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IN THE BEGINNING: PLEISTOCENE AND INFANT AESTHETICS AND TWENTY-FIRST CENTURY EDUCATION IN THE ARTS

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This chapter is written from a viewpoint largely unfamiliar to arts educators and arts education researchers—that of evolutionary psychology, whose basic tenet is that the human mind has been prepared by natural selection, operating over geological time, for life in a human group (Bjorklund and Pellegrini, 2002). My concern here is with the arts as they originated and developed during the evolution of the human species (phylogeny) and as they emerge in individuals (ontogeny). My hypothesis proposes that arts—or, more accurately, aesthetic proclivities that can be realized in every art—evolved over hundreds of thousands of years in our Pleistocene ancestors, contributing to their psychobiological fitness.[1] Manifested first in mother-infant interactions and later elaborated in cultural practices, these inherent aesthetic proclivities are in the repertoire of every individual human, from infancy to old age. They are normal, natural, and necessary human endowments.

Such a broad and perhaps surprising claim provides justification for the importance of arts education and arts educational research, even though its author is not a practitioner of either profession. It is not my task here to suggest subjects or questions for research or point out connections between my ideas and other particular subjects of study that interest arts educators. The aim, rather, is to give arts educators and researchers empirical and theoretical support for an essential, if tacit, principle of their work: that the arts have been and remain not only important but integral to human lives.

My argument is composed of five interrelated claims. These are followed by a concluding commentary that emphasizes the importance to individuals and societies of recognizing and developing the aesthetic abilities with which all humans are psychobiologically endowed. It further describes how a Pleistocene perspective can contribute to ideas about arts education in the twenty-first century.

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[1] . "Pleistocene" refers to the geological period from 1.6 million to 10,000 years ago, coinciding approximately with the appearance and development of the genus *Homo*.

1. Humans Have a "Pleistocene Psychobiology"

Figure 1 shows, in a simplified diagram, 4 million years, roughly the span of time in which our hominid predecessors were adapting to the environments in which they lived.[2] For our purposes, the last quarter-of-a-million years (the 250,000 years represented at the far right of the spiral) is instructive for indicating how infinitesimally

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Figure 1, with legend, goes approximately here

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small has been the proportion of human evolutionary time in which our species, *Homo sapiens sapiens*, has lived in settled societies, not to mention in the industrial and postindustrial settings that characterize humans of modern times. Twenty-five thousand years ago (one-tenth of that quarter-million-year period) is roughly when the Paleolithic (Old Stone Age) cave paintings of France and Spain were made; one-third of *that* 25,000 years is when settled life in "civilizations" first arose in Mesopotamia, the Indus Valley, Egypt, China, and Meso-America. We call this brief 6 to 10 thousand year period "recorded history," since these civilizations have left us writings and other symbolic documents. On the diagram, the Birth of Christ (2000 B.C.) would be barely evident, the Renaissance a millimeter line, and the events of the past century or two, invisible.

Until the domestication of plants and animals that made possible settled life, food surpluses, and large groups, our ancestors lived as hunter-gatherers. As such, they belonged to "societies of intimates," as described by Givón and Young (2002) who contrast them with "societies of strangers," the larger and more complex groupings that began to develop around 10,000 to 8000 BP (Before the Present). Humans evolved to live and prosper in societies of intimates and, as the diagram shows, for 99% of human life on earth they were the sole social form (although such groupings sometimes exist within larger heterogeneous societies). Salient characteristics of societies of intimates are a

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[2] Since the diagram was made in 1988, further archaeological evidence has assigned hominids to dates even earlier than four million years before the present and provided a more complex multilinear set of relationships among various precursor species. The figure suffices for the points made here.

small group size (50 to 150), a foraging economy (hunting and gathering), a nomadic but generally restricted territorial distribution (within a 10 to 20 mile radius), cultural uniformity, informational homogeneity and stability, a consensual leadership structure, and kinship-based social cooperation (Givón and Young, 2002). In such groups, everything needed for life is obtained or made by people's own hands and bodies. Sharing and reciprocity are not optional. Binding cooperative relationships are encouraged, coordinated, and reinforced through frequent rites or ceremonies.

