

Intergenerational Transmission of Attachment in Abused and Neglected Mothers:
The Role of Trauma-Specific Reflective Functioning

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Abstract

There are still important gaps in our knowledge regarding the intergenerational transmission of attachment from mother to child, especially in mothers with childhood histories of abuse and neglect (CA&N). This study examined the contributions of reflective function concerning general attachment relationships (RF-G) and specifically concerning trauma (RF-T), as well as of maternal attachment states of mind, to the prediction of infant attachment disorganization in a sample of mothers with CA&N and their infants, using a 20-month follow-up design. Attachment and reflective functioning were assessed during pregnancy with the Adult Attachment Interview. Infant attachment was evaluated with the Strange Situation Procedure. The majority (83%) of infants of abused and neglected mothers were classified as insecure and a significant proportion (44%) manifested attachment disorganization. There was a strong concordance between mother and child attachment, indicative of intergenerational transmission of attachment in parents with CA&N and their infants. Both unresolved trauma and trauma-specific reflective function made significant contributions to explaining variance in infant attachment disorganization. The findings of this study highlight the importance of trauma-specific mentalization in the intergenerational transmission of attachment by mothers with a history of childhood maltreatment, and provide new evidence of the importance of the *absence of mentalization regarding trauma* for infant attachment.

Keywords: disorganized attachment; unresolved trauma; reflective function; abuse and neglect; mentalization; intergenerational transmission

Introduction

Fraiberg, Adelson and Shapiro (1975), in their article “Ghosts in the nursery”, first drew attention to the challenges adults with childhood histories of abuse and neglect (CA&N) face in freeing themselves psychologically from past traumatic experiences when they become parents. Whereas for Fraiberg et al. (1975) the ghosts are seen as the *presence* of something left by the trauma, in Fonagy’s (1993) conceptualization they are seen more as an *absence* of mentalization. Recent work suggests that the absence of mentalization about trauma — rather than an absence of mentalization in general — may be particularly important for parents with CA&N (Ensink, Berthelot, Bernazzani, Normandin, & Fonagy, in press). Indeed, adults with CA&N manifested striking difficulties in mentalizing regarding their experiences of trauma, while their ability to mentalize regarding attachment relationships appeared relatively less affected (Ensink et al., submitted). Deficits in mentalizing trauma were shown to play an important role in the transition to parenthood in expectant mothers with CA&N, in that reflective functioning concerning trauma was uniquely associated with their levels of investment in the pregnancy, positive feelings towards the pregnancy, engagement in maternity, as well as the quality of their relationship with their partner (Ensink et al., in press). However, it remains to be determined whether mentalization about trauma also predicts infant attachment disorganization. The aim of the present study was to evaluate, using a 20-month longitudinal design, the intergenerational transmission of attachment in abused and neglected mothers and their infants, and to investigate the contribution of maternal attachment states of mind and reflective function to predicting infant attachment disorganization.

Intergenerational transmission of attachment: from maternal unresolved trauma to infant disorganized attachment

Unresolved trauma has been found to be a frequent outcome of maltreatment in studies with clinical or very high-risk adult populations. Indeed, between 27% and 71% (Murphy et al.,

2014; Riggs, Paulson, Tunnell, Sahl, Atkison, & Ross, 2007; Stalker & Davies, 1998; Stovall-McClough & Cloitre, 2006) of adults with histories of abuse show lapses in the monitoring of reasoning or discourse while talking about these traumatic experiences, presumably as a result of dissociated memory systems being activated and becoming unusually absorbed in trauma-related memories (Main et al., 2008). These transient and subtle lapses occurring during the discussion of traumatic experiences have been shown to be associated with infant attachment disorganization (Madigan et al., 2006; Madigan, Benoit, & Boucher, 2011; Main & Hesse, 1990; van IJzendoorn, 1995).

Infants with attachment disorganization display apprehension toward the caregiver and contradictory, interrupted, stereotypic, or dissociated behaviours when their attachment system is activated (Main & Solomon, 1990). These behaviours are considered to reflect an approach/avoidance conflict and the absence of an organized strategy to deal with stress, and are thought to develop as a result of parent-child interactions in which the parent's reactions evoke fear in the infant, or the infant's behaviours evoke fear in the parent (Barnett & Vondra, 1999; Lyons-Ruth, Bronfman, & Parsons, 1999; Main & Hesse, 1990; Solomon & George, 1999; Tarabulsky, Larose, Pederson, & Moran, 2000). This places the infant in a paradoxical situation in which the person who should provide a secure base and to whom the infant instinctively turns to for comfort and protection at times of stress becomes a source of stress (Hesse & Main, 2006; Madigan, Voci, & Benoit, 2011). While the rate of infant attachment disorganization in non-clinical middle-class samples is relatively low (15%) (van IJzendoorn et al., 1999), very high rates have been reported in maltreated infants (77-90%) (Barnett, Ganiban, & Cicchetti, 1999; Carlson, Cicchetti, Barnett & Braunwald, 1989; Cicchetti, Rogosch, & Toth, 2006; van IJzendoorn, 1995). However, little is known concerning the prevalence of disorganized

attachment relationships in infants of parents with CA&N, as opposed to infants who themselves have experienced abuse or neglect.

