

Darwinizing the Philosophy of Music Education

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If I were to give an award for the single best idea anyone has ever had, I'd give it to Darwin, ahead of Newton and Einstein and everyone else. In a single stroke, the idea of evolution by natural selection unifies the realm of life, meaning, and purpose with the realm of space and time, cause and effect, mechanism and physical law.

Daniel Dennett - *Darwin's Dangerous Idea*

Break the pattern which connects the items of learning and you necessarily destroy all quality.

Gregory Bateson - *Mind and nature: a necessary unity*

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Abstract

Educational philosophy generally and the Philosophy of Music Education in particular have been slow to consider in any real depth the findings of those sciences most concerned with explaining human nature, that is, the attributes (capacities, aptitudes, predilections, appetites) we have in common because we share the same genome, much of which we also share with other species. There are several such sciences which may collectively be called Darwinian Science in that they all take as axiomatic Darwin's explanation for how life evolves according to the law of natural selection – a simple, mindless and purposeless algorithm that has played out for over four billion years and which continues to do so, driving not only biological evolution but, as this study argues, cultural evolution as well. Evolutionary Psychology (including Biomusicology and Evolutionary Aesthetics), Cognitive Neuroscience and Gene-Culture Coevolution Theory are the overlapping fields that this study draws from in developing an understanding of the adapted mind useful for engaging with questions germane to the Philosophy of Music Education, principally those concerning the nature and value of music and how best it should feature in general education. These are questions that have not hitherto been addressed from a Darwinian perspective. This study develops such a perspective and applies it not only to questions around music's educational values and possibilities, but to more encompassing philosophical questions, wherein the goals of music education are made accountable in relation both to Dewey's ideal of society as a function of education, and to an ecozoic vision of a sustainable planetary habitat of interdependent and interconnected life forms.

Keywords

Philosophy of Music Education; Educational philosophy; Evolutionary Psychology; Evolutionary Aesthetics; Biomusicology; Gene-Culture Coevolution; Memetics; Critical Pedagogy; Ecopedagogy; Praxis

A note to the reader on my use of Wikipedia

I have found Wikipedia a wonderful tool for getting a quick, often well-informed and generally up-to-date take on ... well just about anything. Where I have found a Wiki-article particularly useful I have embedded a hyperlink to the relevant webpage. These remain underlined in this printed version and need only be copied into the Wikipedia search box to get to the article in question. Recognizing that Wikipedia articles can and do change over time, I have refrained from using Wikipedia as a direct source of information. I do however cite a few Wiki-articles where they have been the means by which original works have been revealed to me, but in such cases I have accessed the original texts to ascertain the accuracy of referencing. (See page 183 for an example.) I have also done this in respect of all other secondary quotations.

Chapter One: *Introduction: purpose of and rationale for this study*

Introduction

It strikes me as commonsense that education should be grounded on the best possible understanding of human nature, an understanding, that is to say, of all those attributes we share that allow us to think, feel and act as we do (some, *but only some*, of which are unique to our species, *Homo sapiens*). Education, as I conceive it at least, is about developing people's abilities to think, feel and act and influencing this development to bring about individuals who think, feel and act in ways needed for the achievement of vital social and ecological goals. Here I am invoking a key tenet of John Dewey's philosophy in claiming that we must see education, not as a "function of society," but as the most important agent for social and ecological amelioration and, where needed, transformation. We must, as Dewey put it, see "*society as a function of education*" (Dewey 1916, cited in Giroux & McLaren, 1989: xvii).

Actually, society is a function of people; it is one of the things they *do*. Just as it is the physical brain that "creates" mind, so do physical organisms of the species *Homo sapiens* "create" society and culture. Some would have it that society creates people (or at least that "part" of personhood that people style as "the self") but one must then ask how the cart got in front of the horse? It is the belief of just about every author cited in this dissertation that the *mind* is not some discreet, immaterial entity that inhabits us (what Descartes had "in mind" when he proclaimed "I think, therefore I am."); rather, it is *what the brain does*. Is it not better to conceive of society similarly, not as a coherent, external volitional agent that creates us, but as what people do when they interact with each other, drawing from what has gone before and what has been created by human effort (the artifactual world)? If we think in this way, there is and can be no cart or horse or question of which comes first or which is more the determining factor as regards behavioral consequences. We should also conceive culture in this way. Thomas Sowell's take on culture is apropos (1996: 378, quoted in Pinker 2002: 67):

A culture is not a symbolic pattern, preserved like a butterfly in amber. Its place is not in a museum but in the practical activities of daily life, where it evolves under the stress of competing goals and other competing cultures. Cultures do not exist as simply static "differences" to be celebrated, but compete with one another as better and worse ways of getting things done – better and worse, not from the standpoint of some observer, but from the standpoint of the peoples themselves, as they cope and aspire amid the gritty realities of life.

Where a group of people are sufficiently "connected" we can speak of a society or culture. But all that we are really saying is that there is a marked level of commonality or agreement in what they do and this reflects commonality or agreement in how they think and what they believe. (Nowadays people do not even have to interact face-to-face in order to be thought of as a society or culture.) Other species do not create anything close to either; they cannot, for the simple reason that they lack certain in-built neural-cognitive mechanisms, even though they may possess a great deal of what is needed in this regard. This raises the question of how much of the commonality or agreement that underpins phenomena like society and culture is the result of aptitudes and predispositions that we come hard-wired for as opposed to what we have learned along the way. That we frequently speak of our "common humanity" or "human society"

suggests that we have important attributes that are not socially or culturally contingent; altruism, empathy, and an intuitive sense of fair play are examples that jump to mind.

Psychology has been the science that education has traditionally turned to for insights into our nature, at least for everything about us that we call mental.⁶ The main interest has been in how we learn and how we develop intellectually, emotionally and socially (including morally and culturally). However, Education has been slow to consider in any real depth the findings of *those* sciences that seek to understand our *innate* psychology: the aptitudes, dispositions and their corresponding neural mechanisms that are encoded for in our genes and which make it possible for us to acquire skills and knowledge and to develop the myriad competences we require in order to engage socially, economically and culturally and thus to function successfully in the environments in which we live out our lives, environments that in key respects have been made by us.

The three principal sciences in this regard are *Evolutionary Psychology*, *Cognitive Neuroscience*, and *Gene-Culture Coevolution Theory* and they will be tapped into in the following two chapters. More specific in their research foci and more directly relevant to the Philosophy of Music Education are the even newer fields of *Evolutionary Aesthetics* and *Biomusicology* which seek evolutionary explanations for artistic abilities and propensities including those vital to most musical behavior. For the most part they can be subsumed under Evolutionary Psychology because of their overriding concern with accounting for human psychological and social phenomena in terms of biological adaptations.

That these sciences have yet to inform educational theory or philosophy to any significant degree (Cognitive Neuroscience being a partial exception) may be in part due to a general inertia in Education together with the relative newness of these sciences. In his *Transformative Learning: Educational Vision for the 21st Century* (1999: 54) O'Sullivan claims inertia to be ~~the~~ most powerful social force.⁷ Taking a Darwinian view, I would argue that inertia is less a social force (which suggests society to be some kind of thing, a volitional agent that can exert force) than it is the expression of a strong, innate proclivity that evolved in our species because it increased the reproductive success of our Paleolithic (and pre-Paleolithic) forbears.¹ People are by their nature conformists and have an in-built resistance to change coupled with a predisposition to: go with the flow, just play the gig, not rock the boat and not reason why (rather just do and die). Moreover, when something becomes or is perceived to be the *status quo*, it is the wont of humans to assume it to be appropriate, even obvious or natural. Therein lies the biggest problem and challenge for education, now more urgent than ever given the high probability of ecological (and therefore also social) collapse that will *only* be averted if people radically change their patterns of

¹ The Paleolithic covers the time from the earliest known stone tools by pre-*sapiens* ancestors (e.g. *Homo habilis*) about 2.5 million until 12 thousand years ago when agriculture began to be practiced, i.e. over 99% of the existence of our kind (of the genus *Homo*) or 94% of the time since *Homo sapiens* first appeared around 200 thousand years ago. We shared a common ancestor with modern day chimpanzees around 6.5 million years ago, but notwithstanding this much longer span of time, our DNA is at least 95% (perhaps as much as 99%) the same.

behaviour, recognizing that the global *status quo* with its rampant consumerism and exponential population growth cannot be for long sustained.²

Inertia is not the only problem. While it may explain the torpidity of the masses, it does not account sufficiently for evolutionary science's negligible impact on educational philosophy and on the so-called *Humanities*. 'Not infrequently in my career as an educator, educationist and Humanities academic, I have encountered a distinct lack of awareness of what has been coming forth from the afore-mentioned sciences which I collectively refer to as *Darwinian Science* for reasons that will be given presently. "It is not my field" is heard commonly enough, but I have also encountered, among colleagues and in my readings, determined resistance to attempts by the *natural sciences* to explain psychological, social and cultural phenomena, resistance of different kinds, revealing different ideological underpinnings, and having different rationales for giving short shrift to these sciences.

In this study I will examine and contest the more influential of these rationales. I must do this if I am to succeed in my principal purpose which is *to demonstrate the critical relevance of Darwinian Science to educational philosophy generally and to the Philosophy of Music Education in particular*. In some cases, it is not active resistance so much as indifference based on the assumption that Darwinian Science and the *natural sciences* have nothing significant to offer Education or the study of music and other *arts*.³ Until a few years ago, I fitted into this category although I have for long believed, based on my own life experience in different countries and among people from different cultures, that there is much *more* about what we humans are psychosocially that is *pre-cultural* than what academia outside of the natural sciences seem wont to concede. But there are many who believe Darwinism's core tenets to be in one or another way antithetical, potentially at least, to the best interests of society and of people generally. If not antithetical, they are at least *dangerous* in their view. History has shown how Darwin's natural selection can be appropriated to serve perverse ideologies (e.g. Nazism) and their inhuman social engineering programs. And, of course, Darwin can be anathema to the seriously religious.

As will become apparent in the discussions that follow, one cannot really embrace Darwinism without calling into question widely-held beliefs that Darwinian Science refutes or at least shows to be highly improbable as indicative of how things *really* are and how they got to be that way. Going the whole distance with Darwin must entail engagement with metaphysical questions and the kinds of answers this leads to are often not concordant with what most people want to believe. It is oddly ironic that much of what they (the majority it seems) want to believe, for example, that life has a purpose (beyond propagating our genes) or that we as a species have been divinely favoured, or that it really matters who wins the Soccer World Cup, can be understood and explained in relation to our innate psychological being, that is, in terms of cognitive predispositions that are biological adaptations. Nothing is more in the realm of Metaphysics than the belief that there is a non-physical self in control of the physical self and that it continues to exist when the physical self dies. These beliefs (e.g. belief in

² The biosphere, that part of Earth wherein life is found, is the dimensional equivalent of a thin layer of varnish painted onto a basketball.

God) did not just somehow appear. They make intuitive sense, they *feel* right, and people embrace them *naturally*. But it also makes intuitive sense to claim that the sun orbits the Earth or that the Earth is flat.

All of the fields explored in this study are Darwinian in that they take as axiomatic Charles Darwin's explanation for how life has evolved – and continues to evolve – according to the process of *natural selection*, which ultimately is the playing out of a simple, mindless and purposeless algorithm. *Everything that we are, mentally, physically, emotionally, kinesthetically and psychosocially, and all that we are capable of is possible only because this mindless, purposeless process has resulted in organisms with the necessary biological equipment.*

An in-depth consideration of- and case for - Darwinism follows further along in this chapter including an explication of the simple algorithm which is claimed to be driving everything. Suffice to say here that the still common notion that we come into the world as *blank slates* must by now be dismissed as *errant nonsense* given what is reliably known about the computational sophistication of our brains as they come pre-wired, and of the genetically instructed predispositions that incline and constrain our behaviour, even though this by no means makes us genetic automatons; nor does it deny the critical role of environment in shaping us into what we become. Indeed, *because* of particular innate attributes such as language, our ability to imitate, and our extraordinary capacity for remembering things, our minds provide a fertile environment in which the same algorithm is quite possibly at work, not on genes, but on the neurally encoded informational units that we call ideas, for which Richard Dawkins (1976) coined the term memes. Imagine the metaphysical shift required if it can be convincingly shown that, contrary to what is so intuitive and commonsensical – that we *have* ideas, it turns out rather that ideas *have* us, or that free-will and consciousness itself are but illusions. The nascent science of *Memetics*, which considers seriously such claims, will be explored in depth in my discussion of Gene-Culture Coevolution Theory in Chapter Three.

What I am in *no* doubt of is that there is far more to our innate psychology than has been conceded by the Humanities and Social Sciences – and that what we are coming to know about our nature should provoke serious reconsideration of many of the assumptions that inform educational philosophy and practice in so much of the world, like, for example, that traits such as jealousy, competitiveness, mistrust, greed, materialism, hunger for status and manipulateness are the result of society's corrupting influence (as Jean Jacques Rousseau hypothesized). I am a child of the '60s and I would *still* very much like to believe that such failings are purely social, that our real nature is to trust, share, be humble, and love one another, that it is the system that makes us competitive, greedy, materialistic, status hungry and manipulative. Evolutionary Psychology has effectively pulled the rug out from under such notions and it now seems clear that the triumph of capitalism over socialism is attributable not to the former being better or more right (it could well be the recipe for our ultimate extinction) only that it is more congruent with our innate psychology; it more successfully exploits our instinctive leanings and even tries to sanctify some of them (competitiveness and materialism for example). In actuality, as per my remarks regarding society, capitalism is no *it* in the sense of a discrete, free-floating entity with intentionality and capable of exploiting anything. There are only people doing for the most part what comes naturally, and capitalism comes more naturally than socialism.

But evolution has also equipped us with the means to override our genetic default settings and actualize the norms and values expressed in so many of those great songs of the sixties.⁴ And there has been at least some success in the achievement of democratic socialism in parts of the world. Our “ability to transcend our genetic imperatives” is —a biological fact, visible to natural science, and something that requires an explanation from natural science” (Dennett 2007: 4). But how successful one is in transcending these imperatives depends critically on the nurturing of what is biologically given. Indeed, as will become ever more clear in the ensuing discussions, enabling and guiding the transcendence of our genetic imperatives is an apt way of summing up education’s main task and *raison d’être*. There is no other way in which broader social and ecological goals can be achieved. For that matter, there is no other way to the acquisition of capacities such as literacy, propositional thinking, moral reasoning or *musicianship*.

Of particular interest to the Philosophy of Music Education is the question of whether or not (or to what extent) music is a biologically evolved adaptation, pertinent because it must influence how we conceptualize music and what values or benefits we ascribe to different kinds of musical engagement and activity. If the cognitive mechanisms with which the brain processes musical stimuli prove to be largely innate, the implications for what and how we teach in and through ‘music’ are considerable. Such implications need to be inferred, articulated and understood curricularly. The same holds if most of what we call music turns out to have no adaptive explanation or function, that it is only “auditory cheesecake” as Steven Pinker has expressed it (1997: 534). Suffice to mention here that reading and writing are *not* biological adaptations, and this *fact* has not negatively affected their perceived value to human life.

Virtually all of what comprises our innate psychology are adaptations that evolved because they enhanced the reproductive success of our ancestors during the thousands of millennia during which they inhabited environments vastly different to what we occupy in the 21st century. Much of what our Paleolithic forbears needed by way of physical and mental prowess is no longer needed and other demands and challenges must now be met for which the kinds and levels of competence demanded are not genetically provided for (even though our genes instruct the ontogeny of the necessary computational equipment); they must be acquired through learning. Music may or may not be a biological adaptation, a matter that will be considered in depth in Chapter Two, but even if, like reading, it is not, it most certainly relies on attributes selected for by natural selection because they served Paleolithic or pre-Paleolithic needs, for example, the capacity of our brains to analyze harmonically rich sounds into their frequency components which is essential for language where we have to be able to distinguish different vowel sounds. I should rather say that such attributes served the propagation of Paleolithic genes nearly all of which are shared by modern day humans (and modern day chimpanzees as it turns out). The upshot is that we continue to live out our lives with what is almost entirely a Paleolithic innate psychology.

⁴ The eminent linguist and evolutionary psychologist Steven Pinker, in the introduction to Chapter 7 of his *How the Mind Works* (1997: 425), strings together some of the best known lines which he wrongly (I believe) styles as ‘treacle,’ e.g.: ‘Come on people now, smile on your brother! Everybody get together; try to love one another right now. ... Harmony and understanding, sympathy and trust abounding ... Imagine no possessions ... and no religion too ... all the people sharing all the world.’

Biomusicology is the name that has come to be applied to attempts to understand and explain music in adaptive terms, that is, in terms of evolved traits that helped our distant ancestors to more successfully adapt to the environments they inhabited, to secure mates and to raise offspring to sexual maturity, all of this necessary for getting their genes replicated in subsequent generations. The ‘_Darwinizing’ of musicology is essentially what Biomusicology is about and this, as will be seen, can entail many things. To Darwinize means to make something consistent with what we can confidently accept as true – or at least probable - about our evolved nature, that is to say, about the attributes that all members of the species *Homo sapiens* have in common, that are genetically provided for and thus the outcome of natural selection.

The truth of the matter is that despite resistance to Darwinian intrusions into social and cultural studies and the ‘_human sciences’ generally, there has always been a tacit acceptance of the fact that we are a cognitively complex species even before environmental influences have a chance to act upon us. Although flaws in their theories have been revealed in the decades that have followed their work, Education and the human sciences still pay heed to Piaget, Erikson, Kohlberg, Vygotsky, Maslow and others who found common features in the ways that we unfold psychosocially, intellectually, emotionally and morally. While these theories all agree that the specifics of how we unfold and what we unfold *into* are critically dependent on the environments we occupy, they have to acknowledge that this necessitates far more than just some general learning capacity that allows environment to write itself on what is essentially a *blank slate*. Noam Chomsky (though himself far from being an ardent Darwinist) made this abundantly clear half a century ago with his ‘_universal grammar,’ a theory that was quickly taken up by key individuals in musical studies because of what they saw as clear implications for our understanding of innate musicality. John Blacking and Leonard Bernstein are the two luminaries who first come to mind in this regard.

Even in Cultural Anthropology there has been an acknowledgement that despite the degree of *différance* culturally and socially among the peoples of the world, underlying it are common human competences and dispositions. Ascertaining the patterns of thought underlying all human activity, be it in pre- or post- industrial societies, was the substance of the late Lévi-Strauss’s *structuralism*. His notion of one such universal competence, *bricolage*, begs investigation from an Evolutionary Psychology perspective and has particular relevance as regards the role of improvisation in music education. *Bricolage*, is the ability and inclination "to make creative and resourceful use of whatever materials are at hand (regardless of their original purpose)".

Two of postmodernism’s better known writers, Gilles Deleuze and Felix Guattari, characterized the unconscious mind as a number of impersonal ‘_desiring machines’ at work in a factory. Alternatively, they use the image of a rhizome (e.g. couch-grass) whose root system is a widely complex network with each point connectable to all other points in the network (Macey 2000: 88-89). Their metaphors are wonderfully apropos Evolutionary Psychology’s portrayal of the brain as a massively parallel computational system connecting up a complex network of neurocognitive mechanisms. The role of *emotion* in the workings of all of this is the focus of the work of the eminent cognitive neuroscientist Antonio Damasio, whose work will feature in several of the discussions that follow, as I believe it to have key implications for how we think about artistic behavior and its value cognitively.

In order to make better sense of the title of this work – *Darwinizing the Philosophy of Music Education* – I need to give clarity as to the nature of the *something* that I claim to be in need of being Darwinized. What is the Philosophy of Music Education and what kinds of questions is it concerned with? Moreover, I need to say more about Darwinism generally and why it is that I have found Darwinian theory and science so compelling and relevant to Education and, therefore also, to Music Education. In other words, I need to make clear *my rationale* for embarking on this study. But, let us deal first with the core concept - *philosophy* – as well as related philosophical concepts germane to this study.

On Philosophy and related matters

We can talk about having a philosophy *of* life, *of* marriage, *of* art, *of* music, *of* whatever, meaning some set of beliefs that one or more people have about whatever it is that comes after *of*. These beliefs don't have to be shown to be *true* on the basis of empirical evidence or otherwise demonstrate scientific validity; they are just what we believe, what we take on faith to be true, contingently true, or at least true enough to guide our actions. When I capitalize the term – **Philosophy** – I am referring *not* to what one personally believes, but to the broad field of inquiry that systematically studies the meaning and justification of beliefs and ideas; and these may relate to a wide range of things. There are several branches of Philosophy concerned with different kinds of questions, mostly metaphysical. Epistemology, for example, is the branch concerned with *knowledge* while Ontology investigates the nature of *being* and *existence* itself. Aesthetics is concerned with how and why we value particular kinds of experience such as those provided by the arts. All of these branches (and there are many others) deal with aspects of being human and although they do not generally proclaim it as such, they all seem to, indeed, they *must* operate on the assumption, however tacit, that there are human capacities and proclivities that are not culturally or socially specific or contingent, even though their behavioral consequences will be very much influenced by the particulars of the social and cultural contexts in which they are played out.

The names given these branches (as with those of individual sciences) are also capitalized because they are labels that stand for conceptually coherent pursuits informed by a significant body of theory, knowledge and research. (They are also commonly used as labels for courses of study at universities.) Capitalizing them in no way is meant to *exalt* them. Their credentials must speak for themselves. Rather, it serves to distinguish a set of individually held beliefs (a philosophy) from a *corpus of understanding* (Philosophy) to whose development well-read people apply themselves assiduously, motivated by a desire to improve this understanding, especially as regards its *truth* value, whatever we may take that to mean. I also capitalize Education and Music Education when I am writing, not about educational processes (e.g. teaching and learning), but about the fields of scholarly engagement that have grown up around these processes. Some prefer the term Pedagogy or Pedagogics in this regard.

