

Topic Review

The Parent's Capacity to Treat the Child as a Psychological Agent: Constructs, Measures and Implications for Developmental Psychopathology

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Abstract

Recent studies of the relationship between parenting and child development have included a focus on the parent's capacity to treat the child as a psychological agent. Several constructs have been developed to refer to this capacity, for example maternal mind-mindedness, reflective functioning, and parental mentalizing. In this review article, we compare and contrast different constructs from diverse theoretical backgrounds that have been developed to operationalize parental mentalizing. We examine the empirical evidence to date in support of each of the constructs and review the relevant measures associated with each construct. Next, we discuss the possibility that these apparently diverse constructs may tap into the same underlying neurobiological socio-cognitive system. We conclude by proposing a testable model for describing the links between parental mentalization, the development of mentalizing in children, and child psychopathology.

Keywords: maternal mind-mindedness; reflective functioning, parental mentalizing; developmental psychopathology

Introduction

The importance of parenting practices for children's psychosocial adjustment has been an undisputed tenet of developmental psychology (Gottman, Katz, & Hooven, 1996). Whereas work in this area has typically focused on practices for obtaining and maintaining discipline, a shift has occurred in the last 10 years to include a focus on parents' capacity to treat the child as a psychological agent. A psychological agent can be defined as a system which can reason about either their own or other people's explicit goals, intentions, and beliefs (Baron-Cohen, Tager-Flusberg, & Cohen, 1993; Davies, 1994; Perner, 1991).

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This shift was partly motivated by a problem in attachment research that until recently had remained unresolved. Ever since Bowlby's (1973, 1980a, 1980b) seminal work suggested that attachment security is transmitted from one generation to the next, attachment researchers have been struggling to formulate the mechanisms responsible for this inter-generational transmission. The results of a meta-analysis have shown that maternal sensitivity (measured during the strange situation procedure and generally referring to global positive features like co-operation, acceptance, contingent responsiveness, and pleasurable affect) accounts for only 23 percent of the variance in the association between maternal attachment representation, as measured by the adult attachment interview (AAI; George, Kaplan, & Main, 1984), and infant attachment (Van IJzendoorn, 1995). As a consequence, the question of how to account for what Van IJzendoorn (1995) terms the 'transmission gap' has become of crucial importance. Could other aspects of the mother-child relationship, apart from maternal responsiveness, account for the inter-generational transmission of attachment security?

An answer to this emerged through the notion of a theory of mind. The concept of theory of mind was coined by the primatologists Premack and Woodruff (1978) and has since been adapted to developmental psychology to refer to the capacity to interpret the behavior of others within a mentalistic framework. 'Mentalistic' in this sense refers to our capacity to ascribe thoughts, feelings, ideas, and intentions to ourselves as well as to others, and to employ this capacity in order to anticipate and influence our own and others' behavior. Over the last decade, however, the construct of theory of mind and its false belief paradigm have been criticized for being too narrow (Carpendale & Chandler, 1996). Thus, some authors prefer to use the term 'mentalizing' instead because it is slightly more general and not limited to specific tasks or age groups (O'Connor & Hirsch, 1999).

Most early work on mentalizing was concerned with investigating the age at which normal children pass theory of mind tasks and the theory of mind deficits associated with autism (Sharp, 2006). For attachment theorists, however, the concept of mentalizing would serve a twofold purpose. Main (1991) suggests that children's early experiences with their caregivers are important for their subsequent metacognitive knowledge and the monitoring of attachment experiences. She suggests that experiences with parents may not only alter the contents of the child's mind, but also the ability to operate upon these contents. For attachment theorists, mentalizing thus becomes the mechanism by which (1) the mother-child relationship exerts its influence on the attachment security of the child and (2) the mother-child relationship influences the child's socio-cognitive development. Taken together, mentalizing is thought to play a central role in the process by which attachment security is passed on from parent to child: secure attachment is fostered through accurate and appropriate parental mentalizing of the child, which in turn positively stimulates the development of the mentalizing capacity in the child. As a result, the mentalizing child is able to form a secure attachment to the parent. However, attachment theorists acknowledge that attachment security in the child is not the result of parental behavior alone. The parent's capacity to engage in accurate and appropriate mentalizing may be disrupted by a variety of child characteristics, most notably temperament. The process by which secure attachment is fostered via accurate and appropriate parental mentalizing is therefore likely to be bidirectional.

A review and integration of the constructs purporting to measure parental mentalization has been lacking. Several constructs from diverse theoretical backgrounds have been suggested, but there is some confusion as to where they overlap and differ, and which measures are employed to tap into each of these constructs. In fact, because no

single review article has synthesized the literature, it is difficult to capture the essential underlying elements shared by the constructs. In the present review article, we compare and contrast different constructs from diverse theoretical backgrounds that have been developed to operationalize parental mentalizing. We examine the empirical evidence thus far accumulated in support of each of the constructs. In so doing, we review the relevant measures associated with each construct. Next, we discuss the possibility that these apparently diverse constructs may all tap into the same underlying neurobiological socio-cognitive system. In short, we suggest that poor parental mentalization may play a role in the development of psychopathology in the child by altering precisely this underlying neurobiological socio-cognitive system. We conclude by proposing a testable model for describing the links between parental mentalization, the development of mentalizing in children, and child psychopathology. As such, we hope to contribute to an already rich developmental literature on the links between attachment and theory of mind, literature that has, by and large, ignored the implications of these links for developmental psychopathology outcomes.

Reflective Function: Parental Mentalization through Attachment Representation

Early research in mentalizing neglected social context as a possible factor for explaining individual differences in children's capacity to mind-read. From a psychoanalytic framework, Fonagy and co-workers noticed this, and, in an early paper, Fonagy (1991) notes: 'I would like to argue that fundamental to the acquisition of these [mentalizing] capacities is a degree of consistency and safety in early object relationships and "good enough" psychic functioning in the parents to empower the process of internalization' (p. 642).

The first clues to indicate that there might be substance behind this suggestion came from mainstream developmental psychology research in the late 1980s and 1990s. Findings showed that children's social-cognitive development does not occur in a vacuum, but is embedded within intimate family interactions (Dunn, 1988, 1993, 1994; Dunn, Brown, & Beardsall, 1991; Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991; Perner, Ruffman, & Leekam, 1994). The fact that family interactions were shown to play a role in the development of mentalizing suggested that attachment security may not only be an important longitudinal, but also a concurrent predictor of mentalizing development.

One of the first studies to explore this was carried out by Fonagy, Steele, Moran, Steele, and Higgitt (1991). In their study, AAI interviews (George et al., 1984) were conducted with 100 first-time mothers and 100 first-time fathers before the birth of their child. AAI responses were coded for the frequency of parents' references to mental states in their descriptions of childhood relationships. The families were followed up at 12 and 18 months after the babies' birth, during which the strange situation procedure (Ainsworth, Blehar, Waters, & Wall, 1978) was administered.