For educators, the relevance of this long Pleistocene heritage is to appreciate that children are born with abilities, capacities, and emotional needs that have prepared them to live and prosper in a "society of intimates," with all that that implies. They are not necessarily predisposed to perform well or enjoy learning in the typical institutionalized modern classroom (Jensen et al., 1997). At the same time, however, this heritage has endowed humans with universal aesthetic proclivities that are evident in children's earliest interactions with parents and other caretaking adults. These proclivities are developmentally important in themselves and may be drawn upon for other learning as little hunter-gatherers are helped to become modernized young adults who can fit into and find fulfillment in complex, technological societies (see section 6).

2. Dyadic Emotional Interaction is a Primary Human Capacity and Need

Human infants are born with predispositions and aptitudes that help them to become socialized to whatever culture surrounds them—that is, to become enculturated. From birth, babies show interest in and pay attention to human voices and faces more than any other sound or sight. Interestingly, they are most responsive to *certain sorts of* sounds and *certain sorts of* facial expressions. They prefer undulant, high-pitched, soft, musical vocalizations—the kind often called "baby talk," with numerous repetitions ("Oh you're so cute! Yes you are. You are!") and dynamic variations (louds and softs, fasts and slows). Worldwide, babies prefer facial expressions that are exaggerated and held—raised eyebrows, open mouth, broad smile and widened eyes, sometimes with the adult's head bobbed sharply upwards or nodded (see Figure 2). These interests and preferences give neonates and infants as young as four to eight weeks remarkable propensities for interaction and intimacy, as does their readiness for sustained eye contact or "mutual gaze" (see, e.g., Beebe, Stern, & Jaffe, 1979; Brazelton, Koslowki, & Main, 1974; Jaffe,

Beebe, Feldstein, Crown, & Jasnow, 2001; Stern, 1971, 1985; Stern, Hofer, Haft, & Dore, 1985; Trevarthen, 1977, 1979a, 1979b, 1980; Tronick, Als, & Adamson, 1979).

In their early weeks, infants respond best to interactions that are regularized and predictable—soothing and lulling—and adults provide these in their soft vocalizations and tender facial expressions as well as with gentle rhythmic stroking or patting. Microanalyses of videotaped interaction between mothers and infants of eight weeks have revealed that the pair together create a closely-attuned, socially-contingent engagement where each responds, within fractions of a second, to the other's vocal and gestural rhythms (Murray and Trevarthen, 1985; Nadel, Carchon, Kervella, Marcelli, & Réserbet-Plantey, 1999). When infants reach four to five months, they desire more excitement and even divergence from their expectation, which adults willingly supply in more vigorous impromptu games and nursery songs (e.g., "This Little Piggy" or "Peek-a-Boo").

Such interactions are critically important for babies. They contribute to a variety of psychological and cognitive skills including homeostatic equilibrium (Hofer, 1987, 1990), self- and interactive regulation (Beebe & Lachmann, 1994; Gianino & Tronick, 1988, Spangler, Schieche, Ilg, Maier, & Ackermann, 1994), and self-organization (Tronick, 1998). Interactive participation also develops an infant's cognitive "narrative" abilities for recognizing agency, object, goal, and instrumentality (Stern 1985). It predisposes the infant generally to intellectual and social competence, including recognizing intentionality, engaging in reciprocity, and developing recall and prediction beyond the present situation (Hundeide, 1991). Additionally, it reinforces neural structures predisposed for socioemotional functioning (Aitken & Trevarthen, 1997, Jaffe et al., 2001, Schore, 1994, Trevarthen & Aitken. 1994). Psycholinguists point to the contribution of early interactions to eventual language learning (Kuhl, 1993, Locke, 1993, Snow, 1977). Equally importantly, they help babies to form emotional relationships with others and thus to thrive. Because of all these benefits to a baby's cognitive, linguistic, social, and emotional abilities, mother-infant early interaction can be considered biologically adaptive (Dissanayake, 2000a,b).

