
Singing to Infants: Lullabies and Play Songs*

Sandra E. Trehub
University of Toronto

Laurel Trainor
McMaster University

The ubiquity of songs is at odds with the prevailing view that music has no survival value (e.g., Granit, 1977; Winner, 1982). In particular, the widespread use of songs in child care (Trehub & Schellenberg, 1995) raises questions about their form and function, historically and cross-culturally, and their special link to caregiving. In the present account of singing to infants, we pursue two rather divergent approaches: one descriptive, the other empirical. The descriptive and historical material on songs, which is drawn primarily from anthropological and ethnomusicological sources, provides a context for the limited body of empirical research on songs for infants. Indeed, the descriptive evidence seems to suggest that the practice of singing to infants and many details of song form and style are rooted in ancient traditions that have survived industrialization and urbanization.

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DESCRIPTIVE AND HISTORICAL PERSPECTIVES

Songs in General

Songs are often described as “the natural human means of musical self-expression” (Kennedy, 1994, p. 828). Although there is little agreement about their origin (Dissanayake, 1992; Révész, 1954; Wallaschek, 1893), there is general acknowledgment of their universality. For the greater part of history, songs were transmitted orally from one generation to the next, a situation that still prevails in much of the world. In general, there are few distinct melodies relative to texts, which means that the same melody often appears with numerous texts (Herzog, 1950; List, 1973; Merriam, 1964). Rural Vietnam provides an unusual example of the disparity between melody and textual variety, with thousands of song texts and a mere three dozen melodies (Cong-Huyen-Ton-Nu, 1979). Even more extreme is the situation among the Siriono of Bolivia, where every individual has a unique tune to combine with improvised texts (Netti, 1965).

The language of song texts, like poetic language generally, differs from everyday language “not only in being more formed and patterned, but by using special elaborating devices to increase beauty, memorableness, and effectiveness” (Dissanayake, 1992, p. 113). This language features consonantal and vocalic play, and some autonomy from the bounds of ordinary semantics (Jakobson & Waugh, 1979). Consistent with the oral tradition, such songs are never repeated exactly in successive performances (Lord, 1964).

One of the hallmarks of song texts and oral poetry is repetition (Bowra, 1962; Finnegan, 1977; Lomax, 1968; Wallaschek, 1893), which can occur at the level of phrases (*Three blind mice, three blind mice; Oh my darling, oh my darling, oh my darling Clementine*), words (*Merrily, merrily, merrily, merrily*), syllables (*Baa, baa, black sheep*), final syllables, or rhyme (*Itsy bitsy spider; You do the hokey pokey*), and initial consonants, or alliteration (*Sing a song of sixpence; 99 bottles of beer on the wall, 99 bottles of beer*). These devices for achieving repetition characterize informal song texts generally, not simply those for children. Moreover, the use of foreign or archaic words, freely altered pronunciation, and the addition of nonsense syllables for mellifluous effects (*ee-ay-ee-ay-o*) can result in texts that are at least partly incomprehensible to singer and listener (Bowra, 1962; Firth, 1940; Merriam, 1964; Netti, 1956).

Repetition figures prominently in the melody (Herzog, 1950) as well as the text of folk materials, for example, repeated refrains, musical phrases, and individual notes. At times, such repetition is congruent across text and melody. For example, the repeated words and syllables in *Row, row, row, your boat* and *Baa, baa, black sheep* have their counterpart in repeated notes, just as the repetitions of *Three blind mice* have their counterpart in repeated musical phrases (see Figure 1). In short, repetition, which is the simplest form of elaboration, conveys emphasis or intensity, making ordinary elements especially interesting in their own right (Dissanayake, 1992).

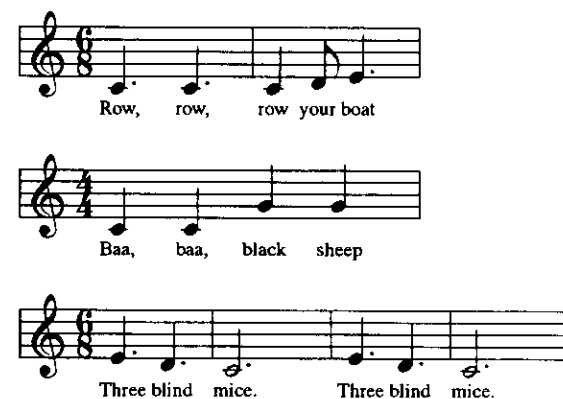


FIGURE 1. In the first two examples, repetitions of words and syllables are matched by repeated notes. In the third example, the repeated verbal phrase is matched by a repeated musical phrase.

Singing in pre-literate cultures is almost invariably accompanied by rhythmic movement, such as dancing, beating a drum, shaking a rattle, patting a child, or the repetitive actions of work (Bowra, 1962; Densmore, 1926; Keil, 1979). For example, Tiv sawyers in Nigeria sing while they fell trees in the forest, their synchronous singing and breathing coordinating the repetitive motions of pushing and pulling the saw (Keil, 1979). Suliteanu (1979) interprets preschoolers' inability to sing without moving as evidence of a natural connection between movement and song.

In contemporary urban societies, adults' exposure to songs comes primarily from leisurely listening to pre-recorded materials and secondarily from occasional attendance at concerts or “live” performances. Beyond these deliberate listening experiences, incidental, often unwelcome, exposure can occur in the course of dental visits, elevator rides, and the like. By contrast, adults' production of songs occurs in rather different contexts—child care (e.g., lullabies, play songs), ceremonial events (e.g., birthday songs, national anthems), religious gatherings (e.g., hymns), and private, self-care activities (e.g., singing in the shower). Thus, except for a small number of committed music-makers and for caregivers of young children, adults in modern industrial societies devote relatively little of their time to singing, generally considering it of trivial significance. By contrast, children in urban as well as rural contexts and in industrial as well as pre-industrial societies make extensive use of chant and song in their solitary and communal activities (Blacking, 1967; Davidson, McKernon, & Gardner, 1981; Dowling, 1984; Moorhead & Pond, 1978).

For adults in pre-industrial societies, music-making in general (singing in par-

ticular) has always been an integral part of work and play, being inseparable from activities such as dance and religious ritual (Firth, 1961; Storr, 1992). At times, songs have served as a repository of knowledge and social customs, as in the depiction of territory boundaries and family histories in Australian aboriginal songs (Chatwin, 1987). A common belief is that singing is a potent means of making good things happen to friends and bad things to enemies (Densmore, 1926; Strehlow, 1971). In effect, songs can become strategic means of coping with the vagaries of life.

Instead of being "art for its own sake," songs are viewed as practical but valued possessions whose security may be entrusted to shamans or elders (Densmore, 1926; Strehlow, 1971). The learning of songs is often motivated by belief in their ancestral or mystical origins and their consequent magical efficacy (Densmore, 1926; Merriam, 1964; Strehlow, 1971; Walker, 1990). The value accorded to song is apparent in various legends, including one from the Mbuti Pygmies about the most beautiful song in the forest. A boy hears an eerily beautiful song, finds the bird that sings it, and brings the bird home to feed it. The boy's father, despite being annoyed at wasting food and time on the bird, responds to his son's pleas and feeds it. The same thing happens the next day, further angering the father, who still complies. On the third day, the father sends his son away and kills the bird, but killing the bird and its song results in the father being struck dead himself (Turnbull, 1962, pp. 82–83).

Song Style: Psychological Distance Between Performer and Listener

In a comprehensive analysis of songs from over 200 cultures, Lomax (1968) describes two common types of performance. One of these, choral or group singing, involves melodically and metrically simple materials, fostering ease of learning and performance for all members of a community. Group performances generally involve singing with an unornamented style and slurred enunciation, perhaps because listeners and singers are familiar with the texts. This "group-involving" style of performance characterizes highly integrated societies such as the Pygmies and Bushmen of Africa (Lomax, 1968) and spiritual contexts such as southern Baptist churches (Pantaleoni, 1985). Such singing is thought to dissolve boundaries between the self and others, promoting feelings of transcendence (Zuckermandl, 1973). The other performance type, solo singing, is "group-dominating" rather than group-involving (Lomax, 1968). On the whole, solo songs are textually and metrically complex, ornamented, highly stylized, and precisely enunciated. Although solo singing is seen, to some extent, in many cultures, it is most characteristic of the complex civilizations of Western Europe, North America, and the Orient. Exceptions to this general description are solitary work songs, sometimes with a non-human audience (Deng, 1973), which provide insight into the singer's representation of the self and the world (Finnegan, 1977). Some societies, including the Maroons of the Suriname rain forest (Price & Price,

1980), have a hybrid song style that involves alternation between a soloist and responsive chorus (i.e., antiphonal singing).

