

In Zijlmans, K.. & van Damme, W. (2008).
World Art Studies: Exploring Concepts and Approaches,
 pp. 241-263. Amsterdam: Valiz.

THE ARTS AFTER DARWIN:
 DOES ART HAVE AN ORIGIN AND ADAPTIVE FUNCTION?

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Introduction:

Like medieval cosmology, which placed the earth and man at the center of the universe, the long philosophical tradition of Western art history and aesthetics considered Western man and his accomplishments to be the measure of all things. This chauvinism was due in part to necessary ignorance: our scholarly forebears could not have known about the cognitive complexity of the languages and kinship systems of the people they considered to be ‘savages’. Nor could they have been acquainted with other of these people’s intellectual and artistic achievements—the richly-carved *masawa* (or ceremonial seagoing canoes) of the Trobriand Islanders, the soaring facades of the *haus tambaran* of the Sepik River area of northern New Guinea, or the impressive *bisj* poles of the Asmat of coastal Irian Jaya, to mention only a few. The founders of Western art theory were necessarily also unaware of the astonishing galleries of Paleolithic cave paintings in France, Spain, and elsewhere.

Although many twenty-first-century scholars in the arts and humanities now wish to redress this neglect and incorporate the works and worldviews of non-Western humans into their studies, they remain encumbered by another legacy of their 2500-year-old intellectual heritage. I refer to the Western humanities’ ignorance of and resistance to the implications of Darwinism—the news that humans have evolved over millennia from simpler forms. Yet it is only by accepting this momentous fact of nature that today’s scholars can truly broaden the humanities to include *humanity*—the lives, minds, and works of people in all societies and historical periods, including prehistory. Such broadening requires that one understand the human species’ evolutionary history and its evolved psychology—in particular, that engagement with the arts is an integral and necessary (adaptive) part of a common human nature.

To adopt a human nature (or “adaptationist”) point of view—accepting that human bodies, brains, and behavior (including making and experiencing the arts) evolved to enable individual survival and reproduction in ancestral environments—is a revolution in worldview for the humanities that can be likened to replacing a geocentric with a heliocentric perspective in cosmology. Having adopted such a perspective, one can go on to study particulars and levels far more specialized than the cosmic or taxonomic but will have gained new tools for framing questions and can avoid spending time on fruitless Ptolemaic paths. For example, knowledge of how and why the brain has evolved to work as it does brings new perspectives to bear on some classical philosophical problems (e.g., how we perceive and “know” aesthetic objects) and disposes of others (e.g., the assumption of mind-body dualism or of the duality of cognition and emotion in aesthetic response).

The adaptationist principle of the unity of species nature is able to provide an underlying framework in which to address what is now an incoherent mishmash of concerns within the humanities about identity, authenticity, relativism, the crisis of representation, and the consequences of globalization. Influential organizing principles of nineteenth- and twentieth-century intellectual discourse such as Marxian interpretation of history, Freudian psychoanalysis, Jungian archetypes, or structuralist mythographies can be reframed (or discarded—see Scalise Sugiyama 2001c, 2003) when one recognizes that principles of human action arise fundamentally from an evolved human nature; different circumstances produce different responses in different individuals, but these individuals have the same underlying psychobiological needs. Jared Diamond’s compendium of world history, geography, and biology in *Guns, Germs and Steel* (1997), is a brilliant example of understanding human diversity, including artistic expression, within an underlying framework of species unity.

In this chapter I shall briefly (i) suggest that art is an adaptation, (ii) counter misconceptions about evolution and one of its core concepts—“function,” (iii) survey four major current adaptationist hypotheses for the evolutionary origin and function of the arts, (iv) propose a common denominator of art and introduce the notion of “making special,” (v) expand upon and defend this hypothesis, and (vi) suggest implications of adopting a humanity-centered art history and aesthetics.

I Considering art as an adaptation.

There are two major problems with considering art to be an evolved (adaptive) component of human nature. The first problem is shared with all who hope to say anything useful about art: what is it that one is talking about? What is art? For now let us simply include in this concept the activities that are commonly and loosely thought of as “the arts”—music, dance, literary language, visual ornamentation and representation, dramatic performance—and return to the question again in Section IV.

The second problem is restricted to evolutionary psychologists (“adaptationists”), who view all physical and psychological effort as being directed toward the ultimate ends of survival and reproduction: what is art’s adaptive function? The ability to make a weapon or a canoe presumably contributes to personal welfare and fitness, but careful decoration of these objects would seem to take time and effort that could be better used in more obviously beneficial activity. The arts—singing, dancing, drumming, complex performances, and the lavish ornamentation of bodies or surroundings—are costly, highly-energetic activities whose ultimate benefits are not immediately apparent. One eminent evolutionist has, in fact, forcefully declared that music (and by implication the other arts) is not an adaptation, but rather a byproduct of other adaptations (Pinker 1997, 2002).

Yet certain observations suggest that art (the arts) might well be adaptive.

A. They are observable cross-culturally in members of all known societies regardless of their degree of economic or technological development.

B. Their traces are evident in our ancestral past, as we find from at least 100,000 years ago with the use of red ochre (Watts 1999) and subsequent material artifacts.

C. Their rudiments are detectable and easily fostered in the behavior of young children, as when babies and toddlers spontaneously move to music, sing along or alone, make marks, decorate their bodies and possessions, play with words, find pleasure in rhythm and rhyme, or enjoy make believe.

D. They are generally attractants and sources of pleasure, like other adaptive behaviors such as mating, parenting, resting, or being with familiars in warm and safe surroundings.

E. They occur under appropriate and adaptive conditions or circumstances—that is, they are typically “about” important life concerns, as in ceremonies that mark stages of life or that concern prosperity, safety, and subsistence.

F. They are costly: large amounts of time, physical and psychological effort, thought, and material resources are devoted to the arts as to other biologically-important activities such as sex, finding, preparing, and consuming food, socializing and gaining social acceptance, helping close kin, talking with friends, and acquiring useful information. Especially in small-scale or subsistence societies, art behavior consumes resources far beyond what one would expect for an unimportant activity. A trait, activity, or behavior meeting these requirements is a candidate for being considered adaptive.¹

II. Misconceptions about evolution and functionalism

Evolutionary theory is the central unifying concept in modern biology. For a century and a half its claims have been tested by countless scientists who overwhelmingly accept its validity and fruitfulness. (Controversies within the field concern not the *fact* of evolution but rather the *mechanisms* by which it operates [Gilman 2003]). The theory has been essential to developments in modern medicine, epidemiology, agriculture, and pharmaceuticals on which our daily lives depend. Yet most people are both uninformed and skeptical about the very idea, particularly when it is applied to humans. Half of American adults, for example, deny evolution as a fact of nature (Gross 2002) and for nearly a century in the United States religious zealots have sought to restrict or even ban the teaching of evolution in the public schools.

Unfortunately, serious misunderstandings about the claims of evolutionary theory are as widespread and pernicious in the academy as they are in popular culture where the word ‘Darwinian’ is synonymous with cut-throat competition. Terms such as ‘survival of the fittest,’ ‘nature red in tooth and claw,’ ‘genetic determinism,’ or ‘selfish’ were not used by Darwin himself and poorly convey the complexity of the theory they are thought

¹ According to evolutionary psychologists Leda Cosmides and John Tooby (1992, p. 165), adaptations are characterized by economy, efficiency, complexity, precision, specialization, reliability, and affect. According to my hypothesis (see IV and V), art meets these criteria, but this chapter is not the place to elaborate my case.

to encapsulate. It should not be necessary to remind readers that current evolutionary thinking about humans, unlike that of some nineteenth-century proponents, is neither hierarchical (with white European males at the top) nor determinist (see Dissanayake 2003, pp. 253-254). Individuals are not in a perpetual struggle of each against all: sympathy, generosity, and cooperation are as much a part of human nature as are self-interest, xenophobia and aggression.

Evolutionists know that both environment and experience affect genetic expression so that the concept of genetic (or any other) “determinism” should be abolished along with the phrase “nature or nurture.” Culture (“nurture”) is not an alternative to but is part of biology (“nature”): every human is born with an unstoppable preparedness to become cultural. Babies come into the world ready to interact socially with those around them, to learn to speak, to imitate and wish to please, to accept the beliefs of their associates, and to play. These behaviors are evolved—adaptive—predispositions—the means by which every human becomes enculturated in the ways of the group into which he or she is born.

