



Mediating and moderating processes underlying the association between maternal cognition and infant attachment



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ABSTRACT

The goal of this longitudinal study was to elucidate aspects of maternal cognition associated with maternal sensitivity and the development of infant attachment. Seventy-seven mothers were administered a number of measures over the course of the infant's first year, including the Adult Attachment Interview (AAI), secure base scripts, and a measure of maternal insight about her infant's behavior. Maternal sensitivity was assessed using the maternal sensitivity Q-Sort and infant attachment using the Strange Situation Procedure. Associations were found between AAI coherence, secure base scripts, and maternal sensitivity; however, no direct association was found between maternal insight and sensitivity. A mediator-moderator model suggested that: 1) AAI coherence mediated the association between secure base scripts and maternal insight; and 2) maternal insight and sensitivity interacted to predict secure attachment. Findings suggest the need to further investigate the role of cognitive factors implicated in the intergenerational transmission of attachment.

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Attachment theory stipulates that cognitive representations of early relationships have an enduring influence on the development and maintenance of subsequent relationships throughout the life span (Bowlby, 1969, 1973, 1980). In line with this theory, maternal attachment representations, measured via the Adult Attachment Interview (AAI; Main, Goldwyn, & Hesse, 2002), have been found to be a strong predictor of the quality of infant attachment (Madigan et al., 2006a; van IJzendoorn, 1995), although the specific mechanisms of this transmission process remain elusive (Atkinson et al., 2005). Central to developmental theorizing is the proposition that maternal sensitivity, such as prompt and appropriate responding to infant needs and cues, is a primary mechanism through which maternal attachment representations shape the quality of infant attachment (Cassidy, 1994; Main, Kaplan, & Cassidy, 1985). However, van IJzendoorn's (1995) influential meta-analysis describing what he termed *the transmission gap* has called this fundamental hypothesis into question. A more recent meta-analysis further concluded that evidence for the mediational role of maternal sensitivity is ephemeral, appearing and disappearing as a function of the particular measures used and the nature of the population under study (Atkinson et al., 2005). These findings suggest a need to explore other mechanisms underlying the transmission of attachment between mother and child (Atkinson et al., 2000; Bernier & Meins, 2008; De

Wolff & van IJzendoorn, 1997; Meins, Fernyhough, Fradley, & Tucky, 2001; Pederson, Gleason, Moran, & Bento, 1998; Raval et al., 2001).

Extant theory and research suggests that other maternal cognitive factors, such as interpersonal scripts related to attachment – termed secure base scripts – as well as a mother's immediate insight or attributions about the nature of specific infant behavior may have an important impact on maternal sensitivity, and in turn, infant attachment (e.g., Bernier & Meins, 2008; Fonagy & Target, 2005; Meins et al., 2001; Oppenheim & Koren-Karie, 2002; Slade, Grienberger, Bernbach, Levy, & Locker, 2005; Tini, Corcoran, Rodrigues-Doolabh, & Waters, 2003). The primary purpose of the present study was to examine the interrelations between different levels of maternal cognitions (i.e., attachment representations on the AAI, secure base scripts, and maternal insight into infant behavior), their associations with maternal sensitivity, and infant attachment. The interrelations between these variables have been relatively unexamined in a single study to date.

Attachment cognition

Based on the premise that information contained in the social world is much too complex for the brain to process in its entirety, Bowlby (1969) reasoned that the brain must contain cognitive structures, which he termed *internal working models*, that direct attention toward, represent, and organize relevant features of the social environment. He surmised that these mental models of relationships are derived from repeated interactions with attachment figures in infancy. Advances in cognitive and social psychology have led to a number of attempts to

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clarify the role of internal working models in attachment beyond infancy by further describing their content, organization, and function in caregiver-child and other close relationships (c.f., Baldwin, 1992; Bretherton, 1991; Bretherton & Munholland, 1999; Main et al., 1985; Mikulincer et al., 2001; Waters, Rodrigues, & Ridgeway, 1998). Many of these authors converge in their conjecture that internal working models are composed of two major components: (1) complementary declarative knowledge about the self and other in various interactions, and the affective and behavioural patterns involved in these interactions (i.e., attachment representations); and (2) procedural knowledge containing rules for processing social information, such as propositional statements in the form of if-then statements, and interpersonal scripts.

Declarative knowledge specifies the properties that characterize objects or people, and consists of episodic memory (memory of specific past events) and semantic memory (abstract or generalized information extracted from repeated experiences of a similar kind). Accordingly, through repeated experiences in interactions with attachment figures, individuals encode episodic and semantic memories of the self, other and their relationship (Baldwin, 1992). A variety of terms have been used to describe the cognitive representations containing declarative knowledge of relationships, including state of mind about attachment (Main et al., 2002), secure base schemas (e.g., Mikulincer et al., 2001), and relational schemas (e.g., Baldwin, 1992). We selected the term *attachment representations* as a more general term to convey the notion that these cognitive structures are organized around key features of the attachment relationship (i.e., secure base/safe haven function of the relationship). The Adult Attachment Interview (Main et al., 2002) provides a measure of the coherence of an adult's declarative knowledge, or attachment representations, regarding their relationship with their own caregivers. It is the degree of coherence with which one articulates episodic and semantic memories of their relationship with parents that is of prime importance in the classification of attachment security in adulthood using this measure.

