

The role of disconnected and extremely insensitive parenting in the development of disorganized attachment: validation of a new measure

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Early adverse caregiving experiences constitute an important risk factor for the development of disorganized attachment in infancy, especially extreme insensitivity and frightening behavior associated with an unresolved loss or trauma. Using existing measures for frightening parenting and disrupted communication, we developed a new measure assessing Disconnected and extremely Insensitive Parenting (DIP), in order to investigate the unique contribution of disconnected and extremely insensitive parenting behaviors to infant disorganization. Maternal behavior was assessed during a laboratory session in a low-risk sample of 202 mothers and their infants. Construct and discriminant validity of the DIP was established for both types of parental behavior. Disconnected parental behavior predicted infant disorganization but not organized attachment security, whereas extreme insensitivity was marginally related to organized attachment insecurity in boys but not to attachment disorganization.

Keywords: disorganized attachment; parenting; dissociation; extreme insensitivity; trauma

Introduction

Disorganized attachment in infants is associated with an elevated risk for later psychopathology, such as externalizing behavior problems and dissociative symptoms (Carlson, 1998; Lyons-Ruth, Easterbrooks, & Cibelli, 1997; for a meta-analysis see Van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). In stressful situations, these infants may perceive their parents as the only potential source of comfort while at the same time they feel frightened by them, which results in an irresolvable paradox (Main & Hesse, 1990; Main & Solomon, 1990). Indeed, specific adverse caregiving experiences are important risk factors for the development of disorganized attachment in infants, especially extreme insensitivity and frightening behaviors that may indicate a dissociative state in the parent (Lyons-Ruth, Bronfman, & Parsons, 1999; Main & Hesse, 1990; for a meta-analysis see Madigan, Bakermans-Kranenburg, Van IJzendoorn, Moran, Pederson, & Benoit, 2006). Extremely insensitive care during infancy may also negatively influence the functioning of the HPA system (Gunnar & Cheatham, 2003) and affect the activation of neural systems involved in stress reactivity (Hane & Fox, 2006).

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Given these negative outcomes, more insight is needed into the nature of the specific caregiving experiences that are associated with disorganized attachment. At present, two coding systems exist for identifying and coding anomalous parental behavior, including extremely insensitive behaviors as well as frightening behaviors (Bronfman, Parsons, & Lyons-Ruth, 2004; Main & Hesse, 1998). However, the unique contributions of parental extreme insensitivity and frightening behavior to infant disorganization are not yet clear: with the existing measures, it is not possible to derive separate scores for these two types of parental behavior. In the current study, we present and test a new measure, Disconnected and extremely Insensitive Parenting (DIP), which distinguishes between two separate dimensions that reflect frightening parental behavior and extremely insensitive parental behavior. The reliability as well as the unique and combined predictive power of both dimensions of parenting for attachment security and disorganization are examined.

During the first year of their lives, infants form attachment relationships with their parents, enabling them to deal with stressful circumstances and negative emotions (Bowlby, 1984). During stressful situations, securely-attached children turn to the parent for comfort and protection, and then return to exploring the environment (Ainsworth, Blehar, Waters, & Wall, 1978). Avoidantly-attached infants minimize the expression of negative emotions, while ambivalently-attached children maximize the expression of negative emotions and remain angrily or passively focused on the parent at the expense of exploration. These insecure forms of attachment are considered to be adaptive to the specific (sub-optimal) child rearing environments that these infants experienced (Main, 1990). Attachment disorganization is considered the most insecure form of attachment and reflects the (often) momentary breakdown of one of these coherent forms of attachment in the face of stress (Main & Solomon, 1990). Disorganized children are most likely to develop disturbances in their HPA axis activity (Hertsgaard, Gunnar, Erickson, & Nachmias, 1995; Spangler & Grossmann, 1993; but see Spangler & Schieche, 1998) and are at the greatest risk for developing internalizing and externalizing behavior problems (e.g., Lyons-Ruth et al., 1997; Shaw, Keenan, Vondra, Delliquadri, & Giovannelli, 1997; for a meta-analysis see Van IJzendoorn et al., 1999), as well as post-traumatic stress symptoms (MacDonald et al., 2008) and dissociative symptoms (Carlson, 1998).

Initially, the concept of disorganized attachment emerged from studies on maltreated infants (e.g., Carlson, Cicchetti, Barnett, & Braunwald, 1989; for a meta-analysis see Cyr, Euser, Bakermans-Kranenburg, & Van IJzendoorn, in press). However, since in nonclinical and middle-class samples a considerable number of infants (15%) also develop disorganized attachment, Main and Hesse (1990) hypothesized that more subtly frightening, frightened and dissociative parental behavior might be the primary determinants of infant attachment disorganization in these samples. Similar to abusive parenting, these *FR* parental behaviors may place infants in an irresolvable and disorganizing paradox: their parents are the only potential source of comfort and protection while at the same time they frighten their children through their behavior.

During the discussion of attachment-related traumas in the course of the Adult Attachment Interview (Main, Hesse, & Goldwyn, 2008; Main, Kaplan, & Cassidy, 1985), parents of disorganized infants tend to show momentary lapses in the monitoring of their reasoning or discourse such as extreme attention to minor details, incompatible beliefs, or sudden visual sensory images. According to Hesse

and Main (2006), these linguistic lapses are indicative of dissociation in the form of absorption, efforts to dissociate memories from awareness, interference from partially dissociated memories, and the existence of incompatible systems of memory and consciousness (pp. 332–333). Indeed, several studies have found an association between self-reported dissociative and PTSD symptoms and unresolved loss (Bailey, Moran, & Pederson, 2007; Harari et al., in press; Hesse & Van IJzendoorn, 1998; Nye, Katzman, Bell, Kilpatrick, Brainard, & Haaland, 2008; Riggs, Paulson, Tunnell, Sahl, Atkison, & Ross, 2007; Schuengel, Bakermans-Kranenburg, & Van IJzendoorn, 1999; but see also Stovall-McClough & Cloitre, 2006; Turton, Hughes, Fonagy, & Fainman, 2004).