In contemporary anthropology, the concept of function has been discarded along with the explanatory models of Durkheim, Malinowski, and Radcliffe-Brown, whose wide-ranging “functionalist” interpretations of society and culture have been replaced with less ambitious and more focused and individualized studies. As used by evolutionists today, however, functional explanations of human behavior bear little resemblance to anthropologists’ assumptions about functionalism. They do not suggest, for example, that all parts of a society are interrelated or that individual behaviors within a society perform some intrinsic function specific to that society. The concept of adaptive function need not be inflexible, hierarchical, or determinist, nor will it force individual instances of a functional (adaptive) behavior, such as art, into a Procrustean bed of Western presuppositions. Quite the contrary—the adaptationist idea is that behaviors are evolved predispositions that can be expressed in a variety of cultural and individual manifestations (Dissanayake 2003).

Adaptationist thinking *requires* functional explanation, as when noting that anatomical features have functions: hands are used for handling and making and eyes for seeing. Similarly, behaviors such as smiling, laughing, playing, or speaking, and

behavioral categories such as courtship, mating, parenting, aggression, or food-sharing have an adaptive function, often several functions. Over evolutionary time, apathetic and unsociable babies would not have thrived as well as their more interactive age-mates, who would better survive to adulthood and pass on their genes to future generations.

Adaptive explanations of behavior distinguish between two levels of functional explanation—“proximate” reasons for the behavior (its ostensible motivation and immediate emotional or psychological effect—usually “this feels good or right”) and its “ultimate” selective value (its biologically adaptive end of contributing to individual fitness—survival or reproductive success). Obviously one rarely acts from a conscious decision or intention to survive or transmit one’s genes to future generations. It is proximate emotional desires and satisfactions that motivate and reward adaptive behaviors such as courtship and mating, caring for children, defending against an aggressor, sharing food with one’s kin and intimates, and participating in art. These desires and satisfactions, products of brain activity, have evolved to motivate adaptive behavior. People engage with the arts for many proximate reasons—to express their inner selves, to demonstrate their devotion to a deity, to earn a living, to assure a successful hunt, to please a client, to impress others, to while away the time, for entertainment and pleasure. One can quickly compile a long list from looking at examples of the arts in various small-scale societies as well as from examining aesthetic theories proposed by people who had no interest in a biological or adaptationist explanation.

An adaptationist view of art should seek to describe a proximate function (or functions) of art that can plausibly be shown to fulfill the ultimate function of contributing to survival or reproductive success.² It is not necessary that each instance of art contribute to these ends, no more than each instance of altruism or mating. However, in the way of life in which the adaptation evolved, those who possessed the adaptation would have tended to survive and reproduce better than those who did not.

III. Current adaptive hypotheses of art

² A would-be adaptationist who might wish to assert that art’s function is, for example, self-expression, wish-fulfillment, projection, or individuation should be prepared to show how these ends contribute ultimately to fitness.

Since about 1990, a growing number of scholars with an evolutionary grounding have published book-length and shorter treatments about the evolutionary function of one or another art—some of which are summarized in this paragraph for readers who are interested in exploring the subject.³ Considerable interest has been shown in a Darwinian view of literature or narrative (e.g., Carroll 1995, 2004; Cooke 2001, 2002, Gottschall and Wilson 2005; Scalise Sugiyama 1996, 2001a,b,c, 2003; Storey 1996). The origin and adaptive function of music in humans has been addressed in papers or books by Brown (2000a,b), Cross (1998, 2003), Dissanayake (2000a,b), Hagen and Bryant (2003), Merker (2000), Mithen (2005), Morley (2002), and Miller (2000a,b)—see also essays by Dissanayake, Merker, and Morley and Cross in Malloch and Trevarthen (forthcoming). Visual art has been treated in books by Aiken (1998a) and Coe (2003), and art in general by Dissanayake (1988, 1992, 2000a) and Miller (2000a).

Rather than describe each author's claims individually, I have apportioned their evolutionary hypotheses of art into four general adaptive functions that the arts are said to serve in human evolution. Some views straddle categories and I am aware that particular proponents of a hypothesis may feel that I have oversimplified or overgeneralized their position.

A. Improving cognition: *the arts contribute to problem-solving and making better adaptive choices.*

This function includes proposals from several bioevolutionary approaches to the arts. Self-labeled “Darwinian” (or “evolutionary”) aesthetics (which despite its label has little if anything to do with aesthetics as philosophers have used the term) addresses preferences for features that influence choices of desirable habitats, healthy and fertile sexual partners, and other judgments that would affect fitness in ancestral environments. For the range of subject matter see the essays and bibliographies in Voland and Grammer

³ Of historical interest are suggestions about the origin and function of human art (usually considered as *visual art*) by ethologically-knowledgeable theorists several decades ago: as a kind of play (Morris 1962), an occasion for individual display, identification, or prestige (Eibl-Eibesfeldt 1988, 1989; Geist 1978), or an enhancement of communication (Alland 1979; Eibl-Eibesfeldt 1988, 1989).

(2003). Although they do not deal directly with art works or art activities, some of these studies have contended that present-day responses to the arts may be derived from the ancestrally-adaptive preferences (e.g., for symmetry of bodies and faces) that they investigate.

In a related vein, neurologists of vision who practice ‘neuroaesthetics’ (Zeki 1999) show how evolved perceptual psychology underlies our appreciation of visual art (see also Ramachandran and Hirstein 1999; Solso 1994). For Zeki (1999, pp. 9-10), the function of art is “to represent the constant, lasting, essential and enduring features of objects, surfaces, faces, situations, and so on, and thus allow us to acquire [a deeper knowledge of them].” These neurocognitivists do not treat the sorts of multimedia and participative arts that presumably characterized early humans but use examples from masterpieces of Western visual art to illustrate their claims.

A third cognitivist approach addresses the human appetite for fictional stories, which on the face of it would seem to be maladaptive in a species that relies on the transmission of accurate information. Following Darwinian aesthetics theorists (and early theorists of children’s play), these hypotheses claim that fiction safely presents vicarious experience of adaptive information to cognitive systems that are involved with foresight, planning, and empathy, thereby providing risk-free practice for later life when similar circumstances might arise (e.g., Tooby and Cosmides 2001). Scalise Sugiyama (2001a) has examined folktales from around the world to demonstrate that in fictional narrative people acquire accurate information about local habitats that may contribute to their fitness.⁴

B. Propaganda: *the arts are used to manipulate, deceive, indoctrinate, or control other people.*

Insofar as art directs attention and emotion to messages, it can be used subversively to the benefit of the artmaker (Aiken 1998a,b; Eibl-Eibesfeldt 1988). Surveying a wide folklore literature, Scalise-Sugiyama (1996) makes a case for storytelling as a means of political

⁴ I regret that the general theme of this essay and its space restrictions do not allow consideration of the comprehensive, integrated, and well-argued cognitivist view of the adaptive function of literature by Carroll (see, e.g., 2004, 2007).

manipulation and fitness-enhancement. Power (1999) offers an unusual argument, supported by studies of rituals described in sub-Saharan African ethnographies, that visual art and dance originated when ancestral females (participating as a group) painted their bodies with red ochre in order to attract males (who assumed they were menstruating and hence fertile—receptive to courtship and eventual insemination), thereby gaining gifts of meat, a valuable resource.

C. Sexual display: *the arts promote mating opportunity through display of desirable qualities (e.g., physical beauty, intelligence, creativity, prestige) which denote fitness.*

At present the most popular and influential evolutionary explanation of the adaptive value of art is the *sexual selection hypothesis*, derived from Darwin's speculations about the extravagant plumage or elaborate songs of some male birds (Darwin 1871). Noting that these conspicuous excesses would seem to impede locomotion or attract predators and therefore be nonadaptive, Darwin suggested that splendidly colorful tails or lusty songs must instead be courtship devices for attracting the attention and sexual favors of females. A twentieth-century examination of such "costly signals" by Zahavi and Zahavi (1997) proposed that they "honestly" convey (to prospective mates and to potential predators) that their owners have unusual vigor. Weak or sickly males could not "fake" such clear signs of vitality which for them would be handicaps rather than advertisements. The ornamental character of plumes, crests, tails, and songs provides an obvious analogy with human arts, which are claimed also to be honest, costly signals since the strength, vitality, intelligence, skill, and creativity required for their display cannot be faked by those who are less well-endowed (see Miller 1999, 2000a, 2001; Voland 2003). The arts thus are seen to be an arena for competition—advertising fitness and therefore leading to reproductive opportunity through female choice.

