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# Music, Memory, and Relatedness

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## ABSTRACT

*This article examines the role of music and musical speech as transitional phenomena, as facilitators of early dyadic and later relationships, as aids to the development of memory, and as assisting in the self-definition of individuals and groups. It draws on literature from psychoanalysis, developmental psychology, and neuroscience, and presents illustrations from individual development as well as cultural phenomena.*


**Key words:** memory, music, prosody, psychoanalysis, relatedness, transitional object

Articles and books concerning music and psychoanalysis have recently appeared with increasing frequency in the psychoanalytic literature, enlarging our understanding of music (Nagel, 2013), musical associations and technique (Lipson, 2006), mourning (Stein, 2004), and aesthetics (Rose, 2004). I have been surprised at the relative infrequency of direct musical associations (apart from song lyrics) in the psychoanalyses and psychotherapies I have conducted, despite having an open ear to them. Nonetheless, even when they are not in the foreground, I believe that musical influences may be present more than is sometimes apparent. While there are innumerable psychoanalytic articles concerning non-verbal communication, it may be useful to consider this matter specifically in relation to music. Musical, non-verbal aspects of speech, including pitch contours, rhythm, timbre, and tone of voice, convey a great deal of the emotional communication of speech, and speech that lacks them sounds monotone and uninformative. Both music and musical aspects of speech play major roles in the development of human individuals, the development and cohesion of human groups, and they likely have significantly influenced the development of our species. In this article I will focus on the relation of music to development, memory, and relatedness.

## FIRST THEME: MUSIC, TRANSITIONAL PHENOMENA, AND EARLY RELATIONSHIPS

Winnicott's brilliant and utterly original article, "Transitional Objects and Transitional Phenomena" (Winnicott, 1953), included a perceptive discussion

of music as a transitional phenomenon, but with some exceptions subsequent usage has tended toward tangible objects or toward a figurative "space" between patient and therapist. Marjorie McDonald (1970), in an article offering psychoanalytic perspectives on the Suzuki violin teaching methods, affirms Winnicott's view of the transitional uses of music. More recently Lipson (2006) has discussed both music's use for transitional purposes as well as to represent expression of, and defense against, conflicts from later phases of development. As Winnicott noted, not only music, but speech itself, can serve a transitional function, which occasionally is important clinically. However, the role of certain shared properties of music and speech, particularly rhythm and repetition, which likely contribute to the development of memory, have not been emphasized in the understanding of music and speech as transitional phenomena.

The creation and use of a transitional object is many things, including an attempt to find comfort, to define self and other, to influence the environment, to deal with separation, and to elaborate an imaginative world. The transitional object is a product of the development of memory, and at the same time suggests that memory is not fully developed, its creation indicating that the image of the parent is not fully internalized and available.

The developmental tasks of recognizing the separateness and distinctness of self and other are universal, but the use of transitional objects is not. Recognizable transitional objects are less likely to be employed by infants in cultures in which the baby is always in physical contact with the mother (McKenna, 2000). Early separations do not need to be negotiated by babies with immature cognitive functions and incomplete internal representations of mother, and thus the need for an object to be used for "security" is diminished. Even the need for speech to bridge distance may perhaps be comparatively less as the mother's body is always present and may play a more significant role in the infant's gradual acquisition of knowledge of self and other.

Regardless of whether there are transitional objects *per se*, all cultures have rituals, practices, and objects that help people to handle experiences that challenge boundaries between self and other, and that attempt a degree of personal magical control over the animate and inanimate world apart from oneself. These practices typically fall at least in part within the domain of religion and invariably make use of music and dance.

Consistent with their roles in transitional phenomena, speech and music share some important roles and properties in the development of both memory and object relations. In *The Singing Neanderthals* (2006), paleoanthropologist Steven Mithen suggests that speech and music share a common origin in a proto-language of gestures and emotive grunts, differentiating over time into separate functions subserved by distinct but overlapping neurological systems. This hypothesis is bolstered by the observation that some patients who have suffered expressive aphasia after a stroke are better able to communicate if they sing than talk (Sacks, 2007). That music is a fundamental part of human-ness is also apparent in fact that while there are many cultures without written language, many



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without other advanced technologies, and a few with very minimal decorative or visual art, there are apparently no human cultures without some form of music and dance (which are often not differentiated from each other). Whether or not one accepts Mithen's phylogenetic hypothesis, it appears to be recapitulated in the development of human infants. The developmental overlap of music and speech is persuasively described in the study of infant-directed speech (IDS).