Main and Hesse (1990, 1992) proposed that parents classified as unresolved display similar collapses of caregiving behavior, when unresolved memories and affects suddenly intrude into the consciousness of the parent. These anomalous and unpredictable behavioral lapses are thought to create fear, confusion and disorientation in the infant, and to subsequently lead to the development of a disorganized attachment relationship. Main and Hesse (1998) developed a coding system to capture these FR behaviors. They focused on frightening/threatening behaviors (e.g., assuming attack postures), frightened behaviors (e.g., frightened facial expression) and direct indices for dissociation (e.g., freezing). These behaviors have parallels to animal behavior displayed as a response to severe threat or trauma (Nijenhuis, Vanderlinden, & Spinhoven, 1998). Furthermore, Main and Hesse observed deferential, sexualized/spousal and disorganized/disoriented behaviors in parents of disorganized-attached children. In the Main and Hesse FR coding system, each instance of such behavior is coded on a 9-point scale. For each subscale a score is assigned, as well as a final score (also on a 9-point scale), based on the severity and pervasiveness of the observed behaviors. An FR classification can be assigned based on the final score. Hesse and Main (2006) have argued that, akin to unresolved loss, the majority of FR behaviors in their coding system are connected by the theme of dissociation. One of the primary subscales concern direct indices of dissociation (such as stilling and freezing), but the other two primary subscales, threatening and frightened behaviors, “may also fit to a dissociative model and should not be overlooked in this regard” (Hesse & Main, 2006, p. 334). Several studies have confirmed the relations between unresolved loss, FR behavior, and disorganized attachment (Abrams, Rifkin, & Hesse, 2006; Jacobvitz, Leon, & Hazen, 2006; Schuengel et al., 1999; True, Pisani, & Oumar, 2001; for a meta-analysis see Madigan, Bakermans-Kranenburg, et al., 2006). The empirical relation between dissociative phenomena and FR behavior appears to be less unequivocal. Schuengel and colleagues (1999) did not find a relation between FR behavior and self-reported dissociative experiences. It should be noted that reporting dissociative experiences requires at least some conscious awareness of these experiences, in contrast to the observation of FR behavior (see for a similar discussion on PTSD symptoms, Turton et al., 2004). Clearly, more research with alternative measures of dissociation less dependent on self-report (Van IJzendoorn & Schuengel, 1996) is necessary to test the possible connection between dissociation and FR behavior.

Unresolved loss or trauma may also negatively affect the openness of the caregiver to perceive and respond to the child's signals in a sensitive and responsive way (Lyons-Ruth, Bronfman, & Atwood, 1999; Lyons-Ruth, Bronfman, & Parsons, 1999). It is hypothesized that the parents' attempts to defend themselves against reexperiencing the fear, helplessness and anger associated with the trauma may result

in repeated failure to comfort and sooth children when their attachment system is activated (Lyons-Ruth & Block, 1996, p. 272). An unbalanced parent-child relationship may develop, manifested in emotional/physical withdrawal and unresponsiveness or in negative, hostile and intrusive behaviors. These behaviors, together with the parent's inability to repair disruptions, are thought to leave the child in a state of extreme fear (see also George & Solomon, 1999). According to Lyons-Ruth, Bronfman, and Parsons (1999), these parental behaviors exceed the tolerance limits for supporting an organized infant attachment strategy and could lead to the development of a disorganized attachment relationship.

Bronfman, Parsons, and Lyons-Ruth (2004) reorganized and expanded Main and Hesse's coding system with a broader range of disrupted parental behaviors, including extreme insensitivity. The resulting measure, the Atypical Maternal Behavior Instrument for Assessment and Classification (AMBIANCE), also relies on the coding of behaviors from an open-ended list of more than 140 items. Ratings are then given on a 7-point scale for each of the five subtypes of disrupted interaction: (1) affective communication errors, (2) role/boundary confusion, (3) frightened/disoriented behavior, (4) intrusiveness and negativity, and (5) withdrawal. Parents are assigned a score on a qualitative 7-point rating scale to indicate the global level of disrupted communication. A classification of disrupted or non-disrupted is also assigned based on this scale. The broader set of anomalous parental behaviors indicative of disruptive parent-child communication was associated with disorganized attachment and unresolved loss in several studies (e.g., Goldberg, Benoit, Blokland, & Madigan, 2003; Grienenberger, Kelly, & Slade, 2005; Lyons-Ruth, Bronfman, & Parsons, 1999; Lyons-Ruth, Yellin, Melnick, & Atwood, 2005; Madigan, Moran, & Pederson, 2006; for a meta-analysis see Madigan, Bakermans-Kranenburg, et al., 2006).

In sum, scores on the AMBIANCE are based on both extremely insensitive behaviors and frightening parental behaviors, but do not distinguish between these two types of parental behaviors. Furthermore, some FR behaviors (e.g., looming) can also be considered to be (extremely) insensitive (Jacobvitz et al., 2006). The exact nature of the parental behaviors that compromise the development of an organized attachment relationship therefore remains equivocal in studies using the FR or AMBIANCE systems.

Here we test the hypothesis that FR behavior may be one of the primary determinants of infant disorganization. Main and Hesse (1990) suggested that frightening behaviors caused by the intrusion of unresolved memories and affects, or by external stimuli that are only idiosyncratically related to the traumatic experience, are especially frightening for the infant since these causes are indiscernible and incomprehensible for the infant. Two studies on the relation between FR behavior and infant disorganization showed that especially the subscale "direct indices of dissociation" predicted infant disorganization (Abrams et al., 2006; Schuengel, Van IJzendoorn, Bakermans-Kranenburg, & Blom, 1998). In addition, several studies suggest that dissociation may be an important mechanism in the intergenerational transmission of child abuse (Narang & Contreras, 2000, 2005). The high prevalence of infant disorganization in samples with maltreated children (for a meta-analysis see Cyr et al., in press) may also reflect the importance of parental dissociation in the development of infant disorganization.

Since an organized (even an organized-insecure) attachment relationship would require a minimal degree of protection and responsiveness (Lyons-Ruth, Bronfman,

& Atwood, 1999), extreme forms of parental insensitivity may also result in disorganized attachment. Indeed, when frightening, frightened, dissociated and role-reversed behaviors were excluded from the AMBIANCE, the final score for the remaining atypical behaviors was still associated with infant disorganization (Lyons-Ruth, Bronfman, & Atwood, 1999). The subscale “affective communication errors” of the AMBIANCE, which is most reflective of extreme insensitivity, was also related to infant disorganization in a recent study (Madigan, Moran, et al., 2006). Furthermore, some FR behaviors related to infant disorganization may be hard to distinguish from extremely insensitive caregiving, in particular some aspects of affective communication errors. Therefore, Madigan, Moran, and colleagues (2006) proposed that the two theoretical models of dissociation and extreme insensitivity as predictors of disorganized attachment should be seen as complementary rather than as alternative accounts in view of the equivocal empirical evidence.

In the current study, we present and test the validity of a new measure, Disconnected and extremely Insensitive Parenting (DIP), based on the FR system and the AMBIANCE. Coding adverse parenting behaviors using one of the two current systems is not easy, and requires extensive training and practice. In addition, in the AMBIANCE, and to a lesser extent the FR system, a clear distinction between FR behavior as indicative of dissociation, and extreme insensitivity cannot always be made. In the DIP, frightening behaviors and extremely insensitive behaviors remain separate dimensions in order to be able to examine the unique contribution of these caregiving behaviors to attachment disorganization in a large, low-risk sample of mothers and infants. A clear distinction between these two dimensions was obtained by formulating extended descriptions and coding instructions for each behavior, resulting in an instrument that appears to be relatively user-friendly.

