Parents’ Sung Performances for Infants

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Abstract  Naive listeners rated the style of singing in mothers’ and fathers’ sung performances for infants and their simulations of those performances (Experiment 1). Performances in an infant’s presence were judged as more expressive — either more playful or more soothing — than were simulations. Parents’ style of singing, as reflected in these ratings, differed as a function of the sex of singer and listener. Both parents sang more playfully for same-sex infants than for opposite-sex infants. Independent listeners rated the manner in which parents enunciated the lyrics of their songs (Experiment 2). Parents rendered the lyrics of songs more expressively in infant-present than in infant-absent contexts. Moreover, this expressiveness was greater for same-sex infants than for opposite-sex infants. These findings are consistent with parents’ greater attachment to same-sex infants. Discrepancies between parents’ choice of songs and their manner of singing lend credence to functional rather than nominal classifications of songs for infants.

Throughout the world caregivers sing to their infants (Brakeley, 1950; Trehub & Schellenberg, 1995; Trehub & Trainor, in press; Tucker, 1984). At times, soothing or sleep is the principal goal, as in lullabies; at other times, play or stimulation is the overriding agenda. In general, the pitch register is lower and the tempo slower in lullabies than in play songs (Trehub & Trainor, in press). Although lullabies are largely confined to soothing and sleep contexts, play songs extend well beyond play contexts, accompanying child care routines such as feeding, diaper changing, and bathing (Trehub, Unyk et al., 1997).

Lullabies are structurally, as well as functionally distinct from other song types, as reflected in the ability of naive listeners to distinguish recorded lullabies from non-lullabies (matched on tempo), even when the songs are from foreign musical cultures (Trehub, Unyk, & Trainor, 1993a). The principal perceptual distinction between a lullaby and non-lullaby, aside from its text and tempo, is the structural simplicity or repetitiveness of the former (Unyk, Trehub, Trainor, & Schellenberg, 1992). In general, musically inexperienced listeners classify a song with slow tempo as a lullaby if its pitch contours are smooth and predominantly descending (Unyk et al., 1992). In deciding what is and what is not a lullaby, listeners do not simply distinguish songs for infants and children from those intended for adults. When vocal cues are unavailable, for example, as in synthesized instrumental versions of songs, listeners can often differentiate lullabies from play songs and from other adult song categories (Trehub & Trainor, in press). For example, adult listeners confuse native American lullabies (instrumental versions) with love songs, which implies that lullabies share some of the structural features of love songs (Trehub, Unyk, Schellenberg, & Kamenetsky, in preparation). Vocal rather than instrumental versions would likely reduce or eliminate such confusions.

In a sense, lullabies and play songs are the musical analogues of soothing and playful baby talk or motherese (i.e., infant-directed speech). For example, caregivers’ soothing utterances to infants are marked by low pitch, a narrow pitch range, and falling pitch contours; their playful utterances are characterized by brevity, high pitch, wide pitch range, rhythmic regularity, and rising or rise-fall contours (Beebe, Feldstein, Jaffe, Mays, & Alson, 1985; Fernald, 1989; Fernald & Simon, 1984; Ferrier, 1985; Papoušek, Papoušek, & Symmes, 1991; Sachs, 1977; Stern, Spieker, & MacKain, 1982). As with soothing and playful speech (Fernald, 1991; Papoušek et al., 1991; Stern, Spieker, Barnett, & MacKain, 1983), lullabies and play songs are presumed to regulate infant arousal (Trehub & Schellenberg, 1995; Trehub, Trainor, & Unyk, 1993). Thus, the measure of a successful performance for infants is not critical accolades or applause but rather signs of interest, contentment, pleasant affect, or rudimentary comprehension. Indeed, infants have the prerequisite skills for processing musically relevant information, being
sensitive to melodic contour (Trehub, Thorpe, & Morrongiello, 1987; Trehub, Bull, & Thorpe, 1984), melodic and harmonic intervals (Cohen, Thorpe, & Trehub, 1987; Schellenberg & Trehub, 1996; Trainor & Trehub, 1993b; Trehub, Thorpe, & Trainor, 1990), tuning (Lynch, Eilers, Oller, & Urbano, 1990), key relations (Trainor & Trehub, 1993a), scale structure (Trehub, Schellenberg, & Kamenetsky, under review), rhythm (Trehub & Thorpe, 1989; Trehub, Hill, & Kamenetsky, 1997), phrase structure (Juszczyk & Krumhansl, 1993; Krumhansl & Juszczyk, 1990), as well as consonance and dissonance (Schellenberg & Trainor, 1996; Trainor, in press; Zentner & Kagan, 1996).

