

The earliest narratives were musical

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**Ellen Dissanayake**

School of Music, University of Washington, Seattle, USA

Abstract

In a baby's first months of life, adults direct a lot of 'talk' at them, to which they respond with obvious delight. Baby talk can be regarded as narrative (or proto-narrative), though of a very peculiar kind, since its recipients don't understand a word of what is said to them. What then do babies respond to? And why do we talk to babies? The importance of these early narratives, both phylogenetically (as they evolved in our species), and ontogenetically (as they develop in each individual person), has interesting implications for the way that narratives have been used historically and culturally – in theory as well as practice.

Keywords

communicative musicality, evolution of narrative, mother–infant interaction, narrative in preliterate societies, origin of narrative, spectrum of narrative

About the time that I first heard about the subject of narrative inquiry in music education (and the NIME3 [third conference on Narrative Inquiry in Music Education] conference), I was asked to contribute an article to a journal of literary studies, *Poetics Today*, for a special issue called 'Narrative and the Emotions' (Keen, 2011). Suddenly I was immersed in an unsuspected wide world of unfamiliar academic discourse – one that even included whole subject areas in English departments called narratology and narrativity. I learned that theory began with Aristotle's *Poetics* and that the subject really came into prominence in the mid-20th century with studies of universals in folklore. Eventually psychoanalysts, philosophers, and literary theorists had got in on the subject and, finally, psychologists, especially cognitive scientists. Narrative inquiry in music education was just one of many sub-fields in this stimulating new theoretical perspective.

My contribution here is not to the larger subject of narrative theory except to suggest where I think narrative began. In sections one through three I use the term 'narrative' in its simplest sense – a communicative utterance to another person – and develop a hypothesis about the evolutionary biological origin of the first narratives. In section four, I'll relate two stories that make clear there is a spectrum of narrative. That will set the stage for me to draw some

Corresponding author:

Ellen Dissanayake, School of Music, University of Washington, Seattle, WA, USA.

Email: edissana@seanet.com

implications about the place of stories and music, the narratives that we tell and listen to today, in different parts of our lives.

1. Mothers and infants

I suggest that the first narratives we experience are the vocalizations that mothers (and others) make to babies. That is, the earliest narratives are baby talk. Babies of course do not understand the *words* but, nevertheless, they are very receptive to what adults say to them. In fact, research has established that babies emerge from the womb expecting us not just to talk to them, but also to talk in special ways that use special musical devices.

Psychologists have discovered that, from birth, infants respond to human voices and faces more than to any other sound or sight. Although they are physically helpless, babies are socially precocious, ready to enter into interactions – one might call them dual narratives – with their caretakers. Intimacy with babies is universal.

Despite being universal, the mother–infant interaction is also somewhat peculiar. People all over the world behave differently with infants from the way they do to adults or older children. Vocally we speak slowly in high-pitched, undulant, soft breathy voices; visually, we make funny faces (wide eyes, raised eyebrows, open mouth, wide sustained smiles). We bob our heads sharply backward and then nod. We gaze right into a baby's eyes – an intimacy that otherwise occurs only between lovers. Kinesically, using body movements, we touch babies, pat, stroke, hold their hands, embrace, groom, sway from side to side or forward and back, hug, and kiss them. In these interactions babies at first prefer regularity and predictability – soothing gentle voices and movements. However, when they are a little older, infants appreciate fun, silliness, and divergence from their expectations. Mothers seem to intuit when to start to make their narratives more suspenseful and interesting.

There are other important and interesting things to note about this interaction. First, all these behaviors to babies are based on expressions that are in common use in friendly, welcoming, happy interactions with other adults. These include 'signals' such as look at, mutual gaze, raise eyebrows (flash), smile, open mouth, bob, and nod (Grant, 1968, 1972; Schelde & Hertz, 1994). We talk with intimates in an agreeable, non-threatening, non-dominating tone, rather than being aggressive or contradictory (Frick, 1985; Puts, Gaulin, & Verdolini, 2006; Scherer & Oshinsky, 1977). Kinesic signals of affinity include touching, stroking, patting, holding the hand, embracing, grooming, hugging, and kissing.¹ The difference is that, with infants, we regularize and repeat these expressions and movements. We exaggerate them (make them slower in duration, larger in size, higher in pitch, more undulant in contour) and even elaborate or vary them.