While there may be exceptions, IDS (or baby talk, or "motherese") appears to be relatively common across many cultures (Ferguson, 1964; Fernald, 1989). "Across different languages and cultures, IDS tends to be higher in pitch, more rhythmic, and, most important for mediating infant preferences, contains slower, more exaggerated pitch contours than adult-directed speech. In a sense, then, IDS could be called musical speech, because it differs from adult-directed speech in its prosodic or musical characteristics" (Trainor, Clark, Huntley, & Adams, 1997, p. 383). IDS is also typically accompanied by exaggerated movements of the head and the lips, providing the infant with additional visual as well as aural cues. IDS can be recognized by listeners who do not know each other's languages, and can recognize intentional categories better in foreign IDS than in adult speech (Bryant & Barrett, 2007). Fernald (1989) provides evidence suggesting that "the prosodic patterns of speech to infants are more informative than those of adult–adult speech, and may provide the infant with reliable cues to the communicative intent of the speaker" (p. 1497), and she proposes particular vocal contours as potentially related to specific communicative intents. Trainor, Austin, and Desjardins (2000) likewise argue that the prosodic features of IDS also serve to facilitate emotional communication. Not surprisingly, infants clearly prefer IDS to adult speech (Cooper & Aslin, 1990). Many elements of speech with exaggerated prosody, often with accompanying gesture, are retained in adult speech, particularly in emotional contexts. Familiar examples include coaxing, whining, scolding, pleading, cooing, etc.

In addition to speech, song is different for children. Listeners from different cultures and languages can distinguish songs sung to infants and the same song sung not to an infant (Trehub, Unyk, & Trainor, 1993b). Lullabies, used around the world to help babies negotiate bedtime separation, appear to have shared elements of repetition and calming (and often falling) intervals of musical pitch. People from different parts of the world can distinguish lullabies from comparison songs in the unfamiliar music of other cultures (Trehub, Unyk, & Trainor, 1993a). Rock, Trainor, and Addison (1999) furnish evidence that infants are more attentive to the external world while listening to play songs, and more to themselves while listening to lullabies. Trehub (2001), exploring universal aspects of human musical predisposition, has collected evidence that infants prefer musical intervals based on small integer ratios (e.g. 2:1, 3:2, and 4:3, for octaves, fifths, and fourths, respectively) than on larger interval ratios (e.g. 45:32 for the tritone) and better discriminate small changes, such as semitones, in the context of these intervals. In addition, the voice is important: Weiss, Trehub, and Schellenberg (2012) have recently shown that adults learned



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unfamiliar melodies better (though did not necessarily like them better) when the melodies were presented vocally rather than instrumentally.

In addition to research from developmental psychology such as discussed above, contributors from a variety of related disciplines have added to our knowledge of the connections between music and social relatedness. In his book, *Affective Neuroscience*, Jaak Panksepp (1998, pp. 278–279) suggests that the tendency to experience "goosebumps" or "chills" while listening to music is a product of the evolution of mammalian relations between mothers and their young. Evolving on a foundation of mothers helping young with thermoregulation (keeping them under their wing), animals evolved a pattern of separation distress calls. Separation distress is alleviated by the return of the mother, and is neurochemically mediated by opiods and by oxytocin and prolactin. Narcotics (opiods) suppress separation distress and narcotic withdrawal is characteristically accompanied by chills and goosebumps (hence the expression "going cold turkey" for sudden withdrawal). Panksepp comments that certain music, especially sad music, "may acoustically resemble [distress vocalizations]," and that "the chills we experience during music may represent the natural tendency of our brain emotional systems, especially those that are tuned to the perception of social loss, to react with an appropriate homeostatic thermal response" (p. 278). "In music that provokes chills, the wistful sense of loss and the possibility of reunion are profoundly blended in the dynamics of sound" (p. 279). I would underscore the importance of the feeling of reunion in this response, and wonder also if listeners may be more likely to experience chills in listening that is communal, as at a concert, or participatory, as compared to individual listening, even though chills are readily experienced by many in solitary listening.

