Infant Behavior & Development 32 (2009) 344–349

Contents lists available at ScienceDirect

Infant Behavior and Development

Brief report

# A longitudinal investigation of maternal touching across the first 6 months of life: Age and context effects

Amélie D.L. Jean[a,*], Dale M. Stack[a,*], Alan Fogel[b]

[a] Centre for Research in Human Development, Department of Psychology, Concordia University, 7141 Sherbrooke Street West, PY-170, Montreal, Quebec, Canada H4B 1R6
[b] Department of Psychology, University of Utah, United States

ARTICLE INFO

*Article history:*
Received 8 October 2008
Received in revised form 12 December 2008
Accepted 13 April 2009

*Keywords:*
Mother–infant interactions
Maternal touch
Interaction context
Longitudinal

ABSTRACT

The types of touch used by 12 mothers with their 1-, 3- and 5.5-month-old infants were examined longitudinally during two different interaction contexts lasting 5 min each. Changes in maternal touching as a function of infants' age and interaction context were revealed.



During mother–infant interactions, touch has been shown to be an influential channel of communication for the mother–infant dyad (de Chateau, 1976; Kaitz, Lapidot, Bronner, & Eidelman, 1992), occurring 55% and 81% of the time during face-to-face interactions (Stack & Muir, 1990). Its presence impacts the quality of dyadic interactions and infants' behavior by, for example, reducing infant stress and increasing positive affect (Stack & Muir, 1992). However, it is not merely the presence or absence of maternal touch that communicates to the infant, but the quality of that touch. For example, it has been demonstrated that active, rather than passive touch, increases infants' smiling during a period of maternal unavailability (Stack & Muir, 1990, 1992). As contended by a number of researchers (Hertenstein, 2002; Stack, 2001, 2004; Tronick, 1995; Weiss, 1979), the specific examination of the type of touch used by mothers is integral to the investigation of the communicative functions of touch since it is believed that different types of touch can communicate different meanings.

To date, only a few studies have shown that mothers use different types of touch while interacting with their infants (Ferber, Feldman, & Makhoul, 2008; Harrison & Woods, 1991; Polan & Ward, 1994). Stack, LePage, Hains, and Muir (1996) found that across instructional conditions, mothers employed different types of touch. For example, when asked to maximize infants' smiling, mothers used high levels of tickling and lifting, and low levels of holding. Moreover, the findings indicate that mothers may use specific types of touch to elicit specific behaviors from their infants (Stack et al., 1996). These findings suggest that the type of touch used by mothers is communicative to the infant and that mother and infants may be sensitive to precise characteristics of their mother's touch, not only to its presence or absence (Stack & Muir, 1992).

In spite of the growing number of studies on tactile communication between mothers and infants, virtually nothing is known about how it develops. To better understand touch as a mode of communication it is imperative to assess its evolution during the first 6 months of life, a time when touch is crucial to the dynamics of the mother–infant interaction

* Corresponding authors. Tel.: +1 514 848 2424x7565; fax: +1 514 848 2815.
*E-mail addresses:* ameliejea@yahoo.com (A.D.L. Jean), Dale.Stack@concordia.ca (D.M. Stack).

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doi:10.1016/j.infbeh.2009.04.005

(Kaye & Fogel, 1980; Tronick, 1995) and to the infant's preverbal communicative skills (Lamb, Morrison, & Malkin, 1987; Stern, 1985). Furthermore, an examination of the change and stability of this communicative system is warranted not only across instructional context (Stack, 2001; Stack et al., 1996) but also across physical context. As underscored by Hertenstein (2002), the context in which the mother–infant interaction takes place influences the way infants perceive the communicative meaning of mothers' touch.

The objective of the present study was to conduct a longitudinal investigation of maternal touching during mother–infant interactions in two different contexts in order to obtain a clearer picture of the development of maternal touching. More specifically, the objectives were to observe the overall duration of maternal touch and the types of touch employed by mothers across age (1, 3, 5.5 months) and interaction context. Twelve mothers and their full-term infants (eight males and four females) were recruited to participate in a 2-year longitudinal study through birth announcements published in local newspapers in a Midwestern community in the US. All mothers were older than 21 years, had completed their high-school diplomas or beyond, and came from intact middle-class families. Eleven mothers were Caucasian, and one was African-American.

The dyads were videotaped weekly during the first year of the infants' lives (from 4 weeks to 52 weeks) and biweekly during their second year (53–103 weeks). Videotapes were made with three wall-mounted cameras, any two of which could be selected by the observers depending upon which had the best view of the dyad in one camera, and the infant's face and body in the other camera. Mothers and infants were videotaped under two interactive contexts. In the first (lap context), mothers sat on a straight chair with their infants on their laps and were asked to play with them as they would normally do at home. During the second (floor context), the dyad played on a blanket on the floor where age appropriate toys were available. All interactions lasted for 5 min.