Pantaleoni (1985), for whom music is a celebration of identity, considers the range of psychological distance between performer and audience to generate a corresponding range of musical styles. Music performed for the most intimately related audience is considered "folk music," in contrast to music for distantly related audiences, which is considered "popular music." For Pantaleoni (1985), "art music," which is marked by great psychological distance between audience and performer, is simply a species of popular music. The apparent differences between art music and other music do not stem from the "artistic" stature of the former, but rather from its historical links to the upper classes.

Song Texts

The earliest songs are believed to have featured tunes combined with unintelligible sounds (Booth, 1981; Bowra, 1962), examples of which are still evident among the Yamana of Tierra del Fuego.

The vocables *hau-a la-mas ke-te-sa hau-a la-mas ke-te-sa* (Bowra, 1962, p. 58) are not only unintelligible, but they also fail to exemplify Yamana phonology or that of any South American language. Nevertheless, the text is uniquely tied to a particular tune; together they express a vague mood, if not a particular meaning. In fact, all Yamana songs are characterized by sequences of untranslatable vocables that are fused with distinct tunes. Some American Indian songs also have entire texts that are meaningless, being analogous, perhaps, to instrumental music (Nettl, 1965).

Meaningful words were eventually substituted for meaningless vocables—a move in the direction of poetry (Bowra, 1962). Many early songs, some of which are still found in contemporary hunting–gathering societies, consist of a single line, which can be repeated, as necessary. An aboriginal children's song from South Australia has the one-line form: *kandanga daruarungu manangga gilbanga*, which translates as *star falling at night-time; go away* (Harney & Elkin, 1949, p. 15). Further developments in song involved the accumulation of independent lines that initially had no fixed order but were ultimately organized into cohesive verses or stanzas (Bowra, 1962). On the whole, however, songs in pre-industrial societies are short (Nettl, 1965; Wallaschek, 1893).

Song Functions

Singing reduces the apparent difficulty of physical labor by coordinating vocal and non-vocal movements (Keil, 1979), keeps hardship at bay with magical charms (Strehlow, 1971), and serves as a repository of cultural knowledge (Chatwin, 1987). Songs can also enhance the solidarity of a community by fostering identification between singer and audience (Booth, 1981; Pantaleoni, 1985), by reiterating cherished values and ideals, and by marking significant rites of passage (Finnegan, 1977;

Lomax, 1968; McCosker, 1974). For example, Pygmies in the rainforests of Gabon celebrate the arrival of a baby boy with a song such as the following:

*A man child is born,
A man child is born.
May he live and be beautiful.
A man child is born.
May he become very, very old.
Joy, joy, praise, praise!
Ngongonabarata, know it, is his name.* (Trilles, 1931, p. 372)

Singing also figures prominently in routine child care across cultures, with mothers often expressing hopeful expectations for their child's health and success (Bowra, 1962). In the following Pygmy lullaby, the mother combines hopes for her child's ascendancy with wistful allusions to her own decline:

*Sleep, sleep, little one, close your eyes, sleep little one!
The night comes down, the hour has come, tomorrow it will be day.
Sleep, sleep, little one! On your closed eyes day has fled.
You are warm. You have drunk, sleep, sleep, little one!
Sleep, tomorrow you will be big, you will be strong.
Sleep, tomorrow you will take the bow and the knife.
Sleep, you will be strong, you will be straight, and I bent.
Sleep, tomorrow it is you, but it is mother always.* (Trilles, 1931, p. 343)

According to the African Basongye, the act of music-making generates feelings of happiness or well-being even though the occasion for singing—a funeral, for example—may be unhappy (Merriam, 1964). In rural Vietnam, songs ease the pain of work and relieve the pressures of daily life (Cong-Huyen-Ton-Nu, 1979). Thus, singing may have secondary rewards for the singer regardless of its primary purpose. For Tiv men and women, song and dance affirm life; negate death and evil; and demonstrate the solidarity, strength, and discipline of participants (Keil, 1979).

Singing songs also provides a socially acceptable means of venting hostility and airing grievances, making it possible to say what may otherwise be "unsayable" (Bascom, 1954; Finnegan, 1977; Merriam, 1964). Historically, disputes in the Arctic were often resolved by singing rather than fighting. The warring parties competed with songs of ridicule, their audience functioning as an informal court (Driver, 1975). Dinka pastoralists of the Sudan also institutionalized insult songs (Deng, 1973). Protest songs of slaves, prisoners, and oppressed minorities may function as a rallying cry in some circumstances and as a safe emotional outlet in others. Such songs provide opportunities for expressing complaints or concerns without disturbing the social order (Finnegan, 1977). "Counter-culture" songs and "rap" may continue to fulfill similar functions for contemporary performers, their audiences, and society at large. These songs of protest and complaint can transform

experiences that are painful or undesirable into objects of art and sources of pride (Deng, 1973, p. 79).

Finally, the didactic function of some songs is of particular importance in preliterate societies or those with low levels of literacy. Rhymed texts set to simple, rhythmic melodies facilitate memorization and information transmission across generations. For example, a number of Vietnamese agricultural songs provide detailed instructions for planting and harvesting a variety of crops (Cong-Huyen-Ton-Nu, 1979).

Lullabies

On the basis of the foregoing review, songs would have much to offer as potential tools in the service of child care. In principle, at least, singing could ease the physical burdens of caregiving and foster feelings of emotional well-being, as it does for laborers everywhere (Keil, 1979; Merriam, 1964). It could provide a medium for expressing positive and negative feelings in protected and unconstrained circumstances (Bascom, 1954). The performance of songs could also be used to enhance the relationship between adult performer and child audience (Pantaleoni, 1985; Zuckerkandl, 1973). By selecting texts with important cultural information or values (Cong-Huyen-Ton-Nu, 1979), caregivers could capitalize on the didactic potential of songs. Finally, the simple, repetitive forms that characterize informal song would be especially suitable for untrained singers in the course of caregiving tasks.

It is generally acknowledged that lullabies are songs for soothing infants or promoting sleep. What is much less clear is whether the defining features of lullabies are in the text (i.e., words relating to soothing or sleep), melody (i.e., melodic and rhythmic forms consistent with soothing or sleeping), performance style (i.e., a lulling manner), or all of these. In practice, however, texts seem to play the largest role in lullaby classification. Accordingly, "Rockabye Baby" and "Hush Little Baby, Don't Say a Word" would qualify as lullabies, but "Amazing Grace," despite its soothing character, would not. A functional or contextual definition (Hawes, 1974), by contrast, would only require that the song in question be used for purposes of soothing or sleep induction. According to that criterion, "Seventy-six Trombones" could conceivably qualify as a lullaby. Indeed, the usual convention of classifying lullabies by lexical content seems peculiar in view of the incomprehensibility of the text to most lullaby listeners.

Although all societies have a distinct genre of musical materials for pacifying infants, it is not uncommon for other songs to be adapted for this purpose (e.g., Hilger, 1952). In general, however, lullabies have simple rhythms (Hawes, 1974) that are related to the accompanying movements of the singer, whether rocking, swaying, or patting (Ayres, 1973). With the exception of the developed world, music-making and music-listening are motor events as well as sonic events (Baily, 1985; Kubik, 1979). Even in the developed world, lullabies are experienced as patterns of movement as well as patterns of sound by their audience and their performers.

There is evidence of preferred sound patterns in lullabies. Humming (Hawes, 1974), nonsense syllables (Brown, 1980; Sakata, 1987), and onomatopoeia (Cass-Beggs & Cass-Beggs, 1969; Curtis, 1921) figure prominently in lullaby performances across cultures, whether or not such devices appear in the "standard" versions of such songs. Although nonsense syllables are infrequent in North American lullabies, many North American mothers generate comparable mellifluous effects by replacing some of the words with nonsense syllables (Hawes, 1974). Accordingly, reduplicated sounds like *loo-loo*, *lo-lo*, *la-la*, *na-na*, *ne-ne*, *bo-bo*, and *do-do* and diminutives (e.g. *doggie*) appear in the lullaby performances of many cultures (Brakeley, 1950; Brown, 1980; Cass-Beggs & Cass-Beggs, 1969; Finnegan, 1977). Such reduplication is thought to augment the form and meaning of words, in a sense, "italicizing" them (Jakobson & Waugh, 1979, p. 177).

