456.
- Benoit, D., Parker, K.C.H., & Zeanah, C.H. (1997). Mothers' representations of their infants assessed prenatally: Stability and association with infants' attachment classifications. *Journal of Child Psychology and Psychiatry, 38*, 307-313.
- Bowlby, J. (1982). *Attachment and loss, Vol. 1. Attachment* (2nd ed.). New York: Basic Books.
- Bretherton, I. (1984). Representing the social world in symbolic play: Reality and fantasy. In I. Bretherton (Ed.), *Symbolic play* (pp. 1-39). Orlando, FL: Academic Press.
- Bretherton, I., & Beeghly, M. (1982). Talking about internal states: The acquisition of an explicit theory of mind. *Developmental Psychology, 18*, 906-921.
- Bretherton, I., Biringen, Z., Ridgeway, D., Maslin, C., & Sherman, M. (1989). Attachment: The parental perspective. *Infant Mental Health Journal, 10*, 203-221.
- Brownell, C.A. (1988). Combinatorial skills: Converging developments over the second year. *Child Development, 59*, 675-685.
- Bus, A.G., & Van IJzendoorn, M.H. (1992). Patterns of attachment in frequently and infrequently reading mother-child dyads. *Journal of Genetic Psychology, 153*, 395-403.
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analyses for the behavioral science* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.
- Cox, M.J., Owen, M.T., Henderson, V.K., & Margand, N.A. (1992). Prediction of infant-mother and infant-father attachment. *Developmental Psychology, 28*, 474-483.
- Crittenden, P.M. (1988). Relationships at risk. In J. Belsky & T. Nezworski (Eds.), *Clinical implications of attachment* (pp. 136-174). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.
- Crowell, J.A., Waters, E., Treboux, D., O'Connor, E., Colon-Downs, C., Feider, O., Golby, B., & Posada, G. (1996). Discriminant validity of the Adult Attachment Interview. *Child Development, 67*, 2584-2599.
- De Villiers, P.A., & De Villiers, J.G. (1992). Language development. In M.H. Bornstein & M.E. Lamb (Eds.), *Developmental psychology: An advanced textbook* (3rd ed., pp. 337-418). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.
- De Wolff, M.S., & Van IJzendoorn, M.H. (1997). Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development, 68*, 571-591.
- Dozier, M., Stovall, K.C., Albus, K.E. & Bates, B. (2001). Attachment for infants in foster care: The role of caregiver state of mind. *Child Development, 72*, 1467-1477.
- Dunn, J., Bretherton, I., & Munn, P. (1987). Conversations about feeling states between mothers and their young children. *Developmental Psychology, 23*, 132-139.
- Fava Vizzello, G., Antonioli, M.E., Cocci, V., & Invernizzi, R. (1993). From pregnancy to motherhood: The structure of representative and narrative change. *Infant Mental Health Journal, 14*, 4-16.
- Fonagy, P., Steele, H., & Steele, M. (1991). Maternal representations of attachment during pregnancy predict the organization of infant-mother attachment at one year of age. *Child Development, 62*, 891-905.
- George, C., Kaplan, N., & Main, M. (1996). *Adult Attachment Interview protocol* (3rd ed.). Unpublished manuscript, University of California at Berkeley.
- Goldfield, B.A., & Reznick, J.S. (1990). Early lexical acquisition: Rate, content and the vocabulary spurt. *Journal of Child Language, 17*, 171-183.
- Goldsmith, H. H., & Alansky, J. A. (1987). Maternal and infant temperamental predictors of attachment: A meta-analytic review. *Journal of Consulting and Clinical Psychology, 55*, 805-816.
- Grossmann, K., Grossmann, K.E., Fremmer-Bombik, E., Kindler, H., Scheuerer-Engelisch, H., & Zimmermann, P. (in press). The uniqueness of the child-father attachment relationship: Fathers' sensitive and challenging play as a pivotal variable in a 16-year longitudinal study. *Social Development*.