On the Philosophy of Music Education

As I conceive it, the Philosophy of Music Education is the field of inquiry that *should* be primarily concerned with understanding how music can most optimally feature *in* and *as* learning activity so as to achieve the best possible *educational* results. I emphasize the word *educational* because I believe that many if not most music educators would substitute the word *musical*, seeing the cultivation of musicianship (being able to do the things musicians do) as music education's *raison d'être*. With my formulation I am giving expression to a key tenet of my own philosophy of music education (note *no* capitalization) that can be summed up by the formulation: *education through music*, and this implies something quite different from education *in, about, or for* music. And it points to the need for some elaboration of my philosophical orientations as regards the broader issues of education and society, the latter being what I, in line with Dewey, regard as education's ultimate function. The primary implication of this is that when *I speak of music education, I am referring to a context of effort wherein all that takes place is accountable ultimately to overarching, interdisciplinary educational goals which in turn are accountable to social and ecological needs and goals*. I believe that whatever takes place under and in the name of *education* should be similarly accountable. Individuals may decide to pursue musical studies for personal or professional reasons, or other reasons none of which need be subordinate or accountable to anything broader. But I prefer not to call this music *education*; perhaps music *training* (or training in music) is a more apt label for many such undertakings. What takes place within schools and which is intended for all students should be *educational*, meaning (for me at least) that the achievement of musical goals must be shown to be means to the achievement of broader educational, and ultimately, social and ecological goals. Musicianship (being able to do the things musicians do) is a worthy goal for all kinds of reasons, but this does not automatically mean that it is a goal that all young people should be expected to achieve or that the world would necessarily be a better place if they all did. The Philosophy of Music Education has only recently begun to be more similarly *outward* looking in its deliberations on the whys and wherefores of music education. Paul Woodford (2005: 86), for example, posits —social intelligence” as an essential goal for music education.

[M]usic education should be reconceived as a study in social intelligence in which consideration is given not just to the pursuit of musical knowledge and skills but also to inculcating in children and music education majors moral imagination and those kinds of personal skills, dispositions, virtues, and attributes needed to mindfully engage in public criticism of musical values.”

I endorse Woodford's proposal except that I would argue that the *social intelligence* that music education needs to foster should be of the broadly applicable kind, not limited to musical values, but concerning *ideology* generally, that is, the assumptions that people accept as *how things are and should be* and that inform *who they are* and *how they act* not only in relation to music but to life as a whole. In this regard, I choose the concept *praxis* and use it in the Marxian sense and as it was developed by Paulo Freire, where the essential element is *critical consciousness* (*conscientizacao*), a capability for questioning one's historical and social situation, for *reading the world* (Freire & Macedo 1987). Implicit in praxis are marked capacities for moral reasoning and ideology critique. But so also, it will be argued, are the capacities of empathy,

imagination, intuition, creativity and even spirituality. Ecopedagogy adds ecological consciousness to the list.

What seems implicit in Dewey's insight is that *before* educational ways and means can be decided on (for example, education through music, science, sports, basket-weaving, or whatever), there must be some clarity about the kind of society education should be engaged in bringing about. One can get no help from Darwinian Science here. If it is not already apparent from what has been said, it will become so in discussions further along, and that is that Darwinian Science can only account for how life has come to be as it is (including such evolutionary anomalies as society and culture); it does not have - indeed, it *cannot* have - anything to say about *how things should be* or where society should be going. It offers no *utopian vision* and has little predictive value. It *can* however help us to understand why ideas (and complexes of ideas) resonate with people in the ways they do, sometimes becoming enshrined as principles or *ideals* that people aspire to, create institutions around, and commit to, sometimes to the extent that they will sacrifice their own life and/or the lives of others in pursuance of an ideal. In most cases however, ideas are just part of the communal furniture, very much in the background, such that they are thought of little if at all. They are not anything like *ideals*, but they are *in sum* a more potent and pervasive influence on the behaviour of the majority of people. They are the stuff of ideology, the assumptions that people abide without ever really questioning. But be it an articulate ideal, an unwitting assumption, or just a general sense about something, ideas are mental constructs that are able to take shape and induce behaviour only by virtue of the synaptic organization and functional capacity of the human brain which, notwithstanding its plasticity, runs on neural-chemical hardware common to all humans. Surely it is crucial to gain an understanding of why the brain is organized the way it is given the innumerable other ways it could have been organized. Even though it is still very early days, Darwinian Science can already tell us much about what we as a species come hard-wired with and how it predisposes and constrains our cognitive processes. And here it is worth noting that predispositions that served the needs of surviving and procreating in [Pleistocene](#) environments *may* in today's world induce behavior that is socially and ecologically counterproductive and thus maladaptive. Nepotism is an example that jumps to my mind in this regard.

A need for utopian vision?

Is Education (including Music Education) in need of a utopian vision? Who could reasonably argue that human society is as good as it could or should be, that education need only be concerned with maintaining the *status quo*? And yet that generally seems to be the assumption informing educational practices in today's world. Certainly there is much talk of development, but little is said as to where this development should ultimately be leading us. O'Sullivan (1999: 4) speaks of a kind of entrancement in modern global society which he couples with ~~a~~ kind of optimism and verve that ours is the best of all possible worlds" and the attendant sense that ~~we~~ should continue what we are doing ... in the same direction that has taken us to this point." He considers this entrancement ~~a~~ profound cultural pathology" which as per his notion of *inertia* is an idea that I and most evolutionary psychologists would challenge, arguing that the problem lies rather with what is one of our strongest innate cognitive biases – our predisposition toward *status quo* thinking and behaviour -not some diseased condition

that society has infected us with. But whichever is the best explanation, the problem is the same: an inertia that education *must* overcome if we are to avert the ecological calamity that is inevitable should we carry on with business as usual. Notwithstanding my disagreements with O'Sullivan regarding the causes underlying educational inertia, I totally agree with him that:

The fundamental educational task of our times is to make the choice for a sustainable planetary habitat of interdependent life forms over and against the dysfunctional calling of the global competitive marketplace. (1999: 2)

The incessant valorization of Science and Mathematics in school curricula is, as I see it, a response to this *calling* O'Sullivan speaks of. The heroes of South Africa's matriculation examinations, those who achieve seven A's, seem also to be heeding the call judging by the numbers who are choosing Actuarial Science as their career path. What better way of equipping one for success in playing the international casino we call the *Market*, where the vast majority of transactions are not paying for any product or service but are only speculative gambles carrying various degrees of risk (which actuarial scientists are adept at gauging)?

O'Sullivan has been strongly influenced by the late cosmologist and Catholic priest, Thomas Berry, and his *ecozoic vision* according to which: ~~the~~ human is derivative, the Earth is primary." The larger ~~earth~~ community" must be, in this view, the ~~primary~~ referent" for and ~~concern~~ of every profession, institute, and activity" (Berry 1996). I for the most part share Berry's vision which is utopian in its ideal of an ecologically balanced and sustainable earth community of interdependent life forms. Where my Darwinism comes in is in my understanding that none of the life forms that comprise the larger earth community is inherently or intrinsically more worthy or entitled. We humans call the shots, but not because we should, *only* because we *can*. For that matter, no particular vision of ecological homeostasis can be claimed to represent how things were *meant* to be. From this it seems inescapable that there must be nihilistic and/or radically relativistic tendencies in Darwinian thinking, a matter that I take up at various points in this dissertation. For now, the suggestion that education should be driven by and accountable to a utopian vision needs further discussion given the paucity of such vision in educational philosophy and the apparent disinclination of philosophers of Education to advance any such vision.

Notwithstanding his endorsement of Berry's vision of an ecozoic era or his espousal of a ~~cosmological~~ perspective," O'Sullivan takes pains to make clear his nonpartisanship with anything ~~Utopian or new age~~" (1999: 6). He evidently realizes how much the term utopia has been tainted by association with the New Age movement, which should not be entirely a bad thing given all that is laudable and ecologically sound in New Age thinking. The problem lies with the spiritual beliefs embraced by many who are identified with the movement, especially those rooted in occultism, astrology, shamanism and other forms of mysticism (for which a whole industry has arisen to supply the accoutrements, e.g. crystals, spirit-catchers, tarot cards, etc.). Utopia seems to have little currency these days, particularly in academia, and is avoided even by some whose thinking is arguably utopian. The Zeitgeist movement, for example, eschews the concept utopia which it sees as ~~static~~." And yet everywhere in its presentations it alludes to an ideal world, not some final state of perfection, but nonetheless a world in which certain conditions obtain (e.g. maximal automation to obviate tiresome, repetitive

labor, the absence of any monetary or barter system, etc.), a world ~~w~~where negative social consequences, such as social stratification, war, biases, elitism and criminal activity will be constantly reduced and, idealistically, eventually become nonexistent within the spectrum of human behavior itself” (*The Zeitgeist Movement* website). What is paradoxical is that notwithstanding the movement’s exaltation of science and scientific method as cornerstones in the envisaged order, it maintains a strenuously *blank slate* take on humanity. It portrays as ~~s~~capist” the notion that our innate nature has much to do with the said ~~n~~egative social consequences.”

In reality, we are nearly clean slates when we are born and it is our environment that shapes who we are and how we behave. (*The Zeitgeist Movement* website)

The following makes clearer what is meant by ~~n~~early clean.”

The bottom line is that it is environmental conditioning that really affects 99% of our actions, and all diligent behavior studies have proven this time and time again. (Ibid.)

No such studies are cited and the studies that will be cited in the course of this inquiry will bear out my earlier dismissal of such a claim as *errant nonsense*. But here, still more needs saying as to the need for a utopian vision, if indeed there is such need.

A utopian vision is unavoidably *idealistic* but in the positive, straightforward sense of representing an ideal, and ideals are useful, often essential, in providing direction to our efforts, most particularly those efforts directed toward making things better, education being foremost in this regard. Of course, a utopian vision is of no value if demonstrably unachievable or absurdly unrealistic. But how can we decide how realistic something is without properly understanding the *agents* or *catalysts* that are to be called upon, that are necessary for its realization? We *Homo sapiens* are amazingly clever and creative, and it is popular to believe that there are no limits to what we can do or achieve. But this simply is not true. At the very least we need to understand what informs, influences, constrains, indeed, what constitutes our *agency*, that is, our ~~f~~aculty of acting or of exerting power” (Wiktionary – ~~a~~gency”⁵). This agency is, in fact, comprises many ~~f~~aculties‘ that integrate in various ways depending on what is required in the moment. Certain of these faculties are what make possible such unique behaviors as language, imitation, remembering, planning, reflecting and so on, and these in turn are what allow our agency to be shaped by what we experience in the course of our lives, what we *learn* that is to say. The question of just how much we are ~~f~~ree agents‘ in all this will be taken up at various points in this study as it is a crucial question for Educational Philosophy.

A utopian vision, according to much postmodernist thinking, must be embedded in some or another metanarrative, which Stephens (1998: 9) defines as ~~a~~ global or totalizing cultural narrative schema which orders and explains knowledge and experience,” ~~a~~ body of shared allusions and experiences that expresses a society’s central values and assumptions.‘ Like anything ideological it needs to be treated with scepticism. This is likely another reason why O’Sullivan, who has definite postmodernist leanings, eschews the concept utopia. This could also explain, in part, the

⁵ ~~a~~gency” at <http://en.wiktionary.org/wiki/agency>

scepticism that is met in the Humanities and Social Sciences regarding Sociobiology and Evolutionary Psychology (the latter by and large being the new name for the former), or whatever science seeks what ultimately are biological explanations for psychological and (accordingly) social phenomena (perhaps including such complex phenomena as *metanarratives* or *art*).

Darwinian Science remains tainted, in many minds it seems, by Social Darwinism, the late 19th century movement that misappropriated Darwin's *survival of the fittest* (which was not Darwin's formulation), changing what was to be understood by *fittest* so as to rationalize social stratification and the exploitation that fuelled the emerging industrial order. Behaviour Genetics is easily seen as Social Darwinism's current guise especially when it postulates on racial differences, even if, as Tooby & Cosmides (1992: 35) have it, Evolutionary Psychology is able to distance itself from theories of difference because its concern is with what is universal and common to us all.

Obviously, claims about a complexly organized, universal human nature, by their very character, cannot participate in racist explanations. Indeed, they contradict the central premises of racialist approaches.

This could be too facile especially as there is a fair deal of research going on in Gene-culture Coevolution Theory concerned very much with quantitative variations in phenotypic attributes between populations of people whose ancestors lived in relative isolation long enough for natural selection to bring about changes in the genome. It is not sufficiently relevant to the present discussion to pursue the matter further here, but it does need to be pursued and will be taken up in Chapter Three.

One other possible explanation for the seeming disinclination of philosophers of education to embrace utopian visions is that too much specificity in the determination of *ultimate ends* is seen as intrinsically undemocratic or even fascist. If education is to serve the realization of a vision, everyone must have and *believe* in the same vision. How could this ever be achieved without education becoming indoctrination? And yet, it can be argued that there are utopian visions that are embraced widely, not only by some quirky cult of devotees or disciples, but by the broad base of humanity. In the last one hundred years we have again and again witnessed nations and people from diverse cultural backgrounds coming together and agreeing on important principles concerning, for example, human rights, environmental standards, and economic relations. And this seems to suggest that there are principles that transcend cultural and other social differences. And what is a principle if not an *ideal*, that is, the articulation of how something should ideally be, e.g. that all people should be treated fairly, that children should not be subjected to any form of abuse, or that other sentient beings (whales and gorillas for example) have as much right to life on this planet as do we humans. In an ideal society (a utopia), these principles would be optimally realized. So it stands to reason that principles collectively describe or at least imply a utopia, a society where the principles are manifest in how its citizens live out their lives.

The most all-embracing and generally the most exalted principles have been given names, for example: democracy, socialism, *ubuntu*, and equity. As is the nature of the English language and those who speak it (and as may well be the case with other languages), by naming them, by making them nouns, we reify them and they become *things* that are thought to exist out there in the world as attributes of human

collectives: societies, cultures, movements, nations, humanity. All that they are *really* are just descriptions of how things *might* be or *could* be provided that certain conditions (not always agreed upon) are met as regards how some group of people behave and how they relate to each other. My argument, therefore, is that they are meaningless terms unless they describe *praxis* and what *praxis* means in the simplest possible terms is that people are living out the principles and doing so in a seemingly natural, spontaneous and unforced way, even though there is much in their *nature* that would have them do otherwise. What is being alluded to here are people at the highest levels of moral self-actualization as Kohlberg portrayed them in his famous theory, people for whom morals are not things that you *believe*, but rather how you *do* things because of who you are. Laws are not prescriptions or proscriptions so much as social contracts that apply only provided that they serve the greatest common good. In the utopia I envisage, laws and/or social contracts are redundant because people have so thoroughly actualized ethical principles that they have become nonnegotiable bottom-lines in all their actions. (Justice is the first principle in this regard.) Very few people achieve such levels of moral excellence, such as we associate with rare exemplars like Mahatma Gandhi or Nelson Mandela.

However much academics in the Social Sciences may eschew *essentialism*, notions of a universal human nature (beyond some 'basic instincts' and a general learning ability), and utopian visions, few of them would style themselves radical relativists, nihilists, or anarchists. There are principles that they embrace and it has been among such academics that I have found, more than in any other milieu, a strong commitment to social and environmental justice. It is a milieu to which I strongly feel a part, my Darwinism notwithstanding. I hope to show that there is nothing like an unbridgeable chasm between the explanations for psychological and social phenomena offered by sociologists and those offered by evolutionary psychologists. The matter has been exaggerated I believe. Moreover, the Evolutionary Psychology portrayal of the *Standard Social Science Model* (SSSM), which is dealt with further along, was posited well over a decade ago and in this time the influence of postmodernism has waned considerably. More and more the social and the natural sciences seem to be finding themselves on the same page and *consilience* should be the name of the game.

Everywhere you turn in today's world you find principles being agreed upon and articulated, most commonly in documents: charters, constitutions, mission statements, protocols and so forth. Let us take for example the *Universal Declaration of Human Rights* (UDHR), a document that academics from both the social and the natural sciences endorse without reluctance. Where this is not so, it is mostly in respect of articles that are problematic vis-à-vis some or another religious tenet. Indeed, there are only a very few of the UDHR's articles that have been publicly challenged, for example, those that are seen to be in conflict with Shariah law by some Islamicists and those 'positive' rights that conservatives and laissez-faire capitalists argue contravene what they see as the *natural, inalienable* right to manage and dispose of one's 'property' as one sees fit. But the point that is urgent here is that the majority of the articles have not been contested. When it was voted on by the UN General Assembly in 1948, 48 countries voted in favour, *none against*. There were 8 abstentions from former Soviet

Bloc states as well as Yugoslavia, South Africa and Saudi Arabia.⁶ Much has changed in the ensuing six-plus decades. The Soviet Union is no longer and South Africa now has a constitution seen as the world's most democratic and consistent with the UDHR. Indeed, the USA, the erstwhile champion of democracy, has become the principal detractor when it comes to international efforts to promote compliance - for example, the International Court of Justice, as well as agreements such the Kyoto Accord.

What I find remarkable about the UDHR is that the *authority* that invests human kind with these rights (the authorizing agent) is nowhere specified. It might have been expected that some entity would be invoked, be it political (the United Nations) or transcendent (God). What is more, the UDHR articulates standards of humaneness that often conflict with one or more innate dispositions, the genetic biases that are part of our evolved psychology, like *'racism'* it might be argued. *And yet*, the articles are standards that resonate with people, that seem intuitively appropriate, and that seem strongly resistant to refutation. Less resonant is the notion that other species have such rights and there is as yet nothing like the UDHR for Earthlings who are not of the species *Homo sapiens*. We are not inclined to accord rights to organisms we cannot procreate with. From a gene's-eye view, this is an entirely valid disinclination. But from a gene's-eye view, nepotism, xenophobia, infanticide and even genocide are valid stratagems.

The important point is that we seem able to uphold such worthy standards and values without *having* to ascribe them to a higher power and yet many of these same standards and values go against the grain as far as our instincts are concerned. It is amazing how far people will override their *nature* because of what they believe, celibate priests and suicide bombers being extreme cases. The Social Sciences are most certainly correct to invoke social and cultural influences in attempting to solve such paradoxes but they should not ignore the reality that much of one's moral sensibility is innate, considerably more than has hitherto been acknowledged if we are to take evolutionary psychologists like Marc Hauser (2007) seriously. When you think of it, most of your judgments are made spontaneously without conscious consideration of *principles*. Our behaviour is decided on the basis of how it causes us to *feel* and for most people across the world, helping *feels* good whereas hurting or cheating *feels* bad. Accordingly we *feel* helping to be right while we *feel* hurting and cheating to be wrong. We do NOT have to be taught this, but education can nurture and cultivate what nature has provided; we can be taught to think and feel in ways that extend and refine what comes naturally, for example, extending our humaneness to species other than our own, *or* at least to generations of humans yet born. The failure of education to foster genuine ecological intelligence makes it an accomplice to the collapse that now seems so sadly inevitable and which will deny future generations health and *'well-being'* if not life itself, *unless* our ways of *'being in the world'* change dramatically.

For those teachers that give much thought to the ultimate rationale for their discipline/subject, they usually do so based on particular attributes that they believe are being cultivated in - or acquired by - their students (musicianship for example). Because particular attributes appear to be widely esteemed (by others in one's profession,

⁶ [Questions & answers about the Universal Declaration of Human Rights](http://www.unac.org/rights/question.html) at <http://www.unac.org/rights/question.html> (Retrieved 12 January 2011).

community, culture, religious milieu, etc.) they are assumed to be worthy and are accepted without any serious interrogation of reasons for why - or explanations for how - a particular attribute came to be widely esteemed or how those who have developed these attributes can offer more toward - how they can better serve - the realization of a more ideal world. Accordingly, no need is felt for a vision of utopia as an ultimate determiner of what they should be striving for through their teaching. Many teachers think of their profession firstly as *teaching a subject* or *discipline* as opposed to *teaching students*, i.e. helping them to become *'better'* people. They are drawn to the profession more by their passion for the subject/discipline than by their commitment to education or social amelioration. The standard line one hears from Music Education majors is that their curricular choice is an insurance policy, something to fall back on if they don't crack it as a professional musician. But there are also many music teachers who *do* have their student's interests as their primary concern and they operate on the assumption that what their students *'get'* from music education makes them better people, because they have been empowered in ways that at the very least affords them rich forms of pleasure (aesthetic pleasure, for example) that are edifying or otherwise of value. Some might go further to theorize the nature of the *'value'* (edifying can mean so many things) and speak in terms of forms of knowing, cognitive capacities, or such-like.