Lullabies are highly repetitive in terms of their individual sounds, words, verbal and melodic phrases, and rhythms (Cong-Huyen-Ton-Nu, 1979; McCosker, 1974; Sakata, 1987; Sands & Sekaquaptewa, 1978). Presumably, the redundant form and content of lullabies facilitate their acquisition and subsequent use in the course of child care. Perhaps the apparent complexity of some North American lullabies stems from analyses of notated or professionally performed versions, which can deviate substantially from the typical performances of caregivers (Hawes, 1974). Nevertheless, cross-cultural differences in the nature and extent of lullaby singing may arise from differences in child care and sleeping practices. For example, infants in most parts of the world sleep alongside their mother (Barry & Paxson, 1971; Morelli, Rogoff, Oppenheim, & Goldsmith, 1992), in contrast to North America where infants and mothers tend to occupy separate beds and rooms.

Lullabies, even those in contemporary use, are similar in many respects to the songs of pre-literate societies, perhaps because lullabies are more stable over time compared to other song forms (Herzog, 1950), or perhaps because the contexts of child care are more stable than other aspects of community life. In contemporary literate societies, lullabies, like other songs, are transmitted orally for the most part. The traditional form of transmission, person-to-person, has been replaced by transmission via recordings.

Lullaby: Work Song, Love Song, Magical Charm, or Emotional Outlet?

If caring for infants is parents' or caregivers' work, and soothing infants and coaxing them to sleep is part of that work, then lullabies can be considered work songs. "A mother who sings some of the comically mean things in lullabies resembles a captive laborer venting spleen at the taskmaster" (Booth, 1981, p. 199). Lullabies have aspects in common with solitary rather than communal work songs, even though the former songs have no human audience. Perhaps the noncomprehending infant audience fills the role occupied by the cherished oxen who witness Dinka solo performances (Finnegan, 1977).

Many lullabies extol the virtues of the infant and can be considered songs of praise and love, as in the following Japanese example:

*My boy is a good child, sleep.
This child's cuteness is limitless.
In the mountain, as much as trees and thatches.
In the sky, as much as stars.
In Numazu, (as much as) one thousand pine trees.
One thousand pine-tree fields and small pine-tree fields.
Cuter than the number of pine leaves. (Usuda, 1978, p. 42)*

Other lullabies intersperse endearments with tranquil images, as in the following Nigerian example:

*Sleep my baby near to me
Lu, lu, lu, lu, lu, lu
Close your velvet eyes.
Far away in their nest
Baby birds flutter down to rest,
High in the trees far from harm
Tiny monkey sleeps
Deep in his mother's arms. (Cass-Beggs & Cass-Beggs, 1969, p. 98)*

Lullabies have also been likened to magical charms and incantations (Farber, 1990; Ikegami, 1986). According to Ikegami (1986), the lullaby singer acts as magician or conjurer when attempting to achieve infant sleep by chanting a particular text. In some instances, she promises gifts in return for falling asleep, as in the following Japanese lullaby:

*Sleep, little one, sleep!
What shall I give to you if you sleep?
A red dress and a pair of red shoes,
And a doll that you'll like. (Ikegami, 1986, p. 99)*

In others, she utters threats, usually in a jocular manner:

*Owls, owls, big owls and little,
Staring, glaring, eyeing each other;
Children, from your cradle-boards, oh see!
Now the owls are looking at you, looking at you;
Saying, "Any crying child, Yellow-Eyes will eat him up."
Saying, "Any naughty child, Yellow-Eyes will eat him up." (Curtis, 1921, p. 557)*

Threat lullabies are sometimes sung half-seriously, especially when the servant caregivers could be punished for the infant's failure to fall asleep.

Sleep, little one, sleep!
If not, I'll throw you into the river.
Sleep, little one, sleep.
If not, I'll build your tomb. (Ikegami, 1986, p. 105)

In all instances, however, the caregiver attempts to influence the noncomprehending infant by her sung verbal formulas. In so doing, she assumes the role of magician.

Farber (1990) describes Babylonian and Assyrian lullabies from the first millennium B.C. as incantations for quieting a baby. The baby's crying not only disturbs the parents, but also the gods of heaven—Ea and Antu:

Baby who made his father nervous, made tears fill the eyes of his mother....
caused Ea to awake....
His mother is weeping and Antu in heaven is in tears. (Farber, 1990, p. 145)

Parents then, like parents now, yearned for peace and quiet in the household.

May his father be able to lie down again, finish his sleep;
May his mother, who has so much to do, be able to finish her work! (Farber, 1990, p. 145)

The use of lullabies as incantations does not imply that crying on the part of babies was regarded as demonic. Magical solutions were sought not only for evil situations but also for a wide range of ordinary difficulties.

When studying archival field recordings, transcriptions, or descriptions, especially those from unfamiliar cultures, it is impossible to gauge the extent of improvisation that any singer might bring to the text or melody. Field recordings by one of the authors (Trehub) in an isolated agricultural village (Southwestern Turkey, September, 1995) confirm that lullabies provide, among other things, a safe outlet for the singer's personal difficulties. In one family, the mother of a newborn and a toddler, upset by her husband's temporary absence, was unable to complain to other villagers because of the local custom of living in her husband's community (at a considerable distance from her own village of origin). Out of earshot of in-laws, neighbors, or anyone else who would understand her words, the mother sang a simple, soothing melody to her toddler, her manner of singing exemplifying warmth and love. Subsequent translation revealed considerable textual improvisation:

Sleep my child, sleep, sleep.
Sleep my daughter, sleep.
My daughter is mad at her father.
Her father left my daughter and ran away.
When her father comes,
Let us say to him, "go away,"
Let us say to him, "don't come near us, go away."

My daughter, my good little daughter, will go to sleep.
Come on, my child.
Come on, my daughter, lie down.
Sleep, sleep.
Let us sleep and grow.
Let her become a good daughter.
Let her become a good child.
Let her not upset her mother.
Let her love her mother.
Let her not love her father.
He deserted her and ran away.
Come on, my child, sleep.
Come on, close, close your eyes.
Don't open them. (S. Karabas, translator, 1995)

The presence of a noncomprehending listener—but a listener, nonetheless—allowed the mother to release her feelings of discontent, illustrating an important function of traditional oral expression in general (Bascom, 1954) and of lullabies in particular (Masuyama, 1989).

Play Songs

In contrast to lullabies, whose principal goal is to soothe infants, play songs are designed "to amuse the child when he is awake by lifting him up in the arms, playing with his fingers and palms, tickling him, moving his hands and feet, teaching basic body movements" (Suliteanu, 1979, p. 205). According to Suliteanu and others, the singing of play songs begins later in the infant's development than that of lullabies, but continues long after lullaby singing has ceased until the child's own repertoire of songs is firmly in place (Suliteanu, 1979).

Songs like "Old Macdonald Had a Farm," "The Wheels of the Bus," and "Frère Jacques" are Western examples of this genre. Many play songs are simpler and more repetitive than lullabies, making it possible for young children to acquire them soon after they have begun to speak. Unlike the quiet and soothing manner of lullaby singing, play songs are generally given lively and exuberant performances, which might include clapping or foot stamping to highlight the beat or pulse of the music. At times, the singer's movements dramatize the text (*The people on the bus go up and down*), encouraging participation (*If you're happy and you know it, clap your hands; Bow, bow, bow; Belinda*). Instead of the sustained vowels that characterize lullabies, play song texts feature sound play of various types including rhyme, alliteration, and repetition (*Miss Polly had a dolly who was sick, sick, sick; Skinna-marinky, dinky, dink; Skinna-marinky doo*). The text may be serious, transmitting important legends and societal expectations (Kartomi, 1980). Pedagogical goals may be evident, as in songs that feature the alphabet (*A, B, C, D, E, F, G*) or counting routines (*One little, two little, three little Indians*). Although few children acquire the lullabies that are

sung to them, most children sooner or later sing play songs together with their parents, and eventually sing play songs on their own.