Second, we do not teach babies to respond to these antics. If anything, they teach *us* to perform for them. Although they don't understand a word we say, they come into the world wanting this kind of 'narrative' and, when we deliver it, they reward us with their adorable smiles, wriggles, kicks, and coos. They don't wriggle and smile if we talk to them as we do to other adults.

Third, studies by psychologists have revealed that, in these interactions, parent and baby coordinate themselves in time. They respond to one another, back and forth, in real time, adjusting their responses to each other's visual, vocal, and gestural signals within fractions of seconds (Beebe, 1982; Stern, 1971). This sort of behavioral-neurological attunement between adult and infant is the basis for later adult interactions that involve coordination and turn-taking, whether

these be in conversation, lovemaking, or performing with others in music, dance, and other 'arts that take place in time' (Dissanayake, 2008, pp. 183–186).

Developmental psychologists have described numerous benefits of this interaction to babies:²

- *Bonding*: physiological and emotional attunement or synchrony becomes established, emotionally joining the pair (Carter, 1998; Carter, & Altemus, 1999; Panksepp, Nelson, & Bekkedal, 1999, pp. 223, 225).
- *Emotion recognition and regulation*: babies learn to identify and discriminate different emotions as they are expressed vocally and visually; they gain acquaintance with their own shifting levels of excitement and positive or negative feelings; they develop some degree of self-regulation of these levels and feelings (Beebe & Lachman, 1994; Hofer, 1987; Spangler, Schieche, Ilg, Maier, & Ackermann, 1994) and learn that, through their own signals, they can, to some degree, regulate the other person's stimulation.
- *Cognitive practice*: by anticipating, a baby 'hypothesizes' what will come next and learns how to evaluate discrepancies from the expected; they can test and perfect these expectations or predictions (Hundeide, 1991).
- *Social practice*: infants become acquainted with back-and-forth, give-and-take socializing – the rudiments of their prospective life as social beings where their behavior calls forth reciprocal responses in another.
- *Language learning*: mother–infant interaction prepares the way for babies to produce and understand the prototypical and meaningful sounds of the language they will eventually speak (Fernald, 1992; Kuhl, 1993; Locke 1993).
- *Learning of culture*: in mother–infant interaction, different cultures instill their own norms of proper behavior, whether dramatic and demonstrative, restrained and sober, and so forth. The pair also learns to adjust to each other's temperaments.

2. The 'obstetric dilemma'

It should now be clear that our earliest responses to narratives begin at birth: they are spontaneous and unrehearsed, part of the repertoire of every mother and her newborn baby. What is more, I suggest that these 'earliest narratives' are the earliest narratives in our *species*. To make that argument, we have to ask *how* mother–infant interaction began in the first place and *why*. What was the evolutionary path that led to the development of this unusual universal behavior between mothers and infants? It began with two conflicting evolutionary trends.

The first trend was walking upright. Numerous anatomical changes had to occur in order to convert a quadruped to bipedal locomotion: both the rib cage and the bones of the inner ear had to be restructured, the spine reshaped, the opening of the spinal cord relocated, the lower limbs and feet altered, the surfaces of joints reconfigured, and body musculature resculpted. These and other changes took place gradually over many hundreds of thousands of generations.

The second simultaneous trend was gradually increasing brain size: the brain enlarged significantly between about four and two million years ago and, again, even more dramatically, around 600 million years ago (Mithen, 2005; see also Falk, 2004, p. 499; Flinn & Ward, 2005, p. 31).

For females, the consequences of upright walking were personal and profound. The birth canal became shorter and narrower, but increasing brain size resulted in larger infant heads. What does a species with a large brain and a narrow pelvis do at parturition? There were both anatomical and behavioral solutions to the dilemma. Again, these didn't happen all at once but took place over millennia.