Findings demonstrated that mentalizing, as measured by the frequency of parents' references to mental states in their accounts of their own childhood during the administration of a *prenatal* AAI, predicted the likelihood of their children being securely attached at follow-up, even when controlling for verbal IQ. Moreover, when children were followed up at the age of five-and-a-half years, security of attachment in infancy predicted performance on a cognitive-emotion task (Harris, 1989). Taken together, these longitudinal findings link all the axes of the mediational model for the role of

mentalizing, including prenatal AAI classification, parental mentalizing, parent–infant attachment, and child mentalizing capacity (Fonagy, Steele, Steele, & Holder, 1997).

These links are furthermore supported by studies investigating the concurrent relationship between attachment security and mentalizing capacity. In preschool children, Fonagy, Redfern, and Charman (1997) have shown that security of attachment, as measured by the separation anxiety test, is a significant predictor of false-belief reasoning, even when verbal mental age, social maturity, and chronological age are controlled for.

The above findings suggest that family relations are important for mentalizing and that mentalizing is important for the development of attachment security as well as for the socio-cognitive development of the child. However, what exactly does mentalizing mean within this context? Slade (2005), writing from a psychoanalytic perspective, summarizes the concept as referring to both a cognitive process, akin to psychological insight or perspective-taking, and an emotional process, that is, the capacity to hold, regulate, and fully experience one's own and others' emotions in a non-defensive way without becoming overwhelmed or shutting down. When this capacity is operationalized within the context of attachment relationships, Fonagy refers to it as 'reflective functioning' (RF).

The most detailed explication of RF can be found in Fonagy, Gergely, Jurist, and Target (2002). The term is used to describe the parent's capacity to reflect upon his/her own or the child's internal mental experience within the context of attachment style. It is operationalized through two different measurement constructs.

The first, called *adult RF*, was developed more than a decade ago (Fonagy, Steele, Moran et al., 1991; Fonagy, Steele, & Steele, 1991) in the analysis of AAI interviews where instances of mentalization were observed during adult narratives of childhood. This led to the development of an RF scale (Fonagy, Target, Steele, & Steele, 1998). The RF scale assesses adults' capacity to reflect upon memorialized childhood relationships with their parents in mentalistic terms. As such, the scale is used to assess responses to questions on the AAI that demand reflection or consideration of complex unobservable mental states, such as, 'Why do you think your parents behaved the way they did?' If, during responses to these questions, adults demonstrate (1) awareness of the nature of mental states, (2) explicit effort to tease out mental states underlying behavior, and (3) the recognition of the developmental aspects of mental states and mental states in relation to the interviewer, the adult is rated as high on the RF scale. Adult RF is thus an overt manifestation, in narrative, of an individual's mentalizing capacity (Slade, 2005). The potential of adult RF as a mechanism for bridging the transmission gap became apparent in a study in which high scorers on the adult RF scale were shown to fall within an autonomous AAI classification (Fonagy, Steele, Moran et al., 1991). In addition, high *prenatal* RF predicted secure parent–infant attachment for both mothers and fathers. In fact, when RF was controlled for, AAI classifications no longer predicted parent–infant attachment security.

Recently, published data have introduced a second index of RF—this time measuring reflective processes within the context of the parent–child relationship as they manifest in parental descriptions of the ongoing, current, and evolving relationship to the child (Slade, 2005). This was motivated by the assumption that a direct evaluation of the parent's capacity to reflect on the child's experience would provide a more direct assessment of the phenomena proposed to underlie the inter-generational transmission of attachment security.

To this end, the parent development interview (PDI; Aber, Slade, Berger, Bresgi, & Kaplan, 1985; Slade, Bernbach, Grienenberger, Levy, & Locker, 2004) was used. The PDI is a 45-item semi-structured clinical interview intended to examine parents' representations of their children, of themselves as parents, and of their relationships with their children. The measure uses many of the questions in the AAI (e.g., 'Choose three adjectives to describe the relationship with your child') and is believed to tap into parents' representations of their children. In addition, it provides an assessment of how well parents understand their child's behavior, thoughts and feelings (e.g., 'Describe a time in the last week when you and your child really clicked').

Several studies have investigated the validity of the PDI. Slade, Belsky, Aber, and Phelps (1999) demonstrated construct and predictive validity for the PDI by showing that parental representations of the child were related to parental representations of attachment and parenting behavior. Convergent and predictive validity were demonstrated in a study showing that PDI representations correlated with both adult (measured during pregnancy) and infant attachment (measured at 14 months). Aber, Belsky, Slade, and Crnic (1999) demonstrated stability in aspects of parents' representations over a follow-up period. Parental representations were also shown to predict children's play behavior at follow-up (Hartmann, 1998). The PDI furthermore displayed differential correlates for parent and child behavior between families in which early adoption and late adoption took place (Steele, 2003). In addition, Grienenberger, Kelly, and Slade (2005) showed that when the PDI is coded using the RF scale (PDI-RF), low parental RF correlated with disrupted maternal behavior during the strange situation as measured by the atypical maternal behavior instrument for assessment and classification (AMBIANCE; Bronfman, Parsons, & Lyons-Ruth, 1999).

Recently, three levels of parental PDI-RF have been described (Slade et al., 2004). Low RF is indicated when a parent seems oblivious to the fact that the child has feelings or thoughts, which are particularly personal to the child, in combination with a denial of the parent's own experience of parenting. Moderate RF is signified if the parent recognizes that the child has mental states, but their responses still lack reflection on their own mental states and the recognition that the child's mental states or their own mental states are connected to behavior. Only when such recognition and reflection take place, can the parent be rated as high on the parental RF scale.

Slade (2005) provides an example of a highly reflective mother:

Sometimes she gets *frustrated and angry* (child mental state) in ways that *I'm not sure I understand* (opacity of child's mental state). She points to one thing and I hand it to her, but it turns out *that's not really what she wanted* (opacity). It *feels very confusing* to me (mother's mental state) when *I'm not sure how she's feeling* (opacity of child's mental state) especially when she's upset. Sometimes *she'll want to do something* and I won't let her because it's dangerous, and *so she'll get angry* (mother recognizes diversity of mother and child mental states). I may try to pick her up and she obviously didn't want to be picked up because *she's in the middle of being angry* (mother recognizes dynamic nature of child's affect) and I interrupted her. In those moments it's *me who has the need to pick her up and make her feel better, so I'll put her back down* (mother recognizes that her need is triggering a behaviour that is not in line with the child's needs, and changes her behaviour accordingly). (p. 279)

Fonagy et al. (2002) believe that it is through the latter kind of parental mentalization that mentalizing capacity, autonomy, and self-regulation are fostered in the child.

It should be noted, however, that parental mentalization is not the only variable seen as affecting child attachment security and consequent socio-cognitive development.

Some children have characteristics that make them more likely than others to elicit positive or negative emotions from parents (Dix, 1991). The parent's capacity to treat the child as a psychological agent may be influenced, for instance, by a 'difficult' child temperament. Since the seminal work of Thomas and Chess (see Thomas, Chess, & Birch, 1968), there has been an explosion of research testifying to the role of child temperament in parenting behavior. This literature has clearly pointed to the fact that most aspects of child development, including attachment style and socio-cognitive development, should be understood in the context of a child's temperament and the style of parenting that temperament engenders.