D. Reinforcing sociality: *The arts enhance cooperation and contribute to social cohesion and continuity.*

Despite the popularity of the sexual selection hypothesis, countless ethnographic accounts attest to the contribution of the arts to sociality and cooperation. Evolutionary psychologists have then attributed to art important social functions such as augmenting the impact of ritual, thereby strengthening religion's power to cement group cohesion

(Boyd 2005), indicating group membership with dress or badges (Aiken 1998a), enabling behavioral coordination and neural entrainment through rhythmic movement and ritualized participation in temporally-organized performances (Dissanayake 1992, 2000a,b), and inculcating “descent amity” (Coe 2003). Based on extensive fieldwork in Spain, Colombia, Ecuador, and the southwestern United States, Coe’s “ancestress hypothesis” describes how the visual arts transmit traditions within kin groups, especially by mothers to children, and encourage cooperation among those identified as co-descendants of a common ancestor (see also Aiken and Coe 2004). Carroll (2004, p. xxii) puts the general argument well when he argues that “the arts are indispensable . . . for the organization of shared experience that makes collective cultural life possible.”

It is obvious that all four hypotheses are plausible in at least some instances—everyone can think of examples that appear to perform these functions and each function can be shown to contribute to survival or reproductive success. All make welcome contributions to a greater appreciation of the deep-rootedness and variety of artful characteristics in our species. Yet I maintain that most of the arguments for the hypotheses are inadequate for understanding art as a broader evolved and adaptive phenomenon. Some are too narrow—focusing on one art (e.g., body decoration) or one evolved capacity (e.g., visual perception). Most are conceptually vague, using the word “art” imprecisely and frequently conflating it with other concepts with which art is often but not universally associated or equated.

For example, in some of the cognitivist explanations, art is treated as being synonymous with or equivalent to “beauty”—defined (circularly) as pleasurable (and thus adaptive) sensory or cognitive preferences (e.g., Thornhill 2003), or art is located in visual stimuli that excite perceptual responses to color, line, and form. Yet in experiences of art one responds to more than adaptive preferences (say, for salubrious landscapes) and to more than single qualities such as color, shape, and line. By considering aesthetic response to be any adaptive preference and by defining beauty as what is highly preferred and enjoyed, Darwinian aesthetics does not distinguish experiences of art from any other

pleasurable or adaptive experience.⁵ Similarly, Scalise Sugiyama's discussions of narrative are wide-ranging, useful, and well-supported, but the adaptive advantages she notes lie in the information content of any narrative—not in what about it might be art (Scalise Sugiyama 2001a,b). Few would consider a newspaper story, a museum guide to an exhibition, a diary entry, an electronic message, or a joke art, even though all are narratives or stories that provide useful knowledge or can manipulate others' behavior.

Advocates of the sexual selection hypothesis focus on art as being a costly display of the artist's beauty, virtuosity, skill, and creativity. Yet these features too are not in themselves art, but broader entities that some but not all instances of art may have or use. Conversely, they are also to be found outside the arts as later examples will show. Granted, art is frequently beautiful, skillful, or costly—as in the ritualized presentation of beautifully garbed marriageable young women, the tireless dancing of impressively masked and costumed males, the displays of wealth such as decorated yams in Papua New Guinea or the prestige of feather headdresses of Polynesian chieftains. But so are other things—a colorful bird or a field of wildflowers, a perfectly-executed gymnastic feat, an ingot of gold. What specifically makes artful instances of beauty, virtuosity, skill, and creativity different from nonartful examples? In other words, one must still specify what *additional* capacity (“art”) has been selected for.⁶

Additionally, a closer look at some hypotheses reveals that they neglect important features of the arts in pre-modern societies. *Contra* the sexual selection hypothesis, in many traditional societies arts are typically if not always conservative. Originality and creativity, so important in Western arts, are often discouraged (Aiken and Coe 2004, Coe

⁵ The position thus unwittingly resembles the “anything can be art” stance of cultural constructivists.

⁶ This objection pertains also to the penchant of archaeologists to consider art as a subset of the ability to make and use symbols. But one can make a symbol that no one would consider art—a scrawled map, a cross or mandala casually drawn with the forefinger on a fogged windowpane. The question similarly remains: what is the difference between an artful and nonartful symbol? When and why does one make the map, cross, or mandala art and what makes it so?

2003). Traditional arts may not necessarily be even beautiful (van Damme 1996) or skilled, as in Yupik painting where stylized simple representation to accompany a story is valued over aesthetic effect (Himmelheber 1993/1938, p. 11, 28; see also Horton 1965, pp. 39-40 and Stott, 1975, p. 38). Often several arts occur and are experienced concurrently—unlike modern societies’ arts, which typically reside in museums, concert halls, and books, created, performed and experienced by specialists who individually practice or appreciate these individual manifestations of paintings, chamber music, or literature. In traditional societies, an entire group may make the art and join in its performance. As Chernoff (1979, p. 21) says, “[t]he most fundamental aesthetic in Africa [is that] without participation, there is no meaning.”

Such considerations suggest that adaptive hypotheses or humanistic proposals for art’s function that are based on a single art, a single artist (as “genius” or as fitness-maximizer at the expense of others), or a single (or no) function require modification as do hypotheses that presuppose the necessity to art of beauty or skill.

IV. A common denominator of art

Scholars versed in historical, anthropological, or philosophical studies of the arts are well aware of the complexities inherent in conceptualizing their subject. They appreciate that orthodox Western notions of aesthetics and art—that art is rare, elite, original, individual, and costly; that it is synonymous with or closely related to concepts of beauty, skill, creativity, imagination, representational accuracy, or self-expression; that it is composed of autonomous objects (paintings, sculptures, ceramics) or activities (dances, songs, performances); that it is the province of specialist “artists”—are derived from Enlightenment ideas (Eagleton 1990) and are by no means universally held or practiced. Moreover, most human societies have no concept of ‘art’ in the Western sense of an overarching category that includes such diverse entities as paintings, carvings, songs, dances, and literature.

Most contemporary evolutionists lack this new and broader understanding of art. In this respect, their assumptions about art and art theory are as outdated and beside-the-point as are most art theorists’ assumptions about evolutionary theory. Yet those who have a sophisticated knowledge of art today—the humanists—adhere to the axiom that

there cannot be a common denominator that characterizes art: for most such scholars today, art is only a socially-constructed concept.

Unfortunately for an evolutionist who wishes to consider art as an evolved component of human nature, there must be some universal proclivity or feature(s) that selection could have acted on, something that encompasses all instances—premodern, modern, and postmodern—and can be shown to have a plausible evolutionary origin and adaptive function or functions. One worthwhile effort to find such a common denominator is that of Dutton (2000), who in the spirit of Weitz (1959) and Munro (1963), used a ‘family resemblance’ notion of art and made a provisional list of eight characteristics which, in whole or large part, will apply to the practice of art across cultures and throughout historical time: giving pleasure in itself, exhibiting specialized skill, being made in a recognizable style according to formal rules, lending itself to a critical discourse of judgment and appreciation, representing or imitating real and imaginary experience of the world, being the product of conscious intention by a maker, being ‘bracketed’ or set off from ordinary life, and serving as an imaginative experience for both producers and audiences.

Dutton’s list is a valiant and useful attempt to delineate universal characteristics of the arts across cultures, but six of the features (i.e., specialized skill, styles and rules, critical evaluative language, representation, conscious intent, and imaginative embodiment) characterize—as Dutton admits—examples of nonart as well.⁷ In this respect they are like the features assumed to characterize art by the evolutionary hypotheses described in Section III. Only intrinsic pleasure (self-reward) and bracketing seem more or less restricted to art or artlike activities (such as play and make-believe, or ritual behavior—see Dissanayake 1988, 1992).