The gestation period was gradually reduced so that infants became smaller and more helpless at birth, thus requiring almost continuous care for much longer than any other primate offspring. It has been estimated that if a human baby today had the physical maturity of a chimpanzee baby at birth, the gestation would have to last 21 months and the baby would weigh 25 pounds (Gould, 1977; Leakey, 1994; Morgan, 1995; Portmann, 1941).

Additionally, the timing of brain growth was gradually altered so that a great deal of it occurred outside the womb. An infant human's brain triples in size between birth and 4 years of age and, at maturity, the human brain is four times its size at birth (1400cc). The infant skull developed a 'soft spot' (fontanelle) so that it could be compressed at birth and the mother's pelvic symphysis became able to separate slightly at birth.

Evolving alongside these adaptive *anatomical* changes was an important *behavioral* modification – the mother–infant bonding interaction that I just described. It ensured that a mother *wanted* to take care of a helpless, demanding (but irresistibly lovable) infant for not just weeks or months, but years. By making friendly signals to her infant and repeating and exaggerating them, mothers – through biofeedback – reinforce neural pathways in their brain for affection and release brain chemicals – like oxytocin – that promote and accompany their feelings of love and affinity (see Ekman, 1992; McIntosh, 1996; Zajonc, 1985; Zajonc, Murphy, & Ingelhart, 1989 for descriptions of biofeedback). Infants, who elicit and respond positively to these signals, ensure that they will attract care. Because the baby is perceived as lovable and interactive (even though it is also helpless and demanding), its mother is persuaded to care for it for months and years. Ultimately, in Darwinian terms, the baby survives and the mother helps to ensure her reproductive success.

3. Mother–infant interaction and music

In addition to the six benefits to babies described in the previous section, the mother–infant 'narrative' has a seventh benefit: it *prepares infants to be musical*, in the broadest sense of the word. Psychologists Stephen Malloch and Colwyn Trevarthen (2009) consider 'musicality' between mothers and infants to be the foundation for all subsequent human communication. They call it 'communicative musicality.'

It is not difficult to find resemblances between music and mother–infant interaction as described here. Both have a temporal and formal structure composed of lines or phrases organized in recognizable or 'framed' episodes that convey a consistent expressive mood. There are recognizable recurrent themes, sometimes with variations. Expectations of the audience may be aroused and manipulated (as, in babies, with 'peek-a-boo' or 'this little piggy'). Both music and baby talk have similar melodic, rhythmic, and dynamic expressive features, which include repetition, exaggeration, and elaboration as well as variation in volume, pitch, and speed. One can even find spontaneous vibrato and glissandi in some mothers' utterances to babies.

When musicians compose or improvise, they apply these same formal structural principles and expressive features to tones, chords, motifs, beats, pulses, rhythms, and timbres. By these means, they attract attention, sustain interest, evoke emotion, and reinforce concord in their listeners. Mothers interacting with infants accomplish the same effects. The fact that babies are receptive to exactly these features and operations, in a multi-modal (vocal-visual-gestural) form, suggests that they are born with cognitive and emotional capacities upon which music (and the other arts) can later be built.

In addition to similar formal structures and expressive features, mothers' narratives have other resemblances to music. Although modern classical music audiences are exceptions,

movement is an inherent part of most musical behavior, as can be noted in pre-modern societies, in vernacular music everywhere, and certainly in baby talk. As with mother–infant interactions, music is generally considered to be highly pleasurable. Both are used for social regulation and enculturation and to create attunement and synchronization in participants or listeners – leading to emotional bonding and sometimes feelings of ‘self-transcendence.’ Reactions to both may be ‘wordless’ or ‘inexpressible’ – not surprising, since infants lack speech.

To summarize, infants of 8 weeks of age, and even earlier, are exquisitely attuned to the music-like narratives of their mothers and others. They are born expecting interaction and coordination with another person in a shared temporal framework – in other words, they are born ready to become musical. Thus music is in our nature. It exists from the beginning of our origin as a species, more than a million and a half years ago and in our origins, at birth, as individuals.

4. Music and narrative

What I have just described is the basis for the remainder of this article, which deals with the implications of our innate musicality, our inborn receptivity to music-like narrative. I want to suggest that, although both story and music originated phylogenetically in ancestral mother–infant interaction (and originate ontogenetically today in each individual pair), they have each developed far beyond these roots, when they were once, essentially, one.