The relative dearth of descriptive material about play songs may reflect their limited use in child care or, perhaps, differences in classification across cultures. For example, the Japanese term *komori-uta* can be translated as "caregiving song," combining *komori*, which means "to protect and raise young children" (or "the person who carries out such actions") and *uta*, or "song" (Adachi, personal communication, July 4, 1996; Migita, 1991). Migita (1991, p. 90) divides caregiving songs for infants into four subcategories: (1) "humoring" songs, or *asobase-uta*, (2) "directly make-sleeping" lullabies, or *nesase-uta*, (3) "indirectly make-sleeping" lullabies, and (4) "nurse-children's" (child-nanny's) songs, or *moriko-uta*, subdividing them further into more specific functional categories (see Table 1). As can be seen in Table 1, some of the "indirectly make-sleeping" lullabies, for example, the "word-playing" or "story-telling" lullabies, may be closer to our play songs than to our lullabies. Nevertheless, such songs often have sleeping as a secondary goal. "Training" (involving physical or intellectual education) and "game" songs as well as "child-nanny game-songs" seem like more straightforward instances of play songs. Nevertheless, *komori-uta* is often translated as "lullaby," potentially obscuring the different forms and functions of these song subcategories. Similarly, Cordes (1996) categorizes lullabies across cultures into those that are soothing, animating, and occasionally rejecting. Her reference to "lullabies of the playsong type" highlights the problems of classification and cross-cultural comparisons.

Our cursory description of lullabies indicates that they do not fit into the performance categories outlined by Lomax (1968) or Pantaleoni (1985). On the one hand, lullabies share the emotional and cohesive nature of group songs from oral cultures, particularly their informal manner of performance (Lomax, 1968), minimal psychological distance between performer and audience (Pantaleoni, 1985), identification of singer and audience (Booth, 1981), dissolution of personal boundaries (Zuckermandl, 1973), and presentation of ritualized praise (Cass-Beggs & Cass-Beggs, 1969; Usuda, 1978) or complaint (Masuyama, 1989; Spitz, 1979). On the other hand, lullabies, as solo songs for solo audiences, have the potential for much more personal, individual-

TABLE 1.
Japanese Caregiving Songs*

Song Types			
Humoring	Directly make-sleeping	Indirectly make-sleeping	Nanny's Songs
1. training songs	1. repeating lullabies	1. family lullabies	1. sighing lullabies
2. game songs	2. guarding lullabies	2. story-telling lullabies	2. opposing lullabies
	3. praising lullabies	3. lyric lullabies	3. nanny's game songs
	4. rewarding lullabies	4. word-playing lullabies	
	5. threatening lullabies	5. monolog lullabies	
	6. reasoning lullabies		

* Taken from Migita, 1991. Used with permission.

ized commentary and improvisation than is possible in group contexts. Feelings of the moment—positive, negative, or ambivalent—can be expressed by means of freely improvised text and performance. Thus, singing a lullaby can reinforce and communicate positive feelings for a particular infant, not merely for infants in general. Such singing can also function cathartically, reducing the impact of negative feelings about the infant or about other aspects of the caregiver's life.

Similarly, play songs do not fit neatly into established performance categories. In fact, the performance style of play songs changes as the infant develops (Trehub & Schellenberg, 1995). In the early months of life, singers of play songs function, in part, as solo entertainers, optimizing infant arousal by means of their individualized performances. Later in the first year, the caregiver attempts to engage the infant in responsive actions during her performance. Once the infant begins to talk, performances often take on an antiphonal (call and response) character, with the singer pausing periodically to allow the infant to contribute key words or sounds. At this point, the caregiver's goals may be instructional as well as playful. Once the child masters the basic elements of songs, caregiver and child sing jointly in the choral style. Eventually, the child sings solo (while playing alone) or together with other children. In short, play songs alter their form and function over time, beginning as intimate solo songs, then becoming antiphonal songs en route to their subsequent status as group or choral songs.

Although play songs do not exhibit the stability of form and function that characterize lullabies, they may be of greater importance as vehicles of enculturation. Play songs provide joyous transitions from the protected world of intimate solo songs to the wider world of interpersonal games, animals, inanimate objects, numbers, letters, as well as particular rituals of the culture in question (Trehub & Schellenberg, 1995). Adults' singing of play songs may also pave the way to the child-created genre of play songs that are sung or chanted in playgrounds the world over (Kartomi, 1980; Opie & Opie, 1960).

EMPIRICAL PERSPECTIVES

Singing to Infants in Everyday Contexts

The North American urban lifestyle has likely altered many aspects of child care including the incidence and contexts of singing to infants. To gain insight into informal singing to infants, we had 67 families complete a one-day diary, recording all instances of singing to their infant, noting the singer, the song, and the context of singing (Trehub, Unyk, Kamenetsky, Hill, Trainor, Henderson, & Saraza, 1997). In the overwhelming majority of instances (74%), it was mothers who did the singing, followed by fathers (14%), siblings (8%), and others (4%). The various song types and singing contexts are shown in Figure 2. It would seem that play songs were overwhelmingly the songs of choice (64%), with lullabies occurring much less frequently (11%). Singing occurred not only in play situations (36%), however, but also in the

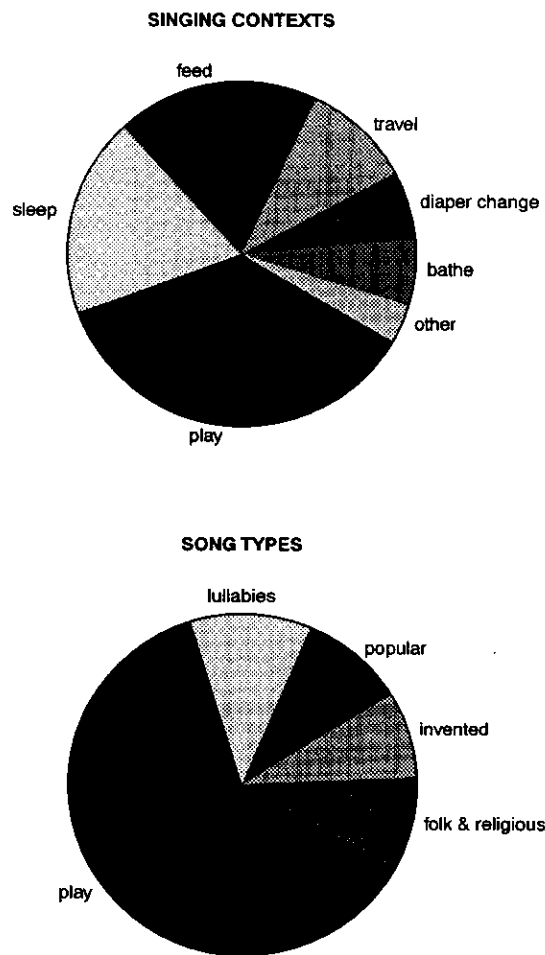


FIGURE 2. Upper panel: caregiving contexts of singing to infants. Lower panel: types of songs sung to infants.

course of routine care such as feeding (19%), diaper changing (6%), and bathing (6%), as well as during car travel (10%).

The diary findings seem to indicate that our family singing practices differ markedly from those of other cultures. Elsewhere, lullabies are the songs of choice from earliest infancy, with play songs being used infrequently, if at all, until the toddler period (Densmore, 1929; Suliteanu, 1979). The cross-cultural disparity in the style and contexts of singing to infants may reflect non-Western practices of care-

givers remaining with infants as they fall asleep (Barry & Paxson, 1971; Morelli et al., 1992; Super & Harkness, 1986) as well as their preferences for soothing over arousing adult-infant interactions (Caudill & Weinstein, 1969; Toda, Fogel, & Kawai, 1990). Indeed, the distribution of soothing and arousing songs to infants in the East and West may parallel the relative incidence of soothing and arousing speech across these cultures (Toda et al., 1990; Trehub, Trainor, & Unyk, 1993).

Speech to Infants

Not only do parents sing to their infants, they also produce highly stereotyped forms of speech (see Cooper, 1993; Fernald, 1991, 1992; Papoušek, Papoušek, & Bornstein, 1985). In essence, the infant-directed speech register is characterized by higher pitch, increased pitch range, simpler pitch contours, shorter utterances, longer pauses, and greater rhythmicity compared to speech typically directed to adults. Moreover, these differences are apparent in a wide range of languages (e.g., Ferguson, 1964; Fernald et al., 1989; Grieser & Kuhl, 1988; Papoušek, Papoušek, & Symmes, 1991), implying that such modifications are effected intuitively. One consequence of these modifications is that infant-directed speech is much more musical than speech directed to adults. Indeed, typical infant-directed utterances have a sing-song quality that sets them apart from other utterances, so that they approach the formulaic expressions of oral poetry (Finnegan, 1977; Lord, 1964).