The first dimension of the DIP, disconnected parental behavior, contains all the behaviors from the FR coding system. The descriptions and coding instructions for each item were adapted to ensure that each FR behavior is not solely insensitive but should be disconnected to context or previous behavior to be counted as FR. In this way, disconnected behavior may also indicate a possible dissociative state. For example, behaviors have to occur unpredictably, not preceded by movements or vocalizations and unaccompanied by affectionate or playful behavior. The term “disconnected behavior” refers to this sudden change in normal (and possibly sensitive) parenting behavior as well as to dissociative phenomena which may underlie these behaviors, causing the parent to be disconnected from the immediate environment. The second dimension, extreme insensitivity, includes those items from the AMBIANCE that refer to withdrawn and neglectful parenting as well as to intrusive, negative, and aggressive behavior. We examined the associations between disconnected parental behavior, parental extreme insensitivity, and infant attachment disorganization. In order to test the discriminant validity of the DIP, we also investigated its association with organized attachment security. Our main hypothesis was that disconnected parental behavior and parental extreme insensitivity would be independent predictors of disorganized attachment.

Method

Participants

The sample consisted of 292 infants with their mothers, who participated in one of three studies at the Centre for Child and Family Studies, Leiden University.

Disconnected and extremely insensitive behaviors were coded for mothers who agreed to participate in follow-up studies focusing on molecular genetic correlates of attachment (not reported in the current paper). One of the studies (hereafter called study 1) is a longitudinal study on the development of empathy and compliance in girls (Van der Mark, Bakermans-Kranenburg, & Van IJzendoorn, 2002). Mothers with a firstborn girl were recruited using town hall records and in the first stage of the study, 131 mothers and their 16-month-old children participated. During the third wave of the data collection, 71 out of the remaining 106 families agreed to participate in the collection of cheek cells. For the present paper, we used observations from these 71 children and their mothers when the children were 16 months old. The second study is a behavioral genetic study of infant attachment (Bokhorst, Bakermans-Kranenburg, Fearon, Van IJzendoorn, Fonagy, & Schuengel, 2003; hereafter called study 2). The twins, aged around 12 months, were recruited through the Netherlands Twin Register (Boomsma, Orlebeke, & Van Baal, 1992). The oldest twin siblings were included in the present paper because they are known to have fewer perinatal problems and therefore resemble the normal population most adequately. Cheek cells were collected for 68 out of 76 children. Third, observations were used from a study on the link between unresolved loss, frightening parental behavior and infant disorganized attachment (Schuengel et al., 1999; hereafter called study 3). Mothers who had experienced an important loss through death were selected for this study. Approximately 10 years later, cheek cells were collected for 63 out of 85 families. We used videotaped maternal and infant behavior when these infants were between 14 and 15 months old.

For the present analyses, observations from these three samples were combined resulting in a total sample of 202 infants and their mothers. These families did not differ from not-included families on age of the mother ($t[274] = 1.65, p = .10$), educational level of the mother ($t[290] = 0.51, p = .61$), the number of hours that mothers worked out of home ($t[280] = 0.51, p = .61$), infant attachment disorganization ($t[284] = 0.67, p = .50$), attachment classification (three-way $X^2 [3, N = 286] = 5.08, p = .17$; four-way $X^2 [4, N = 286] = 2.18, p = .70$) and continuous security scores ($t[284] = -0.97, p = .33$). Significant differences were found for gender ($X^2 [1, N = 292] = 11.58, p < .01$), child age ($t[97.49] = -2.22, p = .03$) and number of siblings in the family ($t[284] = 4.23, p < .01$). Children who were not included in the current study were significantly older, were more often female, and had more siblings than children who were included.

Descriptive statistics for the subsamples as well as the combined sample are presented in Table 1. Infant attachment and maternal behavior were assessed during a visit to the university when the infants were between 10.5 and 19 months old ($M = 14.29, SD = 1.92$). Since one of the studies focused exclusively on girls, boys were underrepresented (35.1%). Fifty-nine percent of the children had at least one sibling. The mean age of the mothers when they visited the laboratory was 32 years ($SD = 3.55$). They were predominantly from middle-class or upper middle-class backgrounds: their mean educational level was 5.29 ($SD = 1.45$) on a scale ranging from 1 to 7. About 72% of the mothers worked out of the home for 22.84 hours ($SD = 7.86$) per week on average.

The subsamples were significantly different for gender ($X^2 [2, N = 202] = 59.34, p < .01$), child age ($F[2,199] = 338.35, p < .01$), number of siblings present in the home ($F[2,199] = 75.20, p < .01$), maternal educational level ($F[2,199] = 18.36, p < .01$), and the number of hours that mothers worked out of home

Table 1. Means, percentages and sample differences for background, predictor and outcome variables.

	Study 1 (<i>n</i> = 71) <i>M</i> (<i>SD</i>)	Study 2 (<i>n</i> = 68) <i>M</i> (<i>SD</i>)	Study 3 (<i>n</i> = 63) <i>M</i> (<i>SD</i>)	Total (<i>N</i> = 202) <i>M</i> (<i>SD</i>)	<i>F</i>
Age child (months)	16.28 (0.94)	12.22 (1.08)	14.27 (0.68)	14.29 (1.92)	338.35**
Number of siblings	0.15 (0.36)	1.49 (0.74)	0.83 (0.75)	0.81 (0.84)	75.20**
Age mother (years) ^a	33.09 (3.39)	32.00 (3.68)	32.37 (3.53)	32.48 (3.55)	1.63
Educational level mother	5.96 (1.09)	4.58 (1.64)	5.32 (1.23)	5.29 (1.45)	18.36**
Hours working out of home ^b	22.03 (10.42)	13.55 (11.72)	13.34 (12.66)	16.48 (12.24)	12.58**
DIP disconnected behavior (continuous)				2.01 (1.83)	11.41**
DIP extreme insensitivity (continuous)				2.70 (2.06)	0.19
Disorganized attachment				3.54 (2.13)	1.58
Richter's security				0.51 (2.63)	0.55
Boys	% 0	% 54.4	% 54.0	% 35.1	χ^2 59.34**
Infant attachment:					10.64
Avoidant (A)				10.9	
Secure (B)				50.5	
Ambivalent (C)				10.9	
Disorganized (D)				26.7	
Cannot Classify (CC)				1.0	
Parental behavior:					
DIP disconnected behavior (classification)				9.9	8.86*
DIP extreme insensitivity (classification)				14.9	2.07

^aFor study 1: *n* = 65. ^bFor study 2: *n* = 67.***p* < .05, ****p* < .01.

($F[2,198] = 12.58, p < .01$). The differences in gender, age of the child and the number of siblings present in the home were due to differences in study design. Posthoc tests showed that children from study 1 were significantly older than children from study 3, who were significantly older than children from study 2 ($ps < .05$). Furthermore, children from study 2 had the highest number of siblings, while children from study 1 were all first born ($ps < .05$). With respect to educational level, posthoc tests revealed that mothers from study 1 had the highest educational level, followed by mothers from study 3; mothers from study 2 had the lowest educational level ($ps < .05$). Finally, mothers from study 1 worked significantly more hours out of home compared to the others ($ps < .01$).

