Maternal attachment and the communication of emotion through song

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Abstract

We explored the relationship between vocal expressiveness in song and maternal attachment representation. Mothers (\(N = 36\), classified as Autonomous, Dismissing, or Preoccupied, sang a play song of their choice in their 6-month-old infants’ presence and absence. Raters (\(N = 50\)) who were naïve to maternal attachment classifications listened to excerpts of each song rendition and rated mothers’ emotional involvement. Mothers, regardless of their attachment classification, sang more expressively in their infants’ presence than otherwise. Unique patterns of vocal expressiveness were associated with different maternal attachment classifications, but only under conditions of infant distress. Unlike Autonomous and Preoccupied mothers, who sang less playfully to distressed than to nondistressed infants, the playfulness of Dismissing mothers’ performances was unrelated to infant affect. These findings support the hypothesis that maternal attachment influences the nature of emotive vocal communication, but only under conditions of infant distress.

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In situations of potential threat, danger, illness, or distress, infants experience physical and psychological arousal exceeding levels that they can modulate independently. As a result, they depend on their mothers (or primary caregivers) to respond to emotional cues in a manner...
that recaptures their emotional equilibrium (Sroufe, 1996). Such sensitive responsiveness is pivotal to the successful regulation of infants’ emotional state and to the formation of secure attachments (Cassidy, 1994).

Mothers differ in their ability to perceive and respond to emotionally salient cues, in part, because of their own attachment history (Cassidy, 1994; Cowan, 1996; van IJzendoorn, 1995). Attachment representations or internal working models of attachment reflect maternal thoughts and feelings about past attachment-related experiences and shape strategies for maintaining important relationships and fulfilling attachment goals (Cassidy, 1994; Collins & Read, 1994). These representations influence the nature of emotion regulation, the appraisal of others’ responses, and mothers’ own responses (Cassidy, 1994; Johnson & Whiffen, 1999). Thus, maternal attachment representations constrain the processing and expression of emotion during mother–infant interactions.

Cassidy (1994) identified three patterns of maternal affective communication—open, minimized, and heightened—associated with different attachment representations as assessed by the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985). Mothers who value attachment relationships and view experiences within these relationships as influential are considered to have Autonomous (secure) states of mind regarding attachment (Main & Goldwyn, 1994). When interacting with their infants, these mothers are consistent in attending to a range of infant emotions, accepting negative emotions, and providing assistance in emotion regulation. They are responsive, warm, and affectionate during interactions with their infants (Crandell, Fitzgerald, & Whipple, 1997; Haft & Slade, 1989). Similarly, mothers of secure infants, who typically have Autonomous attachments, are responsive to a range of infant affect (Goldberg, MacKay-Soroka, & Rochester, 1994). Mothers classified as Dismissing devalue and limit the influence of attachment relationships and experiences in their thoughts, feelings, and daily actions (Main & Goldwyn, 1994). In interactions with their infants, Dismissing mothers exhibit a restricted range of emotional expressiveness and a tendency to withdraw from interactions involving negative affect (Haft & Slade, 1989). Similarly, Goldberg et al. (1994) found that mothers of avoidant infants, who typically have Dismissing attachments, are less responsive than are mothers of secure infants, particularly to negative affect. An overemphasized, heightened, and incoherent focus on attachment relationships and emotion is characteristic of mothers classified as Preoccupied. These mothers appear confused, lacking in objectivity, and preoccupied with past familial relationships (Main & Goldwyn, 1994). When interacting with their infants, mothers with Preoccupied attachments are inconsistently responsive to their infants and provide few emotional anchors for infant emotion regulation. The emotional availability of these mothers tends to be dictated by their own needs, which results in inconsistent responsiveness to infant emotional cues (Haft & Slade, 1989). Similarly, mothers of resistant infants, who typically have Preoccupied attachments, tend to be more responsive to their infants’ negative affect than to their positive affect (Goldberg et al., 1994).