Different models have been proposed to understand the development of disorganized attachment relationships. Hesse and Main (2006) hypothesized that when traumatic experiences have not been resolved, the parent's memories and difficult emotions associated with these experiences may be reactivated by the infant's crying or distress, and may provoke a dissociative state during which he or she engages in bizarre and inappropriate behaviour with the infant. A second theory, developed by Lyons-Ruth et al. (1999), focuses more on the experience of the infant when the parent is not emotionally available to comfort him or her. The authors suggest that infants experience unmodulated fear when their mother fails to provide a minimally adequate response to the infant's manifestations of distress, or displays atypical parental behaviours in parent-child interactions —“whether or not the mother herself is the source of fear” (Lyons-Ruth & Jacobvitz, 2008, p. 677). More recently, Beebe et al., (2010) showed that mothers of infants with disorganized attachment patterns do not manifest *global* failures of empathy or engagement, but rather *specific* failures of contingency when infants manifest distress. Beebe observed that mothers of infants who later manifested attachment disorganization experienced specific difficulties with accepting and “going with” infant facial and vocal distress, and reacted with discordant responses such as surprise or positive emotions. She understands this as an attempt to deny the infant's distress, and considers it defensive. In terms of the impact on the infant, the authors argue that it creates “confusion about their own basic emotional organization, about their mothers' emotional organization, and about their mothers' response to their distress, setting a trajectory in development which may disturb the fundamental integration of the person” (p.119).

At this stage however, there is a relative absence of research on the intergenerational transmission of attachment in mothers with CA&N. Furthermore, while unresolved trauma is

considered a critical risk factor for infant attachment disorganization (van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999), the mechanisms underlying the association between maternal unresolved trauma and infant disorganized attachment remain inadequately understood (Madigan, Bakermans-Kranenburg, van IJzendoorn, Moran, Pederson, & Benoit, 2006).

Reflective functioning

The findings regarding the implications of parental mentalization for infant attachment (Slade, Grienenberger, Bernbach, Levy, & Locker, 2005) can be considered a significant refinement of Ainsworth's pioneering work on the importance of sensitive parenting, in so far as mentalization facilitates sensitive parenting (Allen, 2013). Reflective functioning (RF) and mentalization are generally understood to refer to the capacity to think about oneself and others as psychological beings and to consider underlying mental states and motivations when interpreting behaviours in attachment contexts (Choi-Kain & Gunderson, 2008). Fonagy et al. (1991) demonstrated that prenatal RF predicted infant attachment classification at one year of age. Subsequently, Slade (2005) developed a methodology for assessing *parental* mentalization about the child and showed that parental mentalization mediated the transmission of attachment (Slade et al., 2005). This is congruent with Meins' findings that mothers' appropriate mind-related comments when interacting with their infants predicted attachment security (Meins, 2013; Meins, Fernyhough, Fradley & Tuckey, 2001). In addition, Grienenberger et al. (2005) showed that the relationship between parental RF and infant attachment disorganization was mediated by atypical parental behaviours during interaction with their infants. Mothers with higher RF about their children showed less hostility and intrusiveness in interaction with their infants, suggesting that mentalization buffers against affect dysregulation when mothers confront infant distress.

There are reasons to think that the parents' mentalizing capacity is especially important for understanding the intergenerational transmission of disturbed attachment in parents with histories of deprivation and abuse (Katznelson, 2014). First, good mentalization capacities are theorized to be at the core of resilience processes following abuse and neglect (Allen, 2013; Berthelot, Ensink, & Normandin, 2013a,b; Fonagy, Gergely, Jurist, & Target, 2002; Fonagy, Target, Gergely, Allen, & Bateman, 2003). Second, in a seminal study, Fonagy et al. (1994) found that the mother's capacity to mentalize and think of early attachment relationships in mental-state terms accounted for the link between the mother's attachment representations and that of her infant. Furthermore, among mothers who had been exposed to trauma and deprivation, all those with high levels of mentalization had securely attached infants, while the vast majority of those with low levels of mentalization had insecure infants. However, replication of the findings would seem an important priority, particularly given the small number of individuals with histories of risk and deprivation in the original study ($n = 27$).

The current perception is that mentalization is multifaceted, with mentalization in specific domains likely to be the best predictors of specific skills, difficulties, and psychopathology (Allen, 2013; Allen & Fonagy, 2006; Fonagy & Luyten, 2009; Luyten, Fonagy, Lowyck, & Vermote, 2012). Identification of the domains of mentalization most relevant for specific interpersonal abilities presents a significant refinement that has potentially important implications for intervention. In the context of CA&N, mentalization regarding trauma may be expected to be particularly important for the regulation of affects such as fear, anger and vulnerability, yet also particularly challenging. Conversely, a lack of mentalization regarding traumatic and emotionally painful experiences of fear and helplessness (i.e. the capacity to think about, symbolise, or mentalize abusive experiences) is likely to make the parent vulnerable to identifying with the aggressor when faced with the distress of the infant (Fonagy, 1993).