The philosophy that David Elliott advances in *Music Matters: A new philosophy of music education* (1995) is grounded on forms of cognitive engagement that he convincingly argues to be active in various forms of *'musicing'*, that is, in doing the things musicians do like performing, composing, improvising, and listening to music. As he puts it: "Music making and music listening are unique forms of thinking and unique sources of the most important kinds of knowledge human beings can gain" (14). But he never, according to my reading, makes clear *why* the kinds of knowledge he exalts are so important. He does not suggest, except indirectly, how being able to use one's cognitive resources the way praxial musicians do makes an individual *'better'* socially, ethically or ecologically. Neither does he suggest in what ways a world of *'praxial musicers'* constitutes a better world than that which we live in. This is not to diminish the importance and value of Elliott's contribution to the Philosophy of Music Education, but it reveals what I see as a fundamental *misorientation* that I have found to characterize the field generally. The leading philosophies⁷ are almost entirely in agreement that the purposes and values of music education should derive from - and be consistent with - the nature and values of *music*. As Elliott⁸ put it, *'the nature of music education depends on the nature of music'* and *'the significance of music education depends on the significance of music in human life'* (1995: 12). It is as if the paradigm should be *'education for music'*, not the other way around. Should not the *'significance of music education'* depend on what it contributes to making the world a better place because of how it helps to improve individuals, not only cognitively, but socially and in terms of how they think and behave ecologically?

Perhaps the reason that writers in the Philosophy of Music Education have refrained from couching their theories of music's nature and value within a broader educational value system based upon some social-ecological vision (even if one does not want to

⁷ that is, philosophies that have been articulated in widely read texts and subjected to critical review by other scholars working in the Philosophy of Music Education.

⁸ His *Music Matters* is one of the most widely read texts in Music Education.

style it as ‘utopian’) is because of the possibility that music might turn out *not* to matter, or at least not so much that it justifies inclusion in the education of everyone. Perhaps it mattered more in former times, but like so many other commonplaces of yesteryear, it has been largely superseded by more recent and efficacious ‘pleasure technologies’ that are more successful in commanding our attention, and in ‘satisfying’ social needs and functions. Wherever I have traveled in the world, I have encountered video (or DVD) rental shops, but seldom (almost never) shops that rent music CDs. When someone puts on a video or DVD, all present are expected to watch and keep silent so that there is no distraction, and yet this is almost never expected when music is put on. How many people, musicians included, actually ‘listen’ to music with the same attention as they give to watching a TV programme or a movie? Indeed, how many people are even able to keep their focus on what is unfolding musically while they listen, sticking with a piece of music from beginning to end without their minds wandering off? I find it almost impossible and have restarted a track on my MP3 player four or five times, each time committed to following it through from the first note to the last. But as is usually my experience with Transcendental Meditation, within a short time – and without being aware of exactly when or how it happens – I find my ‘mind’ somewhere else. This does not happen when I watch a DVD. And I repeatedly ask friends, colleagues *and* fellow musicians about their experiences in this regard and they admit to the same.⁹

Because of its ubiquity and because of the plethora of other stimuli that are more entertaining, music seems to have been devalued in the 20th and 21st century. It might be more accurate to say that its value has changed with changes in the way people relate to music. But here we are talking about how they relate to music as aural experience. The situation is somewhat different when it comes to *making* music, but even then, not many people would argue that *everyone* should become capable of performing or otherwise making music. Elliott (as does just about every Music Education philosopher) certainly thinks that everyone should and it could well be – I most assuredly believe – that developing the forms of knowledge he shows to be essential to praxial music making also empowers people in ways needed for the realization of a better, more ideal world, for example, by cultivating in them “the flexible, situated knowledge that allows one to think-in-action,” to engage in praxis (Elliott 1995: 252). I am confident that he thinks as much, perhaps seeing it as obvious and not feeling compelled to be too explicit in this regard.

So perhaps the notion of utopia is more palatable when it describes a world, not in terms of material conditions, technologies and infrastructure, but in terms of the kinds of people who inhabit it, in terms of what they can *and are disposed* to do. My idea of

⁹ Around ten years ago I attended a workshop given by an eminent jazz saxophonist who I will not name. Both I and my sax students were enthusiastic and full of questions of the tricks-of-the-trade variety which the presenter answered more than adequately. But something in his body language expressed disenchantment, as if there was something that worried him about the kinds of questions being asked, perhaps what it revealed about the aspirations of the questioners. After the workshop, I went up to meet and thank him. I really felt I had gained a lot and wanted him to know. He listened graciously and then came closer so as to speak to me alone and said: “There is something you should know. I have come to the conclusion that music is overrated.” He had nothing more to say on the matter. I may have muttered something in reply but I cannot remember what. I do remember feeling unnerved, as if something vital had been betrayed.

utopia is a world where declarations of principles such as the UDHR and the Earth Charter are essentially redundant because the principles they articulate have become enshrined in *praxis*; they have become the ways in which people do things, the choices they make, how they relate to each other and to the rest of life on Earth, in sum, how they live out their lives. For this there needs to be a large enough and sufficiently influential population of people who have achieved the highest levels of moral maturity as described by Lawrence Kohlberg and who have become true self-actualizers as described by Abraham Maslow. They have also achieved the critical consciousness and commitment to social justice Paulo Friere spoke so convincingly to, and they are possessed of the compassion and empathy that we here in Africa give the name *ubuntu*. And lastly, they have achieved high levels of ecological understanding and commitment as are implicit in the principles of the [Earth Charter](#). I describe my utopia in terms of the kind of humans I would most want to share the world with for the simple reason that so much of what the world *is* has been made the way it is by humans. They are and have for long been the catalysts and *if* they are catalysts of the kind characterized in this paragraph, the changes they bring about will in all probability be the most socially and ecologically ameliorative and, where necessary, transformative. No vision of how the world should be technologically, politically or ecologically is realizable without such catalysts and education is the only means by which they can be brought into being, no matter how promising the innate material. Indeed, the crises that continue to dog humanity, like poverty, war, and pollution, need to be acknowledged as symptoms of educational failure on a global scale. But here a caveat must be included: that *schooling* is but one means of education and not necessarily the most important factor in influencing what a person becomes in life. Schooling may be the only institution that has (or should have) education as its *raison d'être*, but most of the *shaping* occasioned by life's experiences happens outside of school. I almost used the term *nurturing* but this implies a helping along to an *improved* state or condition. The most potent of shaping influences, the mass media, is not grounded in any nurturing ethos *or* utopian vision. Profit is its bottom line and that is best served by a population of torpid consumers whose main interest is in keeping entertained and acquiring the latest *stuff*.⁴ But helping them to wake up and think critically about what they do and why it seems to come so *naturally* to them does not appear to be anything like a priority in the school classroom, not here in South Africa according to my experience. That of course is a generalization and there are enlightened teachers who really qualify as educators in being themselves self-actualizers and critical thinkers that treat what they do as *praxis* and try to guide their charges accordingly, but they are sadly very much in the minority. Most of the rest are *just playing the gig*⁴ and the gig seems more geared to market needs than to the achievement of the educational ideals proffered in this discussion. Understanding *what comes naturally*⁴ is crucial to any effort to transcend it and to actualize what we potentially can be. This transcendence does not imply becoming *unnatural*,⁴ or that we must deny our nature (which is impossible really and would not negate it in any case). We must just make the best possible use of it; and for this we need the best possible understanding of what *it* is and how it influences what we become.

As I undertook to do earlier, and as I feel is necessary in making clearer my rationale for turning to Darwinian Science, I now will go into more depth in presenting my understanding of Darwinism and of what Darwinian Science may have to offer philosophical deliberations about educational ends and the means of achieving them. I have already revealed some of what is central to Darwinian thinking, some of its

fundamental tenets and how they have been responded to in academia and in society generally. Some of these will be taken up again and expanded on further and I will try, wherever apropos, to suggest what the impact of a Darwinian precept might be vis-à-vis questions of what education should be achieving and why.

On Darwinism, Darwinian Science and Darwinizing educational philosophy

There is no single, generally agreed upon definition for Darwinism and the term has been used by both proponents and opponents of the theory of natural selection presented by Charles Darwin (1859) one hundred and fifty years ago in *On the Origin of Species by Means of Natural Selection*. It is frequently used as a reference to evolutionary thinking in general, for any conceptual system that explains phenomena in terms of evolutionary processes and which is likely to incorporate findings and theories that Darwin himself never espoused. Several of these have extended our understanding of how natural selection works and what it can reliably be used to explain. The most important of these for sure are the laws of inheritance arrived at by the Augustinian priest, Gregor Mendel in the 1860s which provided the foundation for the science of Genetics. Subsequent breakthroughs like the discovery of DNA, Mitochondrial DNA and an array of technologies crucial to Molecular Biology have placed Darwin's core idea – evolution by natural selection – beyond dispute¹⁰. Accordingly, the Darwinism that informs this study treats natural selection as a *law* of nature and not just a theory among others for explaining the incredible diversity of life on this planet as well as the attributes that characterize our species, *Homo sapiens*.

The idea of evolution by natural selection is so compelling because, as Daniel Dennett (1995: 21) has put it:

In a single stroke, [it] unifies the realm of life, meaning, and purpose with the realm of space and time, cause and effect, mechanism and physical law.

It is encouraging, for Darwinists at least, that natural selection is accorded ‘law’ status in the *National Science Education Standards*¹¹ (1996:116) where along with Newton's laws of force and motion and Kepler's laws of planetary motion, it is presented as evidence of ‘order and regularity’ in the cosmos. As Daniel Dennett (1995) would have it, the order and regularity we encounter, from which we are sometimes able to induce laws of nature, demonstrate that physical reality is inherently *algorithmic*. What we observe, what science tries to explain, and what may ultimately be expressible as a law or algorithm are natural processes following fixed steps, according to fixed conditions or rules, and producing consistent results.

¹⁰ Natural selection can be accepted as a law of nature describing a process that has been proven to work and to yield evolutionary results; but this does not require believing that it governs every evolutionary process or that it can be used to explain everything that living organisms do.

¹¹ These are the standards devised to guide science education in the USA. They are not mandatory and the extent to which they are pursued and achieved varies considerably from state to state and even from district to district.

The natural selection algorithm

Dennett (1995) takes a passage in *On the Origin of Species* and shows how Darwin succeeded, without being aware of it, in reducing natural selection to an algorithm, in this case one of the ‘if... if..., then...’ variety. The passage, as excerpted by Dennett from the original 1859 edition, is given below. The emphases are those added by Dennett.

If, during the long course of ages and under varying conditions of life, organic beings vary at all in the several parts of their organization, and I think this cannot be disputed; *if* there be, owing to the high geometric powers of increase of each species, at some age, season, or year, a severe struggle for life, and this certainly cannot be disputed; *then*, considering the infinite complexity of the relations of all organic beings to each other and to their conditions of existence, causing an infinite diversity in structure, constitution, and habits, to be advantageous to them, I think *it would be a most extraordinary fact if no variation ever had occurred useful to each being’s own welfare*, in the same way as so many variations have occurred useful to man. But *if* variations useful to an organic being do occur, *assuredly* individuals thus characterized will have the best chance of being preserved in the struggle for life, and from the strong principle of inheritance they will tend to produce offspring similarly characterized. This principle of preservation, I have called, for the sake of brevity, Natural Selection. (from chapter 4 of *The Origins of Species* as quoted in Dennett 1995: 48)

Darwin had abundant evidence that traits do get passed on to succeeding generations and that variation does occur. But without a unit of selection like a gene, he could not specify what exactly was being replicated, be it with total fidelity or varied in some way.¹² Mendel’s discovery and the science of Genetics it engendered have made it possible to modify the above passage, to translate and condense it into something more like an algorithm or law of nature. The following is my attempt to do this.

- **If** conditions are such that some entity replicates; and
- **if** the resulting copies similarly replicate, increasing in number within a finite environment with finite resources;
- **then** there will be competition for resources (and space perhaps) and not all copies will successfully replicate.
- **If** in such circumstances some copies are not exact; and
- **if** the difference enhances their chances for successful replication;
- **then** those copies with the difference will in time come to be dominant in their environment provided that key environmental conditions remain sufficiently stable.

Genes are the entities that replicate with variation when it comes to almost all of what is called life on this planet.¹³ They are able to do so because they encode information that

¹² It seems logical that the frequency and degree of variation has to be within some bounds if natural selection is to take place. This is a crucial issue when it comes to the validity of Memetics as a science as will be discussed in Chapter Three. Genetic evolution occurs at a rapid rate in the case of viruses when compared for example with the human genome. And this is because variation (genetic mutation) is occurring much more frequently.

¹³ Prions are an example of what many biologists would call a biological replicator even if strictly speaking they do not replicate. It is only that there is something in their molecular structure that causes

instructs the development of an organism of some kind, capable of behavior allowing it to survive and produce offspring in which its genes get replicated in total or in part.¹⁴ Here it is apropos to point out that a mutated gene may be and apparently often is *dis*advantageous in relation to its replication prospects, or it may be neutral as is also often the case. In the former instance, the organism concerned -what is most commonly understood as the *phenotype* (as opposed to *genotype*) - will be less likely to succeed in reproduction and the problem genes will in time be selected out. This, although not stated, can be logically inferred from the algorithm and has happened innumerable times in evolutionary history. Neutral mutations will get replicated in succeeding generations and could become fitness enhancing because of further mutation or because of mutation elsewhere in the genome, the total complement of genetic information that gets passed on. (Genes do not produce phenotypic results independently. There is no single music gene for example.) However, phenotypic adaptations (the physical expressions of genetic information such as organs, cognitive modules in the brain, appendages, etc.) cannot be neutral in a functional sense. If they no longer are used, they will over generations atrophy and be lost. This is because they become, as Ridley (2000: 279) puts it, —shotthrough with mutations.” Function evolves in response to environmental conditions and if those conditions change in particular ways, natural selection will no longer be able to act on the genes concerned and there will be mutational decay.¹⁵

Genes may not be the only replicating entities however. The [Universal Darwinism](#) espoused by Dawkins (1976), Dennett (1995), Blackmore (1999) claims that the natural selection algorithm *will* play out with *any* replicating entity provided the if conditions of the algorithm are met.¹⁶ Daniel Dennett’s understanding of algorithms (1995: 50-51) has it that they must be: (1) substrate neutral; (2) mindless; and (3) foolproof.

Substrate neutrality

Substrate neutrality means that the physical materials involved are irrelevant to the algorithmic process which relies only on its logic for its evolutionary efficacy. As long as the conditions are being met, the material nature of the replicating entity (its molecular constitution) is immaterial.⁶ This is because what ultimately gets replicated

certain other proteins to change shape and assume the same molecular structure when they come into contact with each other. The result is replication in so far as prions increase in number. Unfortunately some prions tend to do so exponentially within the brains of certain species including ours and this has dire consequences. Whether or not replicating is the same thing as being replicated is by no means a moot point vis-à-vis the algorithm and will be later discussed as a key issue vis-à-vis the validity of Memetics.

¹⁴ With sexual reproduction there is a mixing (but not a blending) of the genes from each parent. The leading theory as to why sexual reproduction evolved as a means of gene replication is that it ensures a degree of variation sufficient to keep the offspring resistant to contagion by viruses and other parasites.

¹⁵ Cormorants on islands in the Galapagos have lost wing size and become flightless because conditions there over evolutionary time almost never warranted the considerable energy costs of flying. As fish eaters, improved speed under water made it a good trade-off. Ridley (*ibid*) gives as his example shrimp and fish that long ago colonized dark caves, whose eyes have virtually disappeared after generations of having no use.

¹⁶ There is no condition that requires other replicating entities to be the same as genes in every respect (in which case they would *be* genes, it can be argued).

is information, something that can be encoded in any number of ways using any number of materials. A recipe for baking a cake, for example, could be in someone's head, written down or printed, implicit in the act of baking the cake, or interspersed with humorous chit-chat on an episode of *The Galloping Gourmet*. The core information remains the same.¹⁷ Life elsewhere in the universe could very likely involve entirely different substrates. The substrate neutrality of the natural selection algorithm has been proven by it successfully having *run* in the binary environment of a computer.¹⁸

Substrate neutrality is an absolutely critical factor in determining whether Memetics is a science worth considering. Memes are the informational units that Memetics proposes as replicating entities responsible for cultural evolution as will be discussed in depth in Chapter Three. They are essentially what might be called ideas and may be encoded in a number of substrates: in neural networks in the brain, in verbal utterances and other symbolic representations, or in artifacts. If cultural evolution is shown to be predominantly the playing out of the natural selection algorithm, the implications are dramatic and rather scary. As Dennett remarks: *'This idea, that all the fruits of evolution can be explained as the products of an algorithmic process, is Darwin's dangerous idea'* (which he uses as the title of his book) (1995: 60).

Mindlessness

Perhaps the biggest challenge that Darwinian thinking presents is that it effectively pulls the carpet out from under teleological beliefs and assumptions that are widely held by people, beliefs and assumptions that intuitively make sense; they feel right and seem obvious. For example, the incredible complexity of functional organization that characterizes life on this planet (that manifests in an *eye* for example) screams *'Design'*. What Darwin discovered and was able to explain was that life evolved to present levels of complexity without involving any design whatsoever. A design is an intentional plan for how something is to be carried out so as to achieve a functional result, and a design necessarily involves a designer and a purpose or intention. None of these is needed as it turns out.

What appears as design comes about because replication is not always exact and some variation among the copies occurs. Occasionally, rarely even, the difference in some way improves the prospects of that copy getting replicated and copies with the difference become more numerous in the environment they occupy. This may and often will be at the expense of copies that do not have the advantageous difference because replication requires resources and space for which there will be competition. Those with the advantageous difference are fitter, but this does not imply that their associated phenotypes, the organisms they engender and inhabit, are necessarily more intelligent or physically stronger. (A virus is far *'fitter'* than any human.) And it most certainly does

¹⁷ Which raises the question: What is information? This will be taken up in Chapter ___ in connection with gene-culture coevolutionary theory and, more especially, with Memetics, the science of memes.

¹⁸ Aunger (2002) cites as an example the computer simulation [TIERRA](#) and its various *'descendants.'* *'It is evident from these simulations that digital analogues to DNA- or RNA-based viruses exist: These are indeed viral agents that exhibit a wide variety of phenomena that parallel those of their biological cousins. This parallel suggests that evolutionary processes really are "universal" in replicators of whatever stripe and color (120).*

not imply that they are more worthy or entitled, adjectives that are actually meaningless from a Darwinian standpoint.

Most humans like to believe that our species is somehow more worthy, that we matter more, and that we are thus entitled to subjugate and exploit the rest of life on our planet. But it is impossible for us to be worthier in any inherent or intrinsic sense *if*, like all other life forms, we are merely the result of the playing out of a mindless algorithm. Indeed, it is not our interests that matter. All that matters according to evolution is replication and humans do not, in fact, replicate. We are merely the means for the replication of our genes. Indeed, humans entertain notions of self-importance and entitlement only because they have been cognitively biased toward such notions by their genes. And it is not that anything actually matters to genes. They do not replicate because they want to, because there is some purpose to their doing so, or because they are part of some design. They replicate simply because they *can*. In most cases they are able to replicate because in their structure is encoded information that, given certain environmental conditions, will lead to the growth of individual organisms¹⁹ capable of and predisposed to behavior that enhances the prospects that the genes they carry will get replicated.

That a simple algorithmic process could lead to organisms of such incredible complexity and agency as inhabit our planet seems too much to believe possible. But this is because it is so difficult to grasp the time frames involved. What may help is to take the 4.6 billion year history of our planet and compress it into one calendar year (with the result that 146 years = one second) Accordingly, the first replication event (the beginning of life) would have taken place somewhere near the end of February. Eukaryotes (cells with nuclei) had to wait until around mid-July to make their appearance and in early September came the first multi-celled organisms. The Paleozoic, the 300 million year period that experienced a burgeoning of multi-cellular life including the first fish, land plants and insects began on the 18th of November and ended on the 12th of December when some cataclysmic event caused the extinction of 96% of life. The Mesozoic, the age of dinosaurs, lasted until the 26th of December when there was another mass extinction occasioned by a comet hitting the Earth. Then followed the Cenozoic, the age of mammals; But it was only at about 5:18 PM on New Years Eve, December 31st, that hominids first appeared. Our species, *Homo sapiens*, had to wait until 11:48. Christ lived for about a quarter of a second less than 14 seconds before midnight (i.e. the present moment). But, even though the entire existence of our genus (*Homo*) is but a blink of the eye in geologic time, it still comprises over 100,000 generations.²⁰

Foolproofness

Merriam –Webster online provides perhaps the most apropos definition of foolproof, i.e. ‘so simple, plain, or reliable as to leave no opportunity for error, misuse, or

¹⁹ And, in some cases like ants, collectives of organisms.

²⁰ See for example, “[Earth's History Compressed in One Year](http://francistapon.com/Travels/Continental-Divide-Trail/Earth-s-History-Compressed-in-One-Year)” at <http://francistapon.com/Travels/Continental-Divide-Trail/Earth-s-History-Compressed-in-One-Year>

failure'.²¹ As Dennett, Blackmore, Dawkins and other Universal Darwinists claim: if the conditions²² of the algorithm are met, you *must* get evolution.

Stuart Kauffman is a complexity theorist who suggests that natural selection is an “incompressible computer algorithm” and agrees that it will play out wherever and whenever it can. Yet because of the randomness of mutation, we cannot predict with any certainty what the evolutionary result will ever be even though environmental factors (gravity for example) constrain in various ways what is ultimately possible. Our existence as a species is the result of pure chance, a sequence of evolutionary serendipities that has been going on for at least 3 billion years. We are, after all, the only *Homo* species to have survived to the present. But, as Kauffman avers, while “we can never hope to predict the exact branching of the tree of life, ... we can uncover powerful laws that predict and explain their general shape” (Kauffman 1996: 23). Doing so with regard to the cognitive adaptations that have evolved in human kind is arguably the *raison d'être* of Evolutionary Psychology, the science from which this study draws most heavily.