To be responsive, sensitive, and emotionally available to their infants, mothers must perceive the full range of emotional cues and respond promptly in an emotionally appropriate manner. A number of investigators have examined qualities such as maternal sensitivity (Oyen, Landym, & Hilburn-Cobb, 2000; Peterson, Gleason, Moran, & Bento, 1998), emotional availability (for review see Biringen, 2000), and affect attunement (Haft & Slade, 1989), highlighting the relation between mothers’ attachment representation and their ability to perceive and respond.
sensitively to a range of infant affect. In general, the focus has been on broad categories of affective behavior, such as warmth or affection (Crandell et al., 1997; Crowell & Feldman, 1989; Cohn, Cowan, Cowan, & Pearson, 1992), with little exploration of the consequences of different attachment representations for specific modes of affective communication. In view of the documented relation between maternal emotional communication and infant attachment security (Izard, Haynes, Chisholm, & Baak, 1991), further study in this realm is warranted. Moreover, the ubiquity of maternal vocal communication makes it an appropriate candidate for investigation.

1. Maternal vocal communication of emotion

When mothers interact with their infants, their speech is characterized by elevated pitch, simplified pitch contours, expanded pitch range, decreased tempo, and repetitiveness, characteristics often referred to as “motherese” or “baby talk” (for a review see Fernald, 1991). From the prelinguistic infant’s perspective, speech consists of sequences of semantically meaningless sounds that provide insight into the mother’s emotional state. A number of investigators (e.g., Bachorowski & Owren, 1995; Scherer, 1986) have documented the relation between specific acoustic features (e.g., pitch, tempo) and emotional states (e.g., happiness, sadness). Simple facial gestures such as smiling alter the shape of the vocal tract, producing audible consequences (Tartter, 1980). According to Fernald (1989), the melodies or intonation contours of maternal utterances convey affective meaning to prelinguistic infants.

Lullabies and play songs, which can be considered musical analogues of motherese (Trehub, Hill, & Kamenetsky, 1997), are used cross-culturally (Brakeley, 1950; Tucker, 1984). Maternal singing is used to attract and maintain infant attention and to regulate infant emotion (for a review see Trehub & Trainor, 1998). Play songs are used during playful interactions or instrumental routines to heighten emotion and increase stimulation. By contrast, lullabies are used to soothe infants or promote sleep. To achieve their emotional regulatory goals, mothers often deviate from conventional renditions of songs, imbuing their performances with situationally appropriate affect (Trehub, Trainor, & Unyk, 1993).

As with infant-directed speech, infant-directed singing has distinctive acoustic features. For example, maternal songs in an infant’s presence have higher pitch and greater emotional expressiveness than do the same songs sung without an infant audience (Trainor, 1996; Trainor, Clark, Huntley, & Adams, 1997; Trehub et al., 1993; Trehub, Unyk, et al., 1997). These expressive features enable naive adult raters to distinguish infant-directed from noninfant-directed singing (Bergeson & Trehub, 1999; Rock, Trainor, & Addison, 1999; Trehub, Unyk, et al., 1997).

The emotive quality of maternal vocalizations is likely to differ when the mother’s emotional availability is decreased. Stern (1985) suggests that mothers’ own needs and perceptual biases lead them to emphasize or dampen their emotional expressiveness. For example, mildly depressed mothers use motherese less frequently and respond more slowly to infant vocalizations than do nondepressed mothers (Bettes, 1988). Mothers with major depressive disorders exhibit less frequent modulation of their infant-directed speech than do control mothers, but partial or full remission of depressive symptoms eliminates these prosodic differences (Kaplan,
Bachorowski, Smoski, & Zinser, 2001). In short, mothers’ emotional availability affects the emotive quality of their utterances, which in turn, affects infant emotional development and learning (Kaplan, Bachorowski, & Zarlengo-Srouse, 1999; Papousek & Papousek, 1983).

In the present study, we investigated the relation between maternal attachment classification and emotional expressiveness in mothers’ sung performances to distressed and nondistressed infants. We restricted our consideration to performances of play songs because of the greater range of performance variations in playful compared to soothing vocalizations (Trehub & Trainor, 1998). Infant distress was of interest because of its potential to activate the maternal attachment system and reveal attachment-related differences (Goldberg, Grusec, & Jenkins, 1999a). Following Rock et al. (1999) and Trehub, Unyk, et al. (1997), we had naïve listeners rate mothers’ emotional involvement, as reflected in their sung performances. Rock et al. (1999) found that, for play songs, such emotional involvement ratings reflected the degree of playfulness, liveliness, and animation in mothers’ performances. Thus, very lively performances received higher ratings in contrast to more soothing performances, which received lower ratings. Indeed, a pilot study with the present materials revealed that ratings of emotional involvement were highly correlated with independent ratings of playfulness, $r = .79$, $p < .01$.