- Grossmann, K.E. & Grossmann, K. (1991). Attachment quality as an organizer of emotional and behavioral responses in a longitudinal perspective. In C.M. Parkes & J. Stevenson-Hinde (Eds.), *Attachment across the life cycle* (pp. 93-114). New York: Tavistock/Routledge.
- Isabella, R. (1998). Origins of attachment: The role of context, duration, frequency of observation and infant age in measuring maternal behavior. *Journal of Social and Personal Relationships, 15*, 538-554.
- Judd, C.M., & Kenny, D.A. (1981). Process analysis: Estimating mediation in evaluation research. *Evaluation Research, 5*, 602-619.
- Kazui, M., Endo, T., Tanaka, A., Sakagami, H., & Sugauma, M. (2000). Intergenerational transmission of attachment: Japanese mother-child dyads. *Japanese Journal of Educational Psychology, 48*, 323-332.
- Korfmacher, J., Adam, E., Ogawa, J., & Egeland, B. (1997). Adult attachment: Implications for the therapeutic process in a home visitation intervention. *Applied Developmental Science, 1*, 43-52.
- Lieberman, A.F. (1999). Negative maternal attributions: Effects on toddlers' sense of self. *Psychoanalytic Inquiry, 19*, 737-756.
- Lyons-Ruth, K., & Jacobvitz, D. (1999). Attachment disorganization: Unresolved loss, relational violence, and lapses in behavioral and attentional strategies. In J. Cassidy & P.R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 520-554). New York: Guilford Press.
- Main, M., & Goldwyn, R. (1998). *Adult attachment classification system, draft 6.2*. Unpublished manuscript, University of California at Berkeley.
- Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A move to the level of representation. In I. Bretherton & E. Waters (Eds.), *Growing points of attachment theory and research. Monographs of the Society for Research in Child Development, 50* (Serial no. 209, pp. 66-104).
- Main, M., & Solomon, J. (1990). Procedures for identifying infants as disorganized/disoriented during the Ainsworth Strange Situation. In M.T. Greenberg, D. Cicchetti, & E.M. Cummings (Eds.), *Attachment in the preschool years* (pp. 121-160). Chicago: University of Chicago Press.
- McCune-Nicolich, L. (1981). Toward symbolic functioning: Structure of early pretend games and potential parallels with language. *Child Development, 52*, 785-797.
- Meins, E. (1997). *Security of attachment and the social development of cognition*. Hove, UK: Psychology Press.
- Meins, E. (1999). Sensitivity, security and internal working models: Bridging the transmission gap. *Attachment and Human Development, 1*, 325-342.
- Meins, E., & Fernyhough, C. (1999). Linguistic acquisitional style and mentalising development: The role of maternal mind-mindedness. *Cognitive Development, 14*, 363-380.
- Meins, E., Fernyhough, C., Fradley, E., & Tuckey, M. (2001). Rethinking maternal sensitivity: Mothers' comments on infants' mental processes predict security of attachment at 12 months. *Journal of Child Psychology and Psychiatry, 42*, 637-648.
- Meins, E., Fernyhough, C., Russell, J., & Clark-Carter, D. (1998). Security of attachment as a predictor of symbolic and mentalising abilities: A longitudinal study. *Social Development, 7*, 1-24.
- O'Connor, T.G., & Croft, C.M. (2001). A twin study of attachment in preschool children. *Child Development, 72*, 1501-1511.
- Pederson, D.R., Gleason, K.E., Moran, G., & Bento, S. (1998). Maternal attachment representations, maternal sensitivity, and the infant-mother attachment relationship. *Developmental Psychology, 34*, 925-933.
- Pederson, D. R., & Moran, G. (1995). A categorical description of infant-mother relationships in the home and its relation to Q-sort measures of infant-mother interaction. In E. Waaters, B. E. Vaughn, G. Posada, & K. Kondokemura (Eds.), *Caregiving, cultural, and cognitive perspectives on secure-base behavior and working models: New growing points of attachment theory and research. Monographs of the Society for Research in Child Development, 60* (2-3, Serial No. 244, 111-132).