Darwinism and nihilism

Kauffman does not only characterize these laws as powerful, but also as “deep and beautiful laws governing [an] unpredictable flow” (ibid). And he is far from alone in deriving great satisfaction from contemplating their elegance, reveling in the awe and sense of wonder they excite. Darwinian thinking, even Universal Darwinism, does not, as so many seem to fear, lead inexorably to *nihilism*, the belief that nothing ultimately matters. You may *know* that nothing matters in an abstract, rational way, a seemingly inevitable result when following Darwinism to its logical conclusion. But it *feels* as though things do matter and how things feel is what really matters in life. I will be building up an argument for this claim at various points in what follows, drawing heavily on the work of cognitive neuroscientist, Antonio Damasio. It must at the very least be made clear that spirituality is *in no way* the exclusive province of religion. Spirituality, as I conceive it, is like aesthetic experience in being foremost a matter of feeling. Spiritual people are those that more readily and intensely undergo the feelingful states that we speak of with nouns like awe, veneration, exaltation, bliss and ecstasy, and with adjectives like sublime, profound, peak and transcendent.

It's all about feeling!

Neuropsychologists like Antonio Damasio (1994, 1999, 2004) have shown convincingly that feeling is indispensable to even the driest, most boringly rational forms of cognition. Everything comes down to the firing of neurons and the neural chemicals that either promote or impede this. There is never cognitive activity that does not entail neural activation in those parts of the brain crucial to feeling and emotion except when pathways have been severed by injury, disease or some congenital pathology.

²¹ <http://www.merriam-webster.com/dictionary/foolproof>

²² Blackmore (1999) reduces these to: variation, selection and heredity.

All of life has emotional content and people universally seek out opportunities to experience emotional elevation. Pleasure is life's bottom-line, or so I will argue, and it can take innumerable forms from subtle to intense, some ephemeral, some lasting, some libidinal or carnal, some intellectual or cerebral, some sadistic, masochistic or otherwise self-serving, while others entail empathy, compassion and self-giving, some are passive while others require engagement, commitment and effort, some are regarded as base, while others are esteemed as virtuous and edifying, some common, some esoteric.

Pleasure is the ever-present need that motivates all behavior including behavior that is anything but pleasurable in the doing of it but which as a result of the doing begets a satisfaction worth the delay in gratification and worth whatever effort and sacrifice involved. We, like all other sentient life-forms, are innately disposed to seek pleasure because certain associated behaviors were crucial in our evolutionary past. Sex is the most obvious example.

Bringing education back into the discussion

Educational philosophy concerns questions of what education should achieve and why. These questions cannot ever be answered adequately without an understanding of what being human really means. The Darwinian understanding thus far presented, its ontological stance, is that we are just another life form without any privileged status in some grand scheme. There is no grand scheme. Our only purpose is as vehicles for the propagation of the genes that we carry in our DNA. As phenotypes, we are nothing more than pleasure seekers, pursuing states of gratification through behavior that enhances the chances for our genes to get replicated.

So what could be the upshot for education of such an unflattering take on human nature? We can be certain that no education mission statement or curriculum has ever proposed genetic fitness enhancement as the overarching purpose of education. But then, neither has the survival of our species ever been thus presented even though our behavior as a species, shaped by educational interventions, has made our survival less and less a certainty and has been disastrous for innumerable other species now extinct or close to extinction.

What then could be proposed as the purpose of education if one's first principles accord with the Darwinism described above, which do not even accord purpose status to our very survival? Is education's purpose to make us more successful in our pleasure-seeking pursuits? Yes, most definitely! As shamelessly hedonistic as this might sound, it is the conclusion that I argue as inescapable when one's first principles are Darwinian. It is also a conclusion difficult to grasp, let alone agree with, if certain facts pertinent to biological and cultural evolution are not adequately understood.

Biological vs. cultural evolution

Given that it is what this study is ultimately concerned with, it is firstly important to remember that institutionalized education (or formal education as it is often called) is a very recent development for our species. Schools have existed for at most only a few thousand years, between 100 to 150 generations. Nearly everything that comprises our

innate psychology, the cognitive abilities and dispositions we are genetically *wired* for, evolved to advantage the reproductive success of our hunter-gatherer ancestors during the Paleolithic (over 100,000 generations), from the first stone tools 2-3 million years ago until around 12,000 years ago when agriculture began to spread and with it *civilization*.²³ Most of what we call cultural evolution, which has given rise to such edifices as institutions of learning, has taken part in the last 12 millennia (approximately 600 generations), less than one half of one percent of *human* existence. There was culture long before that to be sure, but its evolution was at a snail's pace before the agricultural revolution and the social transformations it engendered (urbanization, trade, commerce, war, exponential technological development). Literacy and the later invention of media (books, audio recordings, radio, television, and the internet) caused a telescoping in the rates of cultural change and accumulation (although they are now causing an increased homogenization of culture that we call globalization). And we need to further bear in mind that a significant part of our innate nature had evolved before the genus *Homo* emerged 2.5 or so million years ago.

The role of environment in natural selection

Paleolithic and pre-Paleolithic environments were vastly different to the environments most of the human population now occupies and, as already intimated, environmental factors are what determine whether a phenotypic variation will be advantageous to genetic fitness or not. The environments we inhabit today are in large measure made by us. In this regard, it might seem that natural selection is no longer acting on the human genome given the advances in medicine, food production, and technology with the result that weak genes no longer are being selected out by natural selection.

Has cultural evolution made biological evolution redundant? *Not at all!* There is clear evidence of relatively recent physiological evolution such as smaller teeth and decreased jaw size due to dietary changes brought about by *agriculture*, or the increased lactose tolerance of populations in high latitudes (where there is less vitamin D available from sunlight) who have a tradition of dairy farming. It could be that as much as 10% of our genes have been modified in the last 40,000 years, which, if true, has significant implications as to how genes and culture co-evolve, a topic that will be explored in depth in Chapter Three. Cultural evolution will never be able to make

²³ The problem with this term is that it implies civility and there has been so much that is uncivil in the civilizations of the past and present. Here I am reminded of the reply that Gandhi is purported to have given when questioned as to what he thought of Western civilization. *I think it would be a very good idea.* I use the term as a reference for any large population of interdependent people successfully subsisting together. Obviously there must always be some degree of civility in large and dense populations of interdependent people unless there is either forced compliance or anarchy. What varies from place to place and from time to time is the extent to which civility is extended and to whom. As will be argued further along, predilections for both greater and lesser levels of civility are parts of our genetic makeup. We do have moral instincts as Marc Hauser (2007) has so convincingly argued. It is true that the prospects for achieving a civilization that is genuinely a civil society rests on far more than the genetic potential of the citizenry. Yet that potential, what we come hard-wired with, is essential. No other species has produced civilizations after all.

biological evolution redundant until such time as we begin to engineer the genes of our offspring by technological means.²⁴

What cultural evolution has done is to bring about disparities in the reproductive rates of people living in different social, economic and cultural circumstances. There are countries that have achieved negative population growth through family planning and birth control. But in other parts of the world, population continues to expand exponentially. Notwithstanding the AIDS pandemic, Africa's population is increasing 3% per year (Walt 2009) meaning that it will double in 24 years.

To say that natural selection weeds out the weak is misleading. Are we referring to the physically weak, the intellectually weak, the economically weak, or some combination of these? If we are taking a genes-eye view, the only humans who are 'weak' are those producing fewer offspring, for example, those practicing birth control. Population growth is highest among the poor and less 'educated.' At least 80% of humans live on less than \$10 (USA) per day (Shah 2010); And according to the *Human Development Report 2007/2008* (HDR) of the United Nations Development Program, the poorest 40% of humans accounts for 5% of global income while the richest 20% accounts for 75% (25).

Environmental instability

But such disparities would not have been able to come about and to increase without there having been a relative degree of climatic stability during the 12 millennia since the agricultural revolution, thus allowing the production of food surpluses. Again we are reminded that genes are only fitness enhancing given certain environmental conditions. Global warming could change everything radically. Changing rainfall patterns and rising temperature could devastate agricultural output, especially if the change becomes exponential, for example, because of the sudden release of the massive amounts of methane locked in the tundra of the north, or because of the rapid melting of ice and snow which reflects heat back out into space while water absorbs it. A significant rise in sea level leading to the flooding of coastal lowlands will by far impact the poor the most (McGranahan, G. et al 2007). Moreover, a rapid decrease in oil reserves will increase food prices dramatically because of increased transportation and fertilizer costs and because of more agricultural land being used for growing biofuels.

Even if we were to consider such scenarios as but remote possibilities, this should be enough to activate effort to avert them on every available front. It is on the educational front that we should expect to see the greatest impact being made. The Ecopedagogy movement is trying to move things forward in this regard but it is confronted by the inertia of a status quo which marginalizes environmental education as well as by the general apathy of the rank-and-file, all of which is good news for corporations facing financial loss should they have to comply with the kind of legislation and enforcement needed to bring us back from the brink of ecological collapse. But *they* need not fear too

²⁴ Even then it could be argued that biological evolution will continue. It is only that genetic variation will no longer be random.

much as long as ‘education’ is doing so little to bring about the critical mass of public indignation needed to force the hand of legislators and enforcement agencies.

Who cares?

As established in the introduction, my philosophy of education is strongly informed by my ecological thinking and vision of ‘optimal’ ecological balance, but this does not imply or demand that it be Darwinian. (Darwinism offers no vision as has been explained.) I could be a devout Christian, Jew or Moslem who believes that what God meant by the words ‘in our image’²⁵ and by granting us dominion over all other life, was that we were being entrusted with his/her/their creation and, by virtue of being made in his/her/their image, expected to treat it with the love and care with which he/she/they is/are expected to treat us. Or I may be a *pantheist*, believing God to exist in everything around me and accordingly being committed to protecting, sustaining and communing with nature, not subjugating and exploiting it. Or I may, as I do, align myself with the Ecopedagogy movement and see the achievement of sustainability as a practical matter of survival and a precondition for any real progress toward social justice and an authentically civil society. But I am also a biophile, I genuinely *feel* connection with all that lives on this planet and that admittedly inclines me toward an ontology that doesn’t stop at the species ‘barrier.’ I definitely felt this connection long before I had even heard the name Darwin. That it could be rooted in my innate psychology seems feasible and it may be apropos that Howard Gardner includes ‘naturalistic intelligence’ as one of the eight intelligences, suggesting that we all have, albeit in varying degrees, an intuitive sense of connectedness with nature and inclination toward its nurturance.

I do not need to be a Darwinist to take on any of the personas alluded to above. Indeed, a true Darwinist will argue that all of them are vainly anthropocentric. To argue that there is an ideal kind of ecological homeostasis that we should strive toward could be portrayed as a kind of [Gaian](#) fascism. Environmental changes that are catastrophic for our species could be a boon for others. Just as we are not intrinsically any worthier than any other life form, neither is one environmental state intrinsically better than any other. So having said all this, what could Darwinism possibly bring to the table when contemplating what the ends and means of education should be? Should we concern ourselves at all with an ontology that seems to deny us value or purpose, the arguably quintessential concerns of education?

We care!

The reality of course, as intimated earlier, is that things do matter to us because we are innately disposed to notions of value and purpose. Our purposefulness is one of our most salient and unique attributes as a species. Such notions entail positive feelings and feelingful states that we naturally seek. We want to have lives in which we feel happy and fulfilled, something that does not come automatically and which too many people

²⁵ In all the editions I have checked, Genesis 1:26 give the possessive pronoun ‘our’ which has always confused me given that all the Abrahamic faiths are *monotheistic*.

fail to achieve adequately, in many cases because just surviving is a 24/7 struggle, in many cases because education has failed them and they have not succeeded in developing the competences and dispositions needed for true self-actualization as characterized by [Abraham Maslow](#) almost fifty years ago. And surely the blame lies not only with the educators to whom they have been entrusted, their parents being the most important, but lies as much with the kinds of psychosocial environments they inhabit and the forces that shape them. Here I am thinking mostly of the mass media and the enticing virtual environments they construct for us; and I despair of the inordinate amounts of time that growing numbers of people spend as passive consumers of culture, seemingly content with the ephemeral and shallow pleasures that the profit driven entertainment industries offer in overabundance.²⁶

Pressing Paleolithic buttons

The phrase ‘lowest common denominator’ is often used in a non-mathematical sense in reference to people lacking sophistication in taste, sensibility and critical judgment, the targets of advertisers, film and TV producers and car salesmen. But who are these ‘sheep’ who are being so targeted and how numerous are they in reality? Are they in the majority? To pin down such nebulous attributes as taste, sensibility, sophistication, and even critical judgment, surely cannot be done in an entirely culturally neutral way. Moreover, given the fluidity of culture, how could any position on the matter ever claim to have long standing applicability? Yet, many advertisements and film genres have mass appeal across cultures and ethnicities; and many maintain their popularity across generations.

The cynical, vulgar yet pertinent take on those who target the ‘lowest common denominator’ (dubbed ‘the Sixpack’ in the USA) is that they knowingly appeal to the ‘Four F’s,’ they being our most fundamental instincts: feeding, fleeing, fighting and fornicating. Those who are *not quite* the lowest common denominator might additionally wish to be amused and have some laughs, but surely this is also an innate, species-general proclivity. Cynical all this may be, but it is clearly Darwinian (though Evolutionary Psychologists usually employ other terms for the Four F’s).

Perhaps now the need for educational philosophy to take serious account of what Darwinian Science is uncovering starts to become more apparent, especially as regards Evolutionary Psychology and the sciences that share its theoretical underpinnings (Biomusicology and Darwinian Aesthetics for example). Although it is early days for these sciences and much remains speculative, enough is known with confidence to mark them as the most fecund and reliable sources of insight into our innate psychology and the cognitive biases that the entertainment and advertising industries seem to understand in a very practical and profitable way. But the understandings that EP and the like are offering us, as the ensuing chapters will hopefully demonstrate, go way beyond the Four

²⁶ As quoted from [‘The Sourcebook for Teaching Science’](#) website: ‘According to the A.C. Nielsen Co., the average American watches more than 4 hours of TV each day (or 28 hours/week, or 2 months of nonstop TV-watching per year). In a 65-year life, that person will have spent 9 years glued to the tube.’

F's and shed light on evolved psychological adaptations that make both possible and rewarding the gratification of 'higher order' needs.²⁷

Darwinism and Humanistic Psychology

To my knowledge, Maslow did not ever speak to evolutionary thinking in setting out his humanistic theory of self-actualization with its well-known hierarchy of needs. This is not surprising as there were only the dimmest glimmerings of what was to become Evolutionary Psychology when he was writing his influential texts. Yet he was convinced that what he was proposing about the maturation process we undergo is applicable to all people, everywhere, even if different cultures might place different values on the human attributes he described, particularly on those he posited as characterizing the genuine self-actualizer. His psychology was naturalistic in so far as he recognized that while we all have basic needs, those alluded to by the Four F's, so too do we have needs requiring more faceted and refined forms of engagement, and most importantly, we all, barring some congenital limitation, have the potential to be more than just sheep and torpid consumers of schlock culture. Evolutionary Psychology (EP), I believe, bears out Maslow's humanistic outlook and convincingly shows that those who appear to fit the 'lowest common denominator' bill have not been condemned to this status by their genes. However, there is a huge range of human types between the lowest common denominator and the self-actualizer with most of humanity falling somewhere around the middle. Maslow observed that those who fit the self-actualizer bill are very much a minority, an elite actually. Is this only because society and education have failed the rest? Or could it be due to genetic constraints? If all of what we are is physical, should we not expect psychosocial and intellectual achievement to be as constrained by genes as is athletic achievement?²⁸

Virtual environments

As I have emphasized repeatedly, environment is paramount in how genes get expressed at the phenotypic level. In the virtual environments created by the purveyors of schlock culture, it is our more primitive pleasure buttons that tend to get pressed. But because it is titillating, people get seduced. They get sucked in. This happens easily with people holding down tedious and often stressful jobs from which they come home tired and wanting to escape to an environment that is the least demanding possible, where you (and your kids) can be almost totally passive, uninterested in anything requiring intellectual engagement or wit, and not even having to be sociable.

²⁷ To characterize something as higher-order suggests a value judgment and as has been emphasized repeatedly Darwinism accepts that value and purpose are irrelevant ideas in a genes-eye view of things. But even the staunchest Darwinists aspire to ideals of personal growth and achievement and many would characterize themselves as self-actualizers as per Maslow's hierarchy.

²⁸ I used to be an avid marathon and ultra-marathon runner. But even at peak fitness and having followed the best possible training program, there was NO possibility that I ever could have run a marathon in under two and a half hours (when the winning times are much closer to two hours). Compared with top athletes, I am genetically disadvantaged.

Of course it is television that provides this environment most efficaciously and universally. Ninety-nine percent of households in the USA have television with an average of 2.24 TVs per household with one or more of them on for 6 hours and 47 minutes per day. While the average American parents spend less than 10 minutes per week of tête-à-tête time with their children, the children spend on average 28 hours per week watching TV. In a year they spend 40% more time in front of a TV than they do at school (Herr 2007). It is estimated that in the typical North American family, each individual will have been spoken to by television figures more than they have been spoken to by each other (O'Sullivan 1990: 27).

In my experience, if parents are concerned at all with their children's TV viewing, it is with the content of what they are watching, for example, how much sex, profanity, and gratuitous violence there is. It never seems to occur to them that it surely must be TV's form, not its content, which threatens their children the most. During all of those hours they never have to sustain a visual perception for more than a few seconds. This constant shifting of scenes and camera angles must have an adverse effect on a child's capacity for sustained attention when they are in environments that are relatively static, classrooms for example. If information processing capacity in general suffers, this would not be surprising given that nothing in our evolutionary history is perceptually comparable. Even if prolonged TV exposure does have adverse effects on cognitive functioning, we would be unlikely to intuitively sense anything wrong. There are no evolutionary precedents for the sensorial barrage most of us subject ourselves to each day. The same is true of traveling at high speed in an automobile. It has been for less than two centuries that we have been able to travel at speeds above thirty kilometers per hour, not enough time to evolve the kind of built-in fear comparable to the fear of snakes and heights that people display the world over.

Then and now

Our lives as well as our environments are so radically different from those of our ancestors that we should expect a significant degree of dissonance between our innate psychology and the psychology that life's experience builds on it with the dispositions and abilities needed to negotiate the fast paced and infinitely more complex world of today. Walking across the campus of the university I work at, I am likely to encounter more people than my Paleolithic forbears would have encountered in a lifetime. Because I am literate and because of the media and communication means at my disposal, I can almost instantaneously experience other environments, times and cultures without having to physically occupy them. I do not need much in the way of survival skills beyond the ability to earn an income. I make use of and depend on technologies for which I have not even a clue as to how they are made, how they work or how they can be repaired. My survival depends on specialists, not on fleetness of foot, coordination, or visual and aural acuity.

In many of the environments we find ourselves in, we are inundated with such a cacophony of disconnected and unnatural sounds that we become inured to audio stimulation generally. CDs malfunction in restaurants and no one notices. Silence is something almost impossible to experience and music is so ubiquitous that it has lost most of the wonder and significance it must have had in times where one either had to make it oneself or go to where someone else was doing so. We now live in a world

dominated by simulacra, representations, imitations, pastiches and other artificial, unnatural phenomena and it doesn't seem to bother too many people that their connection with the rest of the biosphere has been almost completely severed, in any spiritual or transcendent sense at least. Nature is *boring* and your mountain retreat had better damn well have satellite TV.

Modern and postmodern discontent

Ellen Dissanayake, a leading writer in Darwinian Aesthetics who I will be drawing from significantly in the next chapter, takes up the notion of the psychological dissonance I alluded to above and attributes to it the malaise in modern society that Marxian writers decades ago characterized with words like alienation, reification, commodity fetishism and one-dimensionality, words that still resonate even in postmodernity. However, Marxists and postmodernists share a certainty that the phenomena they name and shame are social before they are psychological and this is where they appear to part company with Darwinists (although the degree of discord, as will become evident I hope, is more apparent than real). For Marxists and postmodernists, our discontents or inner conflicts are due to social forces and conditions (e.g., the dominating ideologies and discourses) and these forces vary between different social, cultural and historic times and places. We obviously must have species-general characteristics that remain constant from context to context, that evolved to enhance the reproductive fitness of our ancestors. But for Marxists and postmodernists, this innate nature is of such negligible influence in determining how we end up that it can be left out of the discussion completely.

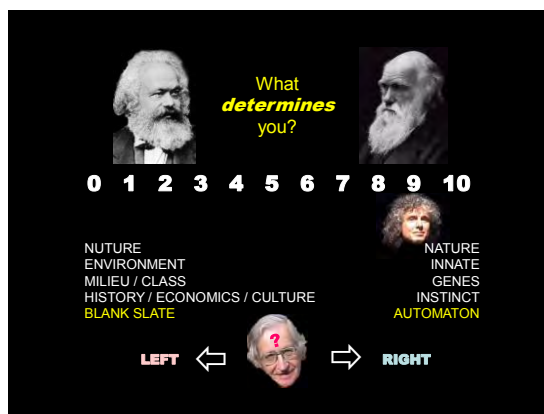
Nurture vs. nature; blank slate vs. genetic automaton

The Marxist/postmodernist position generalized in the last paragraph has been portrayed as the position of the social sciences generally, which in the 1990s were thought to be sufficiently of like mind that evolutionary psychologists started speaking of the *Standard Social Science Model* (SSSM), the set of assumptions about what it means to be human that Tooby and Cosmides²⁹ (1992: 23) said —should be jettisoned” when trying to discern the real psychological foundations of culture. It is worth presenting at least some of these assumptions given that educational philosophy seems to be so thoroughly grounded in the human/social sciences (including Psychology, Sociology and Cultural Anthropology) which purportedly claim autonomy from the natural sciences and hence from any serious Darwinian thinking. It should be noted that these assumptions are not axioms in some Social Science manifesto somewhere and I doubt that many social scientists abide them totally. They are what Tooby and Cosmides (1992: 31-32) synthesized from their reading of the Social Sciences at the time. Below, I have extracted and paraphrased what I find most relevant in trying to understand the distinct lack of Darwinian thinking in the human sciences and educational philosophy.