An augmented hypothesis to the one put forward by Fonagy and co-workers would therefore be one in which the child's difficult temperament disrupts or curtails parental mentalizing. Indeed, in a later section of this review, we will discuss the work of Gottman and colleagues (e.g., Katz & Gottman, 1997), who have prospectively demonstrated the role of child characteristics in the psychosocial development of the child. Fonagy and co-workers do not deny the importance of child temperament. However, they justify the primacy of parental mentalizing on the basis of their longitudinal findings, which demonstrate that *prenatal* adult RF is predictive of *subsequent* attachment security of the infant and of the mentalizing capacity of the same children during the preschool years (Fonagy, Steele, Moran et al., 1991). These findings have recently been replicated by Arnott and Meins (2007) and will be discussed in more detail in the next section.

In summary, we can conclude that the concept of RF, which is rooted in the psychoanalytic tradition, refers to mentalization measured in the context of attachment (Fonagy & Target, 2005). As such, measuring RF involves coding the level of mentalization against the background of individuals' *representations* of their attachment relationships. Mentalization in this context therefore takes place 'off-line' and is thought to tap into a parent's predominant stance toward the child as a more or less intentional being, perhaps reflecting multiple interactions over time. Two types of RF have been operationalized: (1) adult RF as measured by the RF scale (Fonagy et al., 1998) and (2) parental RF as indexed by the application of the RF scale to PDI ratings (Slade et al., 2004).

Maternal Mind-mindedness: Parental Mentalization during Parent-child Interaction

Arguing from a cognitive developmental point of view, Meins (1997) reframes attachment theory within a Vygotskian approach and introduces the concept of maternal mind-mindedness (MMM) as a mechanism for bridging the transmission gap of attachment security across generations. She built her argument across several empirical studies (Meins, 1997; Meins & Russell, 1997; Meins, Fernyhough, Russell, & Clark-Carter, 1998) by first demonstrating an association between secure child attachment and (1) referential tendencies in infant language acquisition, (2) perspective-taking during pretend play, and (3) mentalizing capacity as evidenced by passing a theory of mind task at the age of four. In addition, mothers of securely attached children presented their children with information and instructions that were comprehensible and pitched within the child's zone of proximal development. Such mothers also used speech that contained more mental state terms when describing their children.

These findings provided the necessary evidence to suggest that children of mothers who are mind-minded, that is, who treat their children as individuals with minds, are

more likely to be securely attached. For Meins (1997), mind-mindedness entails more than just treating an infant as an intentional agent. The latter implies that the mother acknowledges that her infant is capable of expressing a desire through a particular mode of communication. Treating one's child as a *mental* agent, however, implies a further understanding that the child is capable of having representations of the world and different stances or perspectives that may be taken toward reality (Meins, 1997). Meins then sees this capacity as the crucial ingredient of maternal sensitivity that fosters secure attachment in the infant. In addition, like Fonagy and colleagues (e.g., Fonagy et al., 2002), Meins argues that MMM may also facilitate in a child a greater understanding of his/her own mind and others as mental agents, thus increasing the child's experience of self-efficacy.

The mere demonstration of a link between MMM and secure child attachment does not necessarily imply that MMM alone provides secure attachment. Fonagy and Meins are yet to measure child temperament in relation to MMM. It is, of course, quite possible that child temperament may interact with MMM in predicting the quality of attachment.

A measure of MMM repeatedly used in Meins's studies was developed based on the question 'Can you describe [child's name] for me?' (Meins & Fernyhough, 1999; Meins et al., 1998). Responses are coded as follows: *Mental*—any reference to the child's mental life, in terms of his/her will, mind, intellect, metacognition, imagination; any comments relating to desires, wishes, and emotion. This category does not include references that are merely comments on the child's likes and dislikes or behavioral tendencies. *Behavioral*—any reference to behavior such as games and activities enjoyed by the child or interactions with others on a behavioral level. Other descriptions included in this category are words like 'lively, talkative, boisterous, aggressive, passive, friendly, restrained, outgoing, naughty'. *Physical*—any physical attributes, the child's age, and descriptions relating to the child's position in the family. *General*—any description that did not fit into the above categories. Proportional scores are then calculated that define the proportion of mentalistic terms used by the mother compared to the total number of coded descriptions.

While it could be argued that the above measure of MMM reflects off-line mentalizing, and is thus in some ways similar to parental RF described above, Meins and colleagues have also developed a more online measurement of MMM. In this measurement, 20 minutes of free play between mothers and their six-month old babies were videotaped and coded for five categories: (1) maternal responsiveness to change in the infant's direction of gaze; (2) maternal responsiveness to the infant's object-directed action; (3) imitation; (4) encouragement of autonomy; and (5) appropriate mind-related comments. In a series of studies, the significance of category five (appropriate mind-related comments) for attachment security and the socio-cognitive development of the child was demonstrated. Appropriate maternal mind-related comments were concurrently predictive of attachment security at six months (Meins, Fernyhough, Fradley, & Tuckey, 2001). Appropriate MMM during infancy was furthermore shown to be longitudinally predictive of attachment security at 45 and 48 months (Meins et al., 2002), and of social-cognitive performance at 55 months (Meins et al., 2003).

This empirical work has provided important information on the MMM-attachment-mentalizing link which forms part of the story to explain the intergenerational transmission of attachment. To complete the story, it is necessary to demonstrate that *prenatal* AAI classification is associated with MMM, which in turn associates with child attachment and mentalizing. Work to this effect has just been completed (Arnott & Meins, 2007). Prenatal autonomous parental AAI classification, higher RF, and

infant–parent attachment security were shown to be associated with greater parental mind-mindedness.

The major contribution of this work lies in its ability to demonstrate that *prenatal* AAI classification relates to online, real life *post-natal* interactions between parent and child. It furthermore confirms the relationship between AAI and off-line representations provided by adult and parent measures of RF, which had previously been demonstrated by Fonagy, Steele, Moran et al. (1991), but remained unreplicated until now. Bernier and Dozier (2003) tested the relationship between AAI and online MMM by measuring MMM as described by Meins et al. (1998) in 6–30-month-old foster children. They found that high MMM related to non-autonomous classifications in adults and insecure attachment relationships with children. This surprising finding may be reflective of the fact that the coding scheme employed by Meins et al. (1998) was developed to be appropriate for slightly older children. It might also be the case that MMM functions differently for foster dyads compared to biological dyads. For instance, it is possible that in this special population, child characteristics and the bidirectional nature of the relationship between attachment security and parental mentalizing is more salient compared to biological dyads. It is likely that the behavioral responses of insecurely attached children call for more intense attempts on the part of foster parents to identify the child's thoughts and feelings.

In summary, MMM is related to RF in as much as both consider the mother's capacity to treat the child as a psychological agent. They differ in operationalization in that MMM involves the evaluation of observed online, real-life interactions between parent–child dyads. Both concepts therefore provide a unique, but related perspective on the capacity to treat the child as a psychological agent. It may be argued that both concepts share a common underlying neurobiology, with MMM expressing itself in real-life interaction with the child, and RF expressing itself through the metacognitive representations that the mother holds about the relationship with the child.

We will return to the question of underlying neurobiology by providing evidence in support of this notion in the last section of this review article. First, we consider other operationalizations of parental mentalization within frameworks that are not explicitly concerned with attachment.

