



# Mutual touch during mother–infant face-to-face still-face interactions: Influences of interaction period and infant birth status



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## ABSTRACT

Contact behaviours such as touch, have been shown to be influential channels of nonverbal communication between mothers and infants. While existing research has examined the communicative roles of maternal or infant touch in isolation, mutual touch, whereby touching behaviours occur simultaneously between mothers and their infants, has yet to be examined. The present study was designed to investigate mutual touch during face-to-face interactions between mothers and their 5½-month-old fullterm ( $n = 40$ ), very low birth weight/preterm (VLBW/preterm;  $n = 40$ ) infants, and infants at psychosocial risk ( $n = 41$ ). Objectives were to examine: (1) how the quantitative and qualitative aspects of touch employed by mothers and their infants varied across the normal periods of the still-face (SF) procedure, and (2) how these were associated with risk status. Mutual touch was systematically coded using the mother–infant touch scale. Interactions were found to largely consist of mutual touch and one-sided touch plus movement, highlighting that active touching is pervasive during mother–infant interactions. Consistent with the literature, while the SF period did not negatively affect the amount of mutual touch engaged in for mothers and their fullterm infants and mothers and their infants at psychosocial risk, it did for mothers and their VLBW/preterm infants. Together, results illuminate how both mothers and infants participate in shaping and co-regulating their interactions through the use of touch and underscore the contribution of examining the influence of birth status on mutual touch.

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During early mother–infant interactions, non-verbal communication is paramount given that infants are largely pre-linguistic during the first year of life. Nonetheless, past studies examining social interactions during early development (e.g., first year of life) have primarily focused on the examination of the distal behavioural indices of gaze and affect, while neglecting to investigate the specific contribution of contact behaviours such as touch. Yet, caregivers commonly employ touch during face-to-face interactions and play, along with their vocal and facial expressions (Stack, 2010). The Still-Face procedure (SF; Tronick, Als, Adamson, Wise, & Brazelton, 1978), an adaptation of the face-to-face interaction, is a popular and valid paradigm to study mother–infant exchanges. The conventional SF procedure consists of two normal periods of

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social interaction (typically providing vocal, visual, and tactile stimulation to their infants) between a caregiver and an infant, separated by a perturbed period of interaction, the SF period. During the SF, mothers assume a neutral, unresponsive “still face” and provide neither vocal nor tactile stimulation to their infants while gazing at their infants. A large body of evidence suggests that the SF period can be challenging for infants since they have to cope with the sudden loss of their mothers’ availability and responsiveness, modulate their own emerging negative emotions, while at the same time attempt to reengage their caregiver into mutual regulation (Manian & Bornstein, 2009). By exhibiting changes in their behaviours during the SF period, infants reveal themselves to be active participants during mother–infant interactions, and show their sensitivity to changes in their mothers’ behaviour (e.g., Stack & LePage, 1996; Tronick, 2003; Weinberg & Tronick, 1996).

Although still in its early stage, significant advancements have contributed to our understanding of tactile stimulation as an integral component of the mother–infant communicative system (Stack & Jean, 2011; Weiss, 2005). During mother–infant interactions, touch has been shown to be an influential channel through which mothers and their infants convey emotion and affection, and establish a strong connection (Stack, 2010). Maternal touch is pervasive during interactions, occurring between 33% and 99% of the time during brief interaction periods (e.g., Field, 1984; Jean, Stack, & Fogel, 2009; Stack & Muir, 1990; Symons & Moran, 1987). Results from a number of studies suggest that mothers communicate with their infants through the use of touch (Feldman, 2011; Field, 2003; Hertenstein, 2002; Jean & Stack, 2009; Stack, 2010), which aids in modulating and regulating infants’ displays of emotion (Hertenstein, 2002). However, much of the research that has examined touch during mother–infant face-to-face interactions has focused on *maternal* tactile behaviours, yet touch is also an important modality of communication for *infants*. Infants are active and competent participants during their early social encounters (e.g., Adamson & Frick, 2003; Cohn, 2003; Moszkowski & Stack, 2007; Moszkowski, Stack & Chiarella, 2009), and mother–infant interactions are a two-way process involving influences from both interactive partners.