In general, infants exhibit more positive affect when listening to approval than to disapproval in speech in different languages (Fernald, 1993) or to synthesized versions of approving than disapproving pitch contours (Papoušek, Bornstein, Nuzzo, Papoušek, & Symmes, 1990). Not only do infants "prefer" speech in the baby talk register over typical adult speech (Cooper & Aslin, 1990; Fernald, 1985; Pegg, Werker, & McLeod, 1992; Werker & McLeod, 1989; Werker, Pegg, & McLeod, 1994), they also prefer songs recorded in an infant's presence to the same songs sung with no infant audience (Trainor, 1996). Moreover, they prefer instrumental music (Mozart minuets) with intact rather than interrupted phrases (Juszczyk & Krumhansl, 1993; Krumhansl & Juszczyk, 1990) and consonant over dissonant music (Trainor, in press; Zentner & Kagan, 1996). Obviously, infant musical preferences cannot be articulated directly but are implied by differential attention or responsiveness to contrasting musical materials.

Caregivers' singing to infants can be considered within the rubric of expressive performance, even though study within this domain is typically limited to notated compositions and to expert performers (e.g., Juslin, 1997a; Palmer, 1997; Sloboda, 1994). Unlike expert performers, however, the performing caregiver need not be faithful to a musical score, a prescribed text, or to expressive conventions. Moreover, caregivers and expert performers have very different relationships with their audiences. For example, caregivers of infants perform for a single, intimately related listener, who is ignorant of musical conventions. Thus, their performance is not geared to conveying the structure of the musical piece in question (Palmer, 1997); instead, their goal is to regulate infant affect. Unlike the performances of professionals, caregivers' "errors," if specifiable, are unlikely to reflect technical difficulty (Sloboda, 1994) or competition from conflicting musical representations (Palmer & van de Sande, 1993). Instead, their deviations from a hypothetical musical standard might reflect the dominance of non-musical over musical goals. Accordingly, caregivers may make some features more salient than others in service of caregiving goals.

Nevertheless, if specific expressive devices characterized sung performances to infants, then such performances would be as orderly or rule-governed as those of musicians (Juslin, 1997b; Palmer, 1989; Thompson, Sundberg, Friberg, & Fryden, 1989). In principle, at least, caregivers might use some of the same devices as professional performers for conveying particular emotions. For example, musicians use fast tempo, relatively loud sound levels and bright timbre to convey happiness; they use slow tempo, relatively low sound levels, and soft timbre to convey sadness as well as tenderness (Juslin, 1997b). Moreover, these expressive intentions are decoded as accurately by musically untrained listeners as by trained listeners (Juslin, 1997a, b). The present approach to the study of parents' informal performances is in accord with Balzano's (1989) ecological emphasis on the performer's coordination with the environment and his de-emphasis of conventional criteria such as tuning accuracy.

The first attempt to explore the possibility of a distinctive performance style for infants involved the recording of English- and Hindi-speaking mothers as they sang a song of their choice in the comfort of their own home (Trehub, Unyk, & Trainor, 1993b). Half of the mothers were asked to sing informally to their infant; for the other half, the infant was not present and the mother was instructed to sing in the informal style she typically used when alone. To lessen singers' self-consciousness, the experimenter was not in the same room as mothers during their performances. Subsequently, mothers were asked to sing the same song again but to sing it in the contrasting context (e.g., to her infant if she had been singing alone). Naive listeners were highly accurate at identifying the infant-directed versions when the materials were play songs and when the listeners and singers were from the same culture. They were considerably less accurate but still above chance levels when the songs were soothing (lullabies and religious songs) and when listeners and singers were from different cultures. In both cases (with foreign and non-foreign materials), listeners reported that the principal cue to the singing context was the singer's tone of voice. Hindi-speaking mothers tended to choose lullabies and religious songs — both with slow tempo — in contrast to English-speaking mothers, who tended to sing lively play songs. This difference in song selection may have contributed to listeners' greater difficulty decoding the context (infant present or absent) of Hindi songs. Playful songs may offer more scope for performance modifications than do soothing songs. In fact, English-speaking mothers sang more slowly when their infant was present rather than absent, but Hindi-speaking mothers did not, perhaps because they sang slowly regardless of the context. Such differences in song selection may well reflect cross-cultural differences in display rules (Fernald, 1992) as well as beliefs about the relative merits of soothing or

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arousing infants (Grieser & Kuhl, 1988; Toda, Fogel, & Kawai, 1990). In any case, these findings indicate that performances for infants are perceptually distinct and that play song performances incorporate more extensive variations across contexts than do performances of soothing songs. Moreover, there are common as well as unique expressive devices across cultures.