Congruent with this conceptual background, pregnant women with histories of CA&N manifested specific deficits in mentalization regarding trauma, rather than global deficits in mentalization regarding their early relationships with attachment figures. In addition, reflective functioning concerning trauma was demonstrated to be independent from unresolved trauma. Furthermore mentalization regarding trauma was found to be particularly important in the transition to parenthood, since it was uniquely associated with involvement in pregnancy, positive feelings regarding pregnancy, and a sense of commitment toward maternity. A strong negative correlation was also found between mentalization regarding trauma and couple functioning (Ensink et al., submitted).

The Present Study

In light of the issues raised above, in this study we aimed to evaluate the intergenerational transmission of attachment in abused and neglected mothers and to examine the contributions of reflective functioning —specifically reflective functioning regarding trauma —and maternal attachment states of mind to the prediction of infant attachment disorganization. We hypothesize that the absence or failures of mentalization regarding trauma is likely to play a key role in the intergenerational transmission of trauma, operationalized as infant attachment disorganization in this study.

Method

Procedure

This study used a subset of data from a longitudinal study regarding the intergenerational transmission of risk related to childhood neglect and abuse. Mothers were recruited during pregnancy at the obstetrics department of a large university hospital. All eligible women in their third trimester of pregnancy were invited to complete the Parental Bonding Inventory (PBI; see below), to screen for mothers with a high probability of childhood abuse or neglect. Of the 809

women who completed the PBI, 173 (21%) had PBI scores below the cut off (24 for mothers, 27 for fathers) indicative of lack of parental care (Parker, 1979). Thirty-one potential participants (18%) refused to participate and 42 (24%) did not meet study inclusion criteria because they lived outside the study area, had been contacted too near their expected delivery date, were under the age of 18, or suffered from a severe psychiatric disorder (e.g., psychosis) or drug addiction. The remaining 100 mothers were then interviewed at home during the third trimester of pregnancy, first using the Childhood Experience of Care and Abuse interview (CECA; see below) and subsequently using the Adult Attachment Interview (AAI; see below).

At the second assessment, when the infants were approximately 17 months old, 57 mother-infant dyads participated in the Strange-Situation Procedure (SSP) to assess infant attachment. Forty-three mothers did not participate in the second assessment, in most cases because of work and family commitments or because they had moved and could not be contacted. However, there were no significant differences between mothers who agreed to participate and those who refused in terms of security of attachment, $\chi^2(1, N = 100) = 1.67, p = .20$, the presence of unresolved trauma or loss, $\chi^2(1, N = 100) = 1.48, p = .22$, reflective functioning, $t(98) = 0.10, p = .92$, or socio-demographic characteristics such as age, $t(93) = -0.64, p = .53$, education ($p = .39$ using Fisher's Exact Test) and annual income, $\chi^2(1, N = 95) = 0.87, p = .77$.

Participants

Mothers ranged in age from 19 to 41 years ($M = 28.77, SD = 5.57$), and most (58%) had children other than the index child ($M = 0.91, SD = 1.02$). In terms of ethnicity, the majority were Caucasian (78%), the remainder being African-American (11%), Hispanic (4%), North African (4%), and Asian (3%). The majority (61%) of mothers were in common-law relationships, 30% were married, and 9% were single. In terms of education, 48% had some post-secondary training

and 47% had university degrees. Sixty-four percent were employed. Approximately half of the sample (52%) had an annual family income of less than CAN\$ 30 000. Given that CAN\$ 34 000 is considered the low-income cut-off for a family with one child in Canada, mothers with low-socioeconomic status were thus well represented in the sample.

Using CECA levels indicating *some*, *moderate* and *marked* abuse or neglect (see below), 58% reported physical abuse, 39% sexual abuse, 79% neglect, and 86% antipathy from a parental figure. The majority (73%) reported marked maltreatment of at least one type. Of the physically abused mothers, 11% reported marked severity, 37% moderate and 52% reported some abuse. The primary perpetrator of physical abuse was reported to be a natural parent in 79% of cases (mother: 38%; father: 41%), a step-parent in 6%, a foster parent in 6%, and relatives or others in 9%; 10% of physically abused mothers reported being physically abused by more than one person. Sexual abuse at the hands of a member of the household was reported by 19% of participants. Perpetrators of sexual abuse were reported to be biological parents (9%), adoptive or step-parents (23%), siblings (9%), relatives (18%), family friends (9%) and peers, strangers or acquaintances (32%). Of the sexually abused mothers, 16% reported abuse from more than one person. Among those who experienced neglect by primary caregivers, 89% identified their mother and 82% their father as neglectful. Among those who experienced parental antipathy, 79% reported antipathy from their mother and 77% from their father.