Ellen Dissanayake, whose work has focused on art and culture, and draws on different materials, makes an argument remarkably parallel to Panksepp's. She offers an evolutionary argument that the helplessness of the human infant has led to increasingly sophisticated mother–infant communications, and ritualization of them, "wherein ordinary communicative behaviors (e.g., sounds, movements) are altered through formalization, repetition, exaggeration, and elaboration, thereby attracting attention and arousing and shaping emotion" (2008, p. 169). Emphasizing human ability to respond to "dynamic temporal patterns … in contexts of affiliation" (p. 186), she cites the work, familiar to psychoanalysts, of Beebe, Lachmann, and Jaffe (1997) and Daniel Stern (1985), concerning the careful, coordinated timing of early parent–infant interactions. These proto-musical developments then form the basis for a more musical form of communication in mother–infant relations which helps to create human bonds, and then provides the basis for musical participation in fostering group solidarity and religious practice. "Although human ceremonies are not instinctive – and indeed are culturally highly varied and complex – I propose that they build upon the proto-musical capacities and sensitivities that developed during human evolution to create and reinforce the mother–infant bond" (Dissanayake, 2008, p. 178). Finally, drawing from the work of the ethologist Eibl-Eibesfeldt, she notes that



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the prosodic, visual and behavioral qualities of mother–infant interaction also form the basis for communications of seduction and love, in humans as well as in other species.

On the basis of evidence from psychoanalysis, developmental psychology, neuroscience, and anthropology and aesthetics, we thus arrive at an understanding that musical propensity is an inherent part of being human; that music, and musical elements of speech and behavior, help to form the mother–infant bond; that they promote emotional communication and connection; and they act as transitional phenomena and help to mediate separation as well as the development of representations of self and other. Further, the same musical tendencies provide substantial underpinnings for future group participation and group identity as well as contributing to later love relations.

## SECOND THEME: REPETITION, RHYTHM, AND MEMORY

In this section, I would like to emphasize the role of repetition and rhythm in relation to memory, starting with neuroscience and ranging to child development and culture.

Neurophysiologic research has shown that the activity of neurons is intrinsically rhythmic. There is a certain baseline frequency at which a healthy neuron depolarizes (fires, sends a message). Certain groups of neurons in the brainstem take advantage of this property to become control centers for the timing of various bodily functions, including heart and lung rhythms; others in the hypothalamus influence diurnal rhythms such as certain hormonal secretion patterns. The basal ganglia appear to be important in regulation of rhythmic activities of both motion and thought (including compulsive and obsessive phenomena). The rhythm of all these neurological centers, like rhythm elsewhere, is dependent on repetition and variation. Rhythm is thus a very basic aspect of the functioning of human beings.

Research in the field of memory has established, perhaps not surprisingly, that repetition is essential in the development of memory. Music with significant repetition and hierarchical structure is easier to remember than music lacking these characteristics (Snyder, 2000).

The rhythms of daily life may have sustained influences in unexpected ways. Ayres (1973) studied the relation of infant carrying practices to the predominant rhythms of music across many cultures. She used data on carrying practices from the Human Relations Area Files and on the rhythms found in the music of 233 cultures in the Cantometrics Project. She found a statistically significant correlation showing that societies with infants carried in mothers' arms or in a sling or shawl tended to have music with much more regular rhythm, while those with infants kept in a cradle or hammock or on a cradle board had more music with irregular rhythms.

Much more attention has been devoted to auditory, rather than physical, rhythm. Babies babble in repetitive syllables, often with a rhythmic quality,



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enjoying the sound. The increased repetition in IDS has been noted earlier, and music, more than speech, is inherently repetitive. Melodic figures and motifs repeat within a melodic line, the melody itself repeats, and a melody typically seeks and returns to a tonic "home" tone. More than melody, rhythm above all, is repetitive. A rhythm that does not repeat is not a rhythm. Anton Webern wrote music with a deliberate lack of repetition, music that is enjoyed only by the few who are able to "find the music" in it. Ornette Coleman's "free jazz," similarly lacking in standard orienting structure, is likewise enjoyed by a select few. Children's songs, in contrast, tend to be simple and repetitive, seemingly designed for easy learning, and predictably structured lullabies are sung around the world, as described above. The repetitive elements of melody and rhythm form patterns, and as with clinical work, pattern recognition is essential for memory and understanding.

Rhyme contains an inherent aspect of repetition. Rhyming children's books, such as those of Dr Suess, have had lasting appeal. Some particularly repetitive, rhyming ones, like Dr Suess's *Hop on Pop*, are often used for pedagogic purposes as well as enjoyment. Rhyme and verse, while early on incorporated into transitional functions as well as used for their own pleasure, continue to have special meaning in later speech, song, chant, and poetry.

Many stories for children (and adults also) deal with magic. Magical incantations invariably rhyme; in fact the word enchantment, with its implication of magic, and the words chant and song share the same etymological root. This special versed, rhyming prosody of magical incantation carries some of its infantile omnipotent, magical qualities from the earliest periods of development, when infant-directed speech and wishful, magical perception and thought were interconnected, into later years. In fact, many magical incantations, including those in such recent and popular works as J. K. Rowling's *Harry Potter* series, are used for purposes of making things appear and disappear, seemingly a corroboration of the enduring influence of latent sensorimotor intelligence described by Piaget, as well as of the phenomena of separation-individuation investigated by Mahler, Winnicott, and many others. Political slogans and football cheers, often equally wishful, typically rhyme as well.