Until recently, and still in many parts of the world, music was quite different from what many Westerners think of as ‘music’ (that is, what is taught in ‘music lessons’ and in schools: music learned from scores, practiced and rehearsed, and also something that is a special talent or skill that not everyone can do). Today, also, music may be listened to raptly in special places like concert halls or alone in one’s home, using various electronic devices – a very recent possibility.

For the greater part of human history and prehistory, music has been (and still is) performative and often improvisatory, a social or communal (not solitary) activity. Everyone participates, if only by standing and clapping or otherwise beating time. It is thus not only vocal/auditory but visibly seen and responded to with one’s own movements, making a single unified multi-modal experience. It is the same with what we call storytelling or narrative which, in its phylogeny and ontogeny, was also performative, improvisatory, social, communal, and multi-modal.

But theorists who write about the subject rarely take these pre-linguistic and pre-verbal roots of narrative into account. I think that this is because of our hyperliteracy. Academics with advanced degrees naturally tend to think of stories or narratives as written and read. It is ironic that the earliest studies of narrative were inspired by folklore which, of course, originated as an oral, not written form. Very quickly, however, down-to-earth narrative has been snapped up by academic theorists and flipped up into an intellectual stratosphere.

Here’s an example from a story of my own. If I *told* it to you face to face, it would differ from its written form here, which is also the point of the story! In the mid-1980s I was teaching at the graduate faculty at the New School for Social Research in New York City, giving a two-hour seminar on my ideas once a week in the Master of Arts in Liberal Studies program. (That class eventually became the book *Homo Aestheticus*.) Jerome Bruner was also teaching at the New School and I attended several sessions of the seminar in which he was developing the ideas about narrative psychology that he would later publish (Bruner, 1986, 1990, 2002).

Bruner distinguished between two modes of thought (or cognitive functioning), called ‘story’ (‘syntagmatic’ or narrative) and ‘argument’ (‘paradigmatic’ or logico-scientific). Argument is what people do when describing or composing a conference paper or an article for a professional journal like *Poetics Today*. We think objectively and generally, trying to make a

meaningful scheme into which knowledge fits and to construct that scheme coherently so that others will understand it. We have to go back and forth, cutting and pasting, inserting and deleting, making sure that one thing follows logically from the next or relates to something we described earlier. *We organize.*

'Narrative' thinking or 'story,' as it was characterized in the seminar, is concerned with another kind of meaning: that of lived experience, the way things that happen *feel*. It is not logical in the sense of having a topic sentence or an outline. Perhaps most conference papers *begin* with narrative thinking – there is something to convey that is important and we are motivated to communicate it – but then one has to stand back and try to sort it out, find words for it, find a way of presenting it logically (or abstractly) and coherently.

Because I had been living in Sri Lanka for 15 years before I came to New York, I was a little puzzled by the dichotomy in Bruner's class of two types of thinking and communicating. I had originally gone to Sri Lanka from an academic environment in the United States (US) and one of the things that quickly struck me in this new life was that people seemed to have a different way of relating to each other in conversation than I was accustomed to. It is hard to describe, except in terms of what it was not: it was less analytic (even when it was critical, say, of a movie or someone's behavior), less self-aware (though concerned with personal impressions), less jokey (though humorous, even silly). I found that talking with others was usually undemanding: I didn't have to think a whole lot. Sometimes conversations were boring, but mostly they were like being in a warm bath – that is, comforting and relaxing: enjoyable.

I do not want to make too much of this. Certainly we all find that talk with colleagues is different from talk with families and friends. But even with fellow academics in Sri Lanka, my relationships were subtly different. With my friends in the US we often wondered why things were as they were – that is, we analyzed ourselves, our relationships, our children's behavior, politics. (When my Sri Lankan husband overheard me talking like that with a Westerner, he thought we sounded like textbooks.) Many of us had gone to therapists and knew how to look objectively at our (or each other's) problems. These conversations could be stimulating, thought-provoking, sometimes clever, sometimes demanding, often ironic and amusing. After spending some time in Sri Lanka, however, I sometimes found them too formulaic and distanced.