Measures

Parental Bonding Instrument. The Parental Bonding Instrument (PBI; Parker et al, 1979) is a 25 item self-report questionnaire developed to assess the perception adults have of the level of parental care and protection/control they received during the first 16 years of childhood. Respondents are asked to recall their experiences with each parent separately, so that care and protection scores can be obtained for each parent. The care scale has 12 items reflecting warmth,

affection, and empathy. The protection scale has 13 items reflecting parental control, intrusion, and overprotection. The instrument was designed to measure perceptions of parenting, but there is evidence suggesting that it is reliable as an indicator of actual parenting (Mackinnon, Henderson, & Andrews, 1991). While the PBI is not a measure of abuse history, low parental care has been shown to be associated with abuse (Cosden & Cortez-Ison, 1999). The psychometric properties of the instrument have been shown to be good (Kay, Niven, Parker, & Hadzi-Pavlovic, 2005; Parker, 1989; Safford, Alloy, & Pieracci, 1997). In the present study, the PBI was used as a screening instrument to identify expectant mothers who experienced low parental care from at least one parent in childhood. Standard PBI cut-off scores (Parker, 1979) were used (27 for maternal figures and 24 for paternal figures). Respondents with scores below the cut-off on the care scale for either parent were invited to take part in the study.

Childhood Experience of Care and Abuse. The Childhood Experience of Care and Abuse (CECA; Bifulco, Brown & Harris, 1994) is a semi-structured contextual interview designed to retrospectively measure adverse childhood experiences before the age of 17. The CECA assesses several domains of childhood experience, including parental antipathy, parental neglect, physical abuse from mothers, fathers or other household members, as well as sexual abuse. Ratings are made for each domain on a 1-4 scale (4 - little/none, 3 - some, 2 - moderate, 1 - marked), based on a detailed rating manual which provides explicit examples of the type of parental behaviour that is considered to represent each level of severity. The investigator-based format of the CECA has the advantage of not depending on participants having previously categorized their own childhood experiences as abusive and is considered to produce a more objective and reliable rating of whether parents behaved in abusive and neglectful ways. The CECA has shown good psychometric properties (Bifulco et al., 1994). Studies have shown that the CECA identifies higher rates of abuse than self-report questionnaires (Finkelhor, 1986) and

produces fewer false positives (Smith, Lam, Bifulco, & Checkley, 2002). In the present study, all interviews were audio-taped and subsequently coded by trained and reliable raters blind to all other measures.

In previous studies using the CECA (Bifulco, Moran, Ball, & Bernazzani, 2002), a severe versus non-severe dichotomisation was used, with having experienced *moderate* or *marked* maltreatment according to CECA criteria considered to have experienced severe maltreatment. Studies using these criteria indicate that women who have experienced severe abuse are at a significantly higher risk for depression, although women who had experienced “some” abuse according to CECA criteria were also at an elevated risk of depression (Bifulco & Moran, 1998). Therefore, and given the absence of research on the relationship between maltreatment, attachment, and reflective function, we used the lower CECA cut-off—including mothers who have experienced “some” maltreatment (severity rating of 3).

Adult Attachment Interview. The Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985) is a semi-structured interview designed to assess mental representations adults have of their early attachment relationships and the implicit set of rules individuals use for organizing and accessing information relevant to attachment (Main, Kaplan, & Cassidy, 1985). Attachment representations are considered to be reflected by the coherence, quality, quantity, relevance and clarity of an individual’s discourse during the AAI. The coding system identifies three major adult attachment classifications, corresponding to distinct patterns of discourse and strategies used to discuss attachment relationships (Main, Goldwyn, & Hesse, 2002): Secure-Autonomous (F), Insecure-Dismissing (Ds), and Insecure-Preoccupied (E). Secure individuals provide relatively clear, coherent, and succinct responses, and accounts which are coherent and consistent. Individuals from challenging backgrounds can also be classified as secure if they provide coherent accounts of these experiences. Dismissing participants, in contrast, provide

highly positive and idealized accounts of their parents which are contradicted later in the interview, and insist that they are unable to remember experiences with their attachment figures. In preoccupied individuals, the interview questions seem to provoke excessive activation of attachment-related memories, and confused, angry, or passive preoccupation with attachment figures. These individuals provide long, rambling, and confusing descriptions and appear to lose the capacity to focus their discourse and respect the rules of communication such as providing clear and succinct accounts. Both dismissing and preoccupied individuals are considered to be insecure. In the rare cases where individuals do not fit in any of the above categories, they are considered “cannot classify” (CC).

When individuals have experienced loss or trauma, an additional classification is made in terms of whether the trauma was unresolved/disorganized (U/d), as reflected in the accounts they provide of their experiences of loss and trauma. Lack of resolution is coded on a scale (1-9) and only scores of 5 and above are considered to reflect lack of resolution (Main et al., 2002). Lack of resolution manifests itself in lapses in the monitoring of reasoning or discourse when individuals discuss traumatic or loss experiences. The coding manual provides a list of experiences that qualify as abuse. In general, abuse is considered to include "any form of experiences which have been overwhelmingly frightening and heightening of fearful attention towards prospective incidents" (Main et al., 2002, p. 137). Current convention is to collapse the U/d and CC categories, because of potential similarities with regard to the origins and consequences of both categories (Bakermans-Kranenburg & van IJzendoorn, 2009). In the present study, only 1 participant was unresolved regarding loss and 3 were classified as CC without an additional U/d classification with regard to trauma.