Procedure

All families were invited for a 1–1½ hour laboratory session when the children were between 10.5 and 19 months of age. The mean age of the children was 16.28 months for study 1 ($SD = 0.94$), 12.22 months for study 2 ($SD = 1.08$) and 14.27 months for study 3 ($SD = 0.68$). The sessions were videotaped with two cameras that were fixed to the walls and were operated from behind the one-way screen. For all subsamples, the session started with the Strange Situation Procedure, after which mothers and children completed several tasks. For study 1 and 2, there was a short break halfway through the session, in which mothers and children had a drink and a snack. Mothers were also asked to complete a questionnaire while the children were playing (“competing demand”). At the end of the session, mothers were instructed to play with their children for 10 minutes with a standard set of toys. Disconnected and extremely insensitive behaviors were coded during the break, the competing demand situation and the free play episode at the end of the session. The total observed time for study 1 varied from 13 to 34 minutes and for study 2 from 26 to 49 minutes. For study 3, the procedure was somewhat different since the break and questionnaire episodes were absent. After the Strange Situation Procedure, mothers were interviewed about loss experiences and subsequently asked to play with their children for 15 minutes. Maternal behavior was observed during the play episode. For all subsamples, the DIP was applied to mother–infant interactions outside the Strange Situation, the procedure to measure infant attachment, so as to avoid common method variance.

Measures

Infant attachment

The quality of the mother–child attachment relationship was measured using the well-known Strange Situation Procedure (SSP; Ainsworth et al., 1978). During this procedure, the child is exposed to three mildly stressful events: an unfamiliar environment, entrance of an unfamiliar person, and two short separations from the mother. The infant’s attachment relationship was classified as secure (B), avoidant (A), resistant (C) or disorganized (D). Children classified as disorganized were also given an alternative classification of A, B or C. Infants were classified as CC (Cannot Classify) when they failed to show a consistent attachment strategy during the SSP, and a disorganized classification did not seem to fit the infant’s behavior sufficiently ($n = 2$). The infant’s behavior during the two reunion episodes was rated with

respect to four scales of infant–mother interactive behavior (proximity seeking, contact seeking, avoidance and resistance to contact and interaction). For the present analyses, a continuous score representing security of attachment was computed on the basis of these interactive scales using the simplified Richters, Waters, and Vaughn (1988) algorithm (Van IJzendoorn & Kroonenberg, 1990). Disorganized attachment was coded using the Main and Solomon (1990) 9-point coding system for disorganized attachment. Reliability among the two coders (MHvIJ and MJB-K) was established on 20 cases from study 3, with 100% agreement on the A, B, C distinction and 85% agreement on the D/non-D distinction. The Spearman correlation between the scale scores for disorganization was .88. For the continuous security scores, reliability was established on 14 cases from another but comparable sample of infants (Klein-Velderman, Bakermans-Kranenburg, Juffer, & Van IJzendoorn, 2006). The intraclass correlation for these cases was .76 (single measure, absolute agreement).

Disconnected and extremely Insensitive Parenting

The coding system consists of two dimensions: disconnected behavior and extremely insensitive behavior (Table 2 & Appendix 1). The complete coding system can be downloaded from <http://www.socialsciences.leiden.edu/educationandchildstudies/childandfamilystudies/organisation/staffcfs/out.html>

Disconnected parental behavior

For the first dimension, all items from Main and Hesse's (1998) coding instrument for frightening, frightened, dissociated, sexualized and disorganized parental behavior were adapted and rearranged, which resulted in five categories of parental behavior: (1) frightening and threatening behavior, (2) behaviors indicating fear of the child, (3) dissociative behaviors indicative of absorption (stilling, freezing or handling as though the child is an inanimate object) or intrusion of an altered state of awareness (such as inexplicable shifts in mood or sudden fear regarding the environment), (4) interacting with the child in a timid, submissive and/or deferential manner, sexualized/romantic behaviors, and (5) disoriented/disorganized behaviors (such as contradictions in behavior or vocalizations, disorientation and other anomalous movements and postures). Initially, very few adjustments were made compared to the original FR system. However, it appeared that the coders differed considerably in their scores on the disconnected dimension. During discussion of the tapes, it became clear that each coder had formed her own assumptions on what constitutes (severe) disconnected behavior. Therefore, several adjustments were made compared to the original FR system because of the complexity of coding disconnected behaviors and in order to further clarify the distinction between these behaviors and extreme insensitivity. In the current DIP coding system, each behavior is accompanied by specific criteria that need to be fulfilled before a score can be assigned. For disconnected behavior, lack of metasignals indicating play or affection (such as smiling), the absence of any explanation or justification for these behaviors and their sudden occurrence are important considerations. Furthermore, behavioral descriptions are presented, specifying different components of parental behavior such as facial expression, vocalizations, posture and movements. Instructions were added for assigning a score to the identified disconnected behaviors. Important

Table 2. Overview of the DIP and examples of disconnected and extremely insensitive parental behavior.

Dimension 1. Disconnected behavior

- A. Frightening/threatening parental behaviors
For example: voice alterations, altered facial expression, attack posture and movements towards the child.
- B. Frightened parental behaviors
For example: frightened facial expression, posture or movements intended to keep the child at a distance.
Example item description and scoring guidelines:
Parent suddenly retreats from the child or startles in response to the child's behavior.
Manifested in a frightened facial expression (e.g. mouth corners back and down, widening of the eyes, sudden intake of breath), sudden rise in intonation or vocalizations indicating fear, and/or frightened posture or movements (e.g. suddenly backing away, moving arm away).
The behavior is not explicable, occurs unpredictably and is not accompanied by playful and/or affectionate behaviors (such as smiling).
Higher scores are assigned when the expressed fear is intense (e.g. backing away with frightened facial expression), when the behavior is prolonged, accompanied by other behaviors from this dimension, or when the child was already in distress.
- C. Dissociative parental behaviors
For example: stilling or freezing, voice alterations, unpredictable and inexplicable mood change.
- D. Deferential and romantic/sexualized behaviors
For example: handling the child or interacting with the child in a timid, submissive and/or deferential manner.
- E. Disorganized/disoriented behaviors
For example: contradictions between behaviors patterns, vocalizations, facial expression and/or voice tone.

Dimension 2. Extreme insensitivity

2.1 Parental withdrawal and neglect

- A. Failure to initiate responsive behavior to the child
For example: parent remains unresponsive while the child is crying at high intensity, parent does not intervene when the child engages in potentially dangerous behavior.
- B. Actively creating physical distance from the child
For example: moving away when the child is in distress.
- C. Lack of interaction
For example: during play situations, involvement is sporadic, the parent rarely speaks, hardly expresses affection to the child.

2.2 Intrusive, negative, aggressive or otherwise harsh parental behaviors

- A. Intrusiveness
For example: overstimulating the child, ignoring the child's cue for distance, physically crowding the child.
- B. Rough, negative and aggressive behaviors
For example: pulling by the wrist, hitting and slapping, hostile or rejecting comments.
Example item description and scoring guidelines:
The parent displays aggressive behaviors towards the child (e.g. hitting, slapping, pushing).
Important factors in deciding whether parental behavior is aggressive, are indications of frustration, the intensity of the behavior (e.g. too forceful), and the consequences for the child (e.g., the behaviors may result in pain). The behavior may be used in the context of (harsh) discipline and does not fulfill the criteria of dimension 1A (frightening or attacking the child).
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(continued)

Table 2. (Continued).