Past and present Western theories of art have considered art as an *artifact* (a work or object of a certain kind, say a painting, mask, song, or literary work), an *essential attribute* that makes a work or object art (e.g., disinterested appreciation, beauty, skill,

⁷ As Weitz (1959) and Munro (1963) noted, if an object or event has many of the eight features and possesses them to an exceptional degree, most Westerners would consider it to be “art.”

costliness, a preference), a *cue* to something else (e.g., the presence of a deity, virtuosity and creativity which denote good genes), or as an activity or *behavior* (e.g., making or displaying).⁸ As explained earlier, however, artifact, essence, and cue are problematic defining features for an adaptationist account of art because they do not pertain to many important instances of the arts in small-scale societies and they beg the question of what art is.

An ethological (biobehavioral) perspective may be helpful here. When studying courtship, parenting, and other characteristic activities of an animal's life, ethologists describe what individuals do or accomplish when they court, parent, and so forth. Art too can be regarded as a behavior by describing what people do or accomplish when they make something art—when they “artify”.⁹ It is easier to conceptualize art as behavior if we think of art as music (chanting, singing, playing an instrument) or performing (dancing, reciting, miming, acting, telling a story), since these arts take place, like “behavior,” in time. In a similar way, one can also think of the plastic or visual arts as making, marking, image-making, adorning (in any medium)—that is, as the process or activity rather than the product or outcome of the artifying. But it is not immediately evident what—if anything—these various activities accomplish or have in common.

In earlier publications (Dissanayake 1988, 1992, 1995), I suggested a common denominator for a behavior of art that I called *making special*. I claimed that in all instances of this behavior, in all times and places, ordinary experience (e.g., ordinary objects, movements, sounds, utterances, surroundings) is transformed, is made *extraordinary*. For example, in *dance*, ordinary bodily movements of everyday life are exaggerated, patterned, embellished, repeated—made special; in *poetry*, the usual syntactic and semantic aspects of everyday spoken language are patterned (by means of rhythm, rhyme, alliteration, assonance), inverted, exaggerated (using special vocabulary

⁸ Art has also been called “a label” bestowed upon certain works by an institutionalized “artworld” (Danto, 1964; Dickie, 1974).

⁹ Coe (2003, p. 76) defines visual art as a behavior: “the modification of an object or body through color, line, pattern, and form that is done solely to attract attention to that object or body.”

and unusual metaphorical analogies) and repeated—made special; in *song*, the prosodic (intonational and expressive) aspects of everyday language (the ups and downs of pitch, pauses or rests, stresses or accents, louds and softs, fasts and slows) are exaggerated (sustained), patterned, repeated, varied, and so forth—made special; in *visual display*, ordinary objects like the natural body, the natural surroundings (e.g., cave walls, logs, anthill mud), and common artifacts (e.g., house walls, canoes) are made special by cultural shaping and elaboration that make them more than ordinary. The notion of making special is congruent with similar formulations by others—e.g., the notion of “bracketing” (Dutton 2000), or “defamiliarization” (“making strange”) and “foregrounding” in literary studies (e.g., Shklovsky 1917/1965, Mukarovsky 1932/1964, and Miall and Kuiken 1994a, 1994b).

I propose that making special (which I now use interchangeably with “artifying”) is the ancestral activity or behavior that gave rise to and continues to characterize or imbue all instances of what today are called the arts. The term “making special” can be substituted for “art” in the six characteristics of an adaptation (Section I) and it avoids the inadequacies and problems noted in the latter part of Section III. It describes an important human propensity that other evolutionists have not seriously considered or examined.¹⁰ Although it does not deny the functions proposed by hypotheses A, B, and C described in Section III, the concept of making special strongly supports hypothesis D—that artification is important in reinforcing sociality (see V-C). Unlike many of the hypotheses, the concept of making special proposes answers to the proximate questions *when* or *why* as well as to the operational question of *what* is art.

V. What, when, and why is something “made special”

“Making special,” not “beauty” or “display,” explains the difference between a collection of decorated yams and a field of wildflowers, or a headdress composed of the colored feathers of thousands of birds and the feathers on the bird itself. Beauty, virtuosity, skill,

¹⁰ Carroll (2004, p. 159) proposes an “elemental, universal [human] motive” that evolutionists have neglected to address sufficiently: the need to create cognitive order. I suggest that the operations of making special (see Section V) not only help to create cognitive order (meaningfulness) but give it added emotional salience.

and costliness, like individual sensory stimuli or preferences, are *ingredients* of the arts that are used to make something special.

Rather than ask why people have *art* (that troublesome word) or why they create fictions, make music, or paint landscapes, the more fundamental evolutionary, adaptive question is to consider why our ancestors intentionally began, and continued—as we continue today—to make things special or extraordinary. Other species display their charms to prospective mates and make choices according to brain-based perceptual and cognitive preferences. Or, with markings that mimic another species, they deceive predators or rivals. But it is only humans who deliberately make bodies, materials, places, vocal sounds, physical movements, words, stories, and even ideas special. It is *making special*—weirdness, strangeness, and unusualness, as well as beauty, costliness, or excessiveness—that requires evolutionary explanation. When and why do people do this? These are *psychological* as much as philosophical or art historical questions and they demand an adaptive answer.

My adaptationist hypothesis about the arts has three strands: *origin, motivation, and manifestation*.¹¹

A. *Origin: Aesthetic predisposition and the operations of making special.* Studies by developmental psychologists reveal universal features in the interactions of human mothers and their infants. Despite cultural variations, mothers (and other adults) everywhere talk to babies in a characteristically soft, high-pitched, undulant voice, which babies prefer to typical adult conversational speech. Along with this special vocal behavior, adults engage infants' attention by the use of rhythmic body movements (touching, patting, stroking, hugging, and kissing), unusual facial expressions (gaze, sustained smiles, open mouth, widened eyes, raised eyebrows), and characteristic head movements (bobs, nods, and wags) in an almost ritualized way. These vocalizations, expressions, and movements are repeated, often with dynamic variations (loud and soft, large and small, fast and slow) in what can be called a “multimedia performance.”

Yet it is more than an individual performance. Minute analysis of videotaped engagements of mothers and babies show that the pair interact in remarkably close

¹¹ For a preliminary but more detailed version, see Dissanayake (2000a).

temporal unity—responding to each other in subtle yet precise ways (see, for example, Beebe, Stern, and Jaffe 1977; Beebe et al. 1988; Nadel et al. 1999; Papoušek and Papoušek 1981; Stern 1971). The mother varies her pace and rhythm in order maximally to fit in with or gently direct the baby’s emotional state. The baby in turn responds to the mother’s signals with kicks, hand and arm movements, facial expressions, head movements, and vocalizations of its own—often as if participating in a mutually-negotiated rhythmic pulse with complementary dynamics. Over much of the first year of the infant’s life, the pair engage and disengage, synchronize and alternate, practicing their physical, physiological, and emotional “attunement” by means of these multi-modal expressive signals.

Because of its spontaneous nature and widespread occurrence, mother-infant interaction as described is assumed to be an evolved, adaptive part of human nature. Among its many practical contributions to the baby’s development are assisting emotional equilibrium (Hofer 1990), self- and interactive regulation (Gianino and Tronick 1988), socialization (Aitken and Trevarthen 1997, Papoušek and Papoušek 1979, Schore 1994), language learning (Fernald 1992), cognitive development (Papoušek and Papoušek 1981, Trevarthen 1997), and acquisition of the parental culture.

It is important, though largely unrecognized, that the very components of the interaction are fundamentally aesthetic or proto-aesthetic (Dissanayake 2000a). The signals used by adults to infants are formalized (simplified or stereotyped), exaggerated, repeated, and elaborated in visual, vocal, and kinesic (gestural) modalities. These features attract and sustain the infant’s attention, maintain the engagement, and serve to bond the partners. They also create and satisfy anticipation. In the early months, babies require predictability, but at about five to six months of age, they start to enjoy suspense and surprise, as in games of “Peek-a-boo” and “This Little Piggy,” in which their expectation is manipulated.