²⁹ Their introductory chapter, ‘The Psychological Foundations of Culture’, in *The Adapted Mind* (1992) sets out the Evolutionary Psychology project probably better than any other text. Steven Pinker (1997: 23) credits the name ‘Evolutionary Psychology’ to them and reckons they are the most referenced authors in EP after Darwin.

- Human beings can be grouped together and identified as having ‘a’ culture, that is, a set of common behavioral practices, beliefs, and ideational systems” which get transmitted from generation to generation. Some of these may be taken on by members of other cultures, but on the whole cultures are more or less bounded entities,” which is why we are able to name them (Zulu culture, for example).
- Similarities and differences between people are the result of similarities and differences in the informational content of their respective cultures. All of that which is organized and contentful in the minds of individuals comes from culture and is socially constructed. What is given biologically is ‘content-independent’ and ‘content-free.’“
- Humans are biologically endowed with general learning capacities that make possible cultural transmission. However, what is biological or innate, while obviously necessary, is of negligible importance in shaping what we become. We have been endowed with sufficient cognitive and behavioral flexibility that biology has been superseded by the capacity for culture.” Accordingly, what you learn is the dominant factor in determining what you come to be.
- However complex our innate cognitive endowment may be (e.g. our genetic capacity for acquiring language) it does not impart any substantial character or content to culture.”

If what one becomes is almost exclusively a matter of what one has ‘learned’ (whether consciously or unwittingly) then it would be proper to describe a human being ontologically as a ‘blank slate.’ The SSSM might accordingly be styled blank slate orthodoxy. But who actually subscribes to such orthodoxy, what I earlier styled as ‘errant nonsense’? I did a quick survey at an academic conference in 2009 where I projected the following PowerPoint slide³⁰ asking everyone to indicate where they stand on the nurture-nature issue by raising their hands at the appropriate time as I counted off slowly from 0 to 10.



³⁰ Going clockwise from the top left, the faces belong to Karl Marx, Charles Darwin, Steven Pinker and Noam Chomsky. Pinker was placed at 9 by Cambridge Professor Simon Blackburn (2002) based on his reading of Pinker’s *The Blank Slate: The Modern Denial of Human Nature*. Noam Chomsky was portrayed as being in a dilemma because I wanted to show as erroneous the tendency to think that where you identify yourself on the nurture-nature issue reveals your political leanings between left and right. Chomsky is famous for his stand against the corporate state and is the bane of the political right. Yet it was he with his ‘universal grammar’ who dealt the fatal blow to Behaviorism, making inescapable that humans do NOT enter life as blank slates.

My paper was attended by researchers in music including musicologists, ethnomusicologists and sociologists of music, many of whom I was acquainted with. Most, I was able to surmise, could be positioned in the Social Sciences in terms of their background and academic orientation. And yet the first hand only went up as I called ‘two’ and the majority declared themselves between 4 and 5. There definitely were no biomusicologists or sociobiologists among them, but at the same time no-one identified him/herself as a ‘blank slater.’ Although hardly credible research, my survey did lend support to my hunch that the SSSM is a model with fewer adherents than Tooby, Cosmides or Pinker might think. How can one entertain such an ideal as ‘our common humanity’ or account for how culturally diverse peoples come together and reach agreements like the Universal Declaration of Human Rights without according more to our common nature than a few instincts and a general learning capacity?

There are those of course who do credit such things to a universal human nature, but one that humans were endowed with by a Creator, not one that evolved according to a mindless algorithm. As they see it, moral progress and social amelioration are possible because God has given us the ability to suppress our innate sinfulness and follow the path of love and righteousness. However, most social scientists of my acquaintance, even those with religious beliefs, accept natural selection as a law of nature and treat the Old Testament account of creation as metaphorical at best. Yet they will not accord to Darwinian Science any real explanatory power when it comes to cultural phenomena. Sadly, it seems that many resist Darwinism without having given the relevant literature a fair reading, if any reading at all. This is indeed unfortunate given that the Social Sciences are just as concerned as is Evolutionary Psychology with the question: What does it mean to be human? This could be variously paraphrased, for example: What is it that marks *Homo sapiens* as a species? Or: What are our essential attributes, that is, those characteristics without which the term human loses its meaning and applicability? But they are not precisely the same questions. Answers to the second and third, if they are to be ventured, must have universal validity and that means they must be characteristics instructed by genes and common to all humans. This is where things start to get problematic.

The Social Sciences are generally thought to eschew essentialism,³¹ and postmodernists have a reputation for virulence in their opposition to it. While no one denies that communicating (a quintessential human trait) requires agreement on what words should be understood to mean, it is maintained that meaning is nevertheless context dependent and thus conditional and provisional. Moreover, words and the discourses that employ them inevitably have ideological and political meanings even if the majority of people

³¹ As a metaphysical theory going back to Aristotle, essentialism claims that a phenomenon has properties essential to it that can be distinguished from properties that are accidental. In recent times, the term has been used in connection with ontological positions, like Darwinism, that regard various psychological and psychosocial traits as being innate and thus common to all humans. This is problematic for social constructionists, particularly so when gender, race, or sexual orientation are being subjected to what they see as biological (or genetic) reductionism. As has already been intimated, there are misconceptions on both sides of the nurture-nature divide and some of these are taken up further along in the present discussion.

fail to apprehend them. This, at least, is the case where human and social phenomena are concerned. And if I understand the postmodernist take on ‘discourse’ correctly, the issue is not so much that language and other symbol systems express subjectivity but that they actually produce it. As with ideology, the subjects (i.e. people) are unconscious of the linguistic and other symbolic ways and means by which they are being constructed.

Interestingly, Daniel Dennett, who I have already cited as a Universal Darwinist, would not have much to disagree with here. When asked what he believes but cannot yet prove, his answer was “that acquiring a human language (an oral or sign) is a necessary precondition for consciousness – in the strong sense of there being a subject, an I” (Brockman 2006: 126). “Human subjectivity” he proposes as “a remarkable byproduct of human language” (129). Consciousness is essentially the internal dialogue that is ever present when awake although we may succeed in quieting it down through meditative practices. It is this ability to talk to oneself silently that allows one:

to muse, to rehearse, to recollect, and in general to engage the contents of events in one’s nervous system that would otherwise leave no memories in their wake and hence contribute to one’s guidance in ways that are well described as unconscious. (129)

But whether talking to ourselves or to others, we do so with lexicons, syntaxes and pragmatics that we have learned and that have evolved in environments where different kinds of social and cultural influences and constraints are operative. In today’s world we are no longer confined to one milieu and we often experience and even employ different discourses as we move from one sociocultural environment to another. With mass media like television and the internet, we do not even have to physically move. Nevertheless, there are discourses that for various reasons come to dominate an individual’s consciousness and they employ words and concepts that are anything but neutral.

No Darwinist that I’ve come across would deny that language is the primary means by which we become socialized and by which we acquire most of the knowledge and skills needed for life in present day environments. Obviously, language is not just a collection of arbitrary labels we stick on things, rather “a toolbox, the importance of whose elements lie in the way they function rather than their attachments to things” (Peregrin 2003: quoted in [Semantics](#) on Wikipedia).

Certainly there are plenty of words that are politically and ideologically charged to the extent that in written texts we often find them placed in inverted commas allowing the writer to use them without necessarily endorsing them, e.g., ‘third-world’, ‘primitive’, ‘feminine’.³² But it could hardly be considered political or ideological to say that human beings are *mortal* and it would be ridiculous to suggest that the truth of this statement is contingent on time or place. But, as a social constructionist might be quick to point out, here we are referring to a physical condition of living organisms; death is an irrefutable fact of life. Obviously humans are physical entities with life spans and particular physiological characteristics, but what concerns social scientists, especially

³² It is not at all uncommon to find academics tweaking the air above their heads with the first two fingers of both hands to achieve the same result with spoken words whose PC status is in doubt.

psychologists, are *minds*, not bodies. And the prevailing position among them is that Darwinian Science is fine when the concern is with the physiological, but has next to no value when the concern is with the mental.

A paradox

Educational philosophy, with never a mention of evolutionary theory, seems to share this perspective. Yet it grants credence to learning theories and theories of cognitive and psychosocial development that posit developmental processes that all humans are claimed to undergo regardless of their culture or language. Names that come to mind in this regard are: Carl Rogers (1961), Jerome Bruner (1960), Jean Piaget (e.g. 1952), Erik Erikson (1950), Lawrence Kohlberg (1981), and Howard Gardner (1983). Even Lev Vygotsky, while he “saw the growth of the mind as a process of constant social transaction,” “well understood that the human mind must be located within an evolutionary framework,” its unfolding proceeding according to species-general psychological processes (Plotkin 2002: 275 & 274). The same could probably be said of Jerome Bruner, who has been significantly influenced by Vygotsky. The theories of these psychologists do not draw from Evolutionary Psychology, it is true, but this is not surprising given that all of their formulators are dead except for Jerome Bruner who is ninety-five. I am convinced that if they were working in the present, they would look to EP as an appropriate framework for developing, refining and validating their theories.

Materialism and the mind-body fallacy

It is convenient to have the pairings mind-body and mental-physiological, and I suspect that even evolutionary psychologists use them in everyday conversation. But given what is now known about the physical workings of the brain, it is untenable to see these dichotomies as descriptive of how things actually are, for example, that the mind is some kind of coherent, unified, bounded entity, separate from the body, that directs our thoughts and behavior but which has no substance; it is immaterial. Granted, this is how it seems to be, that there is a self inside us, a [homunculus](#), which is supernatural in the sense that it is not made up of atoms and molecules. This makes it easy to believe that the self can survive physical death.³³

Because this immaterial you, your spirit, is thought to be your most important and self-defining part, it means that you have eternal life. The Abrahamic faiths have pushed this line, rooting sin in the physical self and thus being mistrustful of sensuous experience. But, as I discuss in Chapter Two (in connection with Damasio and Cognitive Neuroscience), feeling, is very much a physiological affair involving neurons firing in and across different parts of the brain, the release and uptake of neurochemicals, and the integrating of this with the whole body by various means such

³³ Le Doux points out that the notion of a soul that is independent of the body, that survives death, only became a tenet of Christianity in the Middle Ages. Before that, Christians apparently abided the Judaic tradition of the resurrection of the body on the Day of Judgment. Le Doux quotes what Jesus was purported to have said by Mark (9: 47), It is better for you to get into the Kingdom of God with but one eye than to be thrown into Gehenna with both eyes (le Doux 2002: 24-25)

as the endocrine system of hormone producing glands. Feeling is ever-present in and indispensable to cognition (‘mental’ activity). This would suggest that if there were an ‘uncarnated’ self that survives the body, it would be incapable of feeling and therefore incapable of rational thought.

In the cognitive sciences, Materialism³⁴ is the school of thought that makes *no* allowance whatsoever for our having any immaterial parts or dimensions. Everything of what we are is physical. However, very little is inert. Nearly every one of the trillions of cells that make us up is in its own right a living organism that in concert with other cells accomplishes some function in the vast complex of interconnected functioning that we call life as multi-cellular beings.³⁵ In a very few organisms having highly evolved nervous systems and means of internal representation and storage, phenomena *occur* that we call thought and consciousness. In humans, because we have developed symbol systems like language and are able to learn them, it is possible ‘to engage the contents of events in one’s nervous system’ (Dennett quoted in Brockman 2006: 129). Thought, and the assembling of thoughts (what consciousness by and large is) are processes where the bulk of what is happening never enters awareness (is unconscious). But these processes give rise to coherent thought patterns capable of being communicated to others. Words just bubble up as if by magic and coalesce into coherent patterns. An inner ‘voice’ ‘speaks’ and is ‘heard’, and because we are disposed to believe that speaking always involves a speaker, one naturally assumes there to be some neural equivalent of a computer’s Central Processing Unit (CPU) that coordinates all the processing and issues the silent formulations that comprise one’s internal dialogue (which is not in reality all that coherent or dialogue like). And yet there seems broad consensus among neurobiologists/psychologists and evolutionary biologists/psychologists that the brain does not work this way at all.

Even though explaining consciousness is not a project that many scientists or philosophers risk tackling [Damasio (1999) and Dennett (1995) are two that have], the mystery is unraveling as to how physical processes create the illusion of there being a discrete inner self at the control desk in some ‘Cartesian Theatre’ where unconscious processing coheres into conscious experience and from where the self directs all of one’s behavior. But, if the materialist theories of Damasio, Dennett (1995), Le Douarin (2002) and Edelman (1992) are close to the mark, which I am convinced they are, neither self nor consciousness can be any kind of entity or thing. All that can really be said is that they are part of what the brain does in conjunction with the total organism. The brain is a massively parallel processor comprising relatively autonomous subsystems or modules³⁶ that have evolved such that they process different kinds of information and achieve different functional results. All of this parallel processing somehow gets integrated, as it must do in order for the organism to function, survive

³⁴ ‘Physicalism’ is arguably a better word in that there are, according to Physics, entities that are physical but that cannot be easily described as material.

³⁵ We do carry around a substantial number of dead cells, yet it is negligible relative to the number of living cells.

³⁶ Pinker alludes to the problem with the term ‘module’ with its suggestion of a detachable, snap-in component or as something that is visible as circumscribed areas on the surface of the brain. By contrast to supermarket charts showing distinct meat types (rump, porterhouse, fillet, etc.) – a mental module probably looks more like roadkill, sprawling messily over the bulges and crevasses of the brain ... [or] broken into regions that are interconnected by fibers that make the regions act as a unity” (1997: 30).

and reproduce. It is likely that there is a succession of convergences occurring unconsciously at different loci in the brain, what Dennett would call *‘drafts,’* before emerging as a coherent conscious thought. Certain parts of the brain may at times assert greater levels of control in achieving this integration, but this is not to suggest that any of these parts or regions possesses intentionality or is somehow in charge of operations.

So what is the mind? If all that can be said is that, as with self, thought and consciousness, the mind is just what the brain does, then it is not something that can be shaped by environmental inputs, for the simple reason that it is not a thing. But certainly what the brain does, its manner of processing, can be and most assuredly is so shaped, and because of the brain’s plasticity, it can be incredibly responsive and vulnerable to what comes into it via the senses, taking what is salient and encoding and *‘inscribing’* it as patterns of neuronal connectivity (memories which can be later accessed without involving any of the senses).

But to shape something is not to construct it. If those of a blank slate orthodoxy were correct, that what we call the self or the subject is in all key respects a sociocultural construction, this would require that the neural inscribing that society accomplishes in the individual brain *overrides* the patterns of connectivity that are innate (inscribed according to instructions encoded in our genes). This logically cannot be what happens. When using a computer, the information we input gets encoded in the computer’s memory and can be used to achieve tasks only by virtue of a Disc Operating System and the software that has been installed on the computer’s hard drive. Because there is virtually no limit to the number of different informational inputs that can be made (even with just one software application such as MS Word), there is similarly no limit on the number of possible outputs, and there is little doubt that the nature of the outputs will in significant respects reflect the nature of the inputs. But this does not mean that any and all outputs are possible. They are constrained by the programs and their subprograms that have been installed on the computer.

The synaptic self

Very early on in life, a sense of individual self starts to emerge and take form. What makes it possible and inevitable apparently is the [theory of mind](#)³⁷ that we are all genetically programmed to develop starting as early as 7 to 9 months of age when infants begin to attribute mental states to themselves and to others. – intentions, desires, beliefs, etc.³⁷ But it cannot develop in the absence of others (at least not in ways that allow one to function socially) and how it develops depends very much on what one experiences socially and culturally. According to Le Doux (2002: 5):

genes only shape the broad outline of mental and behavioral functions, accounting for at most 50 percent of a given trait, and in many instances for far less. Inheritance may bias us in certain directions, but many other factors dictate how one’s genes are expressed.³⁸

³⁷ See, for example, Baron-Cohen, S. (1991). It has been suggested that autistic individuals lack a theory of mind due to some neurological malfunctioning.

³⁸ In support of this claim, Le Doux cites Tellegen et al (1988).

Nurturing nature

It is not only that nature and nurture both contribute to the development of such meta-traits as self and personality; ~~they~~ actually speak the same language” (Le Doux 2002: 3). By this it is meant that they both make their contributions by shaping the synaptic organization of the brain’ (ibid). And, it seems, they employ and act upon the same neural structures or systems in effecting mental’ and physiological behavior. This is as would be expected given that evolution is naturally parsimonious. The brain is the most energy-hungry organ of the body and it is obviously more efficient if one neural system can process both genetic and learned information when inducing behavior. What experience and society inscribes does not override, negate, or side-step what genes have instructed. To respond to the outside world, the brain employs neural circuits that have been evolutionarily fine-tuned.’ Now they have to be employed in ways appropriate to life in the here and now, and genetic evolution is too slow to bring about the needed modifications. For that we rely on learning and the amazing plasticity of the brain. But many of the buttons’ that need to be pressed to succeed (what needs to be activated neurally) are the same as served the genetic interests of humans in the Paleolithic and their more distant hominid ancestors.

There are various hypotheses that will be discussed in the next chapter that explain the arts and related cultural phenomena in relation to these genetic buttons’ (the evolutionarily fine-tuned circuits that invite activation with the promise of some kind of pleasure). The most famous of these (infamous for many) is Steven Pinker’s take on music as ~~auditory~~ cheesecake”’ (1997: 534). Cheesecake, as Pinker puts it, is a brew of megadoses of agreeable stimuli ... concocted for the express purpose of pressing our pleasure buttons. Pornography is another pleasure technology ... the arts are a third. (525) Like Le Doux, Tooby, Cosmides, Dennett and most other adaptationists, Pinker regards the brain as aneural computer, fitted by natural selection,’ but it is a toolbox,’ he says, that can be used to assemble Sunday afternoon projects of dubious adaptive value.’ (524) Adaptive value, we are reminded, implies that whatever it is being claimed to have it in some way enhances one’s prospects for producing offspring and thus fulfilling one’s purpose as a vehicle for gene replication. As will come to light in the next chapter, there are several adaptationists who are not so dismissive of music and art as Pinker would seem to be, judging by the quotes selected for inclusion here.³⁹

Culture as pleasure technology

What if it turned out to be true that much of what we value as culture is nothing more than ~~pleasure technology~~”, where a cultural practice such as music has no value beyond being ~~a~~ cocktail of recreational drugs that we ingest [through the senses] to stimulate a mass of pleasure circuits” (Pinker 1997: 528)? The neural underpinnings for these practices are what some Darwinian theorists have called evolutionary byproducts or spandrels’, regarded as having no real’ function, but which make use of neural

³⁹ A closer reading of Pinker, as will come out in the next chapter, reveals that his antipathy is more apparent than real and that he has in fact made some compelling points that the Philosophy of Music Education should take cognizance of.

circuitry evolved to function in our genetic interests. Put differently, they are “causally coupled to traits that were selected for” (Tooby and Cosmides 2001: 6). They entail some kind and degree of pleasure, and we are thus innately inclined toward activities that stimulate them. As already intimated, the experience of pleasure (as with fear) is an evolved mechanism for inclining an organism toward ‘fitness’ enhancing behavior. (We are certainly not the only species to experience it.) BUT, what is fitness enhancing in one environment may not be so in another⁴⁰; and, as I’ve already emphasized, the environments we now inhabit, which we have by and large created, challenge us with radically different selection pressures and constraints than those that confronted our hunter-gatherer ancestors.

But what does it matter if music and a host of other social and cultural phenomena are not adaptations per se and hence do not enhance our reproductive capacity? Our innate inclination to ‘go forth and multiply’ is making the extinction of our species almost inevitable. Even if we have no care for the rest of life on our planet, we simply can no longer afford to carry on fulfilling our (one and only) genetic destiny (i.e. REPLICATE) on a planet whose carrying capacity for a resource-hungry species such as we’ve become should limit our number to under one billion.⁴¹ We are now close to 7 billion! But if we can have our cheesecake and eat it too, which birth control and masturbation make possible, should such practices be discouraged? If musical behavior (musicking) utilizes evolutionarily tuned neural systems (perhaps keeping them from atrophying) and satisfies our evolved appetites and predilections, is this not a good thing? And should we not accord value to practices that satisfy higher-order needs and help us to be not only happy, but fulfilled, or even morally righteous? It depends. If profit is the bottom line, there is much better value in growing a population of [Homer Simpsons](#).⁴²

Something more than pleasure technology?

I am here reminded of something the eminent philosopher of music and music education, Wayne Bowman, wrote in 1982 concerning the cognitive value of art. I have always found it thought provoking, even inspirational. In the light of so much that I have recently read in Darwinian Science, Bowman’s words have taken on increased meaning and will be referred to again. Especially pertinent are Le Doux’s observations on the ways and extent to which experience modifies innate neural systems and alters their functioning, such that they continue to have use and value in new and changed environments. Experience rewires us and particular kinds of experience must therefore rewire us in particular ways including how different neural systems from different parts of the brain get linked up and integrated in their functioning. With especially engaging experiences, such as the art experience Bowman has in mind, the result is some degree of *existential transformation*. Here are Bowman’s words:

As one attends to the art object, its powerful image serves to embody the diffuse constellation of tacitly held particulars from which he attends, conferring upon them a unity

⁴⁰ Again, a good example is the Galapagos cormorants whose wings have atrophied and who longer can fly.