Studies suggest that the AAI has good psychometric properties, as evidenced by high test-retest reliability, validity, and stability over time (Bakermans-Kranenburg & van IJzendoorn, 1993;

Benoit & Parker, 1994). In the present study, transcripts were coded by a rater who was trained to reliably adhere to the coding standards of the Berkeley laboratory of Mary Main and Erik Hesse. The coder was blind to abuse and neglect as assessed by the CECA, to the goal of the study, and to the composition of the sample.

Reflective Functioning. The AAI was also used to measure participants' Reflective Functioning (RF). RF was coded according to the *Reflective-Functioning Manual for Application to Adult Attachment Interviews* (Fonagy, Target, Steele, & Steele, 1998). A RF rating of -1 indicates an attack on mentalization. A rating of 0 indicates refusal to engage in mentalization. A rating of 1 indicates the absence of any recognition of mental states, such that interpersonal reactions are described only in behavioural terms, or individuals only in terms of global personality traits. A rating of 3 indicates a limited capacity to acknowledge mental states, without, however, an understanding of how mental states function. A rating of 5 indicates a basic capacity for RF and a basic understanding of how mental states interact and influence behaviour. Higher ratings indicate increasingly sophisticated and full mental-state accounts of interactions and reactions, with ratings of 9 indicating exceptional mental state thinking and insights. RF is typically scored based on all AAI questions that explicitly demand an appreciation of mental states (e.g., "why did your parents behave as they did during your childhood?"). An overall RF score, which represents the respondent's characteristic level of RF, is derived from individual scores, using a decision algorithm, outlined in the manual, that takes into account the respondent's most frequent level of RF responses as well as the frequency of responses characterized by high and low RF. The RF coding system has been demonstrated to have good psychometric properties (Fonagy et al., 1998; Taubner et al., 2013). In the present study, RF was rated by two qualified raters who were trained by the developers of the RF coding system and have more than 10 years of experience in rating RF of adults, parents and children. The inter-rater

reliability was computed for the 10 cases considered to be the most difficult. Intraclass correlations of .79 obtained for the RF ratings of these 10 cases suggested good reliability even with challenging transcripts. RF raters were blind to other measures.

Reflective functioning regarding traumatic experiences. In addition to obtaining the overall RF score (RF-G), as outlined above, which relates to attachment relationships more generally, we were particularly interested in RF regarding traumatic experiences (RF-T). To obtain an RF-T score that would serve as a good indicator of trauma-specific RF, we used the RF scale (range –1 to 9) to rate all interview passages during which abuse was directly probed or explicitly discussed. The structure of the AAI permits such separate ratings, given that respondents having experienced childhood abuse are asked questions eliciting mentalization explicitly when discussing the abuse, for example, “*Do you feel the experience of having been physically abused by your father affects you now as an adult?*”. Ratings of other demand questions such as “*In general, how do you think your overall experiences with your parents have affected your adult personality?*” were used to obtain an RF-G score. Given that the AAI provides a set of questions regarding childhood abuse, but no such detailed questions regarding childhood neglect or other potentially traumatic incidents, only childhood abuse can be coded for RF-T. This means that low mentalization specific to a discussion of abuse experiences would be captured by the RF-T score but would not lower the RF-G score. This is consistent with the approach used when coding attachment: participants who manifest evident lapses in the monitoring of discourse specifically when discussing loss or traumatic experiences can still be considered to be globally coherent and be classified as *secure-autonomous*, while also having an *unresolved* classification (Main et al., 2002).

In order to facilitate reliable rating of RF-T, we developed an addendum to the existing RF coding manual. The addendum was specifically intended to provide examples of the different

types and levels of RF-T. To this end, all examples of mentalization regarding trauma were extracted from the AAIs and rated by two raters. Divergences in ratings were discussed and a consensus rating reached in consultation with a third expert RF rater. The rationale for each rating was developed and clearly formulated, so that this could be used (and subsequently clarified) when similar examples were encountered.

To determine whether our RF-T addendum to the RF coding manual could be used to train raters to become reliable in coding RF-T, we subsequently used the RF-T addendum to train four postgraduate students who were working in our laboratory and already experienced in coding RF. The training comprised an introduction to the RF-T manual, discussion of the different levels of RF-T and of examples, and additional individual practice ratings followed by discussion. After 9 hours of training, excellent agreement between raters was achieved. The four raters then rated 20 protocols; the intraclass correlation between the four raters was .87, suggesting excellent reliability.

