



Mothers who are securely attached in pregnancy show more attuned infant mirroring 7 months postpartum



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ABSTRACT

This study contrasted two forms of mother–infant mirroring: the mother's imitation of the infant's facial, gestural, or vocal behavior (i.e., “direct mirroring”) and the mother's ostensive verbalization of the infant's internal state, marked as distinct from the infant's own experience (i.e., “intention mirroring”). Fifty mothers completed the Adult Attachment Interview (Dynamic Maturational Model) during the third trimester of pregnancy. Mothers returned with their infants 7 months postpartum and completed a modified still-face procedure. While direct mirroring did not distinguish between secure and insecure/dismissing mothers, secure mothers were observed to engage in intention mirroring more than twice as frequently as did insecure/dismissing mothers. Infants of the two mother groups also demonstrated differences, with infants of secure mothers directing their attention toward their mothers at a higher frequency than did infants of insecure/dismissing mothers. The findings underscore marked and ostensive verbalization as a distinguishing feature of secure mothers' well-attuned, affect-mirroring communication with their infants.

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1. Introduction

In many mammalian species, mothers and infants engage in a rich repertoire of species-specific, reciprocal, dyadic interactions. Non-human primate mother–infant pairs show capacity for mutual eye gaze, reciprocal lip smacking, and vocal and gestural mimicry (Bard et al., 2005; Ferrari, Paukner, Ionica, & Suomi, 2009; Mancini, Ferrari, & Palagi, 2013). Human mother–infant dyads participate in communicative exchanges that are far more complex and affectively enriched (Beebe et al., 2010; Brazelton, Koslowski, & Main, 1974; Carpenter, Nagell, & Tomasello, 1998; Feldman, 2007; Gergely & Watson, 1996; Lavelli & Fogel, 2013; Malatesta, Culver, Tesman, & Shepard, 1989; Sroufe, 1996; Tronick, 1989). The infant routinely directs a broad range of affectively nuanced expressions to the mother (Bennett, Bendersky, & Lewis, 2005; Colonnese, Zijlstra, van der Zande, & Bogels, 2012; Messinger, 2002). The mother sequentially mirrors the infant's signals as she empathically delivers her finely tuned response (Jonsson & Clinton, 2006; Lavelli & Fogel, 2013; Papousek & Papousek, 1989; Stern, 1985).

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In turn, the infant attentively responds, organizing his¹ behavior with respect to the mother's input (Beebe et al., 2010; Bigelow & Walden, 2009; Cohn & Tronick, 1987; Soussignan, Nadel, Canet, & Gerardin, 2006). A relatively synchronous flow of affective communication is one of the key indicators of secure mother–infant attachment (Beebe et al., 2012; Crandell, Fitzgerald, & Whipple, 1997; Feldman, Gordon, & Zagoory-Sharon, 2011; Isabella & Belsky, 1991; Lundy, 2003).

Maternal mirroring, or emotionally attuned responsiveness, has received extensive attention in the study of mother–infant behavior (Bigelow & Walden, 2009; Fraiberg, Adelson, & Shapiro, 1975; Gergely & Watson, 1996; Jonsson & Clinton, 2006; Lavelli & Fogel, 2013; Lyons-Ruth, 2000; Stern, 1985; Winnicott, 1967). Mirroring is a construct closely tied to that of secure attachment. Maternal attachment security is a critical determinant of the mother's capacity to provide adequate mirroring for the infant (Main, Kaplan, & Cassidy, 1985; Pederson, Moran, & Bento, 1998; Tarabulsky et al., 2005; van Ijzendoorn, 1995; Whipple, Bernier, & Mageau, 2011). Well-attuned maternal mirroring, in turn, is a necessary antecedent to the development of secure attachment in the infant (Ainsworth, Blehar, Waters, & Wall, 1978; Belsky, Rovine, & Taylor, 1984; Bigelow et al., 2010; Bretherton, Biringen, Ridgeway, Maslin, & Sherman, 1989; De Wolff & van Ijzendoorn, 1997; Isabella, 1993; Jaffe, Beebe, Feldstein, Crown, & Jasnow, 2001). In the early literature that followed Ainsworth's pioneering work on infant attachment (Ainsworth et al., 1978; Ainsworth & Wittig, 1969), mirroring was often studied as an aspect of the broader construct of sensitive responsiveness, which encompasses heterogeneous sets of maternal behaviors (Belsky et al., 1984; De Wolff & van Ijzendoorn, 1997; Grossmann, Grossmann, Spangler, Suess, & Unzner, 1985; Isabella, 1993; Main, Tomasini, & Tolan, 1979). While theoretically important distinctions had been made between types of mirroring generated by the mother, mirroring was coarsely defined as a generic construct under the rubric of sensitivity, and the fine-grained distinctions were overlooked in the early studies.