There is evidence, moreover, of crude comprehension on the part of infants. For example, infants respond in affectively appropriate ways to infant-directed expressions of approval and disapproval (Fernald, 1993; Papoušek, Bornstein, Nuzzo, Papoušek, & Symmes, 1990). They also show affective preferences for infant-directed compared to adult-directed speech (Werker & McLeod, 1989). From as early as the newborn period (Cooper & Aslin, 1990) and continuing thereafter (Fernald, 1985; Kaplan, Goldstein, Huckleby, & Cooper, 1995; Pegg, Werker & McLeod, 1992; Werker, Pegg, & McLeod, 1994), utterances in the infant-directed register have clear effects on infant attention and arousal.

The acoustic features that underlie such differential responsiveness may differ somewhat from early to later infancy. For 4-month-old infants, the pitch contours of infant-directed speech seem to be primary (Fernald & Kuhl, 1987; Papoušek et al., 1990; but see Colombo, 1985; Colombo & Horowitz, 1986). For younger infants, however, various features of infant-directed speech may act in concert to promote optimal attention and arousal, isolated features (e.g., fundamental frequency) being much less effective in this regard (Cooper & Aslin, 1994; Kaplan, Goldstein, Huckleby, Owren, & Cooper, 1995). According to Fernald (1992), infants are biologically disposed to attend to the pitch contours of speech, having primitive access to their meanings. Cooper (1997) disputes the notion of biological dispositions, contending, instead, that infants simply respond to signals with highly contrastive elements, infant-directed speech being one example. She claims, moreover, that over the first few months, infants learn the meanings of maternal signals by associating par-

ticular intonation contours with the regular contexts in which they occur. If infants, in the early days and weeks of life, can learn to recognize global features of their native language (Moon, Cooper, & Fifer, 1993; Mehler et al., 1988), their mother's voice (DeCasper & Fifer, 1980; Mehler et al., 1988), and the odor of her body and breast milk (Cernoch & Porter, 1985; Macfarlane, 1975), then they may well be capable of learning the affective meanings of a few stereotyped intonation contours. Nevertheless, the notion of intrinsic meanings in mothers' pitch contours (Fernald, 1992, 1993) receives support from cross-cultural similarities in the mapping of prosody to emotional meaning in infant-directed (Fernald et al., 1989; Grieser & Kuhl, 1988; Papoušek et al., 1991; Werker et al., 1994) and adult-directed (Frick, 1985; Krauss, Curran, & Ferleger, 1983; Williams & Stevens, 1972) speech.

Perceptual Distinctiveness of Lullabies

Just as there is a special register for speaking to infants across cultures, one that is marked by similarities as well as differences cross-culturally (Fernald et al., 1989; Grieser & Kuhl, 1988; Papoušek & Hwang, 1991; Shute & Wheldall, 1989), so is there a musical genre—lullabies—for soothing or encouraging sleep in infant listeners (Trehub & Schellenberg, 1995). Nevertheless, the existence of a nominal and functional category would not guarantee the perceptual distinctiveness of lullabies, especially across cultures. We know, for example, that child care practices and attitudes toward children differ greatly across cultures (Barry & Paxson, 1971) and that musical systems across cultures are often described as being more different than similar (Dowling & Harwood, 1986; Harwood, 1976; McAllester, 1971; Pantaleoni, 1985; Sloboda, 1985).

To ascertain whether unfamiliar lullabies are distinguishable from non-lullabies, we collected field recordings of foreign lullabies from several regions of the world, including South America, Europe, and the Middle East (Trehub, Unyk, & Trainor, 1993a). Each lullaby was matched with a non-lullaby from the same culture that was similar in tempo and musical style. Then we had adult listeners judge which song in each pair (lullaby and non-lullaby from each culture) was the lullaby. Adults performed above chance levels on the task, indicating that lullabies constitute a perceptually distinct class across cultures. On the one hand, the relatively modest performance levels, 63% correct, would seem to imply that there are important cross-cultural differences as well as similarities. On the other hand, the matching of tempo across song categories may have unduly constrained the range of adult comparison songs, obscuring one of the principal features of a lullaby—its slow tempo. Adult songs with comparably slow tempo are likely to be laments and other soothing songs, which may well be confusable with soothing songs for infants. Thus, we may have underestimated the perceptual distinctiveness of lullabies relative to non-lullabies in general.

Because lullabies have a greater incidence of simple, reduplicated syllables and onomatopoeia than do other songs, we had to be sure that these features were not

responsible for the apparent identification of lullabies. Accordingly, we electronically filtered all songs to exclude frequencies above 500 Hz, which made the words indistinguishable while maintaining the pitch contours, timing, and some of the voice quality. Under such conditions, adults still distinguished the lullabies from the non-lullabies (Trehub et al., 1993a). They were unable to do so, however, with synthesized instrumental renditions in which ornaments (e.g., trills, glides) were excluded and intervals altered to fit the Western chromatic scale (division of the octave into 12 semitones). Listeners' failure to distinguish the synthesized instrumental versions may indicate the role of vocal timbre or "tone of voice" in lullaby identification.

What was it about the sung lullabies that allowed listeners to distinguish them from the non-lullabies? A further study sheds some light on this question. We presented the same song pairs to other adult listeners, asking them to judge which song was structurally simpler (Unyk, Trehub, Trainor, & Schellenberg, 1992). On the whole, adults chose the lullaby as the simpler song (without knowing it was a lullaby, of course). Interestingly, the songs with the highest simplicity ratings had been most readily identified as lullabies. An analysis of all lullaby transcriptions failed to reveal common features such as number of different pitches and pitch range. What it did reveal, however, was that listeners' identification of lullabies was influenced by a preponderance of pitch contours that were smooth (i.e., few pitch directional changes) and descending. In other words, simplicity in general and falling contours in particular, which exemplify soothing speech to infants (Fernald, 1989; Papoušek et al., 1991), seem to be part of adults' lullaby prototype (Trehub & Unyk, 1991).

We pursued another means of searching for common structure in lullabies, using native North American songs collected early in this century from BC Indian, Chippewa, Menominee, Nootka, Teton, Sioux, and Yuman communities (Trehub, Unyk, Schellenberg, & Kamenetsky, in preparation). On the basis of available transcriptions (e.g., Densmore, 1926, 1972a, 1972b), we synthesized (with instrumental timbre) 81 songs of different types including adult songs, children's play songs, love songs, lullabies, men's songs, and women's songs. Pairs of these songs were presented to adults, who were required to identify the lullaby in each pair (when matched with songs from one of the other categories) or to identify another song type (e.g., love song). Adults successfully distinguished lullabies from all categories except for love songs. Moreover, love songs were also distinguishable from other adult songs and from children's play songs. In short, successful classification of instrumental lullabies and love songs implies that these songs are structurally distinct from other song types across several Native American cultures. Moreover, naive listeners' confusion of traditional Native American lullabies and love songs may imply that these songs are more emotionally expressive than other song types. Alternatively, lullabies may function, in part, as love songs for singers and/or listeners. If problems of lullaby classification across cultures could be resolved, then lullabies might emerge as distinct from all other song categories including love songs.

Distinctive Performances for Infants: Mothers, Siblings, and Fathers

Is there a distinctive performance style as well as a repertoire of songs for infants? To explore this issue, we recorded English-speaking mothers as they sang a song of their choice in two different contexts: once directly to their infant and once in their infant's absence (Trehub, Unyk, & Trainor, 1993b, Experiment 1). Adults who listened to pairs of these recordings were highly accurate (91% correct) at identifying the version that had been sung to an infant. Comparable recordings of Hindi-speaking mothers (Trehub et al., 1993b, Experiment 2) resulted in significantly lower performance both by Hindi-speaking judges (71% correct) and by English-speaking judges (57% correct, but still above chance levels). For the most part, Hindi-speaking mothers sang lullabies and religious songs with slow tempo and in a soothing style, in contrast to English-speaking mothers, who tended to sing play songs. This choice of song materials parallels cross-cultural differences in the nature of infant-directed speech (Fernald et al., 1989; Grieser & Kuhl, 1988; Papoušek et al., 1991; Toda et al., 1990). If play songs offer more scope for exaggerations of stress, timing, and dynamic range (i.e., variations of loudness) than is the case for slow, soothing songs, that would account for some cross-cultural differences in the identification of infant-directed singing. Although the superior performance of same-culture listeners confirms the role of cultural facilitation, the findings nevertheless indicate that infant-directed singing is recognizable across cultures and musical systems.