In addition to declarative knowledge, internal working models are also proposed to contain procedural knowledge. According to Main et al. (1985), the procedural aspects of attachment representations provide rules for the direction and organization of attention and memory as it relates to social interaction in significant or intimate relationships. These procedural rules are thought to further control an individual's access to specific forms of declarative knowledge regarding self, other, and the relationship between self and other. Procedural knowledge is thought to function largely outside of conscious awareness, and as a result, it tends to be triggered automatically by relevant information within an individual's environment. These implicit procedural rules are thought to be encoded in the form of if-then propositions and interpersonal scripts (Baldwin, 1992; Bretherton, 1991; Waters et al., 1998; Waters & Waters, 2006).

Secure base scripts

Scripts have been defined as stereotyped sequences of action containing systematic rules about common or frequently occurring situations (Schank & Abelson, 1977). Waters and colleagues (Waters & Rodrigues, 2004; Waters & Waters, 2006; Waters et al., 1998) proposed that interpersonal scripts related to attachment provide a summary of an individual's history of secure base support. By abstracting various features of recurrent interactions with significant caregivers, individuals construct a script-like representation of the attachment relationship, which over time is elaborated and generalized to other close relationships.

In keeping with the primary tenets of attachment theory, Waters and Waters (2006) maintained that attachment representations are organized around a generalized secure base script that is described by the following sequence of events: (1) an individual and secure base (e.g., mother/partner) engage in constructive social interaction; (2) the individual encounters an obstacle or threat, which evokes distress;

(3) the individual seeks comfort and assistance from the secure base; (4) assistance and comfort from the secure base is offered; (5) assistance and comfort from the secure base is accepted and is effective; and (6) constructive social interaction is re-established between members of the dyad. Consistent with Bowlby's (1969) conceptualization of internal working models, the formation of a complete, well consolidated, and readily accessible secure base script is dependent on a history of secure base support that is consistent and coherent. Conversely, a history of secure base support that is inconsistent, incomplete or ineffective should result in the formation of a secure base script that is less well configured, less consolidated and less accessible. Once established, the secure base script is thought to provide individuals with generalized expectations of behavioral and emotional outcomes across all secure base interactions, which aids in the planning and organization of their own behavioral and emotional responses, including those with their own children.

Following this logic, the quality of maternal secure base scripts should provide a cognitive framework for secure base interactions in their relationships with their own children. In a study of 31 mother-infant dyads, Coppola, Vaughn, Cassibba, and Costantini (2006) found that mothers' access to a rich and detailed secure base script was a strong predictor of their sensitivity in responding to their infants' signals and cues. Moreover, the extent to which mothers' secure base scripts were well elaborated accounted for 43% of the variance in their interactive behavior with their infants, substantially more than that predicted by maternal representations of their own attachment history (van IJzendoorn, 1995). Maternal secure base scripts were also found to correlate with coherence scores on the AAI (Coppola et al., 2006; Dykas, Woodhouse, Cassidy, & Waters, 2006), secure infant-mother attachment relationships, as assessed by the Strange Situation Procedure (Ainsworth, Blehar, Waters, & Wall, 1978; Tini et al., 2003) and the Attachment Behavior Q-Set (AQs; Bost et al., 2006; Vaughn et al., 2006a; Waters, 1995; Wong et al., 2011).

Maternal insight into infant behavior

Ainsworth (1969; Ainsworth, Bell, & Stayton, 1971) emphasized the importance of certain cognitive capacities that serve to facilitate maternal sensitivity, and in turn, a secure attachment relationship. These included an awareness of infants' signals and cues, an accurate understanding of infant behavior and the circumstances leading to such behavior, and a cognitive capacity to see things from the infant's point of view. Conversely, she observed that mothers of infants with insecure attachment appeared to be less sensitive in their responding because of a difficulty in reading infant behavior, misattributing the intentions of their infants' behavior, and/or an inability to see past their own perspective to adopt that of the infant. Several terms have been used to describe the cognitive phenomenon alluded to in Ainsworth's early observations, including reflective function (Fonagy, 2002; Fonagy & Target, 1997), mind-mindedness (Meins et al., 2001), and insightfulness (Oppenheim & Koren-Karie, 2002). For the purpose of the current study, the term *maternal insight* was selected to describe a mother's proclivity for understanding her infant's behavior in terms of the underlying emotional or psychological states motivating that behavior.

Drawing on Ainsworth's early observations, several authors examined the proposition that maternal insight about their infant's behavior is associated with maternal sensitivity and the quality of the attachment relationship (Demers, Bernier, Tarabulsky, & Provost, 2010; Fonagy, 2002; Fonagy & Target, 1997; Laranjo, Bernier, & Meins, 2008; Meins et al., 2001; Oppenheim & Koren-Karie, 2002; Slade, 2005). In a sample of 129 mother-infant dyads, Koren-Karie, Oppenheim, Dolev, Sher, and Etzion-Carasso (2002) found that mothers who were classified as positively insightful displayed significantly more sensitive behavior, measured concurrently, than mothers who did not demonstrate a proclivity for positive insight. Further, maternal insightfulness made a unique contribution to the prediction of secure attachment relationships, beyond that of maternal sensitivity. Similarly, in a sample of 71 mother-infant

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