I suggest that the innate capacities and sensitivities that evolved originally between adults and babies to make and respond to protoaesthetic temporal and dynamic manipulations (i.e., formalization, exaggeration, repetition, elaboration, and delayed expectancy) comprised a “behavioral reservoir” from which early humans could draw when at a later point in evolution they began deliberately to artify (see V-B,C). Notably,

it is these same manipulations or operations that are used—intentionally and in varied ways—by artists in any medium when they artify (make something special). Almost any mask from geographical areas as widely separated as sub-Saharan Africa, the Arctic, and Oceania shows the first four of these features. When masks are danced, manipulation of expectation takes place, like song, oratory, and musical accompaniment, in time. (For additional examples from the visual arts, see the final paragraph of V-C).

B. Motivation: *Uncertainty, emotional investment (“caring about”), and coping.* Like proponents of the neurocognitivist and evolutionary aesthetics hypotheses (see III-A), I locate the antecedents of the arts in already evolved propensities. Unlike them, I suggest proximate motivations for when and why our ancestors might have gone on to develop these propensities outside their original context—here, for artifying (making special by means of aesthetic operations).

Humans, more than other animals, use wits rather than instincts to address the problems of their lives. For our species, what to do and how to live are rarely instinctive, but must be learned. Over the millennia of hominid evolution, the mind increasingly became a “making sense” organ: interrelated powers of memory, foresight, and imagination gradually developed and allowed humans to stabilize and confine the stream of life by making mental “connections” between past, present, and future, or among different experiences or observations.

Humans could remember or even dwell upon good and bad things and imagine them happening again.¹² One cost of this growing awareness of the desired possibilities and inevitable unpredictability of life was uncertainty, even anxiety. Because the most conspicuous occasion for the arts in small-scale societies of today is in ritual ceremonies, this association of art and ceremony may hold a clue to the original motivation in ancestral humans for the co-opting and further development of the capacity to make and respond to protoaesthetic operations that originated in mother-infant interaction.

¹² The development of language certainly contributed to the cognitive capacity to simulate the future. In this regard, making special can be considered as being in the same suite of cognitive abilities as language.

What do ceremonies concern? The anthropological literature on ritual is vast and varied, but it seems safe to say that most ceremonies are about biologically important things—e.g., assuring or restoring subsistence, safety, fecundity, health, prosperity, and victory or successfully dealing with the bodily changes and emotional and social concomitants of sexual maturity, pregnancy, birth, and death. The “liminal” occasions for ritual ceremony are times of transition and uncertainty (van Gennep 1908/1960; Turner 1969). *I suggest that uncertainty—leading to emotional investment or “caring about”—was the original motivating impetus for the human invention of religion and its behavioral expression, making special* (see V-C).

Religion and art are usually treated by anthropologists as aspects of “culture,” which according to conventional theory is opposed to “biology.” An adaptationist view, however (see II), views the various components that are called “culture” as outgrowths of evolved psychobiological predispositions. In general, cultural knowledge and practices direct our attention to particular biologically significant things—e.g., ways to become a competent adult, to make a living, to rear children, and to maintain social relationships. Among these “ways” are language and traditions of toolmaking or subsistence practice. At some point, our ancestors had to *care about the outcomes* of these biologically significant and valuable events and states that were not always certain of attainment.

Other animals in uncertain or conflicted circumstances frequently engage in “displacement activities” or evolved ritualized behaviors whose components are drawn from ordinary bodily movements used in everyday contexts such as grooming or locomotion (e.g., scratching, preening, moving back and forth). In the new, uncertain context, these ordinary movements become more stereotyped—that is, exaggerated, patterned in space and time, and regularized (repeated). Such “ritualized” movements reduce the tension of the displaying animal at the same time as they signal its mood and intentions to conspecifics (Lorenz 1982, pp. 249-253). Humans show displacement, sometimes called ‘comfort movements’, when they repeatedly tap a foot, wiggle a knee, or wind a strand of hair around a finger. Caged animals and university lecturers pace.

I suggest that in uncertain circumstances that did not call for immediate pragmatic action (that is, were not matters of immediate fight, flee, or freeze responses), our early human ancestors at some point found that performing repetitious, simplified or

stereotyped, exaggerated sounds and movements (already part of their behavioral repertoire as described in V-A and noted above as displacement or ritualized movements) felt comforting and ultimately eased tension—particularly when performed in a coordinated fashion among members of a group. Perhaps this behavior first occurred during a frightening storm. Such a response was described in two different Melanesian societies by Mead (1930/1976) and Malinowski (1922), when villagers huddled together, chanting charms to calm the violent winds. I further suggest that individuals in groups that responded to uncertainty in stressful circumstances with such coordinative practices would gradually have gained survival advantage over those in groups where each person acted individually or randomly. The tension-reduction capability of coordinated voice and movement is evidenced in infancy, when mother-infant engagement assists biobehavioral self-regulation and the development of infant homeostasis (Gianino and Tronick 1988, Hofer 1990), so it is not farfetched to suggest that the same antecedent mechanisms “worked” for similar ends in ancestral artification of movement and vocalization. Once these became culturally established as ritualized responses to recurrent provoking circumstances, they could become further elaborated and institutionalized as ceremonies.

I suggest that a fifth hypothesis—stress reduction—be added to the four adaptive functions described in Section III: *the temporal arts help individuals psychologically to cope with uncertainty*. Malinowski (1948, p. 60) remarked that the “impetus to do something about our perceived needs is overwhelming; we need to express any strong emotion by some form of action.” In times of anxiety one may not know what action to take and in fact there may be no obvious practical course to follow. Prescribed behavioral coordination with others through moving and singing or chanting provides “something to do.” It additionally relieves tension and anxiety and instills a sense of coping, as is evidenced in countless ceremonial practices that are meant to address some vital but uncertain occasion (Dissanayake 2000a, b). One sees this function of making special, for example, in performances of the lament, an ancient and widespread response to the loss by death or separation of a person or place to which one is attached, where natural weeping and wailing is subjected to aesthetic operations (formalization and so forth) and becomes a musical-poetic cultural artifact.

Relief of uncertainty or anxiety is not the only function of the arts, but making places and actions special continues to provide “something to do” and a means of coping, as was evident in the spontaneous public responses of Americans to the horrifying destruction of the World Trade Center towers in September 2001.¹³

C. Manifestation: *the invention and functions of ceremonial ritual*.

In “traditional” or “subsistence” societies—small-scale groups that are more like ancestral societies than recent, specialized, technologically complex societies with developed agriculture and writing—the primary context for artifications such as singing, drumming, dancing, dramatic performance, poetic language, and visual display is in various kinds of ritual ceremony. Although anthropologists usually conceptualize ceremonies as part of a symbolic cognitive system, here I wish to point out that regardless of what meanings they convey, ceremonies are constituted of arts (again, behavior and artifacts made special) and would not exist without them. In ceremonies, the arts attract attention, sustain interest, coordinate group effort, and provide emotional excitement and satisfaction, plausibly implying that the arts arose in human evolution as adjuncts to ceremonial behavior rather than as independently-evolved activities.

In his essay “Religion and society,” Radcliffe-Brown (1952) unwittingly used adaptationist thinking when he claimed that religion has a function in society apart from whether it does for the participants what they want it to do or think it does. He found its (“ultimate”) function to be to regulate, maintain, and transmit from one generation to another sentiments on which the continuity of the society depends.¹⁴ Radcliffe-Brown’s emphasis on emotion (“sentiments”) begs for an additional clause that emphasizes that

¹³ Several studies find that ritual and artful behavior increased in prehistory at times of resource stress, as in Mimbres (Brody 1977, p. 210), Late Dorset (Taçon 1983) and prehistoric Arnhem Land (Taçon and Brockwell 1995; Taçon, Wilson, and Chippindale 1996) populations (see also Hayden 1987; Mithen 1996, p. 157).

¹⁴ A similar statement can also be found in the *Book of Rites* of Confucius: “ceremonies are the bond that holds the multitudes together and if the bond be removed, those multitudes fall into confusion” (Confucius [Li Ji] 1964-66).

the arts are the crucial mechanisms in ceremonies for regulating, maintaining, and transmitting these sentiments.