Higher scores are given when the behavior is repeated, accompanied by hostile or rejecting comments or other behaviors listed under this dimension, when the behavior occurs at high intensity with the potential to inflict injury or pain, or when the child was already in distress.

The behavior may be used in the context of (harsh) discipline

Note: The categories and examples from the disconnected behavior dimension are based on the FR system (Main & Hesse, 1998); the categories and examples from the extremely insensitive dimension are based on the AMBIANCE (Bronfman et al., 2004).

factors are the severity (for example, fear manifested in facial expressions, movements and vocalizations), the duration and frequency of occurrence, and the timing (whether it occurs when the child is in distress or displaying attachment behavior). Compared to the original FR system, most of these considerations and guidelines were already more or less present. However, making these underlying principles more explicit and systematic across the coding system rendered the coding of disconnected behavior easier, as was clear from intercoder reliabilities (see below). In addition, clarification of the behavioral aspects of disconnected behaviors (e.g., lack of metasignals indicating play) clearly distinguishes these parental behaviors from extreme insensitivity.

Extreme insensitivity

The second dimension covers two forms of extreme parental insensitivity: (1) parental withdrawal and neglect; and (2) intrusive, negative, aggressive or otherwise harsh parental behaviors. The distinction between extreme insensitivity and mere insensitive responses lies in the duration, frequency, quality and severity of the behaviors (e.g., aggressive behaviors) as well as the context in which the behavior occurs (e.g., when the child is in distress). This dimension is an adaptation of a selection of items from the AMBIANCE (Bronfman et al., 2004). The items that referred to extremely insensitive behavior were selected and combined into more general categories of parental behaviors. Similar to the disconnected dimension, specific criteria were formulated that need to be fulfilled for the behavior to be counted as extremely insensitive (and not disconnected or merely insensitive), and coding instructions for assigning a score were added. Parental withdrawal and neglect is scored when the parent (repeatedly) fails to show responsive behavior when the child is in distress, seeks contact or approaches the parent. For example, the parent ignores a crying child, does not respond to the child's repeated vocalizations, or does not intervene when the child engages in dangerous behavior. Physical intrusiveness is scored when the parent gets too close to the child and intrusively overrides the child's cues, resulting in too intense and vigorous interactions. Finally, rough behavior and physical aggression are also included (see Table 2) as well as hostile, rejecting comments in which the parent expresses his or her anger, frustration, contempt or disgust. If any of the extremely insensitive behaviors fulfils the criteria for disconnected behavior, they are scored only under the first dimension of the system. For example, when the parent suddenly displays threatening behaviors and voice alterations, unaccompanied by metasignals of affection or play and unrelated to the context, these behaviors are coded as disconnected. In contrast, when aggressive behavior does not fit this description and is clearly embedded in the context (for

example, the parent hits the child because the child does not comply) it is coded as extremely insensitive.

Discrete disconnected and extremely insensitive behaviors were coded on a 9-point scale every time they occurred. For both dimensions, a final score was assigned, equal to the highest individual score or one point higher when the parental behavior was severe or occurred frequently. A classification was also assigned for both dimensions. Final scores of 6 and higher automatically led to the assignment of a classification of the parental behavior as disconnected or as extremely insensitive; when the final score was equal to 5, the coder could also decide not to assign a classification. For the present analyses, final scores and classifications for both dimensions were used. The (three) coders were unaware of the ratings of (disorganized) attachment. They participated in a workshop on the coding of FR behavior by M. Main and E. Hesse. One of the coders had extensive experience in coding parent–child interactions in high-risk samples and also participated in an AMBIANCE workshop. For reliability purposes, video fragments of 14 mother–infant dyads from home visits and lab visits were selected. Intraclass correlations (single rater, absolute agreement) ranged from .80 to .83 for disconnected behavior and from .80 to .88 for extreme insensitivity. Percentage of agreement on the disconnected classification ranged from 79% to 93% (mean kappa .67). Percentage of agreement on the extreme insensitivity classification was 86% for each pair of coders (mean kappa .72). Difficult tapes were discussed by the three coders during weekly sessions.¹

Analytic approach

First, associations between family background characteristics and the main variables for attachment and parenting were explored. Next, associations of parental extreme insensitivity and disconnected behavior with attachment security and disorganization were examined. The two infants with a CC classification were included in the D category in line with convention and based on theoretical grounds: the overall failure to show a consistent pattern of behavior during the entire SSP is comparable to the temporary breakdown of behavioral strategies characteristic of D infants. For the prediction of attachment security and disorganization, two sets of analyses were conducted. First, hierarchical multiple regression analyses were performed with the continuous scores for disconnected behavior and extreme insensitivity in the first step and their interaction in the next step. In order to examine which parental behaviors contributed uniquely to the dependent variable, organized security was entered as a covariate in the analyses for disorganization, and disorganization was entered as a covariate in the analyses for organized security. Second, analyses of variance (ANOVA) were conducted with the classifications for disconnected behavior and for extreme insensitivity as predictors (including their interaction in the next step) and the continuous score for disorganization and organized security as dependent variables. For the analyses of attachment disorganization, organized security was entered as covariate, and the other way around.

Results

Preliminary analyses

Descriptive statistics for the parenting and attachment variables are summarized in Table 1. A modest number of parents in all subsamples displayed disconnected

behaviors or extremely insensitive behaviors: 19.8% of the mothers received at least one classification for either disconnected behavior or extreme insensitivity and 2.5% of the mothers received a classification for both types of parental behaviors. Significant sample differences were found for the first DIP dimension. Mothers from study 3 displayed more disconnected behaviors ($F [2,199] = 11.41, p < .01$) and received more often a classification for this dimension ($X^2 [2, N = 202] = 8.86, p = .01$) compared to the other subsamples. This difference was not unexpected, since these mothers were selected on the basis of having experienced a (severe) loss or trauma. No significant sample differences were found with respect to extreme insensitivity. Finally, there were no sample differences for the continuous score of disorganized attachment and organized security scores (see Table 1) as well as for the percentage of children with a D classification ($X^2 [2, N = 202] = 1.72, p = .42$).

Associations between attachment and parenting measures

Correlations between the background, predictor and outcome variables are displayed in Table 3. With respect to the background variables, infants with older mothers scored higher on attachment disorganization ($r[194] = .15, p = .03$). No other associations were found between the background variables infant gender, age, number of siblings, maternal educational level, and number of hours that mothers worked out of home on the one hand and the continuous scores for security and disorganization on the other hand (Table 3). Infant attachment classifications (four-way) and percentage of infants with a D classification were also not related to any of these background variables, with the exception of the association between infant D classification and maternal age ($t[194] = -2.99, p < .01$).

With regard to the DIP variables, disconnected parental behavior was not associated with any of the background variables, but mothers with a lower educational level displayed more extremely insensitive behaviors ($r[200] = -.16, p = .03$). Furthermore, disconnected behavior and extreme insensitivity were associated ($r[200] = .21, p < .01$). Finally, security appeared to be negatively related to infant disorganized attachment ($r[200] = -.30, p < .01$): more securely attached children showed less attachment disorganization.