Strange Situation Procedure. The Strange Situation (Ainsworth, Blehar, Waters, & Wall, 1978) was used to assess mother-infant attachment when the infants were approximately 17 months old. The SSP is widely used and its validity has been demonstrated in major long-term studies (Sroufe, 2005). It consists of eight three-minute episodes during which the mother leaves (separation episodes) and rejoins (reunion episodes) the infant twice. Videotaped Strange Situations were coded by a trained coder. The three organized attachment classifications (secure, anxious-resistant-insecure and anxious-avoidant-insecure) were coded using Ainsworth's (Ainsworth et al., 1978) criteria, and attachment disorganization was coded using Main and Solomon's (1990) criteria. In this sample, 50% of the tapes were double coded with 100% agreement for the organized attachment classifications and 97% agreement for infant attachment disorganization.

Statistical Analyses

Because we were interested in the implications of different levels of RF, as defined by Fonagy et al. (1994), mothers were divided in three groups based on their RF scores; absent RF (scores below 3), rudimentary RF (3-4), and solid to good RF (5 and higher). Moreover, because our primary interest was to examine predictors of secure versus insecure, or organized versus disorganized infant attachment classifications, binary comparisons rather than comparisons between the four specific attachment classifications were conducted.

Data analyses are presented in two sections. In the first section (preliminary analyses), the attachment distributions of mothers and infants are described and their concordance examined using chi-square tests. A dose-response analysis (Anda et al., 2006) was performed to examine whether the accumulation of different types of adverse experiences (neglect, antipathy, sexual abuse, and physical abuse) was associated with unresolved attachment in mothers, mothers' level of RF-T, and disorganized attachment in children. In the second section, the respective contributions of maternal attachment and mothers' RF to the prediction of intergenerational transmission of disorganized attachment were examined. A binary logistic regression was used to evaluate the predictors of attachment disorganization in children, using organized (secure, avoidant or resistant) versus disorganized attachment classification as the dependent variable. The statistical model was created hierarchically in two steps. In the first step, mothers' unresolved trauma (unresolved vs. non-unresolved) was entered as the sole predictor. In the second step, RF-T was added. Subsequently, the regression model was performed with RF-G rather than RF-T.

Results

Preliminary analyses

Of the 57 mothers with histories of abuse or neglect, 32% ($n = 18$) were classified as secure, 21% ($n = 12$) as dismissing, 5% ($n = 3$) as preoccupied, and 42% ($n = 24$) as unresolved. Fisher's exact test showed that there were no statistically significant relationships between infant attachment security and demographic variables such as education ($p = .76$), annual earnings ($p = .17$), or marital status ($p = .12$). Furthermore, one-way analysis of variance revealed no significant differences in infant attachment security related to maternal age. Similarly, there were no significant associations between infant attachment disorganization and socio-demographic characteristics.

Table 1 shows the distribution of mother-infant attachment classifications. As expected, the majority (83%, $n = 47$) of abused and neglected mothers had infants with insecure attachments and many infants displayed disorganized attachment behaviours (44%, $n = 25$). Of the 57 mother-infant dyads, 72% ($n = 42$) had correspondent secure/insecure attachment classifications, $\chi^2(1) = 4.53, p = .03$. With regard to the relationship between unresolved trauma and infant attachment disorganization, 70% ($n = 40$) of mother-infant dyads had correspondent attachment classifications, $\chi^2(1) = 8.76, p = .003$. Correspondence between mother and infant attachment classifications is presented in Table 2.

Insert Tables 1 and 2 about here

Next, we examined whether the dose of trauma was associated with unresolved trauma, reflective function regarding trauma, and infant attachment disorganization. Logistic regression showed that the risk of mothers being classified as unresolved increased with number of different

types of maltreatment that a mother had been exposed to during childhood ($\beta = 1.14$, Wald = 9.59, $p < .01$, OR = 3.13), suggesting a dose-response relationship between early adversity and unresolved attachment status. However, there was no association between the dose of maltreatment, the level of mothers' RF-T ($\beta = .07$, $t(35) = 0.48$, $p = .64$), RF-G ($\beta = -.04$, $t(55) = -0.43$, $p = .67$), or infant attachment disorganization ($\beta = 0.28$, Wald = 1.00, $p = .32$).

Relationship between adult attachment, reflective function, and infant attachment

Figure 1 shows that mothers with histories of sexual and/or physical abuse and *high* RF-T predominantly had infants with organized attachment strategies during the SSP. In comparison, two thirds of mothers with histories of sexual and/or physical abuse and *low* RF-T had infants with attachment disorganization. Mothers with low RF-T were 3.43 times more likely to have infants with attachment disorganization than were mothers with histories of trauma but high RF-T.

Table 3 shows the results of hierarchical logistic regressions with infant *disorganized* attachment as the criterion and mothers' unresolved trauma and level of reflective functioning as predictors. At the first step, unresolved trauma accounted for 22% of the variance in infant attachment disorganization, $\chi^2(1) = 6.67$, $p = .01$. At the second step, with the addition of RF-T, the model was significant, $\chi^2(2) = 13.53$, $p = .001$, and accounted for almost twice the variance (41%) in infant attachment disorganization, with both variables independently contributing to infant attachment. When the regression analysis was repeated, this time with RF-G rather than RF-T entered at the second step, the model was significant, $\chi^2(2) = 7.09$, $p = .03$, but only unresolved trauma predicted infant attachment disorganization.