⁴¹ A conclusion arrived at in the final episode of the BBC award-winning series: *Planet Earth*.

⁴² If you have seen even just a few episodes of *The Simpsons*, you have probably concluded that there is more to Homer than meets the eye.

they do not possess of themselves. It provides a focus for the myriad emotions, ideas, sensations, and impulses which constitute our being, such that through it they are "refashioned and amplified into something new."⁴³ One's self is existentially transformed. One's tacit interpretive schemata, the lenses through which he defines his world, are dramatically realigned. Such realignment amounts to nothing less than the attainment of new realities, new perspectives from which to view the world. (1982: 79)

What could *‘tacit interpretive schemata’* be other than the neuronal systems that integrate incoming sense data with data already encoded in the brain, provided by previous experience and neurally inscribed by our genes, a process that for the most part happens without us being consciously aware of it? These are the data that comprise *‘the diffuse constellation of tacitly held particulars from which [one] attends.’* A work of art summons forth particular *‘particulars’* (data), particularly those that are emotionally resonant with the particulars from which the creator of the art work was attending when creating it, and which are in various ways and degrees embodied or somehow encoded in the work. This emotional resonance is surely dependent on congruence between the contents of the respective *‘constellations,’* that is to say, what has been neurally inscribed in the brain of the artistic creator vis-à-vis that of the experiencer. How much of this relies on their sharing a common culture is difficult to gauge. Studies in Darwinian Aesthetics, as will be borne out in the next chapter, are founded on and make a compelling case for the precept that *‘the arts in all their glory are no more remote from evolved features of the human mind and personality than an oak is remote from the soil and subterranean waters that nourish and sustain it’* (Dutton 2009: 2). How else is it possible for an art work to be cherished by people across cultures, languages and times, as does happen?

Existential transformation?

Admittedly, existential transformation is a nebulous concept, but it nevertheless seems safe to say that in today's world, it is not a significant concern in the way most people *‘attend’* to art (if at all they do *‘attend’* to it), even in countries with a long tradition of curricular art education. Everybody most likely possess whatever is needed by way of genetic endowment, but for various reasons, most seldom if ever *‘really tune in’* and *‘tune on’* in their engagements with art. What I see as the main reasons, as suggested earlier in relation to music, is that the ubiquity of art, its commercialization and commodification, together with the overstimulation of our senses in a world of screens has dulled us to sensuousness generally, except when it is of the erotic, gastronomical, or macabre kind (where our Paleolithic pleasure buttons are still primed and ready for action). And it is not as if much is being done to counteract this. People want to be entertained, not enlightened or existentially transformed; and it is in the interests of the profit-driven entertainment industry to keep them that way. Because this industry creates the virtual worlds that the young inhabit for more and more of their waking life, the deck has become very much stacked against art educators, many of whom already feel they are flogging a dead horse. Moreover, the rank-and-file of humanity has, again largely thanks to the entertainment industry, come to believe that art is something

⁴³ The quoted words are Polanyi's (1958: 194) whose *‘tacit knowing’* *‘knowing’* is another theory that could profit from what EP and Cognitive Neuroscience is coming to understand about human cognition.

professionals do, that accordingly it is something for them to consume, not to make themselves. Artistic aptitude (talent) is regarded as something you either have or do not have. For a Darwinist, this is a patently absurd assumption. From Evolutionary Psychology and Evolutionary (Darwinian) Aesthetics is coming a realization that not only are the vast majority of people possessed of more than sufficient aptitude for rich and meaningful artistic activity, they have an innate need for it. Failure to gratify it could be a major cause of the psychosocial disjunction spoken of earlier and which may explain the malaise of global consumerism, where notwithstanding people's unwitting abundance of its workings, there is an unsettling awareness that something important is missing in life.

As to which educational strategies might be successful in vitalizing art's transformative agency and helping people to make art a living praxis, this will be taken up in the final chapter though some 'hints' will be dropped in the intervening chapters where, for example, they are found to be implicit in the findings, claims, assumptions, axioms, hypotheses, etc. under consideration. From what has been discussed in this chapter, it is reasonable to expect conclusions that challenge established and widely embraced philosophical ideals and curricular principles, policies and practices. Cherished beliefs must be accepted as fair game. It can also be anticipated that the most important conclusions will be of relevance to education generally. They will accordingly have significance for every kind of intervention that is truly educational, that contributes to the achievement of one or more of education's overarching goals. What these goals should arguably be vis-à-vis the ecozoic vision I embrace will be given more clarity in the final chapter. Music education is the more specific focus in this study because it happens to be my profession and primary research interest. It is accordingly where the pedagogical relevance of Darwinian Science becomes clearest to me. Moreover, I am reasonably well read in the Philosophy of Music Education and hence better aware of existing theories and philosophical frameworks that are consonant and/or dissonant with Darwinian precepts.

Education for social and ecological transformation

Whatever ultimate educational goals one espouses, they should, as argued earlier be consistent with some vision of the kind of world that education should be tasked with the realization of. In that discussion, it was further argued that there already exists a vision that, in broad terms at least, has the support of progressive thinkers world-wide. It is the vision that is implicit in a myriad of constitutions, bills, declarations, protocols, charters, mission statements and other pronouncements of agreement on what is and is not acceptable in the conduct of people, interpersonally and as it affects the rest of life on our planet. Darwinism, as should be abundantly clear by now, offers no vision of how the world should be; but increasingly from the Darwinian Sciences are coming insights into our nature as a species that help us better understand how we got to where we are now in the early 21st century, how it was possible given what we are innately capable of and inclined to do including the innate proclivities that make us easy targets, that make us the 'suckers' that are 'born every minute' according to the phrase usually credited (erroneously it seems) to P. T. Barnum, of Barnum & Bailey Circus fame.

Darwinian Science has put paid to any notion of there being any plan or design according to which history unfolds, or that the way the world is now is as it should be or

was meant to be, or that technological advance necessarily equals human progress. There is nothing inevitable, natural or obvious about how things have turned out and there is nothing to suggest that life in modern suburbia is qualitatively *better* than life in a clan of hunter-gatherers. We have an innate conformist bias and are thus naturally *disinclined* to challenge what is perceived as the status quo. Even where there might be some doubt, we tend toward a ‘better the devil you know’ approach. We believe that if something is a tradition or a part of one’s culture, it only came to be so because it *is* inherently good or true even if times and circumstances have changed and rendered such assumptions doubtful if not erroneous. Having many children is a good example.

Our reliance on experts

The rapid changes marking human history since the agricultural revolution, which have telescoped in the last few centuries, have not been the result of changes in the human genome. They have been the result of culture, that is, the amassing of information and ideas from which people generate new ways of thinking and behaving and come up with the technologies and social institutions that facilitate them and give them consequence on a wide scale. The problem in all of this is that the innovators and the experts are in the minority and do not necessarily act with the interests of others (human and nonhuman) at heart. Our reliance on experts, as Pinker points out, ‘puts temptation in their path’ and ‘leaves us vulnerable to quacks, from carnival snake-oil salesmen to the mandarins who advise governments to adopt programs implemented by the mandarins’ (Pinker 1997: 305). The marvelous plasticity of our brains is what allows us to learn from others, such that we do not have to individually come up with solutions to the myriad problems life presents us with on a daily basis. The *ideational* environments we inhabit have become far more relevant for us than the physical environment which we erroneously assume will remain stable and continue to provide for our ‘needs.’ Even if it were to, we increasingly rely on experts to locate, extract, and refine the required natural resources, and more experts to transform them into goods that we believe and have been led to believe we *need*. (And there is a great deal of supporting infrastructure, like transportation, where we further rely on experts.) Cultural evolution, in this regard, has been disempowering in key respects. Should the infrastructure that cultural evolution has brought into existence (and which we take so much granted) fail and collapse, all but a few of us would be up the proverbial creek without a paddle in terms of our survival prospects.

The burgeoning infosphere

We speak of the information age because so much of our lives are now caught up in the production, communication, manipulation, promotion and consumption of information. Information, of course, is not like the continuous and unbroken flow of a river. Information is encoded in patterns of discrete informational units (letters, phonemes, syllables, notes, genes, neural representations, etc.) that get combined into larger informational packets (phrases, sentences, motifs, rhythms, instructions, narratives, theories, conscious thoughts). All of these units and packets of information have neural correlates, patterns of neuronal connections and synaptic firing that encode ‘essentially’ the same information. This syntactic mutability of information will become an important point of discussion in Chapter Three and Chapter Four.

Whether encoded synaptically, verbally, iconically, in binary code, electromagnetically, or whatever, we can refer to these units/packets as ideas. Because we have evolved communicative capacities and invented media for the efficient transference of information, these ideas can spread through, among and between human populations just as do viruses. In both cases, they spread because they are entities that can and will replicate if environmental conditions are conducive. If these conditions are optimal, they will proliferate. Also, in both cases, copies of the information may be inexact and this may either increase or decrease the prospects of the information getting copied again and spreading within the environment. Changes in the environment will also increase or decrease these prospects.

Memetic evolution and ideology

The above recalls the natural selection algorithm set out earlier in this chapter, where Memetics was briefly introduced as a science which investigates how natural selection plays out where the replicating entities are ideas (memes) instead of genes. It is a new science that has yet to acquire wide support and does not attract much attention in journals these days.⁴⁴ Its fundamental proposition/axiom/tenet, is too hard a pill for many to swallow, including some eminent Darwinian scholars like Steven Pinker (1997: 208-210) and Dan Sperber (2000). They accept that culture evolves, but not according to the same process as genetic evolution. Music colleagues of mine, who go quite far in their acceptance of Darwinian propositions and even look with interest to work being done in Biomusicology, emphatically draw the line when it comes to Memetics. Yet I have not found their refutations adequate and am convinced that Memetics has got things right in key respects, even though I do not regard it as sufficient for explaining all that is cultural. I will present my case for Memetics in Chapter Three under the broader rubric, Gene-Culture Coevolution Theory and discuss the challenges that it poses to existing educational philosophy and to music education philosophy more particularly.

Of deep significance to both is the question: do we have ideas or do ideas have us? The latter proposition somehow sounds wrong, but it is one that Marxists and social constructivists should surely concur with, at some level at least. It is implicit in many discourse theories and in Marxian understandings of ideology. It is interesting, in this regard, that ideology actually means: the study of ideas. Of course, it is more commonly used in relation to tacit ideas which are potent in their effect on our behavior, but which we do not arrive at or reflect on consciously, let alone critically. Nevertheless, provided one is possessed of sufficient critical consciousness, these tacit ideas can be identified and explained in relation, for example, to socioeconomic realities and to the insidious machinations of the corporate state. In practice this has always required a vanguard of intellectuals to lead the masses who are deemed unready to decide matters for themselves, being too gullible and susceptible to the ploys of those who would exploit them. The assumption, which history has demonstrated to be erroneous, is that after the social-economic-political environment has been transformed (this usually necessitating

⁴⁴ It has however proven useful to ornithologists studying the evolution of bird song, which apparently avails itself well to Memetic analysis, for example: Lynch & Baker 1993; Burnell 1998; Matessi et al. 2001.

a revolution) the masses will in time come to embrace the values of an authentically socialist zeitgeist.

Ideology and our evolved psychology

As intimated earlier, a Darwinian understanding quite probably would be that free-market capitalism has come to be the dominant economic arrangement because it more successfully exploits our evolved psychology. The ideas and assumptions on which it rests are readily internalized; they become neurally inscribed in such a way that they need not be consciously called forth; rather, environmental cues activate them whereupon they bias preconscious processing and hence the content of what bubbles up in consciousness and induces behavior. Capitalism can so easily be ideology in the Marxian sense because its assumptions *feel* right. With no trouble they become tacit assumptions that we abide unwittingly because they do not entail much rewiring of genetically inscribed neural circuits. We are so easily indoctrinated because of how evolution has predisposed us cognitively. It has not predisposed us to a socialist zeitgeist, however it has provided what is needed neurally in order for altruism, empathy and other socially positive traits to win out over our more selfish instincts. In other words, our innate psychology in no way precludes the possibility of socialism as praxis. *It is in fact what makes it possible.* Why we can at times be so remarkably good to each other and why it *feels* right when we are (you don't *think* righteous, you *feel* righteous) are important questions for Evolutionary Psychology as will be discussed in the next chapter. And here we may recall remarks made earlier regarding self-actualization and our genetic capacity for being more than lowest common denominators.'

The Abrahamic faiths have us as being innately immoral, our sinfulness being an inheritance from Eve (and therefore from Adam by virtue of her having been made from him). But we also have an innate capacity for virtue. The Bible is replete with examples of people (all the good guys) whose capacity was such that they were able to endure the worse kinds of ill-treatment and temptation. We have the capacities both for selfishness and selflessness and both capacities are innate. Selfish and selfless behaviors both induce feelings and feelingful states that we are genetically programmed to find desirable. But they are very different kinds of feeling qualitatively, in terms of their duration, and in terms of what we have to invest before savoring them. Selfish behavior provides immediate but short-lived gratification whereas selfless behavior involves sacrifice and often effort, submission and perhaps even discomfort. But the reward is a satisfaction of a deeper and more lasting kind. Most importantly, others benefit and social progress is made possible.

We live in the here and now so we are naturally inclined to favour the *quick fix* and that is precisely the inclination that allows corporate capitalism to thrive while socialism limps along at best. It is the life-blood of consumerism and consumerism rules. Everywhere we turn, our selfish and base' instincts (the four Fs) are being appealed to and we are led to believe that this is *fine*; just check out the covers of the magazines on the display racks at any supermarket (always positioned to catch the eye of consumers in the check out lines). Sadly it is rare that I encounter much real concern about this state of affairs during my face to face encounters with people. Most just choose not to think about it. Many disapprove but have reconciled themselves to the fact that this is

how things are.' It is the devil we know and, after all, it has allowed us to acquire all kinds of cool stuff. Also, there is a great deal of resignation to the notion that we are helpless in the face of it all. But why should there be such resignation when the ideologizing means *par excellence*, education, has not been employed in any focused and coordinated way to challenge the consumerist zeitgeist?

Concluding remarks

The upshot of this introductory chapter is hopefully by now clear, that Darwinian Science is deserving of close attention in discussions around education's purpose and means of achieving it. It cannot suggest where we should be going, what education should ultimately be achieving, but it does help us to better understand what we as a species bring to the table for education in all its forms and guises to work on and with. For an educational philosophy founded on an ecozoic vision, Darwinism clarifies the intimate connection we have with all that lives on this planet and reveals, for the vanity it inescapably is, the anthropocentrism that informs our dominant ways of being in the world and that has led us to this most precarious ecological state of affairs. For the Philosophy of Music Education, it offers grounds for a reconsideration of prevalent notions regarding music's functions, values and educational uses. The hypothesis that the ensuing chapters will hopefully lend credence to is that music, or at least certain ways of musicing, are optimal ways of exploiting our innate aptitudes and predispositions toward the achievement of worthy educational goals, the overarching goal being an Earth citizenry of people living lives of praxis, of *informed*, committed, ecologically accountable action that adds value to the world and which can help turn the tide.

Chapter Two: *The Adapted Mind: What an adaptationist understanding of mind can tell us about music, art, education, and culture*

The nature-nurture dichotomy - a non sequitur

As is probably already clear, a Darwinist is necessarily an adaptationist for the simple reason that adaptations are the biological attributes that result from natural selection and are what make possible whatever behaviors an organism is capable of. This obviously does not imply that all behavior is adaptive or that behavior relies on adaptations only. Neither does it imply that all features of an organism are the result of natural selection. What needs to be understood clearly, if it is not already, is that nature and nurture are *not* two different processes, in humans at least, and most certainly should not be seen as opposites or opposing forces. However useful a dichotomy may be as a conceptual tool, it can be misleading and in the case of the nature-nurture dichotomy, there is the risk that an essential point is missed, that is, that ~~all~~ behaviour requires evolved psychological mechanisms *combined* with environmental input at each stage in the causal chain" (Buss 2008: 58, my emphasis). It is arguably nonsensical in this light to ask whether behaviour is 'evolved' or 'learned;' it is both, inextricably.

Cognitivism and the logical necessity of in-built cognitive mechanisms

Piaget, originally a Zoologist, conceived learning as a process of assimilation, accommodation, and, in the end, *adaptation*. It is not only that information has been taken in and made to fit with information already 'stored' in the brain, but that something has changed in the organism. This change is influenced, but not determined, by the information. After all, there must be something that actually changes (Piaget's *schemas*) as well as mechanisms capable of enacting the change. ~~Simple~~ logic says there can be no learning without innate mechanisms to do the learning," as Pinker reminds us, and he extends that logic to conclude that ~~those~~ mechanisms must be powerful enough to account for all the kinds of learning that humans accomplish," which is formidable (2002:101). To claim that something has been learned is saying nothing more than that a change in an organism has occurred as the result of environmental input being processed by one or more, usually many, of these mechanisms. If we are looking for an explanation "we have to identify the nature of the underlying learning mechanisms that enable humans to change their behaviour as a consequence of environmental input" (Buss 2008: 58). Here it is crucial to grasp what is a core position of [cognitivism](#), the paradigm shift in how we understand learning that followed on Noam Chomsky's groundbreaking work in language acquisition. Imberty (2000: 452) has explained this cogently.

In classical behaviorism, the subject's response to a stimulus is a reaction determined by the nature of the stimulus; in post-Chomskian cognitivism, the response is not a reaction to the stimulus, but the triggering of an adapted program, a response to an internal perturbation of a competence system that is provoked by information in a format that does not conform to the system. The program's effect is to render the object consistent with its own characteristics and to modify atypical variables: thus, it is not the traits of the object that provoke the subject's response, but rather the mere fact that it is not consistent with the competence system.

The necessity of such mechanisms (competence systems, adapted programs) is yet more obvious when we consider that the number of inferences that can be drawn from a limited set of inputs is virtually infinite. Pinker (2002: 101) gives a linguistic example:

The sentences heard by a child ... can be grounds for repeating them back verbatim, producing any combination of words with the same proportion of nouns to verbs, or analyzing the underlying grammar and producing sentences that conform to it.

It would be impossible to make any inferences if the human brain was just a general purpose computational system waiting to be programmed by environmental influences. Without at least some built-in constraints on its operations, the result would be a *combinatorial explosion*. Tooby and Cosmides (2000: web article) explain this succinctly.

[A]lternatives multiply with devastating rapidity in computational systems, and the less constrained the representational and procedural possibilities are, the faster this process mushrooms, choking computation with too many possibilities to search among or too many processing steps to perform. Marginally increasing the generality of a system exponentially increases the cost, greatly limiting the types of architectures that can evolve, and favoring ... the evolution of modules only in domains in which an economical set of procedures can generate a sufficiently large and valuable set of outputs.

If any learning is to take place there must be some mechanism or set of mechanisms that constrains the learner to draw certain conclusions, and not others from the input available, that allows her to make distinctions between, for example true and false, conditional and unconditional, past and future, experiential and imaginary, actual and potential. There must further be some kind of mental ‘_language’ that makes it possible for such distinctions to be marked, expressed, and retained thus allowing us to keep track of what is true or false, conditional or unconditional, etc.. All of this is necessary if we are to be able to plan, reflect, anticipate, infer, synthesize, have language, or just about any other of the cognitive capacities that seem uniquely human including, perhaps, consciousness itself.

On mentalese and innate conceptual structure

In a 2005 TED talk, Pinker speaks to such constraints in his discussions of *mentalese*, the ‘_language’ of thought needed for verbal language acquisition and what makes it possible for a fairly limited number of innate concepts (schemas) to generate infinite word combinations communicating an unlimited number of ideas, including highly abstract ones, and to sequence them into discourses that are coherent, internally logical, and informative. Pinker speaks of mentalese as “a level of fine-grained conceptual structure which we automatically and unconsciously compute every time we produce or utter a sentence - that governs our use of language.” The innate concepts that constitute this structure, and which constrain conscious thought and its expression in language, are fundamental concepts of space, time, causation, possession, containment and intention (e.g. what constitutes a means vs. an end), these overlapping in interesting ways with

Kant's categories which he posited as the framework for thought.⁴⁵ In support of this, Pinker points out that "our unconscious use of language ... doesn't care about perceptual qualities such as color, texture, weight or speed, which virtually never differentiate the use of verbs in different constructions." Rather, it evokes more concrete metaphors whereby, for example, ideas become objects, sentences become containers, and communication becomes a sending and receiving. Pinker gives this example: "We gather our ideas to put them into words and if our words are not empty or hollow, we might get these ideas across to a listener who can unpack our words to extract their content." That music, like language, has an innate generative grammar was theorized in depth by Ray Jackendoff and Fred Lerdahl in their *A Generative Theory of Tonal Music* (1983).

On the neurological basis of innate concepts and mechanisms

But what are these innate concepts and mechanisms in physical terms? It was intimated in the first chapter that evolutionary biologists and evolutionary psychologists are nearly all materialists, making no allowance for a nonphysical mind. But does this make it necessary for Evolutionary Psychology (EP) to put the brain under a microscope in order to arrive at credible and useful conclusions about how the mind works? It would seem futile to try to isolate a concept or mechanism by examining a particular patch of the brain and expecting the concept or mechanism to somehow be displayed in the convoluted network of connectivity, as futile, Pinker suggests, as trying to grasp a movie by examining the patterns of magnetic charges on a videotape or the digital data on a DVD. Pinker makes another important point, that "minute differences in the details of the connections may cause similar-looking brain patches to implement very different programs."