As displayed in Table 3, the continuous scores for disconnected behavior and extreme insensitivity were not associated with attachment disorganization ($r[200] = .10, p = .15$ and $r[200] = .02, p = .76$, respectively) or with overall security ($r[200] = -.12, p = .08$ and $r[200] = .01, p = .94$, respectively). Children of mothers with a classification for disconnected behavior had however a significantly higher mean score for disorganization than children of mothers who did not receive a classification for disconnected behavior ($t[200] = -2.56, p = .01$, effect size $r = .18$). A classification for extreme insensitivity was not associated with disorganization ($t[200] = -0.39, p = .70$) and there was no significant association of disconnected behavior ($t[200] = 1.51, p = .13$) and of extreme insensitivity ($t[200] = 0.32, p = .75$) with continuous security.

We did not find a significant relation between the infant D category and the continuous scores for disconnected behavior ($t[200] = -1.74, p = .08$) or extreme insensitivity ($t[200] = -0.35, p = .73$). However, infants of mothers with a classification for disconnected behavior were more often classified as disorganized in the Strange Situation ($X^2 [1, N = 202] = 8.24, p < .01$). Results were the same when the two infants with a CC classification were excluded from the D category.

Table 3. Correlations between background, predictor and outcome variables ($N = 202$).

Variable	1	2	3	4	5	6	7	8	9	10
1. Gender	1.00									
2. Age child (months)	.43**	1.00								
3. Number of siblings	-.30**	-.56**	1.00							
4. Age mother (years) ^a	.00	.09	.13	1.00						
5. Educational level mother	.21**	.33**	-.31**	.20**	1.00					
6. Hours working out of home ^b	.18*	.31**	-.38**	.06	.39**	1.00				
7. DIP disconnected behavior	-.07	-.04	-.06	-.03	.04	.03	1.00			
8. DIP extreme insensitivity	-.03	.01	.07	-.09	-.16*	.00	.21**	1.00		
9. Disorganized attachment	.02	.08	-.03	.15*	.09	.07	.10	.02	1.00	
10. Richter's security	.02	.05	.04	-.07	-.05	-.00	-.12	.01	-.30**	1.00

^a $N = 196$; ^b $N = 201$.* $p < .05$; ** $p < .01$.

A classification for extreme insensitivity was not significantly associated with infant D classification ($X^2 [1, N = 202] = 0.02, p = .89$).

Multivariate analyses predicting infant disorganization

In Table 4, the results of the multiple regression analysis on infant disorganization are presented. Continuous security was entered in the first step, followed by gender, disconnected behavior and extreme insensitivity in the next step. The interactions between gender and disconnected behavior, gender and extreme insensitivity, and between disconnected behavior and extreme insensitivity were entered subsequently. Before computing the interaction term, the parenting variables were centered in order to reduce multicollinearity and to facilitate the interpretation of the interaction effect (Cohen, Cohen, West, & Aiken, 2003). The predictors from the second step ($F_{\text{change}} [3,197] = 0.38, p = .77$) and from the third step ($F_{\text{change}} [3,194] = 0.21, p = .89$) did not add significantly to the explained variance of infant disorganization. Therefore, the final model consisted only of continuous security ($F[1,200] = 19.10, p < .01$), explaining 9% of the variance in attachment disorganization. An analysis of variance (ANOVA) with continuous security as covariate and with categorically scored (classification for) disconnected behavior and extreme insensitivity as predictors (including their interaction in the next step) showed that disconnected behavior and continuous security significantly predicted disorganized attachment, $F(2,199) = 12.18, p < .01$, partial $\eta^2 = .11$ (see Table 4). Results were similar for both boys and girls; gender was therefore not included in the analyses. After controlling for organized security, disconnected behavior significantly predicted attachment disorganization ($F[1,199] = 4.88, p = .03$, partial $\eta^2 = .02$). Children of mothers with a classification for disconnected behavior showed higher levels of attachment disorganization compared to children of mothers with no classification for disconnected behavior. The effects of extreme insensitivity and the interaction between both types of parental behavior were not significant. Specific subsample and length of observation were included as covariates in the final models, but the results from the regression analyses and the ANOVAs did not change.

Table 4. Multiple regression analysis and analysis of variance predicting disorganized attachment from parental disconnected behavior and extreme insensitivity (continuous score and classification).

	Regression					ANOVA		
	β	t	p	R^2	F	$F(2,199)$	p	Partial η^2
Step 1				.09	19.10**			
Security	-.30	-4.37	<.01			17.25	<.01	.08
Step 2								
Gender								
Disconnected behavior						4.88	.03	.02
Extreme insensitivity								

Note: For the regression analyses, the predictors in the second step and their interactions were nonsignificant and therefore removed from the model. For the analyses of variance, nonsignificant predictors were removed from the model. All statistics are based on the final models. * $p < .05$; ** $p < .01$.

Multivariate analyses predicting infant security

For the multiple regression analysis on continuous security, disorganization was entered in the first step, followed by gender, disconnected behavior and extreme insensitivity in the next step. All two-way interactions between gender, disconnected behavior and extreme insensitivity were entered subsequently. The final equation consisted only of attachment disorganization ($F[1,200] = 19.10, p < .01$) as the predictors from the second step ($F_{\text{change}} [3,197] = 0.74, p = .53$) and from the third step ($F_{\text{change}} [3,194] = 1.64, p = .18$) did not contribute significantly to the prediction of security. An analysis of variance (ANOVA) was also conducted, with disorganization entered as covariate and with gender, disconnected behavior and extreme insensitivity as predictors (including the interaction between gender and extreme insensitivity). Disorganization and the interaction between gender and extreme insensitivity significantly predicted continuous security ($F[4,197] = 6.03, p < .01$, partial $\eta^2 = .11$). After controlling for disorganization, there was a significant interaction between gender and extreme insensitivity ($F[1,197] = 4.63, p = .03$, partial $\eta^2 = .02$). Separate ANOVAs for boys and girls with disorganization as covariate and extreme insensitivity as predictor showed that for boys the prediction of security failed to be significant ($F[1,68] = 3.80, p = .06$), although boys of mothers with a classification for extreme insensitivity tended to be less secure than boys of mothers without a classification for extreme insensitivity. For girls, the difference in security was far from significant ($F[1,128] = 0.97, p = .33$). Specific subsample and length of observation were included as covariates in the final models, but the results from the regression analyses and the ANOVAs did not change.

Discussion

The present study shows that parental disconnected behavior and extremely insensitive behavior can be reliably assessed with the Disconnected and extremely Insensitive Parenting (DIP) coding system. Parental behavior was observed in a laboratory setting during three different contexts (free play, unstructured time and a competing demand situation) that elicited a wide range of parenting behaviors. Disconnected and extremely insensitive behaviors were coded separately in order to investigate their unique contribution to the development of disorganized attachment. The intercoder reliability for these two dimensions was high for both the continuous scores and the classifications. Construct and discriminant validity of the DIP was established for both types of parental behavior: disconnected parental behavior predicted infant disorganization but not organized attachment security, while extreme insensitivity was marginally related to infant insecurity in boys but not to attachment disorganization.