The use of a distinct performing style for an infant audience does not depend upon musical or caregiving experience. For example, performances of songs by children 3-8 years of age differ in different contexts (Trehub, Unyk, & Henderson, 1994). When their infant sibling is in view, children raise their pitch and sing more slowly than usual, which indicates that they incorporate some of the characteristic features of infant-directed speech (Fernald, 1991; Papoushek, Papoushek, & Bornstein, 1985) and song (Trehub et al., 1993b).

Are caregivers' performance changes in an infant's presence driven by a caregiving agenda or are they influenced, at least in part, by the singer's emotional state? "Babyish" appearance (Sternglanz, Gray, & Murakami, 1977) and vocalization quality (Bloom & Lo, 1990) may enhance the infant's appeal, generating emotional consequences for the caregiver and corresponding implications for the performance of caregiving songs. For example, smiling and other facial gestures alter the shape of the vocal tract, leading to perceptible changes in singing (Fonagy, 1981; Sundberg, 1973) and speech (Laver, 1980).

To evaluate the infant's contribution to parental performances, Trehub, Unyk et al. (1997) asked mothers and fathers to produce a song rendition that was identical in all respects to a typical performance for their infants, but to do so in the infant's absence (i.e., a simulation); parents also sang the same song in their infant's presence, either before or after the simulation (Trehub, Unyk et al., 1997). Although the simulations shared a number of features of the infant-present versions, naive listeners, whether musically trained or untrained and English or non-English speakers, successfully differentiated infant-present from infant-absent performances. Mothers and fathers sang more slowly and at a higher pitch level in the infant's presence, but tempo differences between performance contexts (means of 91 and 97 beats per minute in actual and simulated contexts, respectively) predicted identification accuracy more reliably (r = .54) than did pitch differences (r = .38). Independent listeners, who were asked to rate the emotional engagement of each singer on the basis of voice quality, assigned significantly higher ratings of engagement to infant-present than to infant-absent versions. Moreover, the magnitude of the rating difference between the two versions (infant-present, infant-absent) was highly predictive of identification accuracy (r = .76). No doubt parents are aware that their performances to infants are exaggerated in a number of respects. Nevertheless, systematic differences between parents' simulations and infant-directed performances imply that parents use some performance devices intuitively rather than deliberately, as is the case for baby talk or infant-directed speech, (Fernald & Simon, 1984; Jacobson, Boersma, Fields, & Olson, 1983; Murray & Treharthen, 1986). Perhaps parents simply fine-tune their performances to reflect the infant listener's fluctuating interests or arousal level. Regardless, the "live" infant audience makes an important contribution to parents' sung performances.

Trehub, Unyk et al. (1997) focused primarily on listeners' ability to identify infant-directed from simulated performances and secondarily on similarities in mothers' and fathers' performances. Our goal in the present investigation was to explore possible differences between the same mothers and fathers by targeting different aspects of parents' performances and considering the sex of the infant audience. Why might one expect differences? For one thing, fathers spend considerably less time than mothers in one-on-one interactions with their young children (Lamb, 1987; Pleck, 1985). The situation changes minimally when mothers are employed, with fathers increasing their involvement in direct child care by only a half hour per week (Douthitt, 1989). Moreover, fathers' time with young children is occupied primarily with play, in contrast to mothers, whose time is spent attending to the children's physical and affective needs (Jump & Haas, 1987; MacDonald & Parke, 1986; Stevenson, Leavitt, Thompson, & Roach, 1988). By virtue of fathers' limited involvement in child care relative to mothers, fathers are presumed to become progressively less sensitive to the individual needs of their children (Lamb, 1986). Mothers' and fathers' style of play also differs markedly, with fathers favouring physical, arousing play and mothers favouring vocal and toy-centered games (Bronstein, 1984; Roopnarine, Talukder, Jain, Joshi, & Srivastav, 1990; Stevenson et al., 1988). With respect to verbal interactions, fathers talk less to their infants and modify their speech style less dramatically than mothers (Fernald et al., 1989; Papoushek, Papoushek, & Haekel, 1987).