Children as young as 3 years of age also alter their style of performance when singing to their infant siblings (Trehub, Unyk, & Henderson, 1994). Specifically, they sing more slowly and adopt a "smiling" voice in their infant-directed versions, just as mothers do (Trehub et al., 1993b). Children also raise their pitch level in their sung renditions to infants. Thus, young children adjust their songs in some of the same ways that adults adjust their speech to infants (Cooper, 1993; Fernald, 1991). Young children's vocal behavior, along with play routines that they are inclined to use with infants (Whiting & Edwards, 1988), may account for their caregiving role in many cultures (Weisner & Gallimore, 1977).

Do the alterations of performance style in the presence of an infant arise specifically from attempts to engage the infant in interaction? We recorded mothers and fathers who were asked to sing a song exactly as they would if their infant were present (i.e., to simulate their usual performance). We also recorded them singing the same song to their infant (Trehub, Unyk, et al., 1997). Not surprisingly, differences between infant-directed and simulated versions were narrowed considerably under these conditions compared to differences between previous infant-present and infant-absent conditions (Trehub et al., 1993b). Nevertheless, listeners, including those from other cultures, were able to identify the samples sung directly to an infant. The degree to which the singers slowed their tempo and raised their pitch level predicted listeners' accuracy of identifying the infant-directed excerpts ($r = .54$ and $.38$, respectively). Independent listeners who rated the emotional engagement of each singer with the infant listener assigned significantly higher ratings to infant-directed than to simulat-

ed versions. Moreover, rating differences between contexts were highly predictive of identification accuracy ($r = .76$). One can speculate that factors such as the infant's "babyish" face (Sternglanz, Gray, & Murakami, 1977) and voice (Bloom, 1990; Bloom & Lo, 1990) function as innate releasing stimuli (Alley, 1981; Lorenz, 1943), leading to heightened emotional engagement that becomes evident in the caregiver's singing voice. Although mothers and fathers altered their performance in similar ways in the infant's presence, listeners distinguished mothers' infant-directed songs from their simulations (72.7% correct) slightly (but significantly) more accurately than they did for fathers (69.8% correct).

The aforementioned studies of infant-directed singing provide no information about the fine-tuning of these performances for infant listeners. We know, for example, that speech to infants and toddlers differs noticeably as a function of the child's age level (Stern, Spieker, Barnett, & MacKain, 1983). However, maternal utterances in these studies are generally unconstrained so that differences in content and form are necessarily confounded. Bergeson and Trehub (1998) addressed the question of fine-tuning by having mothers sing the same song separately to their infant and preschooler. Naïve adult listeners successfully identified the version sung to infants, confirming the presence of distinctive perceptual features in these contexts. Instrumental analyses revealed that mothers sang at a slower tempo and higher pitch level when performing for their infant than for their preschooler. To accommodate their preschoolers, however, mothers articulated the lyrics more clearly than they did for infants. These findings indicate that mothers alter their sung performances in accordance with the perceived needs of their audience.

Emotional Expression in Infant-Directed Performances

Listeners rate infant-directed performances as more emotionally engaging (Trehub, Unyk, et al., 1997) and more loving (Trainor, 1996) than infant-absent performances. To gain further insight into parents' performance style, we obtained additional ratings and instrumental measurements of mothers' and fathers' songs (Trehub, Hill, & Kamenetsky, 1997b). Parents' infant-directed performances were rated as more expressive—either more playful or more soothing—than their simulations. Baby talk pronunciation (Malsheen, 1980), which was used more extensively in infant-directed versions than in simulations, was also associated with more expressive performances, whether playful or soothing.

Both parents sang more playfully for same-sex than for opposite-sex infants, this pattern being especially striking for fathers. For example, fathers tended to sing in a playful manner to their infant sons and in a soothing manner to their infant daughters. What was especially noteworthy, however, was the means by which both parents achieved their playful and soothing performances. Independent ratings of the performing style and lyrics (i.e., how playful or soothing) indicated that these ratings were highly correlated for mothers ($r = .81$) but not for fathers. In other words, mothers largely chose songs whose lyrics matched their caregiving goals (e.g., play).

Fathers, constrained by limited knowledge of the children's repertoire, sang whatever songs they knew well, whether children's songs (e.g., "Baa Baa Black Sheep") or popular songs (e.g., "Mandy"), transforming them liberally to achieve their expressive intentions. Fathers frequently altered the conventional metrical structure of songs by adding dynamic accents (i.e., stressed syllables), generating more rhythmic versions than otherwise. Fathers' performing strategy is analogous to mothers' increased duration of accented syllables in playful infant-directed performances but not soothing performances (Trainor, Clark, Huntley, & Adams, in press). Fathers' playful performances had more high frequency energy and, presumably, a "brighter" vocal quality than their soothing performances. These instrumental measurements of fathers' performances are consistent with ratings of mothers' playful performances to infants as more brilliant in tone than their soothing performances. The soothing performances are rated as more airy in tone than their playful versions (Trainor & Rock, 1997).

Mothers tended to use more rapid tempo and higher pitch as the primary devices for distinguishing their playful performances from their soothing performances (Trainor & Rock, 1997; Trehub et al., 1997b). When they were free to choose their song and performing style, mothers tended to sing conventional play songs, even for soothing performances (Trehub et al., 1997b). Nevertheless, they tended to reserve songs with word play (e.g., nonsense syllables, diminutives, onomatopoeia), for example, "Skinna-Marink," for their playful performances and those with soothing or neutral words, such as "Twinkle, Twinkle Little Star," for their soothing performances.

Although mothers and fathers used playful and soothing styles of performance equally frequently, only occasionally did they sing classic lullabies (e.g., "Hush Little Baby"). This situation calls into question the usual practice of classifying songs on the basis of text rather than function or performance style. Moreover, it raises questions about our claims of cross-cultural differences in the distribution of play songs and lullabies (e.g., Trehub, Unyk, et al., 1997) because such claims were based on textual rather than performance criteria. Just as fathers' use of popular and folk songs with infants reflects limited knowledge of the children's repertoire, so mothers' use of nominal play songs for soothing renditions may stem from their unfamiliarity with lullabies. Indeed, interviews with mothers indicate that they acquire songs primarily from children's recordings and television programs, which largely feature play songs.

Features of Infant-Directed Performances

By recording several mothers singing the same song with an infant present and absent, we were able to estimate typical differences across contexts. In one study (Trainor, 1996), the songs were sung with the usual words; in another (Trehub, Hill, & Kamenetsky, in preparation), mothers substituted *la, la* for the words of "Twinkle, Twinkle, Little Star." Analysis of the performances revealed that the infant-directed versions were sung at a consistently higher pitch level—in excess of two semitones—

when words were included (Trainor & Adams, under review) but not when they were replaced by nonsense syllables (Trehub, Hill, & Kamenetsky, in preparation). One possibility is that performance differences are simply attenuated in the less familiar version with nonsense syllables. Another possibility is that the low back vowel in the *la-la* syllables relative to high front vowels in conventional songs for infants (e.g., "Twinkle, Twinkle, Little Star") account for pitch differences in the latter but not in the former context (Werker, personal communication, January 29, 1997). In both cases, however, tempo was slower in infant-present than in infant-absent versions. Whether these alterations reflect caregivers' attempts to alter the infant's state or whether they are byproducts of the caregiver's own emotions remains to be determined. In any case, elevated pitch (relative to the singer's usual pitch) should result in a clearer than usual voice quality (Newman & Emanuel, 1991). Moreover, slower tempo should facilitate the perception of such patterns for listeners with limited processing capacity.

Emotional states have correlates in various autonomic and somatic measures, which in turn, affect the vocal musculature (Scherer, 1986). For example, happiness is associated with an expansion of faucal and pharyngeal muscles, resulting in a "wide voice" and greater energy concentration at lower frequencies. Simultaneously, the corners of the mouth might be pulled back in a smile, shortening the vocal tract and raising the formant or resonant frequencies (Tartter, 1980; Tartter & Braun, 1994).