On the basis of the ubiquity of maternal singing to infants (Trehub & Trainor, 1998) and the prevalence of infant-directed performance adjustments (Trainor et al., 1997; Trehub et al., 1993; Trehub, Unyk, et al., 1997), we expected mothers, regardless of their attachment classification, to sing more expressively in infants’ presence than in their absence. A statistical interaction between maternal attachment status and infant affect (i.e., distress or no distress) was also predicted. We anticipated little difference in the liveliness of maternal performances across groups differing in attachment classification for nondistressed infants. Attachment-related differences were expected, however, for songs sung to distressed infants. Specifically, we expected Autonomous mothers would exhibit lower levels of animation and liveliness in their songs to distressed infants than would Dismissing mothers, the former pattern representing an appropriate adjustment to infant distress. Because Preoccupied mothers are inconsistent in their response to infant affect, we had no basis for predicting the consequences of infant distress on the emotional expressiveness of maternal singing for this group.

2. Method

2.1. Mothers

The participants consisted of a subsample of mothers from a larger longitudinal study of attachment (see Raval et al., 2001). Of 70 mothers for whom AAI classifications were available and who completed the singing procedure, 46 agreed to have others listen to their songs. Mothers were excluded from the sample if they sang lullabies ($n = 8$) or popular songs ($n = 2$) rather than play songs ($n = 36$). Mothers in the final sample were 24–35 years of age ($M = 30.9$, SD = 3.02), with 11–20 years of education ($M = 15.17$, SD = 2.81). Most were married (89%) and employed outside of the home during the prenatal period (92%).
2.2. Raters

The raters were 39 female and 11 male undergraduate university students who were 18–24 years of age (\(M = 19.5\) years, \(SD = 1.36\)), with a mean of 2.08 years (\(SD = 3.27\)) of music lessons (64% with none). Raters received partial course credit for their participation.

2.3. Apparatus and materials

2.3.1. Maternal attachment representations

Maternal attachment status was assessed by means of the AAI (George et al., 1985). The AAI is a semistructured interview that probes adults’ memories of their childhood relationships with attachment figures, attachment-related experiences during childhood, including memories of feeling loved or unloved, being ill or upset, loss, and separation, and the effect of these experiences on how they view themselves, their experiences, and their relationships. The recollection of these memories is thought to activate the mother’s attachment system, which affects the content of her responses as well as the overall coherence of her discourse. The AAI was administered during the third trimester of pregnancy to ascertain each mother’s attachment strategy. Interviews were audio taped, transcribed verbatim, and coded according to the guidelines of Main and Goldwyn (1994), which afford greater prominence to qualitative than to factual information. Each transcript was rated on 17, 9-point scales, which assess the individual’s experience with each attachment figure (5 experience scales) and the current state of mind with respect to attachment (12 state-of-mind scales). Based on these ratings, each mother was classified as Autonomous, Dismissing, or Preoccupied. Mothers receiving Unresolved AAI classifications (\(N = 9\)) were categorized into Autonomous, Dismissing, or Preoccupied categories based on their alternate AAI classification. Of the 36 mothers, 17 were classified as Autonomous, 11 as Dismissing, and 8 as Preoccupied.

2.3.2. Mothers’ sung performances

When each infant reached 6 months of age, the mother was asked to sing a song of her choice to her infant. Mothers were also recorded singing the same song in their infant’s absence to provide a baseline measure of vocal expressiveness. Audio recordings of the mothers’ sung performances were collected in a quiet hospital laboratory by means of a Sony Electret Condenser lapel microphone (ECM-T10) and cassette tape recorder. The singing session was also videotaped.

Identical song excerpts, 7–10 s in duration, from infant-present and infant-absent contexts were selected according to the following criteria: (a) as close as possible to the beginning of the song and (b) little noise or extraneous cues that might influence raters’ judgments. Samples were digitized by means of a Denon PMA-680R stereo amplifier and SoundScope software on a Radius 81/110 Macintosh computer. Because infant sounds were present in a number of the infant-present excerpts, infant vocalizations were digitally added to all infant-present and infant-absent samples to ensure that ratings would be based on maternal vocal quality rather than infant sounds. The final stimulus sample consisted of 36 pairs of singing samples, with the order of infant-present and infant-absent versions (first or second in the pair) counterbalanced. The order of song pairs was randomized separately for each rater (PsyScope software), who
listened to the material on Sony CD550 headphones through a Radius 81/110 Macintosh computer connected to a Denon PMA-680R stereo amplifier.