Existing research has focused on examining the important communicative role of *maternal* touch or of *infant* touch from a more unidirectional perspective and has examined touch in the context of other behaviours. Yet, the investigation of *mutual* touch, whereby *both* mothers and infants are active agents in shaping their interactions, has been largely overlooked. We define mutual touch as simultaneous touch whereby both mothers and infants are engaged in continuous and dynamic touching behaviours. Just as with mutual gaze and mutual affect, mother–infant dyads may be touching one another simultaneously during their early interactions, and mutual touch likely serves several functions, such as communicating infants’ and mothers’ states and affect.

The present study’s rationale was to examine mutual touch in order to achieve a more comprehensive understanding of the communicative roles of touch during early mother–infant social exchanges. The objectives were to document: (1) whether the qualitative (types) and quantitative (duration) aspects of touch employed by mothers and their infants varied across the normal periods of the SF procedure (given that the first normal period of the SF procedure is the baseline preceding the perturbation period, where the mother is emotionally unavailable); and, (2) how these were associated with risk status. Few studies have examined the relationship between co-regulation and touch, and this study takes an important first step in this direction. As such, mothers and their 5½ month old fullterm infants, very low birth weight preterm (VLBW/preterm) infants, and infants at psychosocial risk were included in our sample in order to broaden our understanding of the communicative properties underlying nonverbal communication during mother–infant interactions in at-risk groups. With regard to the types of touch under investigation, the goal was to examine how mutual touch occurs in different interaction periods in relation to other types of touch behaviours, such as one-sided touch (i.e., touch eliciting no response from the member of the dyad being touched) and one-sided touch plus movement (i.e., touch eliciting movement but not touch from the member of the dyad being touched).

According to the dynamic systems perspective, mother–infant interactions form a mutually regulated bi-directional system (Fogel & Garvey, 2007; Fogel, 1993; Hsu & Fogel, 2001). Thus, it is not the mother or the infant alone, but the relationship between the two that contributes to the development of infants’ communicative abilities during the first year of life. Working to achieve their mutual goal of coordinated states of interaction, mothers and infants jointly regulate their interactions by modifying their affective states according to changes in their social partner’s behaviour (Fogel, 1993; Gianino & Tronick, 1988). Thus, both mothers and infants modify their behaviours at various times through their interactions, contributing to the creation of a shared dialogue. Complementary to this perspective, the transactional model highlights that just as mother–infant interactions can be a context for fostering healthy development, they can also be a context through which risk can be transferred (Sameroff, 2009). Thus, the co-regulation that is considered normative between mothers and infants may be impaired, particularly in interactions of at-risk dyads (Crockenberg & Leerkes, 2005). Examining touch through a bi-directional process, could add to our understanding of the communicative properties underlying non-verbal communication during mother–infant interactions.

Despite an abundance of studies involving interactions of mothers and their infants, research on touch is sparse, and particularly with at-risk dyads. In the present study, two types of risk were examined (infants born prematurely and infants at psychosocial risk). In very low birth weight preterm infants (VLBW/preterm), several factors (e.g., restricted opportunities for physical contact following birth, modified experiences with touch early in life, maternal stress) may alter their abilities to process and/or reciprocate tactile-gestural stimulation in the same way as normal birth weight fullterm infants. Similarly, interactions may also be altered during interactions between mothers and their infants at psychosocial risk due to disadvantage and problematic patterns of social behaviour and peer relations in their mothers’ childhood histories.

A number of investigations have suggested that preterm infants have less efficient self-regulatory strategies than fullterm infants, as infants born prematurely demonstrate greater reactivity and sensitivity to distress, lower thresholds for displaying

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