In his seminal volume on infant development, Stern (1985) drew a stark contrast between mirroring of the external behavior and mirroring of the internal state, which was echoed with some variation by later developmentalists. In imitation, the mother mirrors and replicates the infant's external cues—facial, gestural, or vocal. The mother need not tune into the infant's internal experiences in order to imitate his external behavior. In contrast, a more sophisticated form of mirroring necessitates that the mother “get inside” the mind of the infant and “read” the affective state that underlies his overt behavior (Stern, 1985, pp. 138–139). This form of mirroring moves beyond the mere matching of the infant's external signals. What the mother observes and mirrors here is not the infant's external behavior per se, but his subjective internal state. Whereas a close within-modal match is found between the mother and the infant in imitation, the mother's mirroring of the infant's internal state is often cross-modal. As Stern (1985) famously observed (p. 140), the mother may match the feeling state conveyed by the infant's vocalization (e.g., exuberant “aaah!”) with her body movement (e.g., performing a shimmy with her upper body for the duration of the “aaah!”), or match the feeling state captured in the infant's movement (e.g., hitting a toy) using her voice (e.g., saying “kaaaaa-bam” in rhythm with the hitting movement).

Thereafter, important empirical advances were made in the literature by Fonagy (1991) and Meins (1997, 1999), who led converging lines of research underscoring the mother's mentalizing capacity. These were respectively termed parental reflective functioning (Fonagy, Gergely, Jurist, & Target, 2002; Fonagy, Steele, Steele, Moran, & Higgit, 1991; Fonagy & Target, 1997; Slade, 2005) and maternal mind–mindedness (Meins, Fernyhough, Fradley, & Tuckey, 2001; Meins et al., 2003), referencing a mother's capacity to adequately mirror her infant's subjective internal state (see Sharp & Fonagy, 2008 for a detailed review of relevant constructs). High levels of reflective functioning and maternal mind–mindedness have been reported in mothers who are securely attached (Arnott & Meins, 2007; Demers, Bernier, Tarabulsky, & Provost, 2010; Fonagy et al., 1991; Slade, Grienberger, Bernbach, Levy, & Locker, 2005). Others have demonstrated that the secure mother's accurate perception and reflection of her infant's internal state are causally related to the key features of the infant's self-development, including self-awareness, self-regulation, and self-efficacy (Bigelow et al., 2010; Fonagy, Gergely, & Target, 2007; Lyons-Ruth, 2000; Mcquaid, Bibok, & Carpendale, 2009; Nadel, Prepin, & Okanda, 2005; Schore, 2005; Tronick & Beeghly, 2011). Far less consensus and empirical support, however, exist on what constitute the essential ingredients of such mirroring and what mechanisms mediate these developmental effects.

Recent research has begun to address this gap. Gergely (2007) has undertaken a fine-grained analysis of the nature of maternal mirroring. He proposed that *markedness* and *ostensiveness* were essential ingredients of mirroring (Gergely, 2007; Gergely & Unoka, 2008a). The putative mechanisms mediating the developmental functions of the *marked* and *ostensive* mirroring were also articulated. At birth, infants are understood to be incapable of differentiating universal categories of emotions that they experience, such as anger, fear, or sadness (Camras, 2011; Gergely & Watson, 1996; Walle & Campos, 2012; Widen, 2013). To infants, their affective experience is one of undifferentiated visceral arousal with overarching positive or negative valence, rather than one characterized by well-defined, discrete emotions (Fonagy et al., 2002, 2007; Gergely & Watson, 1996, 1999). Central to Gergely's proposal is the hypothesized role of the mother's *marked*, *ostensive* mirroring in the infant's emerging capacity for subjective awareness of his discrete internal states. When provided consistently to the infant, the mother's *marked*, *ostensive* mirroring is proposed to serve as the essential foundation upon which the infant learns to organize and make sense of his internal experiences (Gergely & Unoka, 2008a, 2008b).

The mother's *marked* affective communication (Fonagy et al., 2002, 2007) is one in which the mother demonstrates her understanding of the infant's internal state, while concurrently signaling that she is not experiencing the same state herself.

¹ For convenience, we refer to the mother as “she” and the infant as “he” in the present paper, even though both male and female infants were included in our sample.

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