Finally, some cultures have taken advantage of music's ability to promote memory formation for quite specific purposes. The aboriginal peoples of Australia, needing to travel long distances over territory with few distinguishing features, evolved a system of "songlines," songs in which landmarks and directions were embedded, repeated, and hence memorized (e.g. Chatwin, 1987). The same principle operates in Western culture, as illustrated in the triumph of the advertising jingle. The main difference is that we are being trained to remember commercial products rather than geography. I will spare the reader specific references here, as many of these jingles have become so well-learned and familiar as to be irritating (so-called "earworms").

The connections between musical repetitions and memory should augment psychoanalytic awareness that certain repeated themes and variations in patients' words, tone of voice, and behavior can serve as important clues to essential memories, wishes, and aspects of self.



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## VARIATIONS: MEMORY, TRANSITIONAL PHENOMENA, AND RELATEDNESS

The contributions of music and musical speech to memory development, emotional communication, and social relatedness have a variety of clinical and cultural implications. While some of these have been noted earlier, they may benefit from illustration and elaboration.

Given music's connection to early childhood, memory formation, and group cohesion, it is not surprising that it should be used for remembrance and mourning. The use of music for this purpose, discussed Pollock (1975) and Stein (2004), has a long history, and has been of such significance that a substantial number of musical requiem masses are acknowledged as some of the great masterpieces of Western music. Songs of mourning such as Don McLean's *American Pie* and the Beatles' *Yesterday* are some of the most popular in the history of music. When Vladimir Horowitz played in Moscow in 1986 after a six decade absence from Russia, toward the end of the concert he played Schumann's Traumerei (Dreaming). This piece, likely because of its sad, lyrical emotional quality, had been used by the Russians as memorial music since World War II. As Horowitz played it, a large portion of the audience began to weep, a remarkable moment that is preserved on YouTube.

Less related to mourning are other illustrations of music and memory. A college student happened to hear the Chopin piano etude, opus 10#3, on the radio and was struck by an acute sense of *déjà vu*. He would not have thought he knew the piece but instantly felt it intensely, uncannily familiar. His mother could not confirm that she had played the piece, as she often played the piano when he was younger, but on a later visit home he found a well-worn copy in the piano bench.

Many couples remember and mark their finding each other with a particular song, which becomes "our song," and many performers may have special songs with which and by which they are identified. In recent years some people have given their close friends or family members personal identifying ringtones (usually songs) on their mobile phones.

Several examples illustrate the use of musical memory to help deal with anxiety and separation. In a festschrift for Margaret Mahler, Ralph Greenson (1971) reports a remarkable case from his work with the military in World War II. He was asked to evaluate a bombardier whose plane had taken flak over the Pacific and who was unconscious, overcome by fumes, by the time his pilot managed to land the plane. The bombardier awoke with nonsense syllables repeating endlessly in his mind and feared he had gone crazy. Greenson conducted an amytal interview and obtained some fantasy material suggestive of seeking comfort with a large teddy bear. He learned that the young man had grown up on an isolated ranch with his father and that his mother had died when he was little, at what age he did not know. Thinking that the nonsense words sounded foreign, Greenson asked his patient to write to his father and ask how old he was when his mother died and whether his mother might have been



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foreign born. He also asked an air force intelligence officer to try to find the words in a foreign language. About 10 days later a letter from the father arrived, saying that the patient's mother had died just before his second birthday, that she had been born in Belgium, and that when he was a baby she used to sing him children's songs in her native language. A few days later the intelligence officer responded, adding that the words were from a Flemish dialect of northern Belgium. This amazing story says a lot about the role music can play in handling separations, such as bedtime, or potential death, but also about the enduring influences of maternal relationships, about how much of earlier experiences can be preserved unconsciously, and about the adaptive aspects of some types of regression in a terrifying situation. The young man's mind cleared.

Less dramatic, but similarly related to the use of music for transitional function or to manage a scary situation, is the reaction of a 22 month old whose grandparents came to stay with him when his parents left for the hospital for the birth of his sister. After his parents departed he asked his grandmother, "Play Bach concerto." Taken aback, she replied "Show me," whereupon he toddled to the record collection and withdrew the one he had in mind, which contained the 5th Brandenburg that (like the college student earlier) he was used to hearing his mother play on the piano. This was not a lullaby, obviously, but just the same symbolized his relationship with his mother in her absence.