Nevertheless, neuroscience has helped us to understand how it is that the brain gets wired in ways needed for cognition and behavior. In a nutshell, genes instruct the production of proteins that shape the way neurons get connected up and become functioning mechanisms encoded in patterns of connectivity.

Some proteins are enzymes that trigger chemical reactions, others induce additional genes to make additional proteins, some form barriers that guide and restrict the many cell movements that take place, and still others provide adhesive surfaces on cells to which other cells cling while making their way to their final destinations. (LeDoux 2002: 66)

⁴⁵ In *Homo Aestheticus* (1992), Dissanayake remarks on the universality and ease of acquisition of our spatial abilities and, in keeping with Pinker, posits that "spatial cognition begins (in a Kantian ... manner) as internal structures of the mind that are used to model reality," constructing representations of objects, patterns, and events, including the self. They are among the codes, categories, or initial states of the mind out of which more complex perceptions, conceptions, lexical structures, and sentence meanings are composed." (159)

*Epigenesis by synapse selection, a crucial matter for education*⁴⁶

The details of how this all unfolds such that a functioning brain results is coming to be understood better and better (LeDoux 2002: 68-9), but such understanding is not essential to adaptationist explanations of our evolved psychology as will hopefully become evident in the ensuing discussions. Nonetheless, how the brain develops is of critical interest and concern to education. Influencing this development is, after all, the essence of what education is. Education shapes environments, engages students in activity and uses different kinds of informational inputs to develop their brains in specific ways that allow them to do specific things. In this regard, the discovery around which neuroscience has theorized compellingly is the manner in which neural networks are apparently pruned and circumscribed in their functioning as a newborn grows toward adulthood.

Cognitive development paradoxically entails a reduction in the number of neurons and neural pathways in the brain as we mature. As the neuroscientist Jean-Pierre Changeux posited (1989), neural activity “does not create novel connections but, rather, contributes to the elimination of pre-existing ones” (quoted in LeDoux 2000: 73). Gerald Edelman argued in his *Neural Darwinism* (1987) that a selection principle operates much as it does in natural selection. For synapses in the brain, as for organisms, there is competition. It was already pointed out in Chapter One that physical adaptations that do not get put to use, like the wings of a Galapagos cormorant, atrophy and may eventually disappear. This ‘use or lose’ condition applies to synapses according to Edelman, and those that do not get used perish. Having the most profound educational implications is his conclusion that “the pattern of neural circuitry ... is neither established nor rearranged instructively in response to external influences” (quoted in LeDoux 2000: 73). Instead, the external environment influences changes in neural circuitry by activating particular existing synapses and reinforcing ‘selected’ patterns of neural activity. Those that are not activated thusly are likely to be pruned away given the need for economy that characterizes any entity that relies on finite energy resources, the brain being especially voracious in this regard. The implication of this vis-à-vis early childhood education is staring us in the face as I see it, a matter to which I will return at various points in the ensuing chapters.

On the ‘computational theory of mind’

Adaptationist thinking about the ‘mind’ is what evolutionary psychologists engage in and they are seemingly unanimous in regarding as fundamental to their thinking - as an unassailable given - that the brain is a massively parallel information processing system that works algorithmically. Neurons ‘fire’ and connect up according to series of if-then kinds of processes the results of which, provided they fulfill the ‘if’ conditions in other algorithms, will instantiate and inform ever more complex arrays of connectivity leading to ever more complex forms of cognition that become ever more inter-modular and cross-modal. This is computation and happens whenever one pattern of information

⁴⁶ Encarta defines ‘epigenesis’ as “embryonic development by gradual change.” In key respects, it can be regarded as coterminous with ‘phenotypic expression’

induces another because between them is a relation that accords with some law of logic, statistics or cause and effect in the world.

[M]ental life can be explained in terms of information, computation, and feedback. Beliefs and memories are collections of information – like facts in a database, but residing in patterns of activity and structure in the brain. Thinking and planning are systematic transformations of these patterns, like the operation of a computer program. Wanting and trying are feedback loops, like the principle behind a thermostat: they receive information about the discrepancy between a goal and the current state of the world, and then they execute operations that tend to reduce the difference. (Pinker 2002: 32)

What is apparently difficult for many to accept is that when it comes to the workings of our brains *there is nothing but algorithms*. As Tooby and Cosmides see it –“The whole cognitive science game is to take the high level capacities that we intuitively grant to minds - such as consciousness, agency, flexibility, context-sensitive interpretation, and so on - and to see what programming steps they are built out of.” This sounds patently reductionist but is not any more so than pointing out that the experience of love is contingent on chemistry. What Tooby and Cosmides entreat us to accept is what I see as incontestable commonsense, something that we must accept unless we are to invoke some kind of mystic, supernatural explanation, that is:

while consciousness and agency are not themselves ‘automatic’ or mechanistic in the ordinary sense, their constituents must be, because within a scientific descriptive framework everything (including anything, like us, made out of molecules) operates on a micro level in terms of cause and effect. (Tooby and Cosmides 2001b: 199)

On perception and its illusory nature

As with a computer, the brain does not, obviously cannot, compute the actual objects in one’s environment. Our senses interface with the external world but what the brain actually gets as information and computes are *representations* of some sort that encode properties of whatever is being perceived, whether visually, aurally, by touch or by smell. Pinker uses vision to make this point clearer, beginning by pointing out the incongruity of Hollywood portrayals of robot vision, where the audience gets to *see* what the robot is seeing, for example, a wide-angle view with cross-hairs and pull down menus in the case of the *Terminator* (Pinker 2005 – Online source). This begs the question: Who or what is it inside the robot that is seeing this? But the same question applies to human vision for it seems so ‘apparent’ that there must be some kind of self, a homunculus inside one’s head that peers out through the windows of the eyes. But then we are faced with the question: what it is using to peer with? We are thus inescapably caught-up in an infinite regress conundrum.

A better metaphor is a massive spreadsheet with millions of numbers each representing the brightness of light hitting one of the millions of photoreceptor cells in the retina of the eye, this varying according to the brightness of each point in the visual field. As light reflects off objects and gets focused onto the two dimensional retina, these cells transduce light energy into neural symbols registering different levels of light intensity like numbers on a spreadsheet can do. It then becomes the work of dedicated parts of the brain to do the necessary ‘number crunching’ such that we perceive a three-dimensional scene, which according to the computational theory of mind is done

through sequences of interconnecting and looping algorithms as is the case with a computer. The neural mechanisms that make this possible, that are instructed by our genes, can be tricked if the brain is given a spreadsheet of light intensity values that are *not* the result of reflected light, but issue from an array of pixels of illuminated light whose intensity values result in a patterned spreadsheet that gets similarly processed and creates the illusion of looking upon an actual, natural scene. When we watch television, we are actually hallucinating a three dimensional world behind the screen.

On aural perception

With aural perception, the sensorial interface is the eardrum which is caused to vibrate in particular ways by oscillations of pressure in the air outside the ear, this caused by some sound source like a musical instrument. This acoustic energy must first be transduced into manageable mechanical energy which is accomplished by the array of tiny bones in the middle ear. These connect the eardrum to the cochlea, the organ of the inner ear wherein mechanical energy is transduced into electrochemical energy and sent on into the brain. There, various mechanisms analyse the fluctuations in this energy that encode the same information as the waves of acoustic energy received through the outer ear. If the sound source is a CD player, the waves of acoustic energy have been structured by speaker cones moving in and out according to an electrical signal whose varying positive or negative values are instructed by the patterns of binary code on the CDs surface. These in turn encode the same information as the waves of acoustic energy captured by a microphone in some recording situation, perhaps long ago and far away, e.g. King Oliver's Creole Jazz Band playing "Dippermouth Blues" around an acoustic recording horn in Richmond, Indiana almost ninety years ago.

As with vision, the complex of processes we call hearing creates the necessary illusion that you (whatever that ultimately means) are directly experiencing whatever is being perceived and that the experience is necessarily the same for any ear attached to any brain. But of course this is not the case at all. Other species do *not* hear and see the world as do humans. Many bird species can see light in the ultraviolet range. As much as 75% of an elephant's vocal communication is infrasonic, that is, it employs frequencies below what humans are capable of hearing. Such communication can be extremely loud (reaching 110 decibels), carrying for more than 5 kilometers (Smithers 2000: 134). Bats unify sight and hearing in their uncanny ability to echolocate, where they are for all intents and purposes seeing with their ears.

While it is no doubt true that there is more to be learned than what is reliably known, the myriad of mechanisms and processes involved in hearing is understood quite well. Lipscomb and Hodges (1996: 83 -132) make it reasonably accessible to a non-specialist readership and do so in detail far beyond what this discussion requires. From what they disclose, it is sufficient if we understand that the auditory information one receives gets analyzed in several localized processing centers in the brain, each ascertaining a particular feature in the information (e.g. relating to pitch, location, duration, etc.) and that the products of all these analyses get assembled into a coherent sound experience in the primary auditory cortex.

On the feelingfulness of perception and our predispositions toward musical stimuli

But of course it does not stop there. Becoming a meaningful sound experience necessarily engages other mechanisms in other parts of the brain, perhaps the most important for musical behavior being those that imbue the experience with emotional content, that make it feelingful and that incline us toward certain kinds of rhythmic, tonal and timbral organization over others. There can be no denying that these inclinations become shaped in different ways depending on what one experiences aurally while growing up, but it seems clear that what one experiences, and which constitutes one's personal or cultural soundscape, cannot negate what is innate; neither can it easily override it. One never hears and will probably never hear someone whistling a tune built on atonal principles (a 12 tone row for example) and it seems unlikely that serial compositions and works that consciously thwart innate expectations will ever enjoy the popularity of music that satisfies these expectations. My entire life experience of music and music making in different parts of the world has convinced me that there are species-typical predispositions that bias our experiencing of sound in ways that are pre-cultural. And yet, according to Pinker at least, many academics in the Social Sciences continue ~~to~~ cling to a theory of perception ... that the sense organs present the brain with a tableau of raw colors and sounds and that everything else in perceptual experiences is a learned social construction" (2002: 412). Even one of my colleagues in Philosophy with a strong interest in Cognitive Science was wont to say in a matter of fact way, that there is nothing innate that predisposes tastes in music and that we are as naturally disposed to Schoenberg as we are to John Williams. I doubt that many film composers like Williams would concur although they also recognize and make good use of the ways culture has conditioned us to make certain associations between musical idioms and extra-musical phenomena. As regards atonality, David Huron ventured that Schoenberg's twelve-tone compositions are not so much atonal as they are *contratonal* (2007: 339). Dutton clarifies the point.

If Schoenberg had set out with a randomizer to create his tone rows, tonal relations would now and again occur simply by chance. His tone rows, however, are built on a principle of reverse musical psychology: he wrote them precisely to avoid even as much tonality as would occur probabilistically with a throw of a composer's dice. (2009: 216)

Huron quotes Schoenberg to make clear that the composer had himself surmised a natural tendency to hear tonal implications in pitch sequences, especially when there is pitch repetition, as this was what he deliberately sought to avoid activating. In line with Pinker's take on a great deal of contemporary art music (2002: 400-420), Dutton sees the failure of Schoenberg to garner much of a following with the musical public as a vindication of the claim that when it comes to music's tonal organization we are nothing like a blank slate, innately neutral and equally open to any pitch schema (2009: 217). For Dutton it is clear that music cannot have any real aesthetic effect if it fails to induce any sense of anticipation of what is coming next, if it is too unpredictable that is to say. That this kind of sensibility really is innate has been strongly indicated by research with neonates. Zentner and Kagan (1998: 483-492) have demonstrated that a preference for consonance over dissonance is already present in infants only four months old. Moreover, it appears that by the age of 4½ months, infants are already sensitive to phrase structure. A study by Krumhansl and Jusczyk (1990: 70-73) shows that neonates listen more attentively to Mozart minuets phrased normally than to renditions where pauses have been placed in the middle of phrases.

Returning to the question of music's adaptive status

Even if we are equipped by natural selection for music and innately biased in terms of our musical expectations, this does not make music an adaptation per se. The mechanisms involved in auditory processing are obviously essential in musical perception, but this does not necessarily imply that they evolved and became integrated in their functioning *because* they made our distant ancestors more musically competent. To make that case, it needs to be shown that musical competence somehow served the reproductive interests for our predecessors in the Pleistocene.

Steven Pinker would argue that it did not and it is worth considering his position further. His argument is grounded on a particular view of what actually constitutes an adaptation as well as a clearly limited notion of what music or musical competence is. He has in various places in the writings cited in this study emphasized that not all phenotypic traits are adaptive and he has used music as an example in this regard. Our capacity for making and perceiving music is a trait common to all humans, but so too do all humans have blood that is red. The redness is the result of the chemical make up of blood, more specifically the iron rich protein (hemoglobin) that was selected for as a mechanism for transporting oxygen to our organs and tissues. Blood's redness is a by-product of something that was selected for by evolution, but is not in itself an adaptation as it does not fulfill any adaptive function. On the other hand the colour of human skin is adaptive. The photochemical properties of melanin provide protection against ultraviolet radiation, its dark color helping it to absorb UV-radiation. Humans whose ancestors inhabited higher latitudes where sunlight is more indirect and in shorter supply became genetically predisposed to lighter skin, because UV- radiation is nonetheless essential for the manufacture of vitamin D.

Criteria for what qualifies as an adaptation

As to what is or is not an adaptation, Pinker and other evolutionary psychologists by and large are in agreement with what George C. Williams (1966) posited as essential criteria. Simply put, the feature in question must be shown to:

- develop reliably in all members of a species (unless prevented from doing so by abnormal environmental conditions);
- perform reliably the function(s) implicit in its apparent design;
- function so as to solve an adaptive problem adequately without incurring unsustainable costs for the organism. (Buss 2008:16)

On adaptations, by-products, and preadaptations

Once again we are reminded that natural selection does not work according to any design or plan even though it is constrained by the laws of physics and chemistry. Hence we can only speak of *apparent design* and that means design which has been inferred and inferences are not always reliable. The feathers of most birds can be analysed functionally in relation to aerodynamics and hence it seems logical to conclude that they were designed for flight. What is now known is that they originally evolved

from scales and were selected for by natural selection, not because they made flight possible, but because they provided better insulation making those with feathers better able to tolerate temperature extremes. They continue to provide this benefit as well as providing waterproofing. It is just that flight is the big prize when it comes to enhancing survival prospects (although several bird species have lost their ability to fly and their feathers and wings have adapted to better serve the lives they live, e.g. ostriches, Galapagos cormorants, penguins). Even a feather's capacity for reflecting and refracting light in different ways achieves a function that helped solve some adaptive problem at some point in the evolution of most bird species. The point that is important here is that every adaptation that can be identified in living things of present day Earth represent stages in evolutionary processes during which the trait in question functions in ways appropriate to the organism's needs in particular environments. Selection pressures change as environments change and an adaptation that serves an increasingly redundant function can become modified through natural selection to solve other adaptive problems. Dennett puts it thus: "If you go back far enough, you will find that every adaptation has developed out of predecessor structures each of which either had some other use or no use at all" (1995: 281). But here it must be stressed that these predecessor structures were *not* preadaptations. Calling them preadaptations suggests that they were part of a design process with a foreseeable outcome and Darwin's natural selection does not make allowances for foresight or intelligent design of any kind. And this, as was emphasized in the first chapter, is for many the hardest pill Darwinism forces us to swallow.

Does music qualify?

Coming back to William's criteria and the question of music's adaptive status, Pinker nowhere to my knowledge contests the factuality of any of the following points (abstracted from Miller 2000: 335):

- Music is found in all cultures present and past.
- As with language, musical ability "unfolds according to a standard developmental schedule" (335).
- Barring abnormalities that are congenital or have resulted from injury or disease; nearly all humans are possessed of musical aptitude sufficient for active participation in musicking without specific training.
- Nearly all adults are able to quickly recognize and render a vast number of learned melodies strongly suggesting a specialized capacity for storing and retrieving tonal and rhythmic sequences.
- Certain cortical areas appear to have enhanced functioning beyond what language requires and different neuronal processes and systems are involved as indicated by studies of individuals with amusia.
- Analogous behaviors in other species (birdsong for example) are clearly adaptive and the same selective processes are likely to have shaped, in part at least, humans' extraordinary capacities for acoustic and kinesthetic display.
- Music evokes strong emotional responses and particular tonal and rhythmic configurations seem to have near universal appeal.

Notwithstanding such apparent facts, music fails the adaptation test according to Pinker because he cannot see where it could have benefited the reproductive success of

our distant forbears. Of course, one cannot have a credible position in the absence of clarity as to what *music* is being taken to mean and encompass. Certainly there are phenomena that get subsumed under the term music that seem to belie any notion of adaptive function. I am here thinking of practices that while perhaps not being intentionally esoteric, nevertheless attract the interest and participation of but a relative few, as was earlier intimated to be the case with Schoenberg's serialism. Much of what falls into categories like 'New Music,' 'aleatoric music,' and 'avant-garde music' fits this bill and it is nowhere expected that what one experiences aurally will push the same pleasure buttons as popular genres which generally are successful in grabbing the ears of people from diverse cultural backgrounds. Esoteric practices afford different kinds of pleasure such as intellectual stimulation; the experience is intriguing more than it is aesthetic or kinesthetic. That in no way suggests that it is of less value, rather that its value – its associated pleasure – is of a different kind and one that it is highly unlikely our distant ancestors pursued. It is music that fails, as Dutton puts it, "to draw from the wellsprings of musical pleasure in the mind" (2009: 217).

Just as it continues to be the case for the larger musical public, it is highly likely that our ancestors pursued experiences of aesthetic and kinesthetic activation and did so because such activation was pleasurable (as it continues to be). The fact that they might only have been aware of the pleasure of the experience and that it was this that motivated their participation does not mean that having the experience had no benefits of a more adaptive kind, that it was engaging one in behavior advantageous to the reproductive prospects of our ancestors. Darwin certainly considered this vital point, i.e., that a psychosocial trait can function without any conscious awareness. Miller quotes from Darwin's *The Descent of Man* (1871: 881):

The impassioned orator, bard, or musician, when with his varied tones and cadences he excites the strongest emotions in his hearers, little suspects that he uses the same means by which his half-human ancestors long ago aroused each other's ardent passions, during their courtship and rivalry. (Miller 2000: 332-3)

Pinker seems to be stuck on the question of how our ancestors would have benefited reproductively by creating art, including music, given that what is created has no practical use and cannot justify the costs involved in its production. Pinker calls music "auditory cheesecake" and considers it to be like pornography, a "pleasure technology." He goes further to claim that "music could vanish from our species and the rest of our lifestyle would be virtually unchanged" (1997: 528). Actually, these provocative pronouncements, which have incensed many and have been invoked to discredit Pinker generally do not accurately portray Pinker's ultimate position on music's adaptive status wherein he recognizes how music engages cognitive systems that most certainly are adaptations (e.g. language, auditory scene analysis, emotional calls, motor control) *but* that music is a by-product of these capacities. The flaw in this thinking has already been intimated with the example of feathers above. Are flight feathers by-products of insulation devices? No. They are adaptations which like virtually all others have resulted from modifications to predecessor structures that were, in many cases, adaptations themselves but ones that served other functions. Ah yes, Pinker might be quick to interject, but being able to fly has clear survival advantages. The survival advantages of a musical capacity are admittedly not obvious, but this certainly does not make them nonexistent.

Clearing up an apparent confusion: music as artifact vs. music as behavior

The cheesecake metaphor is flawed in other ways. Perhaps Pinker is trying to steer clear of *hyper-adaptationism* and he is warranted in saying that “it is wrong to invent functions for activities that lack [adaptive] design merely because we want to ennoble them with the imprimatur of biological adaptiveness” (1997: 525). But, as Dutton (2009: 96) points out, the question that we should more concern ourselves with is —how genuine adaptations might produce or explain capacities and preferences even for rarefied experiences.” We have an innate sweet tooth which cheesecake obviously appeals to and we have it because it predisposed our ancestors toward certain foods rich in sugar. Pinker’s ascription of cheesecake as a by-product of Pleistocene tastes is misleading. —Rather say that cheesecake *directly satisfies* those very tastes” (Dutton 2009: 96). Music may be cheesecake, but musicality might well be an adaptation.

A Darwinian account of food preferences (for fat, sweet, piquancy, protein flavors, salt, fruit aromas, etc.) need not treat as by-products the items on a present-day restaurant menu; those items directly satisfy ancient preferences. Similarly, a Darwinian aesthetics will achieve explanatory power neither by proving that art forms are adaptations nor by dismissing them as by-products but by showing how their existence and character are connected to Pleistocene interests, preferences, and capacities. (Ibid)

Carrol (2004: 66) offers another critique of Pinker’s cheesecake metaphor.

Rich deserts offer a purely sensual stimulus. They appeal only to the taste buds. They have no intrinsic emotional or conceptual content, and they convey no information from one mind to another. In contrast, art, music, and literature embody emotions and ideas. They are forms of communication, and what they communicate are the qualities of experience.