Parental Meta-emotion Philosophy: Parental Mentalization of Emotion and Emotion-coaching

The concept of parental meta-emotion philosophy (PMEP) was developed in the context of marriage and family psychology (Gottman et al., 1996). Gottman and his colleagues identified a need in the parenting literature to include emotion in the analyses of parenting behaviors. Two areas of research have influenced the development of the notion of PMEP. The first is the emotion-processing research of Ekman and co-workers (e.g., Ekman, Friesen, & Simons, 1985), which suggests great variability in the emotional responses ('meta-emotions') to expressed emotions. The second is the concept of 'metacognition', which also lies at the basis of the theory of mind literature (e.g., Flavell, 1979; Fodor, 1992; Olson & Astington, 1993). Against this background, the concept of PMEP was developed to capture the notion of metacognition about emotion. More specifically, PMEP refers to an organized set of feelings and thoughts about one's own emotions and one's children's emotions.

Gottman and co-workers suggest that the optimal meta-emotion philosophy in terms of preschool children's psychosocial adjustment is that of an emotion-coaching

philosophy. Such a philosophy (as opposed to an emotion-dismissing or 'laissez-faire' philosophy) has five components: (1) parents are aware of low-intensity emotions in themselves and in their children; (2) they view the child's negative emotion as an opportunity for intimacy or teaching; (3) they validate their child's emotion; (4) they assist the child in verbally labelling his/her emotions; and (5) they problem-solve with the child, setting behavioral limits and discussing goals and strategies for dealing with the situation that led to the negative emotion. Gottman et al. (1996) hypothesize that children learn better to regulate their emotions through the parents' ability to 'manoeuvre in the world of emotions' (p. 244).

The overlap with Fonagy's concept of RF and Meins's concept of MMM is clear. Both share a philosophical basis in the notion of 'meta'-processing of cognitions or emotions. At the core of Gottman's concept of PMEP lies the notion of self- and other-reflection in mentalistic terms, specifically during highly charged emotional experiences. Fonagy et al. (2002) refer to this capacity as RF and give similar weight to reflecting on emotions and cognitions. Moreover, the concept of PMEP overlaps with RF and MMM in that they are seen as the mechanisms by which the parent helps the child to learn emotion regulation. Although evaluations of MMM or RF do not explicitly measure emotion regulation, it is implied by both RF and MMM theories. For Fonagy and co-workers, it is through the primary caregiver's capacity to mentalize that infants learn to regulate their own behavior and emotions (Fonagy et al., 2002). Meins refers to this as self-efficacy (Meins, 1997). Gottman and colleagues make this explicit by taking into account emotion regulation in their measurement of parents' mentalizing of the child's emotions.

To measure PMEP, the authors developed the meta-emotion interview (Katz & Gottman, 1986). This interview includes questions about parents' own experience of emotion in addition to their feelings, attitudes and behavior with regard to their children's emotions. Responses are then audiotaped and coded using a checklist rating system called the meta-emotion coding system (Katz, Mitmann, & Hooven, 1994). Coding yields three codes per emotion (sadness, anger, and fear): (1) mother's awareness of her own emotion, (2) mother's awareness of her child's emotion, and (3) mother's coaching of child emotion.

While Gottman and colleagues are not concerned with using PMEP to bridge the transmission gap, their work extends the work on MMM and RF by explicitly measuring the parent's coaching of emotion-regulation strategies alongside the acknowledgment that the child is a psychological agent—that is, an individual with a mind containing feelings, thoughts, and intentions. It also extends RF/MMM work through a series of longitudinal studies that investigate the implications of the PMEP for the emotional well-being of children (Gottman et al., 1996; Katz & Windecker-Nelson, 2004). Findings demonstrate that children whose parents engage in more emotion-coaching show less evidence of physiological stress, greater physiological regulatory abilities, greater ability to focus attention, less physical illness, higher academic achievement, and better peer relations (Gottman et al., 1996).

In another study, Katz and Gottman (1997) examined several protective mechanisms that may reduce deleterious correlates of marital conflict and marital dissolution in young children. These included more traditional parent-child interactions (parental warmth, parental scaffolding/praise, and inhibition of parental rejection) as well as PMEP. In acknowledging that both child and parent characteristics play a role in child development, they also included a third set of potential buffers: the intra-individual characteristics of the child, including the child's intelligence and measures of

regulatory physiology (basal vagal tone and vagal suppression). Fifty-six families with a preschool child were assessed when the children were five years old, and followed up when the children were eight years old. Follow-up outcomes included observations of peer interaction, ratings of behavior problems, peer aggression, child physical illness, and achievement. PMEP was shown to be as good a buffer as traditional parenting variables and child characteristics in protecting children against the adverse effects of marital conflict and dissolution.

In yet another study, Gottman and colleagues have demonstrated that mothers of children with conduct problems are less aware of their own emotions and engaged in less emotion-coaching of their children's emotions than mothers of children without conduct problems (Katz & Windecker-Nelson, 2004). For both aggressive and non-aggressive children, higher levels of maternal awareness and coaching of emotion are associated with more positive and less negative peer play. These data suggest that both aggressive and non-aggressive children can benefit when parents are more aware and coaching of emotion.

In summary, Gottman's contribution is important for several reasons: (1) it highlights the importance of emotion in parental mentalizing by explicitly focusing on the parent's capacity to recognize emotions in themselves and their children; (2) it empirically links parental mentalizing to the child's capacity to regulate his/her own emotions; (3) it extends previous research by empirically demonstrating the importance of parental mentalizing for developmental psychopathology outcomes in the child; and (4) it testifies to the importance of child characteristics that affect the child's psychosocial development in concert with parental mentalization.

Parents' Cognitions about Their Children's Intentions and Attributions: the Accuracy of Parental Mentalizing

In keeping with Gottman and colleagues' endeavors to demonstrate the implications of parental mentalization for child psychosocial outcome and child socio-cognitive development, Sharp, Fonagy, and Goodyer (2006) developed a paradigm for investigating the accuracy of parental mentalizing. Arguing from the perspective of a developmental psychopathology framework, they asked mothers to guess the responses of their 7–11-year-old children, who in turn, were asked to attribute thoughts to their peers in fictitious distressing peer-related scenarios. By comparing children's actual thoughts with their mothers' attributions about their children's thoughts, a continuous measure of maternal accuracy in mentalization could be derived.

Results suggested that maternal accuracy was normally distributed with mothers accurately guessing the responses of their children for about half of the social scenarios. Mothers were furthermore shown to be significantly above chance in the accuracy with which they predicted their children's overall attributional styles. Poor maternal accuracy was shown to be associated with ineffective social-cognitive reasoning in the child during peer-related scenarios. Maternal accuracy was found to be related to child psychosocial adjustment (reduced scores on child psychopathology measures from multiple sources). Importantly, when the maternal accuracy variable was transformed to derive three groups (low, average, and high maternal accuracy), no significant differences were found between the average and high maternal accuracy groups for child psychosocial adjustment. In line with the concept of 'good enough parenting' (originally coined by Winnicott, 1965), good enough parental mentalizing seems to be all that is needed.