2.3.3. Maternal depression

Because maternal depression is associated with decreased levels of affective communication (see Downey & Coyne, 1990 for a review) and motherese (Bettes, 1988), mothers’ depressive symptoms were assessed by means of the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) when infants were 4 weeks, 4 months and 5 months of age. The EPDS is a 10-item questionnaire designed to screen for postnatal depression in community samples. Mothers are asked to indicate the frequency of specific depressive feelings (i.e., from all of the time to not at all). The EPDS has satisfactory validity, split-half reliability, and it is sensitive to changes in the severity of depressive symptoms over time (Cox et al., 1987). Mean depression scores across the three time periods ranged from 0 to 11.67 ($M = 5.33$, $SD = 2.43$).

2.4. Procedure and measures

2.4.1. Ratings of maternal emotional involvement

Participant raters were tested individually in a quiet room. They listened to paired excerpts of mothers’ songs (infant-present and infant-absent versions). After hearing each song, they provided ratings of emotional involvement on a 9-point Likert scale, with a rating of 1 indicating no emotional involvement on the part of the mother, 5 indicating an intermediate level of emotional involvement, and 9 indicating total emotional involvement. Raters were encouraged to make intuitive judgments. As noted, such ratings of emotional involvement have been found to reflect the degree of playfulness or liveliness of maternal performances (Rock et al., 1999). Listeners received four practice trials, including two song pairs that were high and two that were low in playfulness.

2.4.2. Ratings of infant distress

Videotaped excerpts corresponding to the song excerpts were coded for the presence or absence of infant distress by an experienced observer who was blind to maternal attachment classification. Infant crying, grimacing, negative vocalizations, or pushing the mother away with feet or hands were coded as distress signals. The levels of distress, when evident, were relatively mild. Excerpts without any such behaviors were coded as free of infant distress. A second rater who was blind to maternal attachment classifications independently coded 30% of all excerpts as exhibiting some infant distress or no distress. Inter-rater reliability was 100%.

3. Results

Mothers sang a wide range of play songs (24 different songs), including well-known children’s songs (e.g., “Old McDonald had a Farm”) and invented songs (e.g., original tunes or words, often incorporating the child’s name). Mean ratings of emotional involvement (i.e., across all ratings of emotional involvement for each mother’s sung performance) ranged from 4.08 to 7.80 ($M = 6.20$, $SD = 0.99$). A series of paired sample $t$ tests revealed a significant
Table 1
Ratings of emotional involvement by maternal attachment and presence of distress

<table>
<thead>
<tr>
<th>Maternal attachment</th>
<th>Distress</th>
<th>No distress</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>$M$</td>
</tr>
<tr>
<td>Autonomous</td>
<td>5</td>
<td>5.43</td>
</tr>
<tr>
<td>Dismissing</td>
<td>6</td>
<td>6.63</td>
</tr>
<tr>
<td>Preoccupied</td>
<td>2</td>
<td>4.35</td>
</tr>
</tbody>
</table>

Note. The higher the rating is, the more emotionally involved (lively) the sung performance.

difference between ratings of emotional involvement for songs sung to infants and songs sung without an infant audience for Autonomous ($t(16) = 3.71, p < .01$), Preoccupied ($t(7) = 4.87, p < .01$), and Dismissing ($t(10) = 5.84, p < .001$) attachment groups. Infants exhibited some distress in 33% of the maternal singing episodes. Ratings of emotional involvement as a function of maternal attachment representation and distress are shown in Table 1.

3.1. Maternal attachment representation, infant distress, and vocal communication of emotion

Two-way ANOVAs and ANCOVAs were used to compare vocal communication of emotion as a function of maternal attachment representation and infant distress. A two-way ANOVA examining the effect of infant distress (distress, no distress) and maternal attachment (Autonomous, Dismissing, Preoccupied) on emotional involvement ratings revealed a significant interaction between infant distress and maternal attachment, $F(2, 35) = 6.26, p < .005$. Fig. 1, the interaction remained significant when baseline ratings (i.e., infant-absent condition) were controlled for, as revealed by a two-way ANCOVA, $F(2, 35) = 6.02, p < .01$.