The sex of the child also makes a substantial contribution to the nature of parent-infant interaction, with parents responding differentially to same- and opposite-sex children (Basow, 1992; Fagot & Leinbach, 1987). This difference is compounded by fathers' more stereotypic attitudes toward gender norms and their enforcement, especially with respect to sons (Antill, 1987; Basow, 1992). Fathers' sex-stereotyping is evident from the newborn period, even when no behavioural differences are apparent (Barry, 1980; Lynn, 1979). In general, however, both parents are more involved and attached to same-sex than to opposite-sex children, an effect that is especially pronounced with fathers (Dickie, 1987; Fagot & Leinbach,
1987; Morgan, Lyle, & Condran, 1988). Indeed, fathers with sons are less likely to leave a marriage than are those with daughters (Morgan et al., 1988). These biases also result in both parents being more permissive with opposite-sex than with same-sex children (Bronstein, 1984; Maccoby & Jacklin, 1974) and being more restrictive and cognitively challenging with same-sex children (McGillicuddy-De Lisi, 1988; Weitzman, Burns, & Friend, 1985). Not only do mothers talk more to their children than do fathers, but they talk more to their daughters than to their sons (Cherry & Lewis, 1976; Thomann, Liederson, & Olson, 1972). These interactions between sex of parent and child sparked our interest in similar influences on parents' sung performances for infants.

Another goal of the present investigation was to explore the utility of functional classifications of informal performances for infants. For the well-known genres of song for achieving soothing and playful performances, notably lullabies (i.e., soothing or sleep-inducing songs) and play songs, classification is generally nominal rather than functional. For example, "Rockabye Baby" would be considered a lullaby and "Itsy Bitsy Spider" a play song on the basis of their textual content. Lomax Hawes (1974) argues, instead, for classification by function. Thus, lullabies and play songs would be classified on the basis of their use for soothing or playful purposes. Conceivably, the same song could serve different functions when sung by different singers or by the same singers in different contexts. This approach to classification seems especially suitable for informal performances by musically untrained singers (e.g., parents) with a limited repertoire.

**Experiment 1**

Although lullabies and play songs are song genres designed to soothe or amuse young listeners, caregivers are obviously free to perform such songs in ways that emphasize or de-emphasize their soothing or playful qualities (Trainor, 1996; Trehub & Trainor, in press). Flexible performance strategies might be especially advantageous to fathers, whose knowledge of the children's repertoire is limited relative to mothers (Trehub, Uynk et al., 1997). For example, an individual who knows few songs might sing the very same songs to infants in a soothing or amusing manner, as appropriate to the circumstances (e.g., a tired or alert infant). By contrast, those who know many songs might select different songs (e.g., lullabies, play songs) to promote different caregiving goals (e.g., soothing, amusing). Accordingly, we expected ratings of mothers' singing style as playful or soothing to be relatively consistent with ratings of the text or lyrics; in other words, mothers would sing songs with playful lyrics in a playful manner and those with soothing lyrics in a soothing manner. We expected fathers' style of performance to be less consistent with the nature of the lyrics.

Moreover, differences between mothers' and fathers' speech and non-speech interactions (e.g., Cherry & Lewis, 1976; Fernald et al., 1989; Power & Parke, 1983) and interactions between sex of parent and child (Dickie, 1987; Fagot & Leinbach, 1987; Morgan et al., 1988) led to the expectation that mothers and fathers would use different vocal devices in performances of songs for their infant sons and daughters. Finally, we expected performances in an infant's presence to be more expressive — either more soothing or more playful — than those in the infant's absence.

**Method**

**Participants**

The participating listeners were 33 adults (11 male, 21 female) who had a mean age of 25.8 years.

**Apparatus and Materials**

The stimulus materials (from Trehub, Uynk et al., 1997) consisted of paired excerpts from 15 mothers and 13 fathers, all of which were recorded in the infants' own homes. One excerpt from each parent consisted of singing in the infant's presence; the other excerpt consisted of parents' attempt to duplicate their usual performance of the same song to infants but without the infant present. All of the parents who provided song samples sang regularly to their infants and chose the song that they would sing. Half of the parents sang in the infant's presence first; the others sang the simulated version first. Parents expected to provide a single song sample for a study of informal singing, a procedure designed to minimize attempts to generate contrastive versions. Stimuli (infant-directed and simulated versions with order counterbalanced across singers) were presented to naive adult listeners by means of a tape recorder (Sony TC-W32) and headphones (Sony CD550). There were two different random orders of mothers and two different random orders of fathers on separate tapes. Equal numbers of adult listeners heard mothers' singing (one of two random orders) followed by that of fathers (one of two random orders), or fathers' singing followed by that of mothers.