In evolutionary parlance, an adaptation is an anatomical structure, a physiological process, or a behavior pattern that contributed to ancestral individuals' ability to survive

and reproduce in competition with other members of their species (Crawford 1998). Mother-infant early interaction can be viewed as part of a suite of other adaptations that accompanied two characteristic hominid evolutionary trends: *bipedalism*, or upright walking, and greater *encephalization*, or expanded brain capacity. At parturition, these trends became incompatible, as upright walking requires a narrowed pelvis and reshaped birth canal. As a consequence, it was necessary for increasingly brainy babies to be born at a more and more immature state when their heads and bodies were small enough to pass through the birth canal.[3] Because immature babies require almost constant care for an extended period of time, it would behoove an infant to appear particularly lovable and for a mother's maternal feelings to be reinforced so that they would endure through the requisite months and years of infant dependency. Ancestral babies who responded more enthusiastically to altered and enhanced facial expressions, vocalizations, and movements encouraged better care insofar as these conspicuous and emphatic signals better reinforced neural circuits for affiliation in the mother's brain.[4] Interactive behavior served the joint and individual interests of both partners and incidentally provided the raw ingredients of adult aesthetic behavior and response (see section 3 and Dissanayake 2000a, b).

3. The Components of Mother-Infant Interaction are Fundamentally Aesthetic[5]

It is important to realize that adults do not teach babies to respond to the altered and unusual vocal, visual, and kinesic (gestural) features that we use with them in early

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[3] Other adaptations included a separable pubic symphysis in hominid females, compressibility of the infant's skull during birth, and considerable infant brain growth after birth (Dissanayake 2000a).

[4] It is significant that the facial expressions, vocalizations, and movements that mothers and other adults use with infants are exaggerations, repetitions, simplifications, and elaborations of ordinary or everyday affiliative signals that human adults (and some primates) spontaneously use in friendly, cooperative interactions with each other (Dissanayake 2000a, b; King 2004).

[5] Fathers, caretakers, and other adults also engage with babies in interactions like those described here for mothers. The capacity is part of a general human repertoire.

interactions. Rather, infants teach *us* to do these things. With their wriggles and smiles at the features they like best, they reward us so that we want to keep entertaining them. This mutual entertainment system can be observed between adults and infants everywhere in the world (see Figure 2).

Figure 2. 4 B&W Images, with legends, go approximately here (or on p. 4)

It can in fact be said that babies are born wanting not only interaction but specific kinds of interactions, or—indeed—specific "operations" performed by their partners upon their vocalizations, facial expressions, and head and body movements. Let us look at a short extract from a transcript of a recorded interaction with a Scottish mother interacting with her infant of eight weeks (Dissanayake 2001).

(INHALE) Oh! Oh!

Oh, serious face.

What a *ser*ious face.

What a *ser*ious face.

(WHISPERS) Has he got tickly feet? [*accelerando*]

Has he got tickly feet?

Have you got tickly feet?

Where's your tickly feet?

Where's your tickly feet?

[sf] Oh! You blowing bubbles?

[WHISPERS] [*pp*] You blowing bubbles.

Here's your tickly feet?

Where's your tickly feet?

In this interactive segment the mother tries to engage her slightly-grumpy infant by means of voice, facial expression (mock seriousness followed by conspiratorial smiling), and by gentle tickling, actions that have worked before to engage his attention. Certain abstract components or "operations" stand out: *repetition* (of words, phrases, vocal contours); *formalization* (patterning or simplification); *dynamic variation* (variation of 'tickly feet" questions; use of loud and soft, fast and slow); and *exaggeration* ("*ser*ious

face"). Although only the words (vocalized sounds, to the baby) can be shown here, the same operations take place concurrently in visual and kinesic modalities. That is, along with their vocalizations, adults' facial expressions and body movements are also repeated, formalized, varied dynamically, and exaggerated.