Fig. 1. Mean rating of emotional involvement by maternal attachment and presence of distress.
Significant differences were also maintained when the presence of depressive symptoms was controlled for, \( F(1, 31) = 7.09, p < .005 \). Results of this omnibus test imply that, in the absence of infant distress, emotional involvement ratings did not differ as a function of maternal attachment classification. When infants were distressed, however, such differences became apparent.

We explored the nature of these differences with posthoc pair-wise comparisons. First, we compared the emotional involvement (i.e., playfulness) ratings of Dismissing and Preoccupied mothers under conditions of distress and no distress. A two-way ANOVA confirmed the interaction between infant distress and maternal attachment, \( F(1, 18) = 33.29, p < .001 \). The difference remained significant when depressive symptoms served as a covariate in an ANCOVA, \( F(1, 18) = 46.17, p < .001 \). Second, rating differences for Dismissing and Autonomous mothers under distress and no distress conditions were explored by means of a two-way ANOVA. The interaction between attachment representation and distress approached conventional levels of significance, \( F(1, 27) = 3.67, p = .07 \), a trend that remained in evidence when depressive symptoms were controlled for, \( F(1, 27) = 3.57, p = .07 \). Third, rating differences for Autonomous and Preoccupied mothers under distress and no distress conditions were explored by means of a two-way ANOVA. The observed trend, \( F(1, 24) = 2.96, p = .10 \), remained more or less consistent when depressive symptoms were controlled for, \( F(1, 24) = 2.57, p = .12 \). In view of the small cell sizes for each attachment classification in the distress condition, these trends are impressive.

4. Discussion

We examined the relation between maternal attachment classification and the expressiveness of mothers’ sung performances to mildly distressed and nondistressed infants. It is important to emphasize that mothers, regardless of their attachment classification, sang more expressively in their infants’ presence than in their absence. Thus, infant-directed singing adjustments, which have been reported in several studies (O’Neill, Trainor, & Trehub, 2001; Trainor et al., 1997; Trehub et al., 1993; Trehub et al., 1997; Trehub, Unyk, et al., 1997), do not depend on attachment security. The mere presence of an infant seems to trigger expressive singing, even in mothers who are considered Dismissing or Preoccupied on the basis on AAI interviews. This finding is consistent with accounts of maternal singing and speech that emphasize their biological foundations (Dissanayake, 2000; Trehub, 2001).

In line with our predictions, the liveliness of maternal singing was unrelated to maternal attachment classification when mothers sang to nondistressed infants. For mothers who sang to distressed infants, maternal expressiveness in song was related to attachment classification. Unlike Autonomous and Preoccupied mothers, who generated less playful performances for distressed than for nondistressed infants, the performances of Dismissing mothers were unrelated to infants’ affective state. The findings are consistent with Cassidy’s (1994) proposed associations between maternal attachment classification and maternal affective communication.

Dismissing mothers showed no evidence of acknowledging their infants’ negative affect. Instead, they exhibited similar levels of playfulness or animation in performances to distressed and nondistressed infants. This finding is consistent with Dismissing mothers’ reported
tendency to deny the significance of infants’ negative emotions. For example, Haft and Slade (1989) found that mothers with Dismissing attachments were attuned to infants’ expressions of joy and exuberance but tended to reject infants’ bids for comfort or reassurance. For Dismissing mothers, playfulness or animation may be a means of coping with negative emotions, as has been reported for Dismissing adults (Dozier & Kobak, 1992) and for avoidant children (Grossman, Grossman, & Schwan, 1986; Malatesta, Culver, Tesman, & Shepard, 1989; Spangler & Grossman, 1993).

Autonomous mothers demonstrated the ability to respond sensitively to positive and negative infant emotions by modulating the level of playfulness in their songs depending on their infants’ state. When singing to nondistressed infants, Autonomous mothers’ songs exhibited moderately high levels of emotional involvement reflecting animation, liveliness and playfulness. If infants’ affective state were distressed, these vocal qualities were dampened. This pattern of results suggests that Autonomous mothers are both responsive and flexible. They are sensitive to their infants’ emotional state and, as such, adjust their voice quality. This is consistent with past research that has characterized Autonomous mothers as responsive to their infants’ expressions of both positive and negative affect (Goldberg et al., 1994; Haft & Slade, 1989).