**Procedure**

All adult listeners were tested individually in a quiet room. One group (n = 21) listened to the infant-directed and simulated excerpts of mothers and fathers, rating the extent to which each performance was playful or soothing on a scale of 1 to 7 (1 = highly playful; 4 = neutral, neither playful nor soothing; 7 = highly soothing). In assigning ratings, participants were instructed to ignore word meaning, focusing instead on the manner of singing. They listened, first, to examples of playful and soothing styles of singing, specifically, a mother singing one song in a playful manner and another song in a soothing manner.
Then they had four practice trials in which they rated the performance of a man and woman singing in a typical soothing or playful manner. Participants who used the rating scale correctly (i.e., rating the soothing performances as 5 or more and the playful performances as 3 or less in all four instances) proceeded to the test phase. The test phase consisted of 56 trials — all songs of mothers (15 mothers x 2 versions) followed by all songs of fathers (13 fathers x 2 versions) or the reverse order (counterbalanced across listeners). The two versions (infant-directed, simulated) from each parent followed one another to highlight performance differences as a function of context. Listeners rated the singing style (playful/soothing) of each excerpt. A second group of participants (n = 11) received written transcripts of the lyrics from the same songs. Their task was to rate the lyrics of each song on the same 7-point scale (playful/soothing) without considering the melodies that usually accompany the texts.

RESULTS AND DISCUSSION

Listeners used the entire playful/soothing scale, as reflected in mean ratings of performance that extended from 1.38 (1 = highly playful) to 6.81 (7 = highly soothing). Although only one song, “Hush Little Baby”, would be considered a conventional lullaby, 13 of the 28 performances received ratings indicative of soothing (i.e., greater than 4). Soothing performances (i.e., ratings less than 4) were assigned to renditions of “Twinkle, Twinkle Little Star”, “The ABC Song”, “Baa Baa Black Sheep” (all three having the same tune with minor rhythmic differences), “The Wheels on the Bus”, “Mandy”, and “Michael Row Your Boat Ashore”. Other parents sang some of the same songs — “Twinkle, Twinkle Little Star” and “Baa Baa Black Sheep” — in a playful style. Moreover, two parents altered their performing style (soothing or playful) across contexts (infant-present, infant-absent). To establish the utility of the scale in differentiating infant-present from infant-absent (simulated) performances, we calculated deviation scores (without regard to direction) from the neutral midpoint of 4 for each singer in each singing context. Parents’ performances were more extreme, that is, either more soothing or more playful, in the infant-present context (M = 1.55, SD = 0.79) than in the infant-absent (i.e., simulation) context (M = 1.27, SD = 0.77), t (27) = 2.01, p < .05 (one-tailed tests were justified because of the apriori predictions).

Mean ratings of singing style were calculated for each listener for each condition. To examine mothers’ and fathers’ performances to their infant sons and daughters, a repeated-measures analysis of variance on ratings of infant-present excerpts, with singer sex and child sex as factors, revealed a significant effect of singer sex, F(1,20) = 7.26, M_S = .179, p < .02, reflecting greater playfulness in mothers’ performances compared to those of fathers. There was also a main effect of child sex, F(1,20) = 18.35, M_S = .207, p < .0005, which reflected more playful song renditions for boys than for girls. A significant singer sex by child sex interaction, F(1,20) = 75.83, M_S = .230, p < .0001, which is shown in Figure 1, implied that parents, especially fathers, sang more playfully for same-sex infants than for opposite-sex infants (fathers: M = 3.22, SD = 0.68 for boys; M = 4.56, SD = 0.74 for girls; mothers: M = 3.39, SD = 0.63 for girls, M = 3.88, SD = 0.67 for boys). The only mean value that did not differ significantly from the midpoint of 4 (neither playful nor soothing) was mothers’ performances for boys. All but one father sang playfully to their infant sons and all but one father sang in a soothing manner to their infant daughters. Indeed, the only mean value in the soothing range was that of fathers to daughters. By contrast, mothers’ soothing and playful performances were relatively evenly distributed across girls and boys (i.e., four playful performances for girls and four for boys; four soothing performances for girls and three for boys). These findings are consistent with previous reports of differential parenting of same-sex versus opposite-sex infants and with greater effects for fathers than for mothers (Cherry & Lewis, 1976; Dickie, 1987; Fagot & Leinbach, 1987; Morgan et al., 1988).