Insert Figure 1 and Table 3 about here

Discussion

This study addressed the role of unresolved trauma and reflective functioning, particularly reflective functioning regarding trauma, in the intergenerational transmission of attachment disorganization in mothers with CA&N and their infants.

The first goal was to provide data on attachment in infants of mothers with CA&N, as well as on the concordance between mother and infant attachment in this population, given the scarcity of data in this regard. The majority (83%) of infants of mothers with CA&N had insecure attachments, and 44% were classified as having disorganized attachments. This is consistent with findings from a previous study of infants of low-income mothers with histories of sexual or physical abuse in which 47% of infants were disorganized (Lyons-Ruth & Block, 1996). Together, these findings suggest that many mothers with CA&N struggle to respond adequately to their infant's attachment needs and foster the development of secure and organized attachments. Furthermore, there was a high concordance (i.e., 70%) between infant attachment disorganization and unresolved loss or trauma in mothers with histories of CA&N. This is considerably higher than that reported in previous studies, where approximately half (53%) of mothers with unresolved states of mind had disorganized infants (van IJzendoorn, 1995), and is likely due to the fact that previous studies focused on unresolved *loss* (Lyons-Ruth & Block, 1996), rather than trauma. Our findings suggest that unresolved *trauma* (representing 84% of the unresolved states of mind in this study) has an even stronger negative impact on infant attachment disorganization.

The most important new finding of the study is that *both* unresolved trauma and mentalization regarding trauma, measured as RF-T in this study, made significant contributions to explaining the variance in infant attachment disorganization measured 20 months later. The study provides the first evidence of an association between mentalization regarding trauma — involving the mother's capacity to consider traumatic experiences and their impacts in psychological terms — and infant attachment disorganization. Furthermore, mentalization regarding trauma, but not mentalization about attachment relationships, predicted infant attachment disorganization. These findings suggest that it is specific difficulties in trauma-related mentalization that are particularly important for mothers with CA&N and their infants. Awareness of the emotional impact of abusive experiences may help mothers to maintain an appropriate perspective that not only takes into account their own reactivity to their infant's displays of distress that trigger memories and feelings related to their own traumatic past (Fonagy, Luyten, & Strathearn, 2011), but also keep the infant in mind so that they are able to respond appropriately to the infant's need to be soothed. For these parents, the ability to mentalize past traumatic experiences and consider their impacts might increase their ability to maintain controlled reflective functioning in these challenging circumstances and prevent them from switching to more automatic, so-called non-mentalizing, modes that typically emerge under stress. It is unlikely that mothers with CA&N display global failures in sensitivity in interaction with their infants, but we suspect that inadequate mentalization regarding trauma makes some mothers with CA&N vulnerable to momentary displays of inadequately modulated aggression, or underlies affectively inappropriate and mismatched reactions to infant distress. As research by Beebe et al., (2010) has demonstrated, such momentary failures by mothers to go with and accept infant distress, as well as discordant reactions such as smiling when the infant is distressed, have far more important implications for infant attachment disorganization than previously expected.

Interestingly, while there was a dose-response relationship between the number of traumatic experiences and the risk of being unresolved with regard to trauma, there was no direct association between the number of adverse events experienced by mothers and RF-T or infant attachment. This suggests that *mentalization* is not necessarily determined by the characteristics of trauma, nor is there a direct link between exposure to trauma per se and infant attachment. This highlights the importance of trauma-specific mentalization and suggests that it is not the experience of trauma per se, but the *absence of mentalization regarding trauma* that underlies the risk of infant attachment disorganization.

The findings of the present study provide further support for Fonagy's (1993) conceptualization of the "ghosts in the nursery" as an *absence*, and clarifies that it is not an absence of mentalization per se, but more specifically an absence of mentalization regarding trauma that has the most important implications. The findings also extend that of Fonagy et al. (1994) regarding the important implications for infant attachment of the parent's capacity to mentalize and consider the psychological significance of their own early experiences, especially for parents with CA&N. Previous studies exploring the role of parental RF in predicting infant attachment focused either on parents' RF regarding their own attachment relationships (Fonagy et al., 2002; Fonagy et al., 1995; Fonagy et al., 1991; Fonagy & Target, 2005) or parental RF regarding their relationship with their infants or toddlers (Slade, 2005; Slade et al., 2005). Slade (2005), for instance, has argued that parental mentalizing abilities facilitate infant attachment by helping parents hold in mind complex mental states regarding their own reactions as well as the child's inner world. For parents with CA&N, mentalization regarding trauma may be particularly important for the monitoring and regulation of their own reactions of distress, helplessness, or fear when faced with infant distress, and may allow them to prioritize and respond to the distress and needs of the infant. An important next step will be to examine relationships between

mentalization regarding trauma, parental mentalization regarding infant distress, and mother-infant interaction, in order to clarify the processes that might account for the link between difficulties in trauma-specific mentalization and infant attachment disorganization.