Similar to Autonomous mothers, Preoccupied mothers communicated high levels of playfulness to nondistressed infants and dampened their playfulness if singing to distressed infants. This suggests that these mothers are responsive to both infant positive and negative affect. This group of mothers, however, produced the least lively performances for distressed infants, a pattern of emotional communication that may have important consequences for emotion regulation. Cassidy (1994) suggests that although Preoccupied mothers are able to acknowledge infant negative affect, they may fail to assist in regulating their infants’ negative experiences.

To provide optimal assistance for regulating infant distress, mothers must be able to join with infants in their experience of the negative emotion and then provide regulatory assistance. Thus, optimal emotion regulation occurs when mothers mirror infants’ emotional state (e.g., sadness) and display incompatible emotions (e.g., playfulness; Fonagy & Target, 1997). Balancing of these two requirements appears to vary across maternal attachment classification, as can be seen in Fig. 2.

It is interesting to note that attachment-related differences were evident only under conditions of infant distress. These results provide support for a narrower than usual conception of attachment (Goldberg et al., 1999a,b). Bowlby’s (1969/1982) original construct of attachment emphasized the mother’s protective role. In his view, the attachment system is activated by illness, injury, and emotional distress. Interactions with the mother at such times lead the infant to form expectancies about her ability to assume the roles of protector, buffer, and emotional regulator. In the absence of actual or perceived threat or distress, maternal behavior may be largely unrelated to attachment processes (Goldberg et al., 1999a,b).

Goldberg et al. (1999b) bemoans the diffusion of research paradigms in attachment, which increasingly focus on responsivity and parent–infant interaction in general rather than on interactions relating specifically to protection or distress. Although maternal responsiveness in nonstressful situations undoubtedly contributes to infants’ sense of felt security, maternal responsiveness in the context of threat, danger, illness, and distress are of greater relevance (Goldberg et al., 1999a,b). The importance of activating the attachment system is reflected in findings that suggest that adult physiological response (i.e., skin conductance) differs as a
Our results highlight the importance of considering the separate contributions of Dismissing and Preoccupied attachments to maternal behavior in contrast to the more common practice of combining these categories (Crandell et al., 1997; Peterson et al., 1998). The present results indicate that attachment-related differences may be obscured if mothers with Dismissing and Preoccupied attachments are not considered separately. According to Goldberg (1997), the secure-insecure dichotomy undermines the ability of attachment theory to distinguish among outcomes arising from different patterns of attachment, leading to the oversimplified view that all good things go together.

The results of the present study confirm associations between maternal attachment style and vocal responsiveness to distress, but they also indicate the need for further research. The between-subjects design precluded an examination of mothers’ ability to fine-tune their behavior in response to changing infant needs. A within-subjects design that includes distress and nondistress episodes for each dyad could address this issue. Moreover, an evaluation of spontaneous maternal singing in the home or in open-ended contexts would indicate the extent to which mothers in different attachment classifications use expressive singing to regulate infant emotion. On the basis of the present findings, we would expect Autonomous mothers to make more effective use of emotive singing and speech to regulate infant arousal than would Dismissing mothers.

It is possible that maternal singing “tranquilizes the nervous system” (Schore, 1994, p. 244), as does caregiver proximity (Mikulincer, Florian, & Tolmacz, 1990). The cross-cultural prevalence of lullabies (Trehub & Schellenberg, 1995; Trehub & Trainor, 1998) attests to the potency of such vocal behavior in emotion regulation. There is evidence, moreover, that maternal singing

Fig. 2. Proposed relations between maternal attachment, communication of emotion, and infant emotion regulation.

function of attachment classification when responding to questions about relationships but not to other (low-stress) questions (Dozier & Kobak, 1992). In analogous fashion, maternal singing to nondistressed may activate universal aspects of maternal behavior but not attachment-related differences, which emerge primarily in the context of distress.
leads to more sustained reductions of infant arousal than does maternal speech (Shenfield, Trehub, & Nakata, 2002). Thus, mothers’ sensitive use of singing may affect infants’ sense of security and early socialization in general. Determining whether maternal attachment classification is related to the fine-tuning of mothers’ vocal behavior remains an important task of future research.

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