Such operations are characteristic of early interactions, making them different from typical speech to adults or older children. In older infants, a fifth operation may be added—surprise or *manipulation of expectation* (as in nursery songs and games, where a dramatic occurrence may be temporarily withheld: ". . . . Peek-a-boo!"). Notably, these five operations are used by artists in any medium with effects similar to those achieved by mothers: they attract attention and create, mold, and sustain emotion. It may be too much to say that the infant's innate (untaught) preferences for these specific treatments of sounds, sights, and movements are *aesthetic,* but it seems justified to call them *proto*-aesthetic (Dissanayake 2000a).

4. The Arts in Ceremonial Ritual Build Upon the Proto-Aesthetic Components of Mother-Infant Interactions

In the previous two sections I have outlined a hypothetical evolutionary scenario that accounts for the existence of unexpectedly complex emotional communicative interactions between young infants and adults. Such interactions appear to be universal—they have been observed casually in a wide variety of societies and carefully analyzed by developmental psychologists in Europe, Britain, and North America. My hypothesis proposes that proto-aesthetic operations—repetition, formalization, dynamic variation, exaggeration, and manipulation of expectation in visual, vocal, and kinesic modalities—were intrinsic to ancestral mothers' participation in adaptive interactions with their infants, serving to engage the infants' attention and to shape and entrain both partners' emotions. As I described, the interchange evolved to enable mutual bonding as well as to provide other developmental advantages to infants described in Section 2. Such bonding and developmental benefits continue to flow from the interactions between mothers and infants in today's world as well.

This account is the first building-block of a "two-tier" argument about the evolutionary origin and function of the arts. The second step is to show how the alterations and enhancements of mother-infant interaction (the repetitions, formalizations,

dynamic variations, exaggerations, and manipulations of expectation) were found to be emotionally affecting in other circumstances—namely, ritual ceremonies, a practice that eventually became universally intrinsic and adaptively valuable to cultural life.

Anthropologists report that ceremonies are a primary feature of social life in small-scale groups, surrounding people from birth and throughout their lives (Rappaport 1999; Tambiah 1979).[6] It is not usually pointed out that ceremonies are, in fact, composed of arts—are *collections of arts*. Perhaps this fact is overlooked because "art" is a complex modern concept, difficult to translate to a premodern context. However, if one uses the less-contested term "arts" (plural), it is clear that song and other music, dance, visual enhancement of self, artifacts, and surroundings, altered or poeticized language, and dramatic presentations are to be found in all human societies—most conspicuously in their ceremonies. Without arts, there is no ceremony.

Why are ceremonies composed of arts? To put it another way, why do ceremonies use "artified" (made extraordinary, different from ordinary) materials, spaces, bodies, sounds, words, movements, and ideas? Artification accomplishes a number of important things. To begin with, the arts, because they are different from the ordinary, attract attention to the substance and the importance of the event. Additionally, the arts create, shape, and sustain interest and emotion, making the ceremony memorable and meaningful. Using ordinary language to say "I sure hope we get a deer today" or "I don't want to be killed in battle" has an emotional effect quite different from that of participating with others in an artfully-crafted, temporally-organized, multimodal expression of the same desire.

We cannot observe ancestral humans inventing ritual ceremonies and my reconstruction is of course only a hypothesis. However, I suggest that if receptivity to the (proto)aesthetic operations of mother-infant interaction is in place and if the capacity to perform the operations is there (because eventually all humans will have been born with these adaptive receptivities and capacities), then it can be posited that the operations could have been used in other circumstances. The similarities between mother-infant

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[6] Ceremonies occur in larger, complex societies and subgroups as well, but I am here concerned with the origin and development of ceremonial practice in ancestral humans.

interaction and ritual ceremonies are suggestive (Bateson 1979, pp. 74-75). Both are performative events composed of operations (again, repetition, formalization, exaggeration, dynamic variation, and manipulation of expectation) upon vocal, visual, and kinesic modalities.