I view ceremonial arts as the behavioral counterpart of religious beliefs. In this I also follow Radcliffe-Brown (1952, p. 155), who proposed that religion in small-scale societies was less a matter of beliefs than of rites, indeed that belief was an *effect* of rites (which he further described as positive and negative actions and abstentions). Beliefs and doctrines are like black and white outline drawings that require the color of emotion to become psychologically incorporated as a living, forceful presence. The arts in “rites” engage and shape emotion, thereby inducing memory of historical and subsistence information in a nonliterate society where everything must be remembered.¹⁵

Although art-filled ceremonial practices themselves may or may not resolve the immediate vital problems that are their proximate motivation, they address and satisfy other physical and psychological needs. Through aesthetic operations, ceremonial practices create and reinforce emotionally satisfying and reassuring feelings of belonging to a group (Dissanayake 2000). Further, they provide to individuals a sense of meaningfulness or cognitive order and individual competence insofar as they give emotional force to explanations of how the world came to be as it is and what is required to maintain it (see also Carroll 2005). They coordinate and unify group members in a feeling of “oneheartedness.” All these effects contribute to psychobiological homeostasis and thus to individuals’ survival and reproductive success—i.e., fitness.

For these reasons, I question the explanatory power of the sexual selection hypothesis (III-C) with its emphasis on the arts as originating or persisting primarily as indications of personal fitness. Certainly costly display may indicate fitness and hence sexual desirability, or preferred shapes, colors, and movements may provide criteria for mate-choice. However, it should not be forgotten that costliness (specialness) may also signal “Look at how important this is” and “See how much I [we] care about this.”

¹⁵ In a similar way, medieval European images are understood by some contemporary art historians (e.g., Hamburger, 1998) as visual instruments of religious experience and as the visual complement of the study of texts concerned with medieval spirituality (Sauerländer, 2002).

Because in ritual performances the artistic effort that is given to assure good outcomes is “indexical” to the importance they are felt to have (Tambiah 1979), it is not surprising that people use skill, expense, and excess of all kinds to demonstrate their emotional investment in the object or event they choose to artify.

For example, shields that are used for protection in hunting or warfare, as by Maasai men of East Africa or numerous groups in Papua New Guinea, could hypothetically be made of just a plain strong plank of wood. Such shields, however, are invariably decorated—not simply with adaptively-relevant colors and forms but with carefully carved or painted motifs. Although the motifs’ power resides in their supposed magical potency, they are not simply scrawled onto the wood. On the contrary, they must be made with care—not to display one’s virtuosic painting or carving ability for admiring females but so that they will *work*. Similarly, young males who undergo scarification for rites of manhood are not randomly slashed, although any sort of cut would presumably demonstrate their ability to bear pain manfully. Because what the scars will indicate is important—the state of adulthood—they are placed carefully and symmetrically on the face or body of the initiate. The Trobrianders’ ceremonial (*kula*) seagoing canoe (*masawa*) is carved perfectly, whereas carving is often indifferent in fishing canoes and nonexistent in personal ones (Campbell 2002, Malinowski 1922, p. 113). Beauty, skill, and high cost signal (to higher powers, to others, to one’s group, and to oneself) the supreme importance of the artifact or occasion.

VI. Implications of a “humanity-centered” or adaptationist model of the arts
 Only an adaptationist paradigm can address two important and incontrovertible facts about the implied subject of humanistic study—humanity. First, all people who have lived during the past 250 thousand years have been members of one species and, like other species, share a common nature—human nature. Comprehending this fact is essential for contemporary understanding of world art, as of world history, religion, health, education, or any other human subject. Second, the human mind and the behaviors and artifacts it produces are biologically-based—that is, the result of the electrochemistry and anatomical structure of the brain that has evolved like other parts of the body to help individuals survive and reproduce. Because all individuals have similar emotional needs

and motivational structures, it is obsolete and limiting to treat human behavior as being *only* culturally or individually constructed.

Human cultures have developed as ways of addressing and satisfying evolved individual emotional needs and motivations. In other words, all cultures have devised ways of dealing with their members' vital concerns and, as I have shown, the arts are integral parts of this armamentarium. As arts are part of culture, artifying or making special is part of biology.

The concept of making special is congruent with a number of valued premises in contemporary humanistic study. It supports such aims as re-examination and re-evaluation of orthodox anthropological and aesthetic assumptions (Marcus and Fischer 1999, p. 26), and provides good arguments against hierarchical thinking ('Us-They') and for pluralism. Whether in or out of the academy, the problem of cultural bias is lessened if we understand that all cultures address biologically-important matters and that the arts have evolved as integral parts of dealing with these.

Additionally, the concept provides a general and superordinate term for a universal human behavior that helps us to understand the different arts in different societies to be instances of the same underlying propensity. Because the behavior is operationalized (as formalization, exaggeration, elaboration, repetition, and manipulation of expectation) one can recognize its manifestations both in the field and as described by earlier scholars. That is, the concept skirts such perennial and insoluble problems as defining art—e.g., are gift-presentation (d'Azevedo 1958: 705-06) or the Japanese tea ceremony "art"? It further makes clear that the arts are not "disinterested" but, as making special, are performative and experienced multimodally as an integral part of life.

Making special shifts the subject of study from art as an object or product, essence, cue, opinion, label, preference, or experience to *what people do or accomplish* (the operations of making special) and it reframes aesthetics to the larger matter of *when and why people do it*. Studies of the arts of an individual or society can be recast within this framework and then compared with similar what, when, and why questions of another individual or society. The ways that different groups artify the various values themselves (e.g., subsistence, safety, prosperity, health, social harmony, reciprocity, social role, status) can also be a relevant basis for comparative studies.

Similarly, the study of meaning (symbols and language) can be enriched with adaptationist understanding of why humans evolved to have and use these capacities and when and why (not only how) meanings are so often artified. “Meaning” ultimately and necessarily reduces to biological meaning, which is felt emotionally.

Because humans generally artify biologically and psychologically important things, artifications are a useful index to the values of a group or individual and an additional way of identifying those values.

Finally, an understanding that making special is inherent in all societies and individuals compels awareness that the subject of art is of particular and commanding interest and consequence within humanistic studies *and to human life itself*. The current postulate that art has no biological or functional importance has real-world implications outside academic theory. It echoes the traditional Western elitist assumption of “art for art’s sake” and contributes to the broader cultural atmosphere that increasingly reduces support of art programs in schools and communities.

References

- Aiken, Nancy E. 1998a. *The biological origins of art*, Westport CT: Praeger.
- . 1998b. Power through art. In *Sociobiology and politics*, ed. Vincent S. E. Falger, Peter Meyer, and Johan M. G. van der Dennen, 215-28. Vol. 6 of *Research in biopolitics*, ed. Steven A. Peterson and Albert Somit. Greenwich, CT: JAI Press.
- , and Kathryn Coe. 2004. Promoting cooperation among humans: The arts as the ties that bind. *Bulletin of Psychology and the Arts* 5 (1): 5-20.
- Aitken, Kenneth W., and Colwyn Trevarthen. 1997. Self/other organization in human psychological development. *Development and Psychopathology* 9: 653-77
- Alland, Alexander. 1977. *The artistic animal: An inquiry into the biological roots of art*. Garden City NY: Anchor.
- Beebe, Beatrice, Diane Alson, Joseph Jaffe, Stanley Feldstein, and Cynthia Crown. 1988. Vocal congruence in mother-infant play. *Journal of Psycholinguistic Research* 17 (3): 245-259.
- , Daniel Stern, and Joseph Jaffe. 1979. The kinesic rhythm of mother-infant interactions. In *Of speech and time: Temporal speech patterns in interpersonal contexts*, ed. Aron W. Siegman and Stanley Feldstein, 23-34. Hillsdale NJ: Erlbaum.
- Boyd, Brian. 2005. Evolutionary theories of art. In *Literature and the human animal: Evolution and the nature of narrative*, ed. Jonathan Gottschall and David Sloan Wilson. 147-76. Evanston, IL: Northwestern University Press.
- Brody, J. J. 1977. *Mimbres painted pottery*, Albuquerque: University of New Mexico Press and Santa Fe, NM: School of American Research.
- Brown, Steven. 2000a. The “musilanguage” model of music evolution. In *The origins of music*, ed. Nils L. Wallin, Björn Merker, and Steven Brown, 271-300. Cambridge MA: MIT Press.
- . 2000b. Evolutionary models of music: from sexual selection to group selection. In *Evolution, culture, and behavior*, ed. Nicholas S. Thompson and François Tonneau, 231-81. Vol. 13 of *Perspectives in ethology*. New York: Plenum.
- Campbell, Shirley F. 2002. *The art of Kula*, Oxford and New York: Berg.
- Carroll, Joseph. 1995. *Evolution and literary theory*, Columbia: University of Missouri Press.