While in Bruner's seminar I realized that, in Sri Lanka, conversations were much more of the 'story' kind: they were 'situated, particular, contextually embedded' (Bowman, 2009, p. 212). They 'created and conveyed knowledge that was up close and personal rather than general and generic' (p. 212). I concluded that, in addition to the new knowledge and information that we acquire in universities and professional settings, it is critically important to learn to think paradigmatically. It requires a lot of work to think that way until it becomes internalized and then seems 'natural' – one of 'two modes of cognitive functioning.'³ (I doubt that anyone who is not an academic would ever say 'cognitive functioning.')

When asked about current events or even our own lives, we learn to try to decontextualize or disembed our feelings from the raw material and impose some kind of coherent order on our answers and opinions. A second story, this one from my life in Sri Lanka, will further elaborate what I've just described.

From time to time, a local man came to our house to sell jaggery, a kind of solidified brown sugar that is made from the sap of a type of palm tree called *kitul*.⁴ At first I called this person 'the jaggery man,' but eventually learned that his name was Nandasena. He lived down the road with his wife and several children in a small hut made of earth. He was employed by a local landowner, who lived elsewhere, as a sort of caretaker who looked after various trees – coconut, mangosteen, mango, and woodapple – which he would pick when they were ripe. He also tapped *kitul* sap to make jaggery, which he sold to people in the neighborhood.

One evening he came to our door in a state of high excitement after discovering thieves picking coconuts, which are valuable items. He wanted us to inform the police. When we called the police station, the officer who answered asked for Nandasena to speak and make his report. When I held out the receiver he looked discomfited and I realized that he had probably never used a telephone before. (Now, of course, he probably has a mobile, but at that time landline telephones were all that were available, and were costly and rare.) He put his ear and mouth to the receiver appropriately but was more or less tongue-tied and didn't know where to begin. Finally, in answer to the policeman's questions, he began to speak although it was obvious that he could not tell the same story to the police that he had told to us about what was happening. 'They' were stealing coconuts, but he didn't say who or where or how many (thieves or coconuts), or whether it happened in the past or was happening at the moment. When asked who he was, he gave his name as 'Nandasena' (which would be like saying 'Robert') but not that he was the caretaker of so-and-so's property; when asked by the officer, he gave the name of the landowner, with his relevant honorific title of 'mahattaya' (which means 'gentleman'), but he did not specify the location of the property.

I realized that it was the impersonality of the telephone that interfered with Nandasena's ability to say what had happened and to give other relevant details, which he had told us very well. Without another person, a responsive face to talk to, his report could not begin, even though he was perfectly adept at telling and listening to stories. But he had not gone to school and learned how to construct a narrative for an absent listener or reader, anticipating what that other person might need to know, a report of sequential events. I can remember as a child or adolescent feeling myself reluctant to make a telephone call to find out information or make a request; that is, to use some other kind of communication than that of talking with family and friends. Although most adults will eventually find that conversing with strangers on a telephone is not difficult, it is not an inborn skill.

My story about Nandasena's telephone report illustrates that thinking logico-scientifically is not an ability that develops organically or naturally but comes only from education and practice. Saying that people have two modes of thinking is incorrect, if we are talking about people in general. People naturally and spontaneously have one mode of verbal thinking – narrative – and, if they happen to be born in a place where they achieve a high degree of schooling, they can develop and perfect logico-scientific thinking, even to a degree where it occupies a major part of their lives. We never stop telling stories face to face, but humans don't have to communicate paradigmatically at all. Ever. Logico-scientific thinking is best done alone, by oneself, in a study, and most people in the world do not and never have spent time alone, by themselves, in a room.

Isn't this also the case with music today? In a pre-literate society, everyone participates in musical behavior, singing and dancing, in the same space and time, no matter what their 'level of aptitude.' After becoming old enough to start to talk and to play with others, children move from listening and responding to the baby talk of their mothers to a kind of sing-song play-talk and then singing with each other, to listening to adults sing and watching them dance, and quite soon participating with the grown-ups. This is how they learn to talk (face-to-face, using 'communicative musicality,' as described by Malloch & Trevarthen, 2009) and to listen to and tell stories.