I suggest that use of the operations became helpful and valuable especially in times of uncertainty and anxiety—and indeed, anthropologists have pointed out that ceremonies ("rites" or "ritual") occur at such times (e.g., van Gennep 1960/1908; Turner 1969). Consider the lament, an improvised musical-poetic form of mourning the loss of something held dear. Although weeping, moaning, and wailing are common human responses to grief, sadness, and despair, in a large number of societies these "natural" expressions of emotion are traditionally altered and transformed (Holst-Warhaft 1992). Laments are, in fact, "artified" by aesthetic operations: sobs, moans, and sighs are formalized (typically in descending stepwise movement), and the musical-poetic forms and verbalized expressions of loss are repeated, exaggerated, dynamically varied, and manipulated, becoming an improvised cultural artifact. Somehow, by means of these operations, performed in the presence of supportive others, the loss becomes more easily borne. If lamenting did not somehow contain or ease grief, it would hardly occur as widely as it does.

One cannot expect that the early inventors of laments and other rites would have consciously or deliberately set out to formalize, repeat, exaggerate, vary, and manipulate their vocalizations and movements. But if they happened to do so, entraining sounds and gestures with others, I suggest that they would have found at least some relief from and a sense of coping with the anxiety that prompted these actions. Anthropologists have observed groups chanting or moving rhythmically together in stressful times (e.g., Malinowski 1922 and Mead 1930/1976, both of whom describe such behavior in Papua New Guinea peoples during frightening storms).

The ability of coordinated voices and body movements to reduce tension is evident in infancy when mother-infant engagement assists biobehavioral self-regulation

and the development of infant homeostasis (Gianino & Tronick 1988, Hofer 1990).[7] It is not farfetched to suggest that these same mechanisms "worked" for similar ends in ancestral adults. Prolonged stress is known to compromise a wide range of bodily functions including energy release, immune system activity, mental activity, digestion, growth and tissue repair, and reproductive physiology and behavior. An individual's perceived sense of coping with a provoking situation affects the degree of severity of the response and influences whether or not a stress disorder occurs (Sapolsky 1992). It is adaptively advantageous for individuals to cope (or feel that they are coping) with circumstances that provoke stress (Geary 2005). I suggest that ceremonies originated and persisted because the aesthetic operations (artifications) served, as in mother-infant interaction, to attract attention (to the matter of the ceremony), create, mold, and sustain emotion, coordinate body and brain rhythms, and—by doing all these—to provide in individuals and groups, among other satisfactions (see section 5), the feeling that they were coping.

Proposing such an adaptive function for the arts does not preclude recognizing that they are highly valued for giving pleasure and enjoyment as well. Indeed, both mother-infant interaction and much ceremonial behavior is play-like—as performance, pretense, entertainment, and fun. In many African societies, a large repertoire of performance categories for adults and children is referred to as "play," not "dance"—and includes surprise, humor, and social commentary (Mans, Dzansi-McPalm, & Agak, 2003).

5. The Arts in Ceremonial Rituals Help to Satisfy Fundamental Emotional Needs

Although modern humans do not live in a Pleistocene environment, the emotional needs that evolved as part of Pleistocene psychobiology continue to affect our lives. Five fundamental psychological needs seem to have been well satisfied in life as it was lived in societies of intimates and particularly so in their art-filled ceremonies. In modern

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[7] Regularized, rhythmic movements like **rocking,** knee-jiggling and toe-tapping are soothing to humans, and even captive primates perform formalized (stereotyped) and repetitive movements to calm themselves when stressed or to increase arousal when they are bored (Charmove and Anderson 1989, Perry and Pollard 1998).

societies, these needs may not be so well satisfied and can therefore become a source of personal suffering and social dysfunction.

Mutuality, the need to be emotionally close to another person, is the cradle in which the proto-aesthetic capacities and sensitivities are first expressed and developed, as described in Section 2, in interactive communicative exchanges of adults and infants. In societies of intimates, mutuality with a caretaker and other familiar persons moves seamlessly into participation in arts-rich ceremonial practices that address other needs.