Of the primary emotions studied in adults—anger, joy/happiness/humor, sadness, fear/anxiety, and disgust/hatred/contempt/scorn (Murray & Arnott, 1993)—joy/happiness comes closest to the emotions expressed in playful performances (Trainor et al., 1997). Nevertheless, none of these emotions captures the essence of the feelings expressed in soothing performances. Of the secondary emotions—grief/sorrow, affection/tenderness, sarcasm/irony, and surprise/astonishment—affection/tenderness comes closest. In comparison to neutral speech, the emotion of joy is associated with increased pitch, higher variability in fundamental frequency, increased intensity range, greater energy at high than at low frequencies, and faster tempo; happiness differs in being associated with greater energy at lower frequencies and with slower tempo (Murray & Arnott, 1993; Scherer, 1986). Much less is known about affection/tenderness, but it has been linked to slower tempo (Davitz, 1964; Fonagy & Magdics, 1963), more regular rhythm (Davitz, 1964), and bi-directional pitch changes (see Murray & Arnott, 1993). Moreover, greater emotionality has been associated with increases in the rate of fundamental frequency perturbation, or jitter, and in the rate of intensity perturbation, or shimmer (Bachorowski & Owren, 1995).

The availability of the same song sung by parents in infant-present and infant-absent contexts (Trainor, 1996; Trehub et al., in press; Trehub, Hill, & Kamenetsky, in preparation) made it possible to measure a number of known correlates of emotionality across singing contexts. For the playful songs with words and *la la la* versions of "Twinkle, Twinkle," instrumental measurements revealed increased jitter and shimmer in infant-present compared to infant-absent contexts (Trainor et al., 1997; Trehub, Hill, & Kamenetsky, in preparation), reflecting greater emotionality in

the infant's presence. More variable pitch and increased intensity range also occurred in the infant-present context, which is consistent with expressions of joy. The occurrence of relatively more energy at low frequencies in mothers' infant-directed songs is consistent with the expression of happiness (Trainor et al., 1997). By contrast, increased high frequency energy in fathers' playful performances for infants is consistent with the expression of joy rather than happiness (Trehub et al., 1997b). For versions rated as soothing rather than playful, however, mean pitch and jitter increased and tempo decreased, but shimmer, pitch variability, and intensity variation did not differ across infant-directed and infant-absent contexts (Trainor et al., 1997). These modifications in the soothing versions of infant-directed songs are consistent with the expression of happiness in some respects and with affection/tenderness in others. The lesser change across performance contexts for soothing relative to playful songs lends credence to the view that soothing songs offer less scope for expressive variations (Trehub et al., 1993b).

On the basis of the aforementioned acoustic analyses, it is clear that the vocal qualities that are evident in playful and soothing performances do not correspond to any single adult emotion (Trainor et al., 1997). Instead, playful performances seem to involve some combination of characteristics associated with joy and happiness, whereas soothing performances involve some combination of characteristics associated with happiness and affection/tenderness. These differences in the emotional messages of infant-directed songs are nevertheless consistent with differential classifications and ratings of performances as playful or soothing (Trehub et al., 1997b; Trainor, 1996).

Impact of Infant-Directed Music on its Intended Audience

Adult's successful identification of infant-directed performances (Trainor, 1996; Trehub et al., 1993b; Trehub, Unyk, et al., 1997), the greater emotional expressiveness of such performances (Trehub, Unyk, et al., 1997), and the presence of distinctive acoustic features (Trainor et al., in press; Trehub et al., in press; Trehub, Hill, & Kamenetsky, in preparation) do not ensure that the intended audience perceives the differences and decodes the intended emotion. In principle, at least, infants have the potential to perceive and respond differentially to variations in performance and song type. As noted, they show attentional and affective preferences for infant-directed compared to adult-directed speech (Fernald, 1985; Fernald, 1993; Fernald & Kuhl, 1987; Pegg et al., 1992; Werker & McLeod, 1989), even in an unfamiliar language (Werker et al., 1994). They also show attentional preferences for speech with conventionally timed clauses (Hirsh-Pasek et al., 1987) and phrases (Jusczyk et al., 1992) and for words spoken with conventional stress patterns (Jusczyk, Cutler, & Redanz, 1993). Moreover, they use pitch, duration, and intensity as cues to the segmentation of auditory sequences (Chick & Trainor, 1995; Thorpe & Trehub, 1989; Thorpe, Trehub, Morrongiello, & Bull, 1988; Trainor & Adams, under review).

In musical contexts, infants are sensitive to pitch contours (Ferland & Mendelson,

1989; Trehub, Bull, & Thorpe, 1984; Trehub, Thorpe, & Morrongiello, 1985, 1987), as they are in speech (e.g., Fernald, 1991, 1992; Papoušek et al., 1990). They are also sensitive to the rhythmic organization of tone sequences (Thorpe & Trehub, 1989; Thorpe et al., 1988; Trehub, Hill, & Kamenetsky, 1997; Trehub & Thorpe, 1989), exhibiting attentional preferences for melodies with conventionally timed phrases over those with unconventional timing (Jusczyk & Krumhansl, 1993; Krumhansl & Jusczyk, 1990). Although infants encode and retain melodies more readily when their pitches are structured in conventional rather than unconventional ways (Cohen, Thorpe, & Trehub, 1987; Trainor & Trehub, 1993a, 1993b; Trehub, Thorpe, & Trainor, 1990), there is no indication that previous exposure to the music of their culture is responsible for these effects (Lynch, Eilers, Oller, & Urbano, 1990; Trainor & Trehub, 1992, 1994). Instead, there is suggestive evidence that infants are inherently sensitive to simple frequency ratios (e.g., 2:1, 3:2, 4:3) in simultaneous and sequential patterns of tones (Demany & Armand, 1984; Schellenberg & Trainor, 1996; Schellenberg & Trehub, 1996; Trainor, in press; Trainor & Heinmiller, in press), and that they are sensitive to scale structure (Trehub, Schellenberg, & Kamenetsky, in press) as well as rhythmic structure (Trehub, Hill, & Kamenetsky, 1997a). Moreover, infants "prefer" consonant, or pleasant sounding, combinations of tones over dissonant, or unpleasant sounding combinations (Trainor & Heinmiller, in press; Zentner & Kagan, 1996). Finally, infants respond appropriately to some vocal emotional signals in their mothers' speech (Mumme, Fernald, & Herrera, 1996). In light of the aforementioned findings, the perception of subtle distinctions between performing contexts (infant present or absent) or between various song types (soothing, playful) would seem to be well within the capabilities of infants.

To gain insight into the attentional consequences of performing style, infants were exposed to recordings of infant-present and infant-absent versions of songs sung by the mothers of other infants (Trainor, 1996). Each pair of recordings (infant-present, infant-absent) had been obtained by having a mother sing the same song in the two contexts. When the contrasting versions were presented to infants for as long as they looked toward the sound source (one version presented on the infant's left, the other on the infant's right), infants were found to look longer at the side associated with infant-present performances. In other words, mothers' infant-present performances were successful in gaining and maintaining infant attention. Although adults rate fathers' and mothers' infant-present performances as equally appropriate for infant listeners, infants do not show differential responsiveness to fathers' contrasting versions (O'Neill, Trainor, & Trehub, in preparation), as they do for those of mothers (Trainor, 1996). Mothers' naturally higher pitch level may contribute to the attentional salience of her sung performances.

To shed further light on the consequences of different performance styles, mothers were audio recorded singing two different versions of the same song to their infant—performed once in a playful manner and once in a soothing manner (Trainor & Rock, 1997). Independent adult ratings showed overwhelming agreement that the performances intended as soothing were much more soothing,

smooth, and airy in voice quality than the performances intended as playful, which were much more rhythmic, brilliant in voice quality, and precise in consonant articulation. Infants were videotaped while they listened to alternating playful and soothing versions. Silent videotapes of the infant listeners were then presented to adult raters, who were required to judge when infants were listening to playful or soothing renditions. Performance was modest but significantly above chance levels on this task (Trainor & Rock, 1997). Subsequent coding of the videotapes indicated more infant vocalization, movement, and self-focused attention (e.g., looking at their hands rather than around the room) during soothing versions than during playful versions.

In another study, infants were videotaped while they listened to a foreign lullaby (infant-present) and adult song (infant-absent) sung by the same singer, or to a foreign lullaby and play song (both infant-present) by the same singer (Trehub & Kamenetsky, in preparation). Adults subsequently judged the soundless videotape segment that showed greater infant enjoyment. Such judgments revealed that infants "enjoyed" the lullaby more than the adult song or play song. Comparable judgments as infants listened to samples of women's and men's infant-present performances revealed greater infant enjoyment for women's relative to men's singing (Trehub & Kamenetsky, in preparation). Infants' preferences for infant-present over infant-absent songs (Trainor, 1996) and speech (Cooper & Aslin, 1990; Fernald, 1985; Pegg et al., 1992; Werker & McLeod, 1989; Werker et al., 1994) and for women's over men's songs (Trehub & Kamenetsky, in preparation) are consistent with suggestions of preferential responding on the basis of higher pitch (Fernald, 1992); the preferred versions in all instances were higher in pitch than the non-preferred versions.