- Raval, V., Goldberg, S., Atkinson, L., Benoit, D., Myhal, N., Poulton, L., & Zwiwers, M. (2001). Maternal attachment, maternal responsiveness and infant attachment. *Infant Behavior and Development, 24*, 281-304.
- Richters, J.E., Waters, E., & Vaughn, B.E. (1988). Empirical classification of infant-mother relationships from interactive behavior and crying during reunion. *Child Development, 59*, 512-522.
- Sagi, A., Van IJzendoorn, M. H., Scharf, M., Joels, T., Koren-Karie, N., Maysless, O., & Aviezer, O. (1997). Ecological constraints for intergenerational transmission of attachment. *International Journal of Behavioral Development, 20*, 287-299.
- Sagi, A., Van IJzendoorn, M. H., Scharf, M., Koren-Karie, N., Joels, T., & Maysless, O. (1994). Stability and discriminant validity of the Adult Attachment Interview: A psychometric study in young Israeli adults. *Developmental Psychology, 30*, 771-777.
- Shatz, M., Wellman, H.M., & Silber, S. (1983). The acquisition of mental verbs: A systematic investigation of the first reference to mental state. *Cognition, 14*, 301-321.
- Shore, C. (1986). Combinatorial play, conceptual development, and early multiword speech. *Developmental Psychology, 22*, 184-190.
- Slade, A. (1987). A longitudinal study of maternal involvement and symbolic play during the toddler period. *Child Development, 58*, 367-375.
- Slade, A., Belsky, J., Aber, J.L., & Phelps, J.L. (1999). Mothers' representations of their relationships with their toddlers: Links to adult attachment and observed mothering. *Developmental Psychology, 35*, 611-619.
- Sroufe, L.A., & Waters, E. (1977). Attachment as an organizational construct. *Child Development, 48*, 1184-1199.
- Steele, H., & Steele, M. (1994). Intergenerational patterns of attachment. In D. Perlman & K. Bartholomew (Eds.), *Advances in personal relationships, Vol. 5*. London: Kinsley.
- Tabachnick, B.G., & Fidell, L.S. (1989). *Using multivariate statistics* (2nd ed.). New York: Harper Collins.
- Tamis-LeMonda, C.S., & Bornstein, M.H. (1994). Specificity in mother-toddler language-play relations across the second year. *Developmental Psychology, 30*, 283-292.
- Teti, D.M., & Ablard, K.E. (1989). Security of attachment and infant-sibling relationships: A laboratory study. *Child Development, 60*, 1519-1528.

- Teti, D.M., Gelfand, D.M., Messinger, D.S., & Isabella, R. (1995). Maternal depression and the quality of early attachment: An examination of infants, preschoolers, and their mothers. *Developmental Psychology, 31*, 364–376.
- Thompson, R.A. (1997). Sensitivity and security: New questions to ponder. *Child Development, 68*, 595–597.
- Thompson, R.A. (1999). Early attachment and later development. In J. Cassidy & P.R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 265–286). New York: Guilford Press.
- Thompson, R.A., Lamb, M.E., & Estes, D. (1982). Stability of infant–mother attachment and its relationship to changing life circumstances in an unselected middle-class sample. *Child Development, 53*, 144–148.
- Valenzuela, M. (1990). Attachment in chronically underweight young children. *Child Development, 61*, 1984–1996.
- Van IJzendoorn, M.H. (1995). Adult attachment representations, parental responsiveness, and infant attachment: A meta-analysis on the predictive validity of the Adult Attachment Interview. *Psychological Bulletin, 117*, 1–17.
- Ward, M.J., & Carlson, E.A. (1995). Associations among adult attachment representations, maternal sensitivity, and infant–mother attachment in a sample of adolescent mothers. *Child Development, 66*, 69–79.
- Weinfield, N.S., Sroufe, L.A., Egeland, B., & Carlson, E.A. (1999). The nature of individual differences in infant-caregiver attachment. In J. Cassidy & P.R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 68–88). New York: Guilford Press.