We suspect that inadequate mentalization of traumatic experiences may make mothers more vulnerable to momentarily failures in responding congruently or modulating aggression or fear in the context of mother-infant interactions where trauma related affects or memories are triggered. For instance, using microanalytic studies of parent-infant interaction, Beebe et al. (2010) found that inappropriate, unexpected responding at 4 months was a primary determinant of subsequent disorganized attachment. Bion's (1962) model of an absence of containment helps to understand how such relatively minor absences could have devastating consequences when the infant's behaviour triggers trauma-related ideation in the caregiver. Given that the infant's distress is the most probable trigger for brief failures of mentalization — when there is an activation of the mother's memories of trauma — it is these experiences of distress that will remain without adequate second-order representation, as a result of the failure of mother's mirroring response. We believe that the absence of the contingent, marked, mirroring response from the mother leaves an unmentalized alien core around the child's experience. Furthermore, we suggest that Winnicott's (1967) model of the failure of maternal mirroring may be operationalized as the absence of marked contingent mirroring and result in the infant's internalization of the mother's re-experience of unmentalized trauma. This may be a seed for the experience that we have termed “the alien self”, by which we mean a direct experience of distress which is both felt to be within the self and yet also feels inexplicably independent of other aspects of subjectivity. For example, the feeling of badness that cannot be mitigated by reassurance and exists despite a generally benign environmental context may be exactly such an internalization of temporary maternal absence. Clinically, when patients re-experience these moments, they tend to

come closest to feelings of de-realization and dissociation. These experiences of un-metabolized distress can lead to experiences of incoherence of the self that are so painful that they are only regulated through complex processes of projective identification where alien parts of the self are lodged in another. This may provide temporary relief from the incoherence, but creates another problem: provoking the other to become the disowned self-fragment that the patient requires the other to be. In this way a persecutory self-experience can be actualized as a persecution and the internal sense of feeling tortured is exchanged for a feeling of being victimized. We propose that this is a relatively economical explanation of the intergenerational transmission of the experience of trauma, and should be tested through studies with data on mother-infant interaction and infant attachment.

While this study has several strengths, such as a prospective design and the use of state of the art measures of attachment in mothers and infants, its findings should be interpreted in the context of some limitations. First, even though our sample size of 57 mother-infant dyads was rather large in comparison to related studies (Fonagy et al., 1994; Slade et al., 2005; Suchman et al., 2010; van IJzendoorn, 1995) a larger sample would have eliminated possible type 2 errors. Second, the small number of mothers who had experienced antipathy and neglect without other types of abuse resulted in inadequate power to examine the impact of other types of maltreatment. Third, the retrospective self-reports of childhood maltreatment may have led to biases or distortions in recall, although critical analysis of retrospective reports suggest that such presumed biases do not systematically affect the association between childhood maltreatment and later outcomes (Brewin, Andrews, & Gotlib, 1993). Finally, the causal relationship suggested between the variables under study remains hypothetical.

Overall, this study sheds light on the intergenerational transmission of attachment in mothers with histories of CA&N, and confirms the importance of trauma-specific mentalization

capacities. These findings call for further research concerning the relative importance of general versus specific aspects of RF, and should inform prevention research and clinical practice with vulnerable parents. Clinical interventions with abused and neglected parents should consider adding specific components that aim to help these parents develop an awareness of the impacts of trauma on the self and on parenting, and to reflect on the particular challenges parenting represent for them.

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Table 1

Distribution of mother-infant attachment classification and comparison with data from previous meta-analysis.

	Current sample	van IJzendoorn, Schuengel, & Bakermans-Kranenburg (1999)	
	Total N (%)	Low risk infants	Maltreated infants
Infant attachment	N = 57	N = 2 104	N = 165
Secure	10 (18%)	1299 (62%)	15 (9%)
Avoidant	13 (23%)	311 (15%)	47 (28%)
Ambivalent	9 (16%)	182 (9%)	24 (15%)
Disorganized	25 (44%)	312 (15%)	79 (48%)

Table 2
Correspondence between mother and infant attachment classifications

Infant Attachment	AAI: security				AAI : Trauma and Loss			
	Secure		Insecure		Unresolved		Non-Unresolved	
	n	(%)	n	(%)	n	(%)	n	(%)
Security of Attachment								
Secure	6	(33)	4	(10)	2	(8)	8	(24)
Insecure	12	(67)	35	(90)	22	(92)	26	(76)
Attachment Disorganization								
Organized	15	(72)	19	(49)	8	(33)	24	(73)
Disorganized	5	(28)	20	(51)	16	(67)	9	(27)

Table 3

Hierarchical regression analyses predicting infant disorganized attachment from maternal unresolved attachment and mother's reflective function

<i>Variables</i>	<i>B</i>	<i>SE B</i>	<i>Wald</i>
U/d and RF-T			
Unresolved vs Non-Unresolved	2.54	.94	7.25 **
RF-T	-1.50	.65	5.37 *
U/d and RF-G			
Unresolved vs Non-Unresolved	1.77	.60	8.60 **
RF-G	.40	.40	.98

* $p \leq .05$. ** $p \leq .01$