- . 2004. *Literary Darwinism: Evolution, human nature, and literature*. New York and London: Routledge.
- . 2007. The adaptive function of literature. In *Evolutionary and neurocognitive approaches to aesthetics, creativity, and the arts*, ed. Colin Martindale, Paul Locher and Vladimir Petrov, 31-45. *Foundations and frontiers in aesthetics*, ed. Colin Martindale, Arnold Berleant. Amityville, NY: Baywood.
- Chernoff, John Miller. 1979. *African rhythm and African sensibility: Aesthetics and social action in African musical idioms*. Chicago and London: The University of Chicago Press.
- Coe, Kathryn. 2003. *The ancestress hypothesis: Visual art as adaptation*. New Brunswick, NJ: Rutgers University Press.
- Confucius [Li Ji]. 1966. *The sacred books of China: The texts of confucianism*, Trans. James Legge. Delhi: Motilal Banarsidass.
- Cooke, Brett, ed. 2001. *Interdisciplinary Literary Studies* 2(2), Special issue on Darwinian literary study.
- . 2002. *Human nature in Utopia: Zamyatin's We*. Evanston, IL: Northwestern University Press.
- Cosmides, Leda, and John Tooby. 1992. Cognitive adaptations for social exchange. In *The adapted mind: Evolutionary psychology and the generation of culture*, ed. Jerome H. Barkow, Leda Cosmides, and John Tooby, 163-228. New York and Oxford: Oxford University Press.
- Cross, Ian. 1998. Is music the most important thing we ever did? Music, development and evolution. In *Music, mind, and science*, ed. Suk Won Yi, 10-39. Seoul: Seoul National University Press.
- . 2003. Music and evolution: Consequences and causes. *Contemporary music review* 22 (3): 79-89.
- Danto, Arthur. 1964. The artworld. *Journal of Philosophy* 61 (19): 571-84
- Darwin, Charles. 1871. *The descent of man and selection in relation to sex*. London: Murray.
- d'Azevedo, Warren L. 1958. A structural approach to esthetics: Toward a definition of art in anthropology. *American anthropologist* 60 (4): 702-14.

- Diamond, Jared. 1997. *Guns, germs, and steel: The fates of human societies*. New York: Norton.
- Dickie, George. 1974. *Art and the aesthetic: An institutional analysis*. Ithaca NY: Cornell University Press.
- Dissanayake, Ellen. 1988. *What is art for?* Seattle: University of Washington Press.
- . 1992. *Homo aestheticus: Where art comes from and why*, New York: Free Press, etc.
- . 1995. Chimera, spandrel, or adaptation: Conceptualizing art in human evolution. *Human nature* 6 (2): 99-117.
- . 2000a. *Art and intimacy: How the arts began*, Seattle: University of Washington Press.
- . 2000b. Antecedents of the temporal arts in early mother-infant interaction. In *The origins of music*, ed. Nils L. Wallin, Björn Merker, and Steven Brown, 389-410. Cambridge MA: MIT Press.
- . 2003. Art in global context: An evolutionary/functionalist perspective for the 21st century. *International Journal of Anthropology* 18 (3): 245-258.
- Dutton, Denis. 2000. But they don't have our concept of art. In *Theories of art today*, ed. Noël Carroll, 217-38. Madison: University of Wisconsin Press.
- Eagleton, Terry. 1990. *The ideology of the aesthetic*, Oxford and Cambridge, MA: Blackwell.
- Eibl-Eibesfeldt, Irenäus. 1988. The biological foundations of aesthetics. In *Beauty and the brain: Biological aspects of aesthetics*, ed. Ingo Rentschler, Barbara Herzberger, and David Epstein, 29-68. Basel: Birkhäuser.
- . 1989. *Human ethology*. Trans Geoffrey Strachan. Hawthorne NY: Aldine de Gruyter.
- Fernald, Anne. 1992. Human maternal vocalizations to infants as biologically relevant signals: An evolutionary perspective. In *The adapted mind: evolutionary psychology and the generation of culture*, ed. Jerome H. Barkow, Leda Cosmides, and John Tooby, 391-428. New York and Oxford: Oxford University Press.
- Geist, Valerius. 1978. *Life strategies, human evolution, environmental design: Toward a biological theory of health*. New York: Springer.
- Gianino, Andrew, and Edward Z. Tronick. 1988. The mutual regulation model: The infant's self and interactive regulation and coping and defensive capacities. In *Stress*

- and coping across development*, ed., Tiffany Field, Philip M. McCabe, and Neil Schneiderman, 47-68. Hillsdale NJ: Erlbaum.
- Gilman, Alfred. 2003. 'How should schools teach evolution?: Emphasize the scientific facts', *Reports of the National Center for Science Education* 23 (5-6):8-9.
- Gottschall, Jonathan, and David Sloan Wilson, eds. 2005. *Literature and the human anima: Evolution and the nature of narrative.*, Evanston, IL: Northwestern University Press.
- Gross, Michael. 2002. Red head: US-style creationism spreads to Europe. *Current Biology* 12 (8): 265-66.
- Hagen, Edward H., and Gregory A. Bryant. 2003. Music and dance as a coalition signaling system. *Human Nature* 14 (1): 21-51
- Hamburger, Jeffrey F. 1998. *The visual and the visionary: Art and female spirituality in late medieval Germany*. New York: Zone Books and Cambridge, MA: MIT Press.
- Hayden, Brian. 1987. Alliances and ritual ecstasy: Human responses to resource stress. *Journal for the Scientific Study of Religion*. 26 (1): 81-91.
- Himmelheber, Hans. 1993. *Eskimo artists: Fieldwork in Alaska, June 1936 until April 1937*. Trans. D. G. Gunderson and author. [Fairbanks]: University of Alaska Press. Originally published as *Eskimo-künstler: Teilergebnis einer ethnographischen Expedition in Alaska von Juni 1936-April 1937* (Stuttgart: Strecker & Schröder, 1938).
- Hofer, Myron A. 1990. Early symbolic processes: hard evidence from a soft place. In *Pleasure beyond the pleasure principle*. Vol. I of *The role of affect in motivation, development and adaptation*. ed. Robert A. Glick and Stanley Bone, 55-78. New Haven, CT and London: Yale University Press.
- Horton, Robin. 1965. *Kalabari sculpture*. Apapa, Lagos: Nigerian National Press for: Department of Antiquities.
- Lorenz, Konrad. 1982. *The foundations of ethology: The principal ideas and discoveries in animal behavior*. Trans. Robert Warren Kickert and author. New York: Simon and Schuster.
- Malinowski, Bronislaw. 1922. *Argonauts of the Western Pacific*, London: Routledge and Kegan Paul.

- . 1948. *Magic, science and religion and other essays*, selected and with an introduction by Robert Redfield. Boston: Beacon Press.
- Malloch, Stephen and Colwyn Trevarthen, eds. Forthcoming. *Communicative musicality: Narratives of expressive gesture and being human*, Oxford: Oxford University Press.
- Marcus, George E., and Michael M. J. Fischer. 1999. *Anthropology as cultural critique: An experimental moment in the human sciences*. 1st ed. published 1986. Chicago and London: University of Chicago Press.
- Mead, Margaret. 1975. *Growing up in New Guinea: A comparative study of primitive education*. 1st ed. published 1986. New York: Morrow.
- Merker, Björn. 2000. Synchronous chorusing and human origins. In *The origins of music*, ed. Nils L. Wallin, Björn Merker, and Steven Brown, 315-27. Cambridge MA: MIT Press.
- Miall, David, and Don Kuiken. 1994a. Beyond text theory: understanding literary response. *Discourse processes* 17: 337-52.
- . 1994b. Foregrounding, defamiliarization, and affect: Response to literary stories. *Poetics* 22: 389-407
- Miller, Geoffrey F. 1999. Sexual selection for cultural displays. In *The evolution of culture: An interdisciplinary view*, ed. Robin Dunbar, Chris Knight, and Camilla Power, 71-91. Edinburgh: Edinburgh University Press.
- . 2000a. *The mating mind: How sexual choice shaped the evolution of human nature*. New York: Doubleday; London: Heinemann.
- . 2000b. Evolution of human music through sexual selection. In *The origins of music*, ed. Nils L. Wallin, Björn Merker, and Steven Brown, 329-60. Cambridge MA: MIT Press.
- . 2001. Aesthetic fitness: How sexual selection shaped artistic virtuosity as a fitness indicator and aesthetic preferences as mate choice criteria. *Bulletin of Psychology and the Arts* 2 (1): 20-25.
- Mithen, Steven J. 1996. *The prehistory of the mind: The cognitive origins of art, religion, and science*. London: Thames and Hudson.