Most of the previous studies on attachment disorganization utilized the existing coding instruments, the FR system (Main & Hesse, 1998) and the AMBIANCE (Bronfman et al., 2004), which do not make a sharp distinction between extreme insensitivity and frightening behavior. This is the first study that investigated the unique contribution of these parental behaviors to infant disorganization. Although significant, the association between extreme insensitivity and disconnected behavior was modest, implying that these parenting behaviors are qualitatively different. As expected, more disconnected behavior was observed in the subsample of mothers

who were selected on the basis of having experienced the loss of an important person. Moreover, in this subsample the free play episode was preceded by an interview about loss experiences, which may have primed the participants and may have triggered subsequent disconnected behavior. The power of priming has been demonstrated in experimental attachment studies (e.g., Mikulincer & Shaver, 2007). This potential priming should be investigated further in the context of unresolved loss, as it may provide valuable insights into how unresolved loss is manifested in disconnected behavior towards the infant.

Consistent with the hypotheses of Main and Hesse (1990; Hesse & Main, 2006), our results show that disconnected parental behavior is associated with infant attachment disorganization. The effect size in our low-risk sample was small to medium (Cohen, 1988), equaling $r = .18$, and not statistically different from the combined effect size for the association between FR and disorganized behavior ($r = .32$, 95% *CI* .17 ~ .46) as reported in a meta-analysis by Madigan, Bakermans-Kranenburg, and colleagues (2006). Larger effect sizes are to be expected in at-risk and clinical samples.

The underlying mechanisms of unresolved loss/trauma and FR behavior are suggested to be similar to those underlying posttraumatic stress symptoms (Fearon & Mansell, 2001; Harari et al., in press; Stovall-McClough & Cloitre, 2006). A traumatic experience is initially represented in memory as a large associative network consisting of representations of stimulus features (sights, smells, sounds) and cognitive, behavioral and physiological responses to these stimuli (Fearon & Mansell, 2001, p. 384; Foa & Hearst-Ikeda, 1996; Foa & Kozak, 1986). Normally, the traumatic memory is gradually integrated into its context in time, place, subsequent and previous information and autobiographical memory (Ehlers & Clark, 2000, p. 325). However, in individuals with PTSD, elements of the traumatic experience are not integrated but instead are stored as isolated fragments consisting of sensory perceptions or affective states (Van der Kolk & Fisler, 1995). These memories can be easily and abruptly activated by stimuli associated with the traumatic event, which may disrupt attention and parental behavior involuntarily in the form of absorption and unmonitored intrusions of memories, affects and sensory perceptions concerning the trauma (Hesse & Main, 2006).

For young infants, the resulting disconnected behaviors are thought to be directly frightening, especially because their appearance is sudden, unpredictable and out of context (Main & Hesse, 1990). The stimulus for the parent's behavior is not discernible or comprehensible for the infant, since the behaviors are thought to result from the activation of the traumatic memory by stimuli that are only distantly related to the trauma. Even the infant may trigger disconnected parental behaviors when his or her behavior reminds the parent of the traumatic experience (Liotti, 1992; Pasquini, Liotti, Mazzotti, Fassone, & Picardi, 2002). Consequently, at high levels of intensity or in stressful situations, disconnected behaviors are hypothesized to be extremely frightening for the infant. The infant is not free to approach the parent for comfort and repair and is left in a disorganizing state of fright without solution (Hesse & Main, 2006, p. 321).

Extreme insensitivity was not related to attachment disorganization. This type of parental behavior is essentially different from disconnected behaviors (see also Hesse & Main, 2006). From the child's point of view, disconnected behaviors appear suddenly and out of context, interfering with the parent's normal (and possibly warm and sensitive) way of interacting with the child. In contrast, extreme insensitivity can

be part of a more consistent pattern of behaviors. Therefore, the infant may still be able to develop an organized (albeit insecure) strategy to deal with stressful circumstances and negative emotions, for example by a shift of attention away from the attachment figure (Main & Hesse, 1990). Furthermore, the stimulus for the parent's extremely insensitive behavior may be more easily discernible for the child (as in the case of harsh discipline) compared to disconnected behaviors. The infant may still be able to approach the parent and has more control over the parent's behavior, for example, the infant may terminate the parental behavior by compliance (Hesse & Main, 2006). Therefore, extreme insensitivity may be less fear-inducing.

The present study included a low-risk sample of mothers who were predominantly from middle-class backgrounds. Even though a wide range of extremely insensitive behaviors was observed, very few mothers displayed behaviors that could be considered abusive. Since attachment disorganization occurs at a much higher frequency in samples with maltreated children or multiple-risk environments (Cyr et al., *in press*), more research is needed to investigate whether DIP behaviors are associated with attachment disorganization in high-risk samples. More extreme forms of maternal insensitivity (such as abuse and neglect) may be as fear-inducing as the disconnected behaviors observed in the current study. Some studies of high-risk samples found that attachment disorganization was indeed related to maternal insensitivity (Bailey, Moran, Pederson, & Bento, 2007; Carlson, 1998; Moran, Forbes, Evans, Tarabulsky, & Madigan, 2008).

However, even in these cases it may be important to distinguish between extremely insensitive and disconnected parental behaviors. In fact, in a sample of abused and neglected children, physically abusive mothers showed more disconnected behaviors than mothers who neglected their children (Cyr et al., 2009). Therefore, even in high-risk samples, disconnected behavior may be one the primary determinants of infant disorganization.

Extreme insensitivity was marginally related to organized insecurity of attachment while controlling for attachment disorganization. However, this relation between extreme insensitivity and attachment insecurity was only apparent in boys, who may be more vulnerable for extreme insensitivity than girls. This result is consistent with previous studies on externalizing behavior problems showing that associations with parenting are stronger for boys (for a meta-analysis see Rothbaum & Weisz, 1994). Moreover, boys were found to be more often insecure and disorganized in response to frightening maternal behavior than girls (David & Lyons-Ruth, 2005; see also Carlson et al., 1989; Lyons-Ruth, Bronfman, & Parsons, 1999). The relation between externalizing behavior problems and insecure attachment is also stronger for boys versus girls (Fearon, Bakermans-Kranenburg, Van IJzendoorn, Lapsley, & Roisman, *in press*). Gender differences are generally not found in research on sensitivity and attachment, but because regular (in)sensitivity is not equivalent to extreme insensitivity and only few studies have been conducted on this latter type of parenting more research is needed on gender differences related to the effect of extremely insensitive as well as disconnected parental behaviors to settle this issue.