In contrast, student musicians today take regular, often private, lessons, laboriously learn to decipher and interpret musical scores, and practice, practice, practice, by themselves. There is a right way to play and sing that they must master over hundreds and thousands of hours of

solitary work. They listen critically, often alone, to recordings of others making music or sit silently listening in a concert setting.

Music educators become experts first in musical sounds (which are the rudiments of music), then musical narratives (the more or less organized sequences of musical sound that become the music they intentionally make and listen to), then narratives about what they and other people feel about the practice or learning of music and finally—at an advanced level—the objective-analytic-abstract-theoretical sorts of narrative that they tell each other at conferences or in journal articles. That is, there is a *spectrum of narrative*.

Nandasena was not a hunter-gatherer, but his narratives (both his emotional description to us of the robbers and his telephoned report to the police officer) were on a similar spectrum to the kinds of storytelling abilities humans have made use of from the Pleistocene to the present. I think this is important to understand when we use theoretical terms such as ‘narrative.’ I would say that, at its fundamental level, narrative, whether verbal or musical, is the *way the mind evolved to relate to other persons through language and musical/emotional sounds*. That is, individual person, context, and relationship are involved.⁵ And the kinds of subsequent narratives we tell each other (or sing and play for each other) vary according to our social environment and developmental stage.

Earlier I described mother–infant interaction as being highly musical: it has melodic contour, pulse or meter, expressive dynamics in volume, speed, and intensity. Mothers and infants engage in pre-literate or proto-narrative duets, which involve musical sound, then spoken words, then spoken and musical narrative. Most verbal narrative, like musical narrative, is about *feelings*.⁶ Nandasena’s narrative to us was about his feelings in response to the coconut thieves – his shock, helplessness, worry about what his boss would say and do as a result.

5. Narrative and music in lives today

Readers of my work know that I often describe the varied ways of life and thought of non-Western people, including people of prehistory insofar as archaeological information allows reasonable speculation. After I lived for over 15 years in Sri Lanka, married to a Sri Lankan, I appreciated the coherence and value of another culture’s ideas and practices, even as I also discovered that humans are fundamentally similar, especially in their psychological or emotional needs – which include a need to participate in the arts. In my work, I have also proposed plausible evolutionary origins of the various arts, which requires that one also study infants and small children who show universal needs, emotions, and cognitive capacities, before they are quickly channeled into their unique surrounding culture.

Thinking in this ‘paleoanthropsychobiological’ way is useful when examining or making use of some of the theoretical constructs of modern academic society. To give just one example, when I first learned about Howard Gardner’s influential ‘frames of mind,’ or ‘multiple intelligences’ (Gardner, 1983, 1999), it struck me that, of the seven or eight intelligences, only two – ‘logical-mathematical’ and ‘linguistic (reading, writing, analyzing)’ – were requirements for what, in modern societies, is considered to be success. That is to say, having these skills to a high degree is essential for ‘argument’ (‘paradigmatic’ or logico-scientific thought, as it was characterized in the New School seminar I described in section 4). But logic, science, math, and the literate skills of reading and writing can be acquired only after many years of training in schools: they have not been essential for any kind of life but our own.

On the other hand, spatial, kinesthetic, musical, interpersonal, intrapersonal, naturalistic, and existential intelligences are evident in our children and ourselves because we were once

hunter-gatherers who relied on them for our very survival. Our pre-literate and pre-scientific ancestors valued linguistic intelligence of the *oral* kind, as 'story' or 'narrative,' although unfortunately this intelligence is no longer rewarded in modern societies by scholastic success.

I am aware that, over the years, Gardner's construct has been criticized in various respects, but its outlines serve well my purposes here. It is interesting that he does not describe an 'artistic' intelligence but rather suggests that art can be made with (or with regard to) any of the intelligences. Nor does he use the term 'narrative.' But certainly in musical behavior, which in pre-modern societies nearly always includes movement and dance (and therefore spatial, kinesthetic, musical, and interpersonal intelligence), our ancestors communicated (both with and without words) in the sorts of narratives for which Malloch and Trevarthen (2009) have provided a name: communicative musicality.