- . 2005. *The singing neanderthals: The origins of music, language, mind,, and body*. London: Weidenfeld & Nicolson.
- Morley, Iain. 2002. Evolution of the physiological and neurological capacities for music. *Cambridge Archaeological Journal* 12 (2): 195-216.
- Morris, Desmond. 1962. *The biology of art: A study of the picture-making behaviour of the great apes and its relationship to human art*. New York: Knopf.
- Mukařovsky, Jan. 1964. Standard language and poetic language. In *A Prague School reader on esthetics, literary structure and style*, ed. and trans. from the Czech by Paul L. Garvin, 17-30. Washington, DC: Georgetown University Press. Originally published as *Jazyk spisovny a jazyk básnický. Spisovná čeština a jazyková kultura* (1932): 132-56.
- Munro, Thomas. 1963. *Evolution in the arts and other theories of culture history*. [Cleveland:] Cleveland Museum of Art.
- Nadel, Jacqueline, Isabelle Carchon, Claude Kervella, Daniel Marcelli, and Denise Réserbet-Plantey. 1999. Expectancies for social contingency in 2-month-olds. *Developmental Science* 2 (2): 164-173
- Papoušek, Hanuś and Mechthild Papoušek. 1979. Early ontogeny of human social interaction: Its biological roots and social dimensions. In *Human ethology: Claims and limits of a new discipline: Contributions to the colloquium*, ed. M. von Cranach, et al., 456-78. Cambridge: Cambridge University Press.
- . 1981. Musical elements in the infant's vocalization: Their significance for communication, cognition, and creativity, In *Advances in infancy research*, Vol. I, ed. Lewis P. Lipsitt and Carolyn K. Rovee-Collier, 163-224. Norwood, NJ: Ablex. S. Pinker, *How the mind works*, New York: Norton 1997
- Pinker, Steven. 1997. *How the mind works*. New York: Norton.
- . 2002. *The blank slate: The modern denial of human nature*, New York: Viking.
- Power, Camilla. 1999. "Beauty magic": The origins of art. In *The evolution of culture: An interdisciplinary view*, ed. Robin Dunbar, Chris Knight, and Camilla Power, 82-112. Edinburgh: Edinburgh University Press.

- Radcliffe-Brown, Alfred Reginald. 1952. Religion and society. In *Structure and function in primitive society*. Glencoe, IL: Free Press, 153-77. Originally published in *Journal of the Royal Anthropological Institute* 75 (1945) 1-2: 33-43.
- Ramachandran, V.S. and William Hirstein. The science of art: A neurological theory of aesthetic experience. *Journal of Consciousness Studies*.6 (6): 15-51.
- Sauerländer, Willibald. 2002. Images behind the wall: Review of *The visual and the visionary: Art and female spirituality in late medieval Germany* by Jeffrey F. Hamburger. *New York Review of Books* 49 (7) April 25: 40-42.
- Scalise Sugiyama, Michelle. 1996. On the origins of narrative: storyteller bias as a fitness-enhancing strategy. *Human Nature* 7 (4): 403-25.
- . 2001a. Food, foragers, and folklore: The role of narrative in human subsistence. *Evolution and Human Behavior* 22 (4): 221-40.
- . 2001b. Narrative theory and function: Why evolution matters. *Philosophy and Literature* 25 (2): 233-250.
- . 2001c. New science, old myth: An evolutionary critique of the Oedipal paradigm. *Mosaic* 34 (March): 121-36
- . 2003. Cultural variation is part of human nature: Literary universals, context-sensitivity, and "Shakespeare in the Bush". *Human Nature* 14 (4): 383-96.
- Schore, Allan N. 1994. *Affect regulation and the origin of the self: The neurobiology of emotional development*. Hillsdale NJ: Erlbaum.
- Shklovsky, Victor. Art as technique [1917]. In *Russian Formalist criticism: Four essays*, ed. and trans. by Lee T. Lemon and Marion J. Reis, 3-24. Lincoln: University of Nebraska Press.
- Solso, Robert L. 1994. *Cognition and the visual arts*, Cambridge, MA: MIT Press.
- Stern, Daniel. 1971. A microanalysis of mother-infant interaction. *Journal of the American Academy of Child Psychiatry* 10: 501-17.
- Storey, Robert F. 1996. *Literature and the human animal: On the biogenetic foundations of literary representation*. Evanston, IL: Northwestern University Press.
- Stott, Margaret A. 1975. *Bella Coola ceremony and art*. Ottawa: National Museums of Canada.

- Taçon, Paul S. C. 1983. Dorset art in relation to prehistoric culture stress. *Études Inuit/Inuit Studies* 7 (1): 41-65.
- , and Sally Brockwell. 1995. Arnhem Land prehistory in landscape, stone, and paint. *Antiquity* 69 (259): 676-95.
- , Meredith Wilson, and Christopher Chippindale. 1996. Birth of the rainbow serpent in Arnhem Land rock art and oral history. *Archaeology Oceania* 31 (3): 103-24.
- Tambiah, Stanley J. 1979. A performative approach to ritual. *Proceedings of the British Academy, London LXV*. London: British Academy; Oxford: Oxford University Press, 113-69.
- Thornhill, Randy. 2003. Darwinian aesthetics informs traditional aesthetics. In *Evolutionary Aesthetics*, ed. Eckart Voland and Karl Grammer, 9-38. Berlin: Springer.
- Tooby, John, and Leda Cosmides. 2001. Does beauty build adaptive minds?: Toward an evolutionary theory of aesthetics. In *On the origin of fictions: Interdisciplinary perspectives*, ed. H. Porter Abbott. Special Issue, *SubStance: a review of theory and literary criticism* 94/95, vol. 30 (1-2): 6-27.
- Trevarthen, Colwyn. 1997. Fetal and neonatal psychology: Intrinsic motives and learning behavior. In *Advances in perinatal medicine*, Proceedings of the Fifteenth European Congress of Perinatal Medicine, ed. F. Cockburn, 282-91. New York: Parthenon.
- Turner, Victor. 1969. *The ritual process: Structure and anti-structure*. London: Routledge and Kegan Paul.
- van Damme, Wilfried. 1996. *Beauty in context: Towards an anthropological approach to aesthetics*. Philosophy of History and Culture 17, Leiden, New York, and Cologne: Brill.
- van Gennep, Arnold. 1960. *The rites of passage*. Trans. Monika B. Vizedom and Gabrielle L. Caffé. London: Routledge and Kegan Paul. Originally published as *Les rites de passage* (Paris: Nourry, 1909).
- Voland, Eckhart. 2003. Aesthetic preferences in the world of artifacts—adaptations for the evaluation of “honest signals”? In *Evolutionary aesthetics*, ed. Eckhart Voland and Karl Grammer, 239-60. Berlin: Springer.
- , and K. Grammer, eds. 2003. *Evolutionary aesthetics*, Berlin: Springer.

- Watts, Ian. 1999. The origin of symbolic culture. In *The evolution of culture: An interdisciplinary view*, ed. Robin Dunbar, Chris Knight, and Camilla Power, 113-46. Edinburgh: Edinburgh University Press.
- Weitz, Morris. 1959. The role of theory in aesthetics. In *Problems in aesthetics*, ed Morris Weitz, 145-56. New York: Macmillan.
- Zahavi, Amotz, and Avishag Zahavi. 1997. *The handicap principle: A missing piece of Darwin's puzzle*. Oxford: Oxford University Press.
- Zeki, Semir. 1999. *Inner vision: An exploration of art and the brain*. Oxford: Oxford University Press.

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