Mean playful/soothing ratings of the lyrics of songs were calculated across raters for each song. As predicted, ratings of text and performance style were highly correlated for mothers, r = .81, p < .0005, but the correlation was not significant for fathers, r = .45, p > .10. In other words, more soothing or more playful lyrics were associated with more soothing or more playful performances, respectively, on the part of mothers only. Presumably, mothers were more likely than fathers to choose different songs for different caregiving goals, thereby achieving
more congruence between song type and performance style. Fathers, drawing on a more limited song repertoire than mothers, expressed their caregiving intentions by varying their performance style, which led to greater discrepancies between the lyrics (e.g., playful) and performing style (e.g., soothing).

**Experiment 2**

*Baby talk* (Ferguson, 1964), also known as *motherese* (Gelman & Shatz, 1977), or *infant-directed speech* (Fernald, 1991; Werker & McLeod, 1989), is thought to be effective in communicating emotional meanings, even to prelinguistic listeners (Fernald, 1993). Aside from pitch, tempo, and rhythmic variations, speech to infants is characterized by a distinctive style of articulation (Malheen, 1980). Although distinctive pitch contours are central to *baby talk* (Cooper, 1993; Fernald, 1989, 1991; Papousek et al., 1990), they play a lesser role in song performance because of obvious melodic constraints. By contrast, pitch level and tempo, which are free to vary in song as well as speech, are noticeably different in the infant's presence or absence (Trehub et al., 1993b; Trehub, Unyk et al., 1997). What is also variable, in principle, is the manner of rendering the lyrics. In the present experiment, we explored the extent to which mothers and fathers varied their pronunciation to achieve expressive performances for their infant audience. On the basis of the prevalence of *baby talk* to infants and young children (Fernald, 1991; Sachs, 1977), we predicted more *baby talk* enunciation in infant-present than in infant-absent excerpts. Because mothers make more extensive alterations in their infant-directed speech than do fathers (Fernald et al., 1989; Papousek et al., 1987), mothers might also show greater increases of *baby talk* enunciation from simulated to infant-directed songs. Different performing styles for same-sex than for opposite-sex infants in Experiment 1 led us to expect comparable interactions between sex of singer and infant in the present experiment.

**Method**

**Participants**

The 20 adult listeners (8 male, and 12 female) had a mean age of 28.4 years.

**Apparatus and Procedure**

The equipment and materials were the same as in Experiment 1. Participants listened to each excerpt of singing and were asked to rate the extent of *baby talk* enunciation on a scale from 1 to 7 (1 = typical adult speech, 4 = neutral, 7 = typical *baby talk*). To clarify the concepts of *baby talk* and adult enunciation, participants first listened to samples of a mother's infant-directed and adult-directed utterances. Subsequently, they received four training trials in which they rated samples of men's and women's typical infant- and adult-directed speech. Participants who used the rating scale correctly (i.e., rating all infant-directed speech samples as 5 or more and all adult-directed samples as 3 or less) proceeded to the test phase, which consisted of 56 trials — all songs of mothers (15 mothers × 2 versions) followed by all songs of fathers (13 fathers × 2 versions) or the reverse order.