The focus of the present study was on the interactions of mother–infant dyads when their infants were 1, 3, and 5.5 months of age. Data were available at these three time points for all dyads except for two; one began the study when the infant was 1.5-month-old and the other terminated the study before the infant was 5.5 months of age. For the selected sessions, face-to-face interactions were coded by an undergraduate student using the Caregiver Infant Touch Scale (CITS) developed by Stack et al. (1996) which classifies maternal touching into eight possible types of touch: (1) static touch, (2) stroke/rub/caress/massage, (3) pat/tap, (4) grab/squeeze/ pinch, (5) tickle/finger-walk/prod/poke/push, (6) shake/wiggle, (7) pull/lift/flexion/ clap, and (8) other types of touch (kiss, posture change, adjusting clothing, rocking, bouncing, touching with toys). For each 1-s interval of the 5-min interactions, the type of touch utilized by mothers was coded. In order to avoid coding touching behaviors that were accidental, mothers' touch had to last a minimum of 0.5 s per 1-s interval in order to be coded as one of the eight types of touch. A second-coder, blind to the research hypotheses, re-coded 15% of all interactions in order to establish inter-rater reliability. Using a kappa coefficient (Cohen, 1968), inter-rater reliability was found to be 90.07% for the types of touch in the lap context and 87.67% for the floor context.

Descriptive statistics were conducted to assess for the presence of outliers, and to verify the normality of the distribution (Table 1). When significant skewness or kurtosis was found, outliers were brought in according to the method described by Tabachnick and Fidell (1996), where the score is brought in to the next acceptable level and 1 is added to the score. As a result of bringing in outliers, there was no skewness or kurtosis in the data hence no transformations were required. Repeated measures analysis of variance (ANOVAs) were conducted. For all the analyses, when ANOVAs revealed significant interactions, Šidāk pair wise comparisons were used to isolate the source of the significance (Šidāk, 1967). Furthermore, for all the significant ANOVAs, partial eta-squared ($\eta_p^2$) are reported as a measure of effect size (Olejnik & Algina, 2003).

A 3 × 2 (age × context) repeated measures ANOVA, using the total duration of touch in each observation session as the dependent variable, revealed that collapsed across age and context, mothers touched their infants for an average of 66.26% of the time ($SE = 2.57$). Specifically, mothers touched their infants more during the lap context ($M = 99.53\%$, $SE = 0.16$) than during the floor context ($M = 32.99\%$, $SE = 5.17$), $F(1, 11) = 165.55$, $\eta_p^2 = .94$, $p < .0001$. Furthermore, they touched their infants more when they were 1-month-old ($M = 72.32\%$, $SE = 5.08$) compared to 3-month-old ($M = 60.86\%$, $SE = 1.80$), $F(2, 22) = 3.60$, $\eta_p^2 = 25$, $p < .05$. No significant differences were found in the amount of touching provided to infants at these ages and at 5.5 months ($M = 65.61\%$, $SE = 3.04$).

**Table 1**
Means and standard deviations for the percent duration of each type of maternal touch and overall touch across age and context.

| Type of maternal touch | Lap | | | Floor | | |
|---|---|---|---|---|---|---|
| | 1 month | 3 months | 5.5 months | 1 month | 3 months | 5.5 months |
| Static | 37.33 (17.64) | 37.82 (19.34) | 48.27 (11.33) | 8.94 (9.31) | 3.83 (3.73) | 11.56 (14.82) |
| Stroking | 8.545 (7.43) | 5.58 (7.47) | 2.82 (2.48) | 3.11 (2.72) | 1.06 (1.21) | 1.58 (1.29) |
| Patting/tapping | 11.42 (13.41) | 5.64 (9.02) | 0.82 (1.21) | 228 (3.47) | 0.44 (0.83) | 0.55 (0.52) |
| Squeezing | 3.54 (3.19) | 4.32 (2.31) | 4.66 (1.33) | 2.1 (2.45) | 1.44 (1.26) | 0.98 (1.01) |
| Tickling | 0.33 (0.45) | 1.22 (1.91) | 3.21 (3.45) | 3.18 (4.01) | 2.96 (3.17) | 1.52 (1.97) |
| Shaking | 1.88 (2.26) | 2.43 (3.05) | 0.84 (1.04) | 2.84 (4.04) | 1.25 (1.66) | 0.61 (0.85) |
| Lifting | 17.58 (15.31) | 16.47 (16.26) | 26.03 (10.52) | 13.36 (18.29) | 4.83 (3.44) | 1.52 (1.60) |
| Other | 17.48 (11.89) | 20.57 (20.30) | 10.91 (3.05) | 6.59 (9.88) | 6.36 (4.66) | 10.15 (5.71) |
| Total touch | 99.90 (0.28) | 99.30 (1.11) | 99.38 (1.06) | 44.73 (35.18) | 22.41 (12.14) | 31.85 (21.78) |