Sharp et al.'s (2006) study extends RF/MMM work by demonstrating the implications of parental mentalization for symptoms of psychopathology. It also introduces a method for tapping into parental mentalizing of older, middle school-aged children. Although the study was not designed to directly test the intergenerational transmission of poor mentalizing skill, the finding that low maternal accuracy is associated with ineffective attributional processes in the child speaks to the possibility that poor mentalizing in the mother (low maternal accuracy) may carry over so that ineffective mentalizing is facilitated in the child.

Of course, it is acknowledged that many other factors affect the development of a child's mentalizing capacity. For instance, Perner et al. (1994) demonstrated accelerated theory of mind development in children with older siblings. It should also be recognized that correlational data cannot be taken to infer causality. It is nevertheless worthwhile considering the importance of parental mentalizing capacity in concert with other factors in the psychosocial development of the child.

In further support of the importance of accurate parental mentalizing, other studies of developmental psychopathology have shown that mothers of aggressive children attribute their children's misbehavior and unresponsiveness to noncompliant, defiant, and hostile intent (Dix & Lochman, 1990; MacKinnon-Lewis, Lamb, Arbuckle, Baradaran, & Volling, 1992; Smith & O'Leary, 1995; Strassberg, 1995, 1997). Strassberg (1997), for instance, showed vignettes to mothers of aggressive vs. non-aggressive children. The vignettes reflected different forms of child non-compliance, each varying in severity of non-compliance. As predicted, mothers of aggressive children ascribed hostile intent to children on *all* forms of non-compliance and not only the severe conditions, while average mothers attributed hostile intent only to the most severe conditions.

According to Strassberg (1997), an important question for the interpretation of these results is whether they reflect the mother as an accurate appraiser of her child's intention (a 'child effect'). It is certainly reasonable to argue that aggressive boys do in fact display more hostile intent compared with 'average' boys. The alternative account is that the underlying process may be ascribed to a predisposition to negative attributions of intentions (a 'mother effect'), in which case mothers may be maintaining or even causing aggressive behavior. Strassberg (1997, p. 214) opts for the latter: 'It is patently irrational to interpret mild non-compliance (such as affectively benign requests for permission or well-mannered statement of preference) as representing hostile and coercive intentions. The notion that the child's benign (even nice) behavior is intended to force the mother into capitulation is a logical inconsistency on the mother's part'. This 'hostile attribution bias' on the part of the mother was furthermore shown to be a better predictor of aggression in children compared with the mother's judgement of the severity of non-compliance.

Taken together, the above research suggests that although the mother may be mentalizing her child, she is doing so incorrectly. Thus, a 'misinterpretation' or 'misreading' of the child's mind takes place, akin to what Meins et al. (2001, 2002) refer to as 'inappropriate MMM' or what Sharp (2006) refers to as 'distorted mentalizing'. It furthermore confirms the link between the misreading of children's intentions and attributions, and the child's socio-cognitive reasoning and psychosocial adjustment.

Distorted parental mentalization may, however, have implications for the parent's own emotions as well. How upset parents become with children who misbehave depends on inferences parents make about children's intentions (Dix & Crusec, 1985). Mothers have been found to be more upset when they think that children understand,

intend and have control over negative behavior, and that negative acts therefore reflect negative personality dispositions in the child (Dix & Lochman, 1990; Dix & Reinhold, 1991; Dix, Ruble, & Zambarano, 1989; Dix, Ruble, Crusec, & Nixon, 1986). Moreover, the tendency to misinterpret children's intentions and thoughts seems to be more apparent in depressive or abusive mothers (see Dix, 1991, for a review).

In summary, distorted parental mentalizing, or the lack thereof, whether due to child characteristics or parental pathology or both, seems to be an important correlate, if not predictor, of child psychosocial outcome.

Implications for Developmental Psychopathology

In this review article, several constructs and measures of parental mentalizing have been described from diverse theoretical backgrounds—all of them indices of the parent's capacity to treat the child as a psychological agent. While some of these constructs have been developed to account for the gap in the inter-generational transmission of attachment security (RF and MMM), others (PMEP and distorted parental mentalization) have been developed to investigate the relationship between parental mentalization and the psychosocial and socio-cognitive development of the child. Some, like RF, MMM, and PMEP, are explicitly concerned with emotion- and self-regulation, while others are less so. Moreover, while some occur off-line (e.g., RF), others occur online in real-time parent-child interactions (MMM). What all these indices of parental mentalization have in common, despite different operationalizations, is the fact that they involve what we are going to refer to as 'a meeting of minds' between parent and child. But what makes this meeting of minds possible? We will first approach this question from a cognitive science point of view, and then consider the neurobiological level of explanation, in order ultimately to formulate an argument of how both parental and child mentalization may play a role in the development of emotional-behavior disorders of childhood.

According to Tomasello and colleagues, a meeting of minds is made possible by 'shared' or 'we intentionality' (Tomasello, Carpenter, Call, Behne, & Moll, 2005). They propose that 'human beings, and only human beings, are biologically adapted for participating in collaborative activities involving shared goals and socially coordinated action plans (joint intentions)' (p. 676). However, in addition to the capacity to understand the goals, intentions and perceptions of other persons (theory of mind), a meeting of minds requires the *motivation* to share these things in interaction with others (Tomasello et al., 2005). Tomasello and colleagues argue that at the basis of this lies the motivation to share *emotions* with others. It is thus the motivation to share emotional states with others that distinguishes us from apes, who despite sophistication in understanding many aspects of intentional action, seem to lack the motivations and skills for sharing even the most basic forms of psychological states with one another. Tomasello et al. (2005) conclude that as humans, we are motivated to engage in shared intentionality because we are hardwired to want to be part of a 'we'. As a species, this enables collaboration, which is necessary for our survival. Against this background, parental mentalization, which facilitates a meeting of minds between parent and child, whether operationalized by RF, MMM, or by any other means, can then be seen as a species-typical social interaction early in ontogeny.

In addition to the above two prerequisites for shared intentionality (the capacity to understand intentions and the motivation to share psychological states), Gergely and colleagues (Csibra & Gergely, 2006; Gergely & Csibra, 2005) suggest an ability

to *communicate relevant information* as a third prerequisite: 'Participants must negotiate and co-ordinate at all levels of Joint Collaborative Activities by means of communicating relevant information' (Gergely et al., 2005, p. 702). They suggest that because of increasingly sophisticated teleofunctional understanding of tools during hominoid evolution, a selective pressure for a new type of cultural learning mechanism was created. This learning mechanism ensures the transmission of relevant knowledge by making the latter manifest to the observer, which leads to the emergence of the specialized communicative system of human 'pedagogy'. Shared intentionality is thus a product of the capacity of the parent to convey accurate information, coupled with receptiveness on the part of the child to receive relevant knowledge. Therefore, while Tomasello and colleagues view the meeting of minds as a mere by-product of a species-specific motivation to co-operate and share mental states with each other, Gergely and colleagues explain it by appealing to a species-unique capacity for cultural learning through the communication of relevant knowledge.