If high pitch were the only factor underlying such preferences, then young children's sung performances might be even more appealing than those of women. The "babyish" voice quality of young children might further enhance the appeal of their songs (Trehub & Henderson, 1994). Infants 6–7 months of age were videotaped as they listened to excerpts of a woman singing to her infant ("Twinkle, Twinkle, Little Star" or "Doo-wah Ditty") followed or preceded by a young child singing to her infant sibling ("Twinkle, Twinkle, Little Star" or "Jingle Bells"). As before, adult viewers judged the video segment that showed greater enjoyment. Overall, the comparison of women's and young children's singing revealed higher ratings of infant enjoyment for women's singing (Trehub & Fellegi, 1997). When the sample was subdivided into infants who did not have siblings (first-born) and others who did (later-born), the later-born infants were found to prefer children's singing over that of mothers. Thus, some exposure to the overall vocal style of singers (children, in this case) may be necessary to prime infants' inherent preference for higher pitched voices. Alternatively, there may be inherent preferences for a variety of features associated with typical maternal performances, these preferences being modifiable by experience.

Overt reactions in these situations are subtle, presumably because all of the songs tend to capture infants' attention, leading to a reduction in ongoing activity (i.e., a

sustained orienting response). Nevertheless, the differences favor infant-present over infant-absent performances, lullabies over other song types, women's songs over men's songs, and either women's or children's songs, depending on the infant's birth order. Moreover, infants respond distinctively to playful and soothing renditions of the same song. In short, songs and performance variations have measurable attentional and affective consequences for prelinguistic listeners, even in unfamiliar laboratory situations with recorded, unimodal stimuli. The sung messages seem to regulate infant state in ways that likely promote caregiving in general and caregiver–infant interaction in particular (Trainor, 1996; Trainor & Rock, 1997; Trehub et al., 1997b). Presumably, the "live" multimodal product, which would provide opportunities for seeing or experiencing the caregiver's facial expressions, movements, and smells, as well as her finely tuned vocal improvisations, would have even more dramatic consequences for the infant audience. The infant's reaction would no doubt affect the performer, and the resultant interactive process would likely foster reciprocal emotional bonds.

THEORETICAL SPECULATIONS

Why do we sing to infants? On one level, we can answer the question of why we sing to infants by simply stating that we do so to regulate their state, to amuse them, and to teach them a bit of this and that. We might acknowledge that it feels good to sing to infants and children, perhaps to sing generally. Such answers would be analogous to claiming that we eat to satisfy our hunger or because of our knowledge of the benefits of nutrition. Behind the superficial question of why we, as individuals, sing at any particular moment is the more profound question of why most caregivers, regardless of their origin and lifestyle, sing to their infants and have always done so. In the case of eating, sleeping, and the satisfaction of other primary needs, we would have little difficulty moving beyond proximal causes to considerations of reproductive fitness and natural selection. But what about music in general and singing in particular? Why have all societies from time immemorial incorporated singing—on the surface, a mere vocal frill—into various aspects of life, including child care? Why, indeed, have those entrusted with the care of infants—mothers, grandmothers, aunts, siblings, nannies—"chosen" to sing to their infant charges?

Dissanayake (1992), in her provocative account of man as "art-maker"—*Homo aestheticus*—describes a universal, biological disposition to "make things special" (p. 51). "Making special" involves embellishing objects, events, and states of being that are highly valued as a way of setting them apart from those that are merely ordinary. For Dissanayake (1992), "art" and "the arts" are not viewed as products but as inherently gratifying, sensually or intellectually pleasing behaviors pursued by all members of traditional societies to enhance domains of acknowledged importance. Such domains would include life transitions (e.g., rituals of birth, puberty, marriage, death), procuring food (e.g., tool decoration, elaborate food preparation), curing the

sick (e.g., healing songs and rituals), and attracting mates (e.g., body adornment). The portability of songs, dance, and oral literature would have made them ideal "enhancers" for our nomadic ancestors (Anderson, 1990). So how have we managed, in the industrialized world, to stray so far from such "predispositions"? According to Dissanayake (1992), industrialized, specialized societies have forsaken "art for life's sake"—art linked to rituals that foster group survival—in favor of "art for art's sake"—art separated from ritual and function (p. 222). In divorcing art from its roots in nature and in culturally created ritual, we have transformed it into a rarefied domain—fine art—dominated by relatively few creators of esoteric objects and by an elite coterie of critics and connoisseurs who declare which objects are and which are not works of art (see also Alsop, 1982; Anderson, 1990).

In a related vein, Pantaleoni (1985) bemoans the "upward" trivialization of music, not by the popular music industry, with its contributions to dancing, courtship, and conversation, but rather by those "who would remove music from its fundamental place in the lives of everyone and put it on a pedestal beyond the reach of all but the specially talented" (p. 12). "In the long view the history of Western art music has been on its pedestal just a few moments" (p. 409). High levels of literacy have likely fueled the transition from the personal and involved style of oral societies to the impersonal, detached style of literate societies (Dissanayake, 1992). Remnants of the personal, involved style can still be seen in some religious rituals, perhaps even at rock concerts where the audience is overtly expressive in ways that are unacceptable at concerts of art music. Perhaps the need to "make special" also underlies the enduring success of commercial ventures that promote personal decoration or adornment.

The proclivity to embellish language (e.g., poetry, song), body movement (e.g., dance), and utilitarian objects (e.g., by painting or carving) in inherently pleasing ways would have contributed to the creation of ritual ceremonies that were not only enjoyable, but also unifying and memorable, thereby enhancing the survival of the group (Dissanayake, 1992). For bands of hunter-gatherers, in particular, the adaptive value of music likely stemmed from its ability to express shared cultural meanings (Dowling & Harwood, 1986). Thus, the disposition to "make special," consisting of a set of behaviors that "felt good," would have served as "enabling mechanisms" for other behaviors that were more directly related to survival (Dissanayake, 1992).

In this light, songs can be seen as embellishments of human vocal communication achieved by decorating, elaborating, and exaggerating meaningless as well as meaningful sound sequences. Although most writers have focused on the use of songs in group ceremonies and rituals (Booth, 1981; Deng, 1973; Dissanayake, 1992; Finnegan, 1977), their use in the more private contexts of infant care would derive from the same general class of behaviors. Caregivers embellish their expressions of love and concern for infants, on the one hand, and their more self-centered concerns on the other. Such behaviors, satisfying to the singer as well as the listener, would calm or arouse both parties, as necessary, enhancing the mutual interests of the dyad. The extent of singing to infants in different cultures may reflect, in part, the relative value accorded to infants. Other more public means of embellishing the domain of

infant care, such as cradle decoration, would affirm the importance of infants to the community, simultaneously indicating appropriate attitudes on the part of particular families. In the modern era, the relative privacy of caregiver-infant contexts may have allowed caregiving songs to escape the fate of many other acts of "making special." Also of interest is the fact that singing to infants, "special" as it is, has been too "ordinary" to capture the attention of most music and child care scholars (Trehub & Schellenberg, 1995).

If we acknowledge that singing to infants reflects a human predisposition to enhance activities surrounding child care—our proclivity to celebrate and ritualize aspects of this critical domain—why do we, in the industrialized world, go about the process in ways that are somewhat different from those of caregivers in other times and places? Biological dispositions need not come with recipes for cultural expression. Thus, although singing may reflect, in part, the extent to which a culture values its infants, cross-cultural differences in singing style may also reflect the different ways in which societies value their infants. For example, soothing infants by lulling or mesmerizing them emphasizes their "humanness" (and ours), fostering peaceful communion between the nurturer and nurtured. The singer achieves success when the infant complies by drifting contentedly into sleep. By contrast, playful singing highlights individuality and virtuosity, the dramatic vocal and gestural displays of the singer prompting the infant listener to take note and respond—to smile, laugh, coo, even sing—providing concrete rewards for the singer's performance. Success may be reflected in the extent to which infants respond with vocal and gestural embellishments of their own. In any case, the act of singing to infants is one realm of ritual activity shared by hunting-gathering, agricultural, and highly industrial societies.

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