Ceremonies encourage individuals' sense of *belonging* as they focus on the same activities, move to the same rhythms, and participate in the ceremony's temporal unfolding with other members of the group. Dancing together, or simply moving together in time, creates and reinforces what William McNeill has aptly called "muscular bonding" (McNeill 1995), as he recalls his feelings as a young recruit during military drill. Initiations, in particular, provide a sense of identity by age and gender ("Now you are a man/woman") that art-saturated participation reinforces.

Ceremonies also contribute to a sense of physical and psychological *competence*, providing "something to do" during circumstances of transition or uncertainty, as when someone becomes ill, when game is scarce, when rain is late, when a baby is on the way. As described in section 3, ceremonies are age-old ways of dealing with anxiety about such vital matters. Preparation for ceremonies can also affect the sense of practical competence that is inseparable from hand use. It is well to remember that in pre-industrial societies, humans made everything they needed with their hands. Anatomists and neurologists describe the remarkable human hand with its opposable thumb, precision grip, and unusual tactile sensitivity (Wilson 1998). Hands evolved to be dextrous and flexible in part so we could make tools and other things from natural materials for our subsistence. People generally *like* to use their hands because they *needed* to use their hands.

Ceremonies also provide and reinforce a sense of *meaning* in life. They present a systematic account of the origin of the group and its environment and offer correct methods of dealing with the world as it is experienced. The very excess of many ceremonial practices is commensurate with people's concern about the vital subjects of

the occasion—prosperity, health, fertility, safety. Through the arts and in ritual humans recognize an extraordinary dimension of experience and become part of it.

Unlike needs for mutuality, belonging, competence, and meaning, a fifth fundamental human need—"artifying"—is not discussed or even recognized by most psychologists or biologists. Ceremonies provide occasions for people to show (to themselves and others) that they care about important things. By visually enhancing bodies, surroundings, and valued objects, with song, dance, special language, and performance, humans exercise their innate predispositions to make ordinary things special or extraordinary. Ceremonies provide the opportunity to use and respond to repetition, formalization, exaggeration, dynamic variation, and surprise in vocal, visual, and kinesic modalities: in short, they encourage making and responding to the arts.

6. Today, the Arts Remain Avenues for Inner Satisfactions and Practical Skills

It is well-recognized that human infants are born with evolved psychological and emotional predispositions that help them to become socialized to whatever culture surrounds them. Among these capacities are the readiness to bond with caretakers, imitate others, learn a language, play, and care about the opinions of others. The present chapter adds to this list of inherent cultural predispositions by showing that infants have also evolved to be receptive to (proto)aesthetic operations—repetition, formalization, exaggeration, dynamic variation, and manipulation of expectation. These operations are first displayed and developed in interactions with adults, typically mothers, who spontaneously use them to attract infant attention and interest and to coordinate both partners' emotions and behavior.

My hypothesis proposes that "arts" were invented by our Pleistocene ancestors when they performed these same aesthetic operations on materials, bodies, surroundings, sounds, words, and movements in ritual practices that addressed vital subsistence needs such as safety, health, success in hunting, prosperity, and transition through important life changes. Whether or not these intended goals were immediately attained (perhaps rain did not come or the patient did not recover), the aesthetic operations performed in ceremonial ritual, especially repetition and formalization, had adaptively beneficial effects of reducing stress, focusing attention on the vital matter, and promoting group coordination and concord.

As just outlined, a behavior of art, or "artification" (making use of and responding emotionally to aesthetic operations) thus can be said to have a phylogenetic origin (in capacities used in interactions that contribute to infant well being and survival) and biological function (in cultural practices that provide a sense of control of disturbing circumstances, thereby relieving anxiety, and contributing to group oneheartedness).

If this hypothetical reconstruction is accepted, it follows that infants and children, like all humans, are inherently artful. Such a possibility is difficult to promote or even to recognize in modern societies that typically treat the arts as separate from life and where art practice is largely individual, institutional, competitive, commercial, and held to virtuoso standard. Yet the artful predispositions of toddlers and young children are evident in their untaught readiness to sing and dance, to play with words, to make believe, to decorate their bodies and possessions, and to enjoy stories and dramatic presentations by themselves or others. If surrounded by adults who also readily and unselfconsciously engage in these arts, as is the case in numerous pre-modern societies, children develop their latent aesthetic tendencies easily by imitation and practice just as they also learn to speak and perform other required cultural behaviors.