Evidence for the evolutionary basis of a meeting of minds (whether through the mechanism of 'we intentionality', pedagogy, or both), comes from recent neurobiological studies. Neuroimaging data have provided compelling evidence that a specific brain system, analogous to those systems already identified for spatial navigation and face recognition, is uniquely dedicated to our capacity to mentalize (Frith & Frith, 1999). Proof now exists to suggest that mentalizing is mediated by a circumscribed network that includes the superior temporal sulcus, the medial prefrontal cortex (including the anterior cingulate cortex) and, to some extent, the amygdala (Fletcher et al., 1995; Frith & Frith, 2003; Gallagher & Frith, 2003). This is the case for both verbal- and cartoon-based theory of mind tasks (Gallagher et al., 2000).

Parallel to this work has been research examining the neurobiological correlates of social cognition in general, of which the mentalization circuitry forms a subsystem. This work has offered a possible reconciliation of biological and psychological approaches to social behavior (Kyte & Goodyer, 2005). For instance, Adolphs (2003) concludes that the neural regulation of social cognition reflects both innate automatic and cognitively impenetrable mechanisms, as well as acquired, contextual and volitional aspects. Adolphs (2003) explains that 'an acknowledgement of such an architecture simply provides detail to the way in which social cognition is complex—it is complex because it is not monolithic, but rather it consists of several tracks of information processing that can be variously recruited depending on the circumstances' (p. 165).

Taken together, these new developments are suggestive of the possibility that social-environmental factors such as MMM (Meins, 1997), RF (Fonagy et al., 2002), distorted/inaccurate parental mentalizing (Dix, 1991; Sharp et al., 2006; Strassberg, 1997) and PMEP (Gottman et al., 1996) may play a crucial role in the process of hardwiring mentalization circuitries as the child matures into a mentalizing agent. Nothing is yet known about the development of these brain circuitries in children, but it is conceivable that if parental mentalizing processes do not function at an optimal level, this (along with other factors not specified in the current model) may have implications for the child's psychosocial functioning. Indeed, in this review, we have reported findings to suggest that children of poor mentalizers are at greater risk of symptoms of psychopathology (Gottman et al., 1996; Katz & Windecker-Nelson, 2004; Sharp et al., 2006; Strassberg, 1997).

As outlined elsewhere in this review, we do not mean to say that parental mentalization is the *only* vehicle by which child psychopathology develops. One can imagine

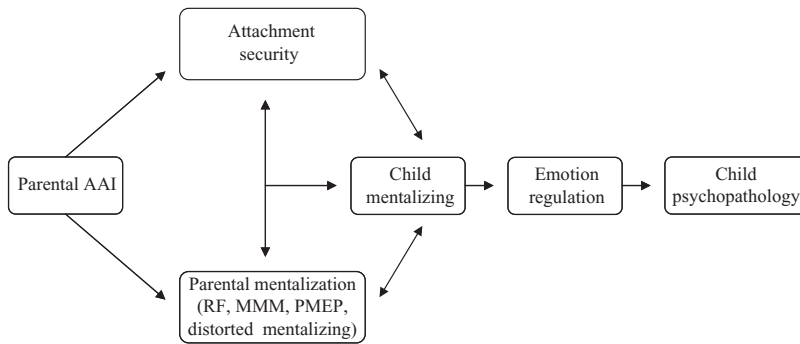


Figure 1. Testable Model of Factors that Relate to Parental Mentalization and Suggested Pathway for the Development of Psychopathology through Mentalization.

myriad factors that may impact parental mentalization: child temperament, parental psychopathology, family structure, life events, genetic predispositions, to name but a few. Our model cannot encompass all of these factors at once. It does, however, suggest *one* pathway by which normal development may go awry. That is, when a meeting of minds does *not* take place between parent and child, the child may be at greater risk for the development of psychopathology.

Just how should the pathway by which parental mentalization exerts its influence on the development of psychopathology be conceived of? The model in Figure 1 suggests such a pathway and offers several hypotheses to be investigated by future research.

Fonagy, Steele, Moran et al. (1991) have demonstrated the link between AAI, RF, and attachment security. This compelling finding needs further replication beyond the recent replication by Arnott and Meins (2007). Moreover, the relationship between parental mentalizing (RF or MMM) and emotional regulation, suggested by both Fonagy's and Main's work, has not been empirically tested. Although studies have investigated the link between attachment security and psychopathology (Sroufe, Carlson, Levy, & Egeland, 1999), between parental mentalizing and psychopathology (Gottman et al., 1996; Sharp et al., 2006; Strassberg, 1997) and between psychopathology and emotion regulation (Southam-Gerow & Kendall, 2002), these factors have not yet been considered in a longitudinal or concurrent path analysis with psychopathology as outcome.

Conclusion

In this review article, we have summarized the different constructs and the measures that index parental mentalization. We have suggested that these constructs, although distinct in the operationalization of parental mentalization, all rely on a common and evolutionary-based neurobiological mentalization circuitry that, if 'broken' in the parent, may lead to reduced mentalization capacity in the child, which, in turn, through deficient emotional regulation processes, may lead to the development of symptoms of psychopathology.

Acknowledging the importance of parental mentalizing for the socio-cognitive and psychosocial development of the child has several practical and clinical implications. Recently, mentalization-based treatment programs that specifically target the mentalizing capacity of individuals have been developed for inpatient care settings (Bateman

& Fonagy, 2004), families (Fearon, Target, Sargent, Williams, Bleiberg, & Fonagy, 2006), mother–infant dyads (Sadler, Slade, & Mayes, 2006), and schools (Twemlow, Fonagy, & Sacco, 2001, 2004). By linking the capacity to mentalize to developmental psychopathology outcomes, the urgency of the further development of such programs is emphasized.