**Results and Discussion**

Mean ratings of *baby talk* were calculated separately for each listener in each condition. A repeated measures analyses of variance, with *baby talk* ratings as the dependent measure, and singing context (infant-present, infant-absent), singer sex (mother, father), and child sex (boy, girl) as within-subject factors yielded a significant effect of singing context, \( F(1,19) = 60.91, M_S = 1.103, p < .0001 \), confirming higher *baby talk* ratings in the infant-present context \( M = 4.58, SD = 0.92 \) than in the infant-absent context \( M = 3.28, SD = 0.74 \). Ratings fell significantly above the neutral midpoint of 4 in infant-present contexts, \( t(27) = 3.14, p < .005 \), and significantly below the neutral midpoint for infant-absent contexts, \( t(27) = 4.325, p < .0002 \). A singing context by singer sex interaction (see Figure 2), \( F(1,19) = 5.06, M_S = 0.427, p < .05 \), implied that mothers exhibited greater differentiation in the use of *baby talk* across performance contexts (infant-present: \( M = 4.72, SD = 0.92 \); infant-absent: \( M = 3.19, SD = 0.74 \)) than did fathers (infant-present: \( M = 4.44, SD = 0.92 \); infant absent: \( M = 3.37, SD = 0.73 \)). Comparisons of infant-directed songs to boys and girls revealed higher *baby talk* ratings in mothers' performances to girls \( M = 4.91, SD = 0.92 \) than to boys \( M = 4.54, SD = 0.90 \), and in fathers' performances to boys \( M = 4.65, SD = 0.96 \) than to girls \( M = 4.22, SD = 0.84 \), \( F(1,19) = 10.776, M_S = 0.294, p < .005 \).
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The others sang conventional children's songs ("Twinkle, Twinkle Little Star", "Itsy Bitsy Spider"), folk songs ("Flowers are Red", "Michael Row Your Boat Ashore"), pop songs ("Mandy", "Doo-Wah Diddy"), or invented songs. Classification by performance ratings yielded 13 soothing songs rather than the single song that was nominally soothing. Our use of the designations soothing and playful rather than lullabies and play songs freed raters from conventional classifications of text and performance. Accordingly, song texts such as "Twinkle, Twinkle Little Star" and "Flowers are Red" were classified as soothing, and song texts with obvious word play such as "Skinna-Marink" and "Doo-Wah Diddy" were classified as playful.

Regardless of whether parents sang in a soothing or playful manner, their performances were rated as more soothing or more playful when they sang directly to their infant rather than to a hypothetical or imagined listener (i.e., the simulated or infant-absent performance). The intensification of the performance as more soothing or more playful involved more expressive renditions of the lyrics as well as the melody, which were influenced by the sex of singer and listener. Thus, as noted, mothers generated greater performance alterations of melody and lyrics for their infant daughters and fathers did so for their infant sons.

Ratings of text and performance style were largely congruent for mothers but less so for fathers. The use of folk or pop songs by some fathers arises, in all likelihood, from their limited repertoire of children's songs. Mothers' predominant use of nominal play songs, even in soothing contexts, may also stem from their limited knowledge of lullabies. Surveys conducted in our laboratory confirm that mothers know few nominal lullabies, and that they sing these infrequently. In fact, the children's songs that mothers know tend to be acquired from children's television programs or recordings, which largely feature play songs. The use of conventional lullabies is more common when mothers sleep with their infants (Trehub et al., 1993b), a practice that is widespread in the non-industrialized world (Morelli, Rogoff, Oppenheim, & Goldsmith, 1992). Despite some unusual choices of songs, the singing caregivers in the present study used highly overlearned materials — a fundamental rule of musical performance — which afforded the liberty of expressive variations.

Are such performances of parents rule-governed? Although the musical performances evaluated by Juslin (1997a, b) had specified emotional intentions, the intentions of the present parental performances were unspecified. Nevertheless, there were orderly distinctions between infant-present and infant-absent contexts, even though the latter performances were intended to duplicate the former. From previous investigations, we know that parents raise their pitch, slow their tempo, and use a more "loving" tone of voice in infant-present than in infant-absent contexts (Trainor, 1996; Trehub et al., 1993b; Trehub, Uynyk, et al., 1997). Raised pitch level in adult speech is associated with joy (Murray & Arnott, 1993; Scherer, 1986) and slow tempo in music as well as speech is associated with affection and tenderness (Fonagy & Magidics, 1963; Juslin, 1997b). The present investigation indicated, further, that parents make their performances more extreme — more playful or more soothing — in an infant's presence. They also alter their rendition of the lyrics of songs in ways that mimic their speech to infants. Although these features of infant-directed singing hardly constitute a set of rules, they represent an initial step in that direction.