Rather than preparing students specifically for academic success, the narratives of communicative musicality instead contribute to the satisfaction of five psychological necessities that I describe in *Art and Intimacy* (Dissanayake, 2000): intimate relatedness or mutuality, the sense of belonging to a group, personal and collective meaning, individual and group competence, and the opportunity to demonstrate and communicate, through elaborations (intentional, set-apart, art-filled behaviors), how much we care about vitally important matters of our lives. The result here is social and psychological well-being.

Whether argued in an academic article or told as stories about my work, I like to think that the same message comes through: the arts and all our 'intelligences' made and make us human: we ignore them at our peril.

Acknowledgments

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Notes

1. As well as being common gestures of sympathy and affection, these also occur in affiliative social contexts with wild and captive primates and probably early hominins (deWaal, 1989; King, 2004; Nicolson, 1977; Silk, 1998).
2. The biological and cultural importance of this interaction came to light in an unintended experiment when the psychological effects on emotionally neglected infants from Eastern European orphanages were discovered after the collapse of the Soviet Union.
3. In numerous writings, Jean Piaget (e.g., 1951) distinguished between three stages of the development of thought: sensorimotor, concrete operations, and formal operations. It is interesting to realize that formal operations is a stage reached only by well-educated, highly-literate people (Hallpike, 1979) and is not necessary for a rich and meaningful life. It should be said that, although Piaget's observations and methods have been criticized and his work does not have the same influence today as it did 50 years ago, his analyses still reward our perusal and many have been incorporated, often without attribution, into current knowledge.
4. Just before the bud of the kitul palm is ready to open, one binds it tightly, makes an incision in the top, and ties a clay pot underneath. The sap or nectar drains into the pot and can be collected every few days. After boiling and being poured into half a coconut shell, the sap hardens into a hemispherical piece of delicious, rich, sweet substance called jaggery. If allowed to ferment as liquid, it became an alcoholic beverage called 'toddy,' which could also be distilled into a strong liquor called 'arrack.'
5. Two well-known experts on the cognitive science of language (Pinker & Jackendoff, 2005) have suggested that language evolved and developed in order to exchange complex propositions. In my

experience, few people utter many complex propositions, unless they are writing a dissertation or academic article. Nandasena got through his life just fine without complex propositions until he had to make a police report over the telephone, when he needed some disembedding skills. Chapters in Malloch and Trevarthen (2009) establish that communication is motivated from birth by relationship with another human being, what is called intersubjectivity. The earliest communicative partners are usually parents – especially mothers – and the mother–infant pair, as described here, spontaneously creates proto-conversations or proto-narratives that are made not of words but of vocal sounds, facial expressions, and head and body movements. This is the scaffolding on which spoken language eventually develops, but speaking or talking grows out of the desire to exchange feelings (not ideas or propositions) with intimate others. I am inclined to suggest that this was also true of our hominin ancestors in the Pleistocene.

6. The right hemisphere of the brain, which is ‘mute,’ nevertheless is responsible for what are called the prosodic parts of speech – the musical or emotional aspects such as melodic contour, rhythm, stresses, and dynamics – that give color, emphasis, and irony to the words of our spoken stories, expressing the feelings of the speaker (McGilchrist, 2009).

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Author biography

Ellen Dissanayake (see www.ellendissanayake.com) is an independent scholar, lecturer, and author of three books, *What Is Art For?* (1988), *Homo Aestheticus: Where Art Comes from and Why* (1992), translated into Chinese and Korean, and *Art and Intimacy: How the Arts Began* (2000). Combining her interest in the arts with evolutionary biology, and using insights drawn from 15 years of living and working in non-Western countries (Sri Lanka, Papua New Guinea, India, and Nigeria), she has developed a unique perspective that considers music and other arts to be normal, natural, and necessary components of human nature. A native of Washington State, USA, she currently resides in Seattle where she is Affiliate Professor in the School of Music at the University of Washington.