Accepting that modern children have minds and emotional needs that are adapted to Pleistocene ways of life in societies of intimates has implications for arts education and research. Such a perspective supports hard-won experience in the classroom, helping us to understand why many children who might be well-suited for a hands-on life as hunter-gatherers are not especially gifted in book-learning (Jensen et al. 1997). Educators and other readers are invited to think of adolescent boys they know, for example, who seem more suited to hunting woolly mammoths or building a long house with their buddies than to learning algebra. Moreover, it is helpful to realize that for at least a quarter of a million years people much like ourselves led fully human lives without reading, writing, or arithmetic. It is not "natural" to sit in school six to eight hours a day.

The arts can be viewed as "Pleistocene" ways to learn and help develop concentration. They give practice in using analogy and metaphor**.** Seeing relationships, imagining, and imitating are all skills that hunter-gatherers automatically practice but that may be easily obliterated by mediated entertainment. Arts also give practice in cooperating with others, again a difficult skill for children who may spend too much time

alone with television and computer games. The arts provide connections to the natural world for material, images, and metaphors. They help children to explore their feelings and find ways to express these feelings to themselves and others. In modern classrooms, they help students learn about other cultures' ways of addressing fundamental needs through *their* arts. And they provide a ritual and social dimension to lives in which these may be otherwise lacking.

In addition to pointing out these *practical benefits* of the arts that were inherent in Pleistocene lives, this chapter has also described inborn aesthetic capacities that evolved to help individuals *satisfy fundamental emotional needs.* The problems that beset twenty-first century children and adults generally have to do with the five emotional needs described in section 5: feeling intimacy with one other person (mutuality), feeling that one is integral to a group and has an identity with regard to others (belonging), feeling physically and mentally capable to make one's way in the world and to deal with the practical and social problems that arise (competence), feeling a sense of purpose and value in the world and in what one does (meaning), and being able to demonstrate regard for one's life, showing oneself and others that one cares (artifying). Although these needs are largely fulfilled in societies of intimates in which ceremonial arts are prominent, they are easily neglected in complex, modern, pluralistic, highly technological, largely secular societies where art-filled ceremonies are fragmented and often disparaged and where there is more complex (and one might say "*in*human") information to be acquired and mastered. It is not sufficiently realized that the arts can contribute to addressing these emotional needs.

I think it is not too much to say that an awareness that the arts are deeply rooted in our evolved psychobiology, as individuals and as a species, should inform theory and practice in arts education and arts education research. Although we live today in societies very different from those in which human nature evolved, recognition of the aesthetic nature inherent in humans from infancy is a potent ally as we help children to satisfy their emotional needs for mutuality, belonging, meaning, competence, and artful participation along with the academic and social skills they need for modern life. A well-supported claim that the arts are an inherent and integral (i.e., evolved) part of human nature has

implications not only for theory, method, and practice within arts education but for others outside the profession who are in a position to foster and support our efforts.

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Legends

Figure 1. Four million years of hominid evolution. From *What Is Art For?* by Ellen Dissanayake (Seattle, University of Washington Press, 1988).

Figure 2.

a. Yanomamö (Upper Orinoco, Brazil) father and infant, mutual gaze and raised eyebrows (Photo, I. Eibl-Eibesfeldt)

b. !ko San (Southern Africa) woman and baby, playful grimace with raised eyebrows (Photo, I. Eibl-Eibesfeldt)

c. Eipo (Irian Jaya) woman and baby, mock surprise with raised eyebrows (Photo, I. Eibl-Eibesfeldt)

d. East Sepik (Papua New Guinea) grandfather and infant granddaughter, raised eyebrows and exaggerated smile (Photo, Maureen MacKenzie).