Finally, the aforementioned descriptions of parents' songs for infants do not come close to conveying the flavor or expressiveness of the resulting performances. Although such performances would not meet conventional musical standards of excellence, most of the renditions are quite "charming" to naive adult listeners. The descriptive notes of musically trained listeners provide additional insight into unquantified aspects of the performances. For example, parents used a dynamic range that is unparalleled not only in infant-absent contexts but in vocal performances generally. Within the same song, they whispered some words and sang others loudly, using crescendo and diminuendo to maintain cohesion in the context of considerable variation. Although professional performers' vary tempo and dynamic range to achieve different emotional interpretations (e.g., happy, sad) of the same piece of music (Gabrielsson, 1995), their variations are much more subtle than those of parents. With respect to timing, parents' deviations from "mechanical regularity" (i.e., timing corresponding to notated values) were considerably greater than those reported for professional performers (Gabrielsson, 1993). Mothers and fathers' tendency to slow their tempo toward the end of key phrases (ritardando) was especially marked, as was the use of free tempo or rhythm (rubato). On the whole, parents used very smooth transitions from one note to the next (legato) rather than sharply detached notes (staccato), even in their renditions of play songs. At times, they glided from one note to another (portamento) rather than moving in discrete pitch steps, and spoke rather than sang (parlando). We do not mean to suggest that these expressive devices were used in the usual manner of professional performers. Nevertheless, the aforementioned features are typically associated with tenderness (Juslin, 1997b), which may well reflect the expressive intentions of parental performers. In any case, the use of these vocal devices and others resulted in performances for infants that were unmatched in their rich texture and expressiveness, if not in their adherence to conventional standards of musical tuning and timing. In a word, bravissimo!
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References


Des recherches antérieures ont démontré que lorsqu’un parent chante une chanson pour bébés, il ne le fait pas de la même manière, sur les plans acoustique et perceptuel, si le bébé n’est pas là. L’objectif de la présente étude était d’examiner les différences entre la façon dont les mères et les pères chantent des chansons à leurs bébés. Au cours de l’expérience 1, des auditeurs novices ont évalué le style joyeux ou apaisant de deux versions de la même chanson chantées par 15 mères et 13 pères. Dans une première version, les parents chantaient directement au bébé, tandis que dans la deuxième, ils tentaient de reproduire, en l’absence du bébé cette fois, ce qu’ils lui chantaient normalement. Les exécutions en présence du bébé ont été jugées beaucoup plus expressives, plus joyeuses ou plus apaisantes, que celles où le bébé était absent. La façon de chanter des parents, tel qu’il est indiqué dans l’évaluation, différerait en fonction du sexe du chanteur et de celui du bébé. Les mères, comme les pères, chantaient de façon plus joyeuse pour les bébés du même sexe qu’eux que pour les bébés du sexe opposé et cet effet était plus prononcé chez les pères que chez les mères. En fait, les pères chantaient de façon joyeuse à leurs fils et de façon apaisante à leurs filles.

Au cours de l’expérience 2, des auditeurs indépendants ont évalué la façon dont les parents exprimaient les paroles de leurs chansons. Les parents rendaient davantage l’expressivité des paroles (dans un langage adapté au bébé) en présence du bébé. De plus, l’expressivité des mots était plus forte pour les bébés du même sexe que pour les bébés du sexe opposé et cet effet était plus marqué chez les pères que chez les mères. Ces résultats confirment le plus grand attachement des parents pour les bébés du même sexe qu’eux et cette différenciation entre les sexes est plus prononcée chez les pères que chez les mères. Finalement, l’écart entre les choix de chansons des parents et leur façon de chanter renforce davantage une classification fonctionnelle plutôt que nominale des chansons pour bébés.

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Sommaire

Des recherches antérieures ont démontré que lorsqu’un parent chante une chanson pour bébés, il ne le fait pas de la même manière, sur les plans acoustique et perceptuel, si le bébé n’est pas là. L’objectif de la présente étude était d’examiner les différences entre la façon dont les mères et les pères chantent des chansons à leurs bébés. Au cours de l’expérience 1, des auditeurs novices ont évalué le style joyeux ou apaisant de deux versions de la même chanson chantées par 15 mères et 13 pères. Dans une première version, les parents chantaient directement au bébé, tandis que dans la deuxième, ils tentaient de reproduire, en l’absence du bébé cette fois, ce qu’ils lui chantaient normalement. Les exécutions en présence du bébé ont été jugées beaucoup plus expressives, plus joyeuses ou plus apaisantes, que celles où le bébé était absent. La façon de chanter des parents, tel qu’il est indiqué dans l’évaluation, différerait en fonction du sexe du chanteur et de celui du bébé. Les mères, comme les pères, chantaient de façon plus joyeuse pour les bébés du même sexe qu’eux que pour les bébés du sexe opposé et cet effet était plus prononcé chez les pères que chez les mères. En fait, les pères chantaient de façon joyeuse à leurs fils et de façon apaisante à leurs filles.

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