References

- Aber, J. L., Belsky, J., Slade, A., & Crnic, K. (1999). Stability and change in mothers' representations of their relationship with their toddlers. *Developmental Psychology, 35*, 1038–1047.
- Aber, J. L., Slade, A., Berger, B., Bresgi, I., & Kaplan, M. (1985). *The parent development interview*. Unpublished protocol, The City University of New York.
- Adolphs, R. (2003). Cognitive neuroscience of human social behaviour. *Nature Reviews Neuroscience, 4*, 165–178.
- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Arnott, B., & Meins, E. (2007). Links between antenatal attachment representations, postnatal mind-mindedness, and infant attachment security: A preliminary study of mothers and fathers. *Bulletin of the Menninger Clinic, 71*, 132–149.
- Baron-Cohen, S., Tager-Flusberg, H., & Cohen, D. J. (1993). *Understanding other minds: Perspectives from autism*. Oxford: Oxford University Press.
- Bateman, A. W., & Fonagy, P. (2004). Mentalization-based treatment of BPD. *Journal of Personality Disorders, 18*, 36–51.
- Bernier, A., & Dozier, M. (2003). Bridging the attachment transmission gap: The role of maternal mind-mindedness. *International Journal of Behavioral Development, 27*, 355–365.
- Bowlby, J. (1973). *Attachment and loss: Separation*. New York: Basic Books.
- Bowlby, J. (1980a). *Attachment and loss: Loss, sadness and depression*. New York: Basic Books.
- Bowlby, J. (1980b). *Attachment and loss: Vol. 3. Loss, sadness and depression*. London: Hogarth Press.
- Bronfman, E., Parsons, E., & Lyons-Ruth, K. (1999). *Atypical maternal behavior instrument for assessment and classification (AMBLANCE): Manual for coding disrupted affective communication, Version 2*. Cambridge, MA: Harvard Medical School.
- Carpendale, J., & Chandler, M. J. (1996). On the distinction between false-belief understanding and subscribing to an interpretive theory of mind. *Child Development, 67*, 1686–1706.
- Csibra, G., & Gergely, G. (2006). Social learning and social cognition: The case for pedagogy. In M. H. Johnson & Y. Munakata (Eds.), *Progress of change in brain and cognitive development: Attention and performance* (pp. 249–274). Oxford: Oxford University Press.
- Davies, M. (1994). The mental simulation debate. In C. Peacocke (Ed.), *Objectivity, simulation and the unity of consciousness* (pp. 99–128). Oxford: Oxford University Press.
- Dix, T. (1991). The affective organization of parenting: Adaptive and maladaptive processes. *Psychological Bulletin, 110*, 3–25.
- Dix, T., & Crusec, J. E. (1985). Parent attribution processes in the socialization of children. In I. E. Sigel (Ed.), *Parental beliefs systems* (pp. 201–234). Hillsdale, NJ: Erlbaum.
- Dix, T., & Lochman, J. E. (1990). Social cognition and negative reactions to children: A comparison of mothers of aggressive and nonaggressive boys. *Journal of Social and Clinical Psychology, 9*, 418–438.
- Dix, T., & Reinhold, D. P. (1991). Chronic and temporary influences on mothers' attributions for children's disobedience. *Merrill Palmer Quarterly, 37*, 251–271.
- Dix, T., Ruble, D. N., Crusec, J. E., & Nixon, S. (1986). Social cognition in parents: Inferential and affective reactions to children of three age levels. *Child Development, 57*, 879–894.
- Dix, T., Ruble, D. N., & Zambarano, R. J. (1989). Mothers' implicit theories of discipline: Child effects, parents effects, and the attribution process. *Child Development, 60*, 1373–1391.
- Dunn, J. (1988). *The beginnings of social understanding*. London: Blackwell Publishing.
- Dunn, J. (1993). *Young children's close relationships: Beyond attachment*. Thousand Oaks, CA: Sage Publications, Inc.

- Dunn, J. (1994). Changing minds and changing relationships. In C. Lewis, & P. Mitchell (Eds.), *Children's early understanding of mind: Origins and development* (pp. 297–310). Hove: Lawrence Erlbaum Associates.
- Dunn, J., Brown, J., & Beardsall, L. (1991). Family talk about feeling states and children's later understanding of others' emotions. *Developmental Psychology*, 27, 448–455.
- Dunn, J., Brown, J., Slomkowski, C., Tesla, C., & Youngblade, L. (1991). Young children's understanding of other people's feelings and beliefs: Individual differences and their antecedents. *Child Development*, 62, 1352–1366.
- Ekman, P., Friesen, W. V., & Simons, R. C. (1985). Is the startle reaction an emotion? *Journal of Personality and Social Psychology*, 49, 1416–1426.
- Fearon, P., Target, M., Sargent, J., Williams, L., Bleiberg, E., & Fonagy, P. (2006). Short-term mentalizing and relational therapy (SMART): An integrative family therapy for children and adolescents. In J. Allen & P. Fonagy (Eds.), *Handbook of mentalization-based treatment* (pp. 201–222). Winchester, UK: John Wiley and Sons, Inc.
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34, 906–911.
- Fletcher, P. C., Happé, F., Frith, U., Baker, S. C., Dolan, R., Frackowiak, R., et al. (1995). Other minds in the brain: A functional imaging study of 'theory of mind' in story comprehension. *Cognition*, 57, 109–128.
- Fodor, J. A. (1992). A theory of the child's theory of mind. *Cognition*, 44, 283–296.
- Fonagy, P. (1991). Thinking about thinking: Some clinical and theoretical considerations in the treatment of a borderline patient. *International Journal of Psycho-Analysis*, 72, 639–656.
- Fonagy, P., Gergely, G., Jurist, E. L., & Target, M. (2002). *Affect regulation, mentalization, and the development of self*. New York: Other Press.
- Fonagy, P., Redfern, S., & Charman, T. (1997). The relationship between belief-desire reasoning and a projective measure of attachment security (SAT). *British Journal of Developmental Psychology*, 15, 51–61.
- Fonagy, P., Steele, H., Moran, G., Steele, M., & Higgitt, A. (1991). The capacity for understanding mental states: The reflective self in parent and child and its significance for security of attachment. *Infant Mental Health Journal*, 13, 200–217.
- Fonagy, P., Steele, H., & Steele, M. (1991). Maternal representations of attachment during pregnancy predict the organization of infant-mother attachment at one year of age. *Child Development*, 62, 891–905.
- Fonagy, P., Steele, H., Steele, M., & Holder, J. (1997). Attachment and theory of mind: Overlapping constructs? *Association for Child Psychology and Psychiatry Occasional Papers*, 14, 31–40.
- Fonagy, P., & Target, M. (2005). Bridging the transmission gap: An end to an important mystery of attachment research? *Attachment and Human Development*, 7, 333–343.
- Fonagy, P., Target, M., Steele, H., & Steele, M. (1998). *Reflective-functioning manual, version 5.0, for application to adult attachment interviews*. London: University College London.
- Frith, C. D., & Frith, U. (1999). Interacting minds—a biological basis. *Science*, 286, 1692–1695.
- Frith, U., & Frith, C. D. (2003). Development and neurophysiology of mentalising. *Philosophical Transactions of the Royal Society London, Series B*, 358, 685–694.
- Gallagher, H. L., & Frith, C. D. (2003). Functional imaging of 'theory of mind'. *Trends in Cognitive Sciences*, 7, 77–83.
- Gallagher, H. L., Happe, F., Brunswick, N., Fletcher, P. C., Frith, U., & Frith, C. D. (2000). Reading the mind in cartoons and stories: an fMRI study of 'theory of mind' in verbal and nonverbal tasks. *Neuropsychologia*, 38, 11–21.
- George, C., Kaplan, N., & Main, M. (1984). *The adult attachment interview. Unpublished protocol* (3rd ed.). Berkeley, CA: University of California.
- Gergely, G., & Csibra, G. (2005). A few reasons why we don't share Tomasello et al's intuitions about sharing—Commentary/Tomasello et al: Understanding and sharing intentions. *Behavioral and Brain Sciences*, 28(5), 701–702.
- Gottman, J. M., Katz, L. F., & Hooven, D. (1996). Parental meta-emotion philosophy and the emotional life of families: Theoretical models and preliminary data. *Journal of Family Psychology*, 10, 243–268.
- Grienenberger, J. F., Kelly, K., & Slade, A. (2005). Maternal reflective functioning, mother-infant affective communication, and infant attachment: Exploring the link between mental