The use of sound to diminish separation anxiety was perhaps first reported by Freud, who reported overhearing a three year old child calling out of a dark room, "'Auntie, speak to me! I'm frightened because it's so dark.' His aunt answered him: 'What good would that do? You can't see me.' 'That doesn't matter,' replied the child, 'if anyone speaks, it gets light'" (Freud, 1905, p. 224fn; similar Freud, 1917, p. 407). Most therapists are familiar with patients who, in times of anxiety, or of difficulty sustaining a good internalized representation of the therapist, will call the therapist's voicemail "just to hear your voice." Further evidence of the use of early music and speech to aid connection and memory is the frequency with which people, of all ages, talk or sing to themselves when they are anxious or alone (Andresen, 1980).

Less emphasized in the psychoanalytic than in the anthropological literature, less directly of clinical relevance, but of importance in analytic understanding of social relatedness, is the role of music as an ingredient of the social glue of larger groups. In contrast to our society, characterized by highly differentiated social functions, in which music is typically played by specialists, in the majority of smaller human societies musical participation is simply part of being human, being a member of that society. Singing and dancing are not necessarily distinguished as separate matters. Almost any important social event or function will involve song and dance. Rituals that seek contact with the spirits of ancestors via trance invariably involve chant or music, the dissolution of boundaries between present and past, the material and spirit worlds, echoing the symbiotic ties between mother and infant. Ritual contact with the spirits may be performed by a solo ritual specialist, or it may involve heavy, repetitive rhythm,



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often with drumming, that synchronizes the activity of the individuals into a larger whole.

Music is used to establish and dissolve boundaries in other ways as well. American adolescents mark social groups by their music, and at times they carefully compare their preferred music in the process of selecting friends.

Music is also commonly used to foster group unity and mark group boundaries in larger societies, again resonating with the use of musical speech and music in the self-definition of earliest childhood. Soccer fans around the world pass many matches standing and singing their team songs. "You'll Never Walk Alone," from Rodgers and Hammerstein's *Carousel*, was adopted as a theme song by FC Liverpool in the 1960s, and has since spread around the soccer world to the extent that "YNWA" now has its own dictionary entries, as well as dozens of YouTube postings of hundreds of thousands of fans singing this song, with vast numbers of viewings. In Japan, before FC Tokyo begin a soccer match, 40,000 fans stand together and sing YNWA, *a capella* after the first chorus, in tune, and in English.

Music has been used similarly to promote unity for political purposes. The significance of music in the South African overthrow of apartheid is documented in the movie, *Amandla*, and a movie titled *The Singing Revolution* describes the process by which Estonia achieved freedom from Soviet domination. One of the more moving scenes in the much-loved World War II movie, *Casablanca*, is the defiant singing of the Marseillaise in the presence of Nazi officers in Rick's café. The singing by a Nazi youth, joined by the other patrons, also at a café, has a similarly stirring, but chilling, effect in *Cabaret*. On perhaps the largest level, most countries have national anthems, many of which, depending on history and occasion, have great emotional meaning. I refer to the national as "perhaps" the largest level because composer Eric Whitacre, in a dramatic gesture of global community, has now conducted and recorded one of his works with a virtual chorus of more than 3700 singers from 73 countries (http://www.youtube.com/watch?v=V3rRaL-Czxw).

## REPRISE: SUMMARY

We have seen that the musical qualities of speech, and music *per se*, are essential elements in early relations between mothers (and other caregivers) and infants, serving transitional functions, promoting emotional communication, and facilitating formation of memory and thus of object representations and object constancy. We also observed that just as music and musical, infant-directed speech promote early dyadic relationships, music and musical, seductive speech similarly contribute to later loving and romantic relationships. Further, we have seen that social bonds promoted by music readily, and inevitably, spread beyond the dyad and mark one's participation in, and identification with, social groups on every scale, and that the shared and memorial aspects of music contribute to this. That music is the food of love is less poetic license than part of our endowment as a species.



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Some music simply ends with little demarcation, but most music has a marked ending. The melodies, rhythms, and harmonies have communicated and elicited emotional responses, the repetitions and patterns have served recognition and memory, and in most music, the theme seeks to rest on the tonic note of the key. I have attempted to highlight the role that music plays in human development, especially in relation to the development of memory in the service of self and object differentiation, and in the service of social relatedness. I have tried to accent the musical qualities not only of non-verbal, but also of much verbal, communication, and to call attention to opportunities for clinical and cultural understanding that this awareness may periodically present. And having no need for further thematic recapitulation, I will bring this article, slowing slightly, to a conclusion. Right here.

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