The current study has some limitations to consider. First, disconnected and extremely insensitive behaviors were assessed in a selection of mothers who agreed to participate in a follow-up study. Therefore, it is possible that mothers who displayed more extreme behaviors were underrepresented in the current sample. However, the families who agreed to participate did not differ from the remaining families in

educational level or age of the mother nor in infant attachment security and disorganization. A second limitation might be that the mean scores for disconnected behavior and the number of classifications for this dimension were lower compared to previous studies that used the FR system in a comparable sample (e.g., Abrams et al., 2006). It should be noted that the coding procedures of the DIP were slightly different compared to the FR system. For the DIP, disconnected behaviors had to fulfill several stringent criteria in order to clearly distinguish them from extreme insensitivity. This may have resulted in lower frequencies of disconnected behaviors. Finally, we did not find a significant association between the continuous scores for disconnected behavior and infant disorganization, only an association with the classification for disconnected behavior. This may indicate a threshold effect (Bernier & Meins, 2008), where disconnected behaviors have to be rather severe before the infant's organized strategy to deal with stress falls apart. The relatively low frequency of disconnected behavior and the absence of a significant association between the continuous measures may also be related to the non-stressful observation setting. The DIP was applied to mother–infant interactions outside the Strange Situation, so as to avoid common method variance. More stressful contexts may however elicit more disconnected and extremely insensitive behavior (see for example Jacobvitz et al., 2006). The competing demand task may in fact have inhibited disconnected behaviors. Future research with the DIP should include various observational settings in order to shed light on conditions that may trigger disconnected and extremely insensitive parental behavior.

The lack of a significant continuous association may also be explained by child characteristics (such as genetic make-up) that may render some children to be more and others to be less vulnerable to the influence of parenting (Bakermans-Kranenburg & Van IJzendoorn, 2007; Belsky, 2005; Belsky, Bakermans-Kranenburg, & Van IJzendoorn, 2007; Fox et al., 2005; Rutter, 2006). Given the importance of differential susceptibility in child development, more research is needed into the effects of the early caregiving environment on infant attachment disorganization, taking into account specific risk factors that may modulate infant sensitivity to care (see Bernier & Meins, 2008). Not only is it important to specify which child characteristics might influence vulnerability to the negative effects of parenting behavior, careful observation of specific types of parenting behavior is also essential (see Rutter, 2003; Wong, Day, Lyan, Chan, & Wareham, 2003).

Using the DIP, we were able to distinguish between two different types of adverse parenting behavior, extreme insensitivity and disconnected behavior, which could be reliably assessed in a brief time period (see also Abrams et al., 2006). We showed that especially disconnected behavior (and not extreme insensitivity) is associated with the development of disorganized attachment in infants. Of course, replication of this study in a high-risk environment is essential. Even though the magnitude of the associations between parental behavior and infant security and disorganization was small to medium, if replicated they may prove to be of significant practical importance (McCartney & Rosenthal, 2000). We therefore argue that in future research it is important to distinguish between the various subtypes of adverse parenting behavior. In the present middle-class low-risk sample, low frequencies of subcategories of disconnected and extremely insensitive behavior prohibited separate analyses on this level. High-risk samples may offer the opportunity to examine how the various subcategories of disconnected and extremely insensitive parenting are related to infant attachment security and disorganization. Parental behaviors

associated with infant CC classification may also be investigated in more detail in high-risk samples. Two CC infants were observed in the present study; in one case the mother received a high score for disconnected behavior, whereas in the other case she received a high score on extreme insensitivity. High-risk samples may provide more insight into the nature of the potentially heterogeneous CC category. It is also imperative to investigate the association between disconnected parental behavior and dissociative symptomatology.

Finally, intervention studies aiming at reducing parental disconnected behavior are needed. It has been meta-analytically shown that interventions focusing on parental sensitivity reduce the level of infant disorganization (Bakermans-Kranenburg, Van IJzendoorn, & Juffer, 2005; for a successful intervention see also Cicchetti, Rogosch, & Toth, 2006). These interventions may have been successful in reducing disconnected parenting behaviors by directing the parent's attention to the child and thereby preventing absorption and the intrusion of unresolved memories and affects (Bakermans-Kranenburg et al., 2005, p. 210). Interventions to prevent the development of disorganized attachment and its negative long-term consequences should be given high priority. The DIP may be of essential service to delineate the specific types of parental behavior that are related to infant disorganized attachment.

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Note

1. Several colleagues have since been successfully trained in the use of the DIP. Training consisted of ten 2-hour meetings during which practice tapes were discussed. In total, the participants invested about one week for training and one week for reliability tapes.

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Appendix 1. Disconnected and extremely Insensitive Parenting (DIP): Dimensions and categories

In the following, an overview of the dimensions, categories and behaviors listed in the DIP is given. The first dimension captures disconnected behaviors and is based on the FR system by Main and Hesse (1998). This dimension consists of five categories with individual behaviors. The second dimension captures extreme insensitivity and is based on the AMBIANCE by Bronfman and colleagues (2004). This dimension consists of parental withdrawal/neglect (subdimension 2.1) with three categories and intrusive/negative/aggressive behaviors (subdimension 2.2) with two categories.

Dimension 1. Disconnected behavior (adapted from Main & Hesse, 1998)

- (A) Frightening/threatening parental behaviors
 - (1) Pursuit movements, assumption of attack postures, attacking or threatening to attack.
- (B) Frightened parental behaviors
 - (1) Parent suddenly retreats from the child or startles in response to the child's behavior.
 - (2) Parent appears frightened by the child, indicated by a frightened facial expression, comments to or about the child and/or by posture and movements.
- (C) Dissociative parental behaviors
 - (1) Stilling or freezing in trance-like posture with trance-like expression.
 - (2) Voice alterations.
 - (3) Handling as though the child is an inanimate object, and other handling indicating lack of sense of child's animate status.
 - (4) Sudden inexplicable and unpredictable change or shifts in mood.
 - (5) The parent shows inexplicable fear regarding aspects of environment which have no intrinsically frightening aspects.
- (D) Deferential and romantic/sexualized behaviors
 - (1) Handling the child or interacting with the child in a timid, submissive and/or deferential manner.
 - (2) The parent is overly responsive, deferential and submissive in response to the child's anger, rejection or displeasure.
 - (3) The parent fails to stop the child from parent-directed aggression.
 - (4) Spousal/romantic and sexualized behaviors.
- (E) Disorganized/disoriented parental behaviors
 - (1) Simultaneous and sequential contradictions in behavior and/or vocalizations.
 - (2) Anomalous movements and postures.
 - (3) Disoriented parental behaviors.

Dimension 2. Extreme insensitivity (adapted from Bronfman et al., 2004)*2.1. Parental withdrawal and neglect*

- (A) Failure to initiate responsive behavior to the child
 - (1) When the child is in distress, the parent does not respond or the parent's response is too minimal.
 - (2) The parent does not intervene when the child engages in potentially dangerous or harmful behavior.
 - (3) The parent does not respond to the child's repeated vocalizations and cues.
- (B) Actively creating physical distance from the child
 - (1) When the child is in distress, the parent actively creates physical distance from the child.
 - (2) When the child seeks contact or approaches the parent, the parent responds in such a way as to create distance from the child.
- (C) Lack of interaction between parent and child
 - (1) Lack of interaction between parent and child.

2.2. Intrusive, negative, aggressive or otherwise harsh parental behaviors

- (A) Intrusiveness
 - (1) The parent displays physically intrusive behaviors towards the child.
- (B) Rough, negative, aggressive or otherwise harsh parental behaviors.
 - (1) The parent handles the child in a rough and insensitive way.
 - (2) The parent displays aggressive behaviors towards the child.
 - (3) The parent makes negative, rejecting or hostile comments concerning the child or to the child.