- states and observed caregiving behavior in the intergenerational transmission of attachment. *Attachment and Human Development*, 7, 299–311.
- Harris, P. L. (1989). *Children and emotion*. Oxford: Basil Blackwell.
- Hartmann, A. (1998). *Links between maternal representations of the child, observed maternal behaviors, and the quality of dyadic engagement in play at 28 months*. Unpublished doctoral dissertation, The City University of New York.
- Katz, L. F., & Gottman, J. M. (1986). *The meta-emotion interview*. Seattle: University of Washington.
- Katz, L. F., & Gottman, J. M. (1997). Buffering children from marital conflict and dissolution. *Journal of Clinical Child Psychology*, 26, 157–171.
- Katz, L. F., Mitmann, A., & Hooven, C. (1994). *The meta-emotion coding system*. Seattle: University of Washington.
- Katz, L. F., & Windecker-Nelson, B. (2004). Parental meta-emotion philosophy in families with conduct-problem children. *Journal of Abnormal Child Psychology*, 32, 385–398.
- Kyte, Z., & Goodyer, I. M. (2005). The neurobiology of social cognition and its relationship to unipolar depression. In A. Easton & N. J. Emery (Eds.), *Cognitive neuroscience of social behaviour* (pp. 257–290). London: Psychology Press.
- MacKinnon-Lewis, C., Lamb, M., Arbuckle, B., Baradaran, L. P., & Volling, B. L. (1992). The relationship between biased maternal and filial attributions and the aggressiveness of their interactions. *Development and Psychopathology*, 4, 403–415.
- Main, M. (1991). Metacognitive knowledge, metacognitive monitoring, and singular (coherent) vs. multiple (incoherent) models of attachment: Findings and directions for future research. In C. M. Parkes, J. Stevenson-Hinde, & P. Marris (Eds.), *Attachment across the life cycle* (pp. 127–159). London: Tavistock-Routledge.
- Meins, E. (1997). *Security of attachment and the social development of cognition*. Hove, UK: Psychology Press.
- Meins, E., & Fernyhough, C. (1999). Linguistic acquisitional style and mentalising development: The role of maternal mind-mindedness. *Cognitive Development*, 14, 363–380.
- Meins, E., Fernyhough, C., Fradley, E., & Tuckey, M. (2001). Rethinking maternal sensitivity: Mother's comments on infant's mental processes predict security of attachment at 12 months. *Journal of Child Psychology and Psychiatry*, 42, 637–648.
- Meins, E., Fernyhough, C., Russell, J., & Clark-Carter, D. (1998). Security of attachment as a predictor of symbolic and mentalising abilities: A longitudinal study. *Social Development*, 7, 1–24.
- Meins, E., Fernyhough, C., Wainwright, R., Clark-Carter, D., Das Gupta, M., Fradley, E., et al. (2003). Pathways to understanding mind: construct validity and predictive validity of maternal mind-mindedness. *Child Development*, 74, 1194–1211.
- Meins, E., Fernyhough, C., Wainwright, R., Das Gupta, M., Fradley, E., & Tuckey, M. (2002). Maternal mind-mindedness and attachment security as predictors of theory of mind understanding. *Child Development*, 73, 1715–1726.
- Meins, E., & Russell, J. (1997). Security and symbolic play: The relation between security of attachment and executive capacity. *British Journal of Developmental Psychology*, 15, 63–76.
- O'Connor, T. G., & Hirsch, N. (1999). Intra-individual differences and relationship-specificity of mentalising in early adolescence. *Social Development*, 8, 256–274.
- Olson, D. R., & Astington, J. W. (1993). Thinking about thinking: Learning how to take statements and hold beliefs. *Educational Psychologist*, 28, 7–23.
- Perner, J. (1991). *Understanding the representational mind*. Cambridge, MA: MIT Press.
- Perner, J., Ruffman, T., & Leekam, S. R. (1994). Theory of mind is contagious: You catch it from your sibs. *Child Development*, 65, 1228–1238.
- Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a 'theory of mind'? *Behavior and Brain Sciences*, 4, 515–526.
- Sadler, L. S., Slade, A., & Mayes, L. C. (2006). Minding the baby: A mentalization-based parenting program. In J. Allen & P. Fonagy (Eds.), *Handbook of mentalization-based treatment* (pp. 271–288). Winchester, UK: John Wiley & Sons, Ltd.
- Sharp, C. (2006). Mentalizing problems in childhood disorders. In J. G. Allen, & P. Fonagy (Eds.), *Handbook of mentalization-based treatments* (pp. 201–212). Chichester, UK: John Wiley & Sons.

- Sharp, C., Fonagy, P., & Goodyer, I. M. (2006). Imagining your child's mind: Psychosocial adjustment and mothers' ability to predict their children's attributional response styles. *British Journal of Developmental Psychology, 24*, 197–214.
- Slade, A. (2005). Parental reflective functioning: An introduction. *Attachment and Human Development, 7*, 269–281.
- Slade, A., Belsky, J., Aber, J. L., & Phelps, J. L. (1999). Mothers' representations of their relationships with their toddlers: Links to adult attachment and observed mothering. *Developmental Psychology, 35*, 611–619.
- Slade, A., Bernbach, E., Grienberger, J., Levy, D., & Locker, A. (2004). *Addendum to Fonagy, Target, Steele & Steele reflective functioning scoring manual for use with the Parent Development Interview*. New York: The City College and Graduate Center of the City University of New York.
- Smith, A. M., & O'Leary, S. G. (1995). Attributions and arousal as predictors of maternal discipline. *Cognitive Therapy and Research, 19*, 345–357.
- Southam-Gerow, M. A., & Kendall, P. C. (2002). Emotion regulation and understanding: Implications for child psychopathology and therapy. *Clinical Psychology Review, 22*, 189–222.
- Sroufe, L. A., Carlson, E. A., Levy, A. K., & Egeland, B. (1999). Implications of attachment theory for developmental psychopathology. *Development and Psychopathology, 11*, 1–13.
- Steele, M. (2003). *A longitudinal study of previously maltreated children: Attachment representations and adoption*. Paper presented at the conference Developmental Science and Psychoanalysis: Integration and Innovation, Yale Child Study Center, New Haven, CT.
- Strassberg, Z. (1995). Social information processing in compliance situations by the mothers of behavior-problem boys. *Child Development, 66*, 376–389.
- Strassberg, Z. (1997). Levels of analysis in cognitive bases of maternal disciplinary dysfunction. *Journal of Abnormal Child Psychology, 25*, 209–215.
- Thomas, A., Chess, S., & Birch, H. G. (1968). *Temperament and behavior disorders in childhood*. New York: New York University Press.
- Tomasello, M., Carpenter, M., Call, J., Behne, T., & Moll, H. (2005). Understanding and sharing intentions: The origins of cultural cognition. *Behavioral and Brain Sciences, 28*, 675–691.
- Twemlow, S. W., Fonagy, P., & Sacco, F. C. (2001). An innovative psychodynamically influenced approach to reduce school violence. *Journal of American Academy for Child and Adolescent Psychiatry, 40*, 377–379.
- Twemlow, S. W., Fonagy, P., & Sacco, F. C. (2004). The role of the bystander in the social architecture of bullying and violence in schools and communities. *Annals of the New York Academy of Science, 1036*, 215–232.
- Van IJzendoorn, M. H. (1995). Adult attachment representations, parental responsiveness, and infant attachment: a meta-analysis on the predictive validity of the Adult Attachment Interview. *Psychological Bulletin, 117*, 387–403.
- Winnicott, D. W. (1965). *The maturational process and the facilitative environment*. New York: International Universities Press.

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