What seems a more promising approach with regard to music is to analyse it behaviorally and consider how engagement in musical behavior, *musicking* that is (and there are several varieties of this), could have helped solve adaptive problems in the Pleistocene. It seems more than likely that our forbears were more interested in the doing of music than in the product of this doing which until the advent of sound recording was ephemeral. In this regard, it seems entirely unlikely that our incredible capacity for remembering and being able to recall tonal sequences (tunes) over long periods of time, essential to most forms of musicking, would have evolved if this capacity had not served Pleistocene interests. Furthermore, researchers are coming to the conclusion that musical and verbal memory are encoded differently in our brains which would call into question Pinker’s hypothesis that music is a by-product deriving largely from our capacity for language (e.g., Samson and Zatorre 1991). Adding more weight to the claim that we have special evolved neural mechanisms for processing musical information are studies of [amusia](#), a disorder that may be congenital or the result of damage to the brain. Congenital amusia mostly affects pitch discrimination while acquired amusia may involve dissociations in music processing between rhythmic, melodic and emotional components.⁴⁷

⁴⁷ The Wikipedia article on [amusia](#) provides a very good list of references including what I would highly recommend: Oliver Sacks’ *Musicophilia* (2007).

Musicking engages neural systems with clear adaptive functions

The conclusion that more and more research such as that under discussion is placing increasingly beyond doubt is that humans are born musical.⁴⁸ But this is not the same as saying that we are born *for* music, that is to say, that we evolved the mechanisms needed because they made possible the production and appreciation of the kinds of sound structures that we have come to think of as music. Our music-specific capacities and predispositions employ neural systems that most assuredly evolved to serve other functions which Pinker postulates and explores in turn in *How the Mind Works* (1997: 534-538).

Music and language

Pinker suggests that because music employs systems also employed by language (e.g. prosody) and because language and music share common or analogous features (e.g. how phrases are constituted and grouped hierarchically), that music necessarily “borrows” language’s “mental machinery” (535). This in turn suggests that our capacity for language preceded that for music in our evolutionary history. There are more and more theorists who argue compelling that Pinker has got it wrong in this key respect. Steven Brown (Wallin et al 2000: 271-300), for example, suggests that both capacities evolved from a common ancestor, what he calls —“music language,” basing his theory on his analysis of their respective phrase structures and phonological properties. Like language, music is a “combinatorial system” with a hierarchical structure comprised of acoustic elements that can be combined variously, this often leading, as it does in language, to recursion where a limited number of elements can yield an almost infinite range of expressive possibilities by embedding them variously in phrases and longer structures. That the capacity for recursion is unique to humans has been convincingly challenged and recent research has substantiated my own surmise regarding the vocalizations of some bird species wherein recursive elements seem evident (Marcus 2006: 1117-1118).

Steven Mithen agrees that music and language must have had a common ancestor and devoted his *The Singing Neanderthals* (2005) to substantiating John Blacking’s insightful surmise that “at the level of deep structures in music there are elements that are common to the human psyche, although they may not appear in the surface structures” (Blacking 1973: 108-9). In his *How Musical is Man?*, Blacking ventured that “what is ultimately of most importance in music can’t be learned like other cultural skills: it is there in the body, waiting to be brought out and developed, like the basic principles of language formation (1973: 100).” Mithen marshals and interprets evidence from archaeology and the fossil record, from primate research, from work in child development, and from cognitive neuroscience. The “common ancestor” theories of Brown, Mithen, and others are compelling and have important implications for questions around the kinds of musical behaviours that should be prioritized in music education. They will accordingly be returned to further along in this chapter as well as

⁴⁸ The number of studies that have placed this beyond dispute are many. Again, Wikipedia’s article on “[amusia](#)” provides a succinct, well referenced summary of what are strong points of agreement as to the nature of our innate musicality.

in the concluding chapter. For now, let us return to Pinker's postulations about music as a by-product of other capacities.

Auditory scene analysis

After language, Pinker cites auditory scene analysis as another evolved cognitive system that was needed if our forbears, including those that preceded hominids, were to gain an accurate sense of what was going on in their immediate environments on the basis how their ear drums (or analogous structures) were being caused to vibrate by waves of compression and rarefaction in the surrounding air (or water). Few if any natural sound-makers produce anything close to a *sine wave*, that is, a pure sound of fixed pitch. Natural sounds, like the sounds of musical instruments, are complexes of pitches that the ear and associated neural mechanisms in the brain must fuse together such that our perception corresponds reliably with an external reality of simultaneous sounds from different sound-makers that it was in our ancestors' interests to be able to differentiate and recognize. In the total mix of frequencies, those that are multiples of some 'fundamental' frequency get glued together by the brain because they most likely issue from the same source. Pinker points out how melodies employ fundamental frequencies that are harmonically related, that they are essentially "serialized overtones," and suggest that we find them pleasing, perhaps because, like symmetrical, regular, parallel, and/or repetitive visual patterns, they are linked to natural phenomena that for our ancestors were worth taking note of.

Being able to fuse overtones into a composite tone is of course an essential capacity for language given the need to differentiate different vowel sounds where fundamental pitch and other sound properties may remain constant (as in singing e-a-i-o-u to a constant pitch). But surely the ability to fuse overtones into composite tones is common in other species, none of which have language even though they may have much of the cognitive machinery needed for language, and many of which are vastly superior in their capacity for auditory scene analysis. Bats are the exemplars as intimated earlier. The case for the 'common ancestor' theory of language and music is strengthened by this realization, I believe.

A universal penchant for harmonic consonance (not as defined by any culture but by the mathematical relationship of their fundamental frequencies) as well as marked similarities in the emotional connotations attributed to intervals has been strongly indicated by research.⁴⁹ That these preferences and attributions have been entirely 'learned' (are socially constructed) is something that John Blacking doubted very much.

I find it hard to accept that there has been a continuous musical tradition between England in 1612 and Russia in 1893, in which certain musical figures have had corresponding emotional connotations. The only justification for such an argument would be that the emotional significance of certain intervals arises from fundamental features of human physiology and psychology. If this is so, some relationship between musical intervals and human feelings ought to be universal. (Blacking 1973: 68-9, quoted in Miller 2000: 90-1)

⁴⁹ Mithen cites a study by Oelman and Løeng (2003) that showed significant agreement in the emotional meanings attributed to particular intervals by individuals from markedly different musical, linguistic and cultural backgrounds.

Music, proprioception and kinesthesia

With mammals as with most insect species, precise movement is essential to survival and this involves some means of internally sensing motion, weight, posture, balance, and the location of body parts relative to each other. The capacities involved have been given the names *proprioception* and *kinesthesia* even though they do not stand for separate, independent processing systems. Kinesthesia tends to be applied where overt movement is involved even though the covert manipulation of the larynx and vocal tract when singing and talking is clearly kinaesthetic. But both kinesthesia and proprioception involve feedback loops between proprioceptors (sensory nerve endings in muscles, tendons, and joints), the inner ear, and a host of neural systems in the brain. The vital point from an educational point of view is that while the phenotypic machinery required is encoded for in our genes, how this gets expressed in actual behavioural capacities is dependent on experiential factors, in short, they have to be shaped and fine-tuned through learning. This fine-tuning, as I will argue in the final chapter, is something that should command far more attention in music education than is generally given except in programmes with a strong *eurhythmics* component.

Music and sentience

Pinker remarks on the fact that people find synchronous and metrically grounded movement pleasurable and gives pushing a child on a swing as an example (1997: 538). He suggests that music and dance offer a concentrated stimulation of such pleasures and cites the theories of Jackendoff and other music theorists interested in the psychological underpinnings of musical behaviour and responsiveness, who attribute the feelingfulness of music to its activation of patterns of tension and release that we are innately predisposed to find pleasurable. It strikes me as incongruous that Pinker does not find here a basis for positing music as an adaptation which like play activity (common in many species) helps to shape, fine-tune and optimize proprioception and kinesthesia. The fact that musical behaviour is ‘aesthetically driven’ (is pleasurable in other words) and the fact that it doesn’t yield “useful outcomes in the external world” is not problematic when, as Tooby and Cosmides point out, “the system driving the behaviour is designed to produce adaptive *internal* changes,” and “when the *external* price is not too great” (2001a: 16 - my emphases). There are several potential systems in this regard: play, dreaming, fiction, and babbling being likely candidates. Their ontogenic importance is critical if we agree with Tooby and Cosmides that: “the task of organizing the brain both physically and informationally over the course of the lifespan is the most demanding adaptive problem posed by human development,” one which they are convinced has been “vastly underrated” (14).

Emotional calls

Pinker interestingly makes the connection between sound productions that are natural and those that are contrived even though he doesn’t speak to this connection in these terms. Many species communicate emotional states through calls that are not learned but innate, for example; moans, growls, whines, purring, cooing, and so on. Pinker

remarks that we can find many of these as inflections and expressive devices in the singing of popular vocalists. I have remarked elsewhere on the melismatic moaning that is a signature of most R&B and I have little doubt that it is erotic in intent even if unwittingly so.⁵⁰ What Pinker does not appear to grasp is that the capacity for contriving and effectively performing a sound production could in itself be an adaptation if it is was successful in communicating information important to the reproductive interests of oneself and/or that of a prospective mate.

Music and sexual selection

Drawing from Dawkins and Krebs (1978), Miller (2000) emphasizes that it is essential to think of music as a “set of signals emitted to influence the behaviour” of others. As to what is communicated, Miller is convinced that the most important Pleistocene message was: choose me as your mate! This is an answer implicit in Darwin’s own theory on the origins of music.⁵¹ Darwin theorized that human music evolved to serve the same purpose that bird song serves for birds, that is, as a courtship display. In developing his theory of the evolution of human music through sexual selection Miller takes up Darwin’s idea which he feels has been “dismissed too readily” (2000: 355), convinced that there are definite functional analogs between music and the ways a large number of other species use sound and movement in attracting and choosing mates. The core premise in his thinking is that the calls, songs and dances (as well as a host of visual stimuli such as bright plumage, size, skin quality, physiological symmetry, etc.) are fitness indicators, but they can only function as such provided that there are evolved psychological mechanisms in prospective mates that incline them toward those attributes most indicative of strong genes. A peacock’s exorbitant tail is of no account if peahens fail to be impressed by it. As regards acoustic courtship displays, Darwin spoke to this seemingly obvious point in *The Descent of Man*: —“unless females were able to appreciate such sounds and were excited or charmed by them, the persevering efforts of the males, and the complex structures often possessed by them alone, would be useless; and this is impossible to believe” (1887: p. 878 quoted in Miller 2000: 332).

As to the specific forms of fitness that musical behavior (including dancing) could provide an indication of, Miller posits several, some related to general physiological well-being (e.g. aerobic fitness, strength, motor control) but others more psychosocial (e.g. self-confidence, extroversion, creativity and the capacities for sequencing complex movements reliably and for automating complex learned behaviors). Miller does not speak of kinesthesia or proprioception, but they are fundamental to everything on his list (Miller 2000: 340). He concedes that what he posits in this regard is still speculative but is confident that any indicator hypothesis can be subjected to empirical testing.

⁵⁰ Which makes ironic in a humorous way that the same vocal device has found its way into so much so-called Gospel music, much of which strikes me as R&B but with different words about loving Jesus vs. loving what we got up to last night.

⁵¹ Miller (2000: 329) quotes the following from *The Descent of Man* (1871) in which Darwin devoted six pages to human music: —“. . . it appears probably that the progenitors of man, either the males or females or both sexes, before acquiring the power of expressing their mutual love in articulate language, endeavored to charm each other with musical notes and rhythm.” (Darwin 1871: 880)

Sexual selection vis-à-vis natural selection

Before exploring Miller's theorizing in more depth, it needs to be made clear that sexual selection is not something different from natural selection; it is merely one of the ways in which the natural selection algorithm presented in Chapter One plays out such that genes with sexually advantageous phenotypic results (like success in securing a quality mate) get replicated more often than those with less. But what is special about sexual selection is that it necessarily is *relational* (and hence social), involving as it does the reproduction interests of another member of one's species who is genetically alike in crucial ways, essentially sharing the same traits, but different in particulars that affect and constrain how these traits get expressed phenotypically.

Bateman's principle

While a mate has just as much 'interest' in genetic propagation as oneself, she or he is different in important respects as regards the innate cognitive biases that influence choice of mate, biases which entail different cost factors. This is for the simple reason that males and females have different investment interests, this because of differences in what reproduction requires of them, what it costs them in the expenditure of time, effort and resources as well as how it may affect their survival prospects (by becoming more vulnerable for example). The British geneticist, Angus John Bateman, advanced the theory which has for long been accepted as a principle in Evolutionary Biology and EP and which has been given his name. *Bateman's principle* holds that the disproportionate energy expended by females in having children is a limiting factor on fertility that leads naturally to a situation where males compete for females and are comparatively more promiscuous, and where females, the limiting sex, are more cautious and discerning when choosing a mate (Bateman 1948). This does not imply that males are not choosy. Both sexes are 'looking for' many of the same attributes, in particular, those that signify health and vitality, such as skin, teeth and hair quality, anatomical symmetry, clarity of eyes, good posture and general behavioral traits that reveal cognitive normality or deficiency.

Men may (but also may not) invest considerable time and effort in providing for, nurturing and protecting offspring, but when it comes to producing offspring, they have it comparatively easy. They have no direct participation in gestation, lactation or most of the rigors of infant care, here remembering that the cost of having the amazing and necessarily large brains we have was that children have to be born prematurely and remain essentially helpless for far longer than is the case in any other species.⁵² Moreover, whereas a woman has only around four hundred eggs which reduce in number by one or two every month until menopause, men produce millions of sperm in a day and can impregnate almost any number of women, circumstances provided; and they are not forced by circumstances to provide for the nurturance, protection and material needs of their offspring. Neither do they have their sexual productivity arrested for extended periods following successful conception (gestation + lactation). Men vary in relation to their proclivity for parental investment and obviously a woman's success

⁵² It is in the foundational intimacy between mother and infant that Dissanayake (2000) roots her adaptationist theory of the origin of the arts, as will be engaged with further along.

in getting her genes replicated is enhanced by having a mate who cares and provides though this is clearly less a necessity now than was the case in the Pleistocene. But we are all still innately disposed toward finding optimal mates, those with the best genes and accordingly we are innately biased toward and sensitive to whatever indicators of genetic fitness are available to the senses. But a man can clearly afford to be less discriminating and cautious, not to mention, less faithful.

Add status and competitiveness to the mix

Competition is a principal cog in the natural selection algorithm. With many species, including ours, females may and do compete with other females in efforts to secure a preferred male, but it is rare among mammals that females physically compete through fighting and demonstrations of strength and physical prowess. It is quite another story with males as is and always has been manifest in their behavior, especially when hormonally primed. In some species, males are particularly aggressive and may even fight to the death over who is to get access to females. Where physical conflict has for long enough been a significant selective force, physical traits that provided the needed edge evolved as secondary sexual characteristics, horns, antlers and extraordinary body mass being good examples. However, physical combat in which a male runs the risk of serious injury or death is what one would assume to be a weaker force in natural selection. And, as is easily confirmed by spending some time among mammals in the wild, sparring and other shows of bravado are much more the norm than fights to the death.

Far better are traits that dissuade other males from attempting to thwart one's access to females, that accord one higher ranking in the pecking order, without engaging one in energy sapping, dangerous conflict. An impressive set of antlers need not get put to the test if other males defer to the possessor's status and allow him preferential access to females and food without challenge. And the indicators that serve to establish a pecking order need not be weapons like horns or antlers. Any trait that conveys superiority can impress other males just as much as it can impress potential mates, and it is safe to assume that such traits can be behavioral just as they can be anatomical. Prowess of any kind can serve in this way.

Music and machismo

The dominance of males in jazz and its conspicuous elements of machismo come to mind in this regard. Even its parlance speaks to this: instrument = *axe*; virtuosity = *chops*; good/well = *mean* (as in —~~H~~ plays a mean axe.""). Demonstrating one's improvisational chops and challenging established *lions* were the *raison d'être* of *cutting sessions* in Charlie Parker's time, which have their modern day equivalent in the emcee *battles* of Hip Hop, also a male dominated culture. Miller (2000: 337) notes Miles Davis's surmise that having sex before an important performance takes away the sexual edge needed by male musicians and athletes. In many Gangsta Rap videos, there is a bevy of scantily clad bitches moving seductively behind the rapper, generally a muscular, bling heavy, unashamedly misogynistic, mother-f..ker whose

deportment and gestures (including the ubiquitous downward sweep of hand assuming a gun shape), all say: “Don’t f..k with me!”⁵³

Art and status

One Darwinian understanding of the arts for which there is considerable support is that they came into being, to a significant degree, as a response to our innate need for status, what is undeniably one of the strongest motivators of human behavior. The acquisition of it brings satisfaction and the lack or denial of it brings disquiet and even despair. A great many commercial advertisements are designed as appeals to it and the mass media continuously reinforces what people, particularly the young, have for long been conditioned to believe, that status is critically dependent on having all the right stuff, those things which mark one as cool in the eyes of one’s peers and hence increases one’s popularity, e.g. name-brand clothes and particular models of cell phone. Many of them maintain this materialistic bent late into life kept unwittingly in line by a continuous barrage of messages coming from all sides that are all saying “Spot on! This is how life was meant to be.” No sensible capitalist would have it otherwise.

Of the Four Fs, Feeding, Fighting, Fleeing, Fornicating, status is most closely allied with the last. In thousands of species including our own, passing on one’s genes requires securing a mate and not just any mate will do. The genes with which one’s own are to be mixed should be of the highest possible grade. Accordingly one intuitively seeks a mate who has the physical attributes most indicative of genetic fitness, e.g. smooth, unblemished skin, a certain hip-waist ratio, muscle mass, physical symmetry, hair quality, strong white teeth, agility, good hearing, good eyesight, good parents, and so on. Secondary (usually) to these are behavioral and psychosocial indicators, demonstrations of skill, talent, creativity and personality. To such physical and behavioral qualities are usually added material indicators (property, wealth, clothing and adornments). The relative importance accorded specific traits may and often does vary from culture to culture, but there is a great deal of overlap and the broad requirements seem to be common to all, e.g. tangible health, physical prowess and material wealth. Moreover, with globalization there is a steadily increasing homogenization of culture. Even though people may still identify strongly with an ethnic past and partake of some of its customs, most have fallen into step with the ideology of consumerism and regard material wealth as a key criterion in the determination of status. And it has happened so easily, it is as if people come prewired for it; we are born consumers just as we are born status-seekers.

Throughout human evolution having high status has been the surest means of securing a mate and so evolution has given us a strong appetite for it, different to but just as intense and critical as the sex urge. (And so it is for many other species.) It has to be strong because the pursuit, acquisition and maintenance of status are expensive in terms

⁵³ In *The Stuff of Thought* (2007), Pinker makes an adaptationist case for taboo words, positing that they “tap into deep and ancient parts of the emotional brain.” (331) One phenomenon that he invokes as evidence pointing to his theory (which seems so intuitively right for those like me who let loose occasional expletives) is that aphasics, while losing the capacity for articulate language, more than often retain the ability to swear. (334)

of time, energy and material costs; but evolution determined it to be worth the price, for our ancestors at least. With a population of close to 7 billion and being such a resource hungry species, the propagation of our genes, no matter how powerful our innate inducements, cannot continue to run unabated.⁵⁴ Neither can be sustained the excessive consumption that is driven by our craving for status. But our genes are not aware of this or care in anyway. They continue to instruct the development of organisms with the same ultimate purpose – reproduction - just as they did in the Pleistocene.

Status vis-à-vis Maslow's needs

Interestingly, Maslow did not include status as a need in his well-known hierarchy. It might be argued that he did accommodate it, in part at least, by the needs for social acceptance (love/belonging) and for esteem (including self-esteem and the respect of others), but it is clear Maslow wasn't thinking of the kind of felt need that drives the acquisition of such accoutrements of status as a luxury motorcar, bling jewelry, and Gucci shoes, which like a peacock's tail may be inimitably gaudy and intrinsically worthless, but are treated as if they were valuable and *are* valuable because everyone treats them that way" (Pinker 1997: 494). Abraham Lincoln was right in saying that: "You may fool all of the people some of the time; you can even fool some of the people all of the time; but you can't fool all of the people all of the time."⁵⁵ But he failed to include the more evolutionarily pertinent axiom that you can fool *most* of the people *most* of the time. This is all that consumerism and capitalism actually require. People the world over follow fashion in their apparel, accessories and behavior, and they do so without question as to the rationale for such behavior; it is just how things are done, it feels natural and it supposedly makes people happy. For men, a suit and tie has almost universally become a marker of status, especially one's professional ranking and socioeconomic class. It is not however, as we must all realize, a reliable indicator of competence or moral integrity; the conduct of too many prominent "suits" in the political and corporate world (arguably one and the same) has mortally undermined any such supposition.

Status belongs closer to the base of Maslow's pyramid where it is more about surviving and "getting laid" than about integrity or getting respect. Being near the bottom, however, is not in itself a denigration or devaluation of status, just an acknowledgement of its more fundamental adaptive value. Status is a need that must be gratified before other needs can become motivators of behavior.

On music and gender

In examples like those found in much Jazz and Gangsta Rap, the concern seems as much with establishing rank in some pecking order as it is with impressing females. And one might see the higher level of aggressiveness and competitiveness in male-dominated musical practices to have some explanation here. Of course, there is a great

⁵⁴ It took all of the hundreds of millennia up until sometime in the mid 19th century just to reach a population of 1 billion!

⁵⁵ Attributed to Lincoln by among others - Alexander K. McClure (1904: 184)

deal of music that is not so conspicuously gendered and it seems clear enough that the production and reception of musical displays has comparable pleasures for both sexes. This might be expected given that whatever it is that is being communicated through musical behavior is usually being communicated intrasexually as well as intersexually. That there is a great deal of similarity in how men and women relate to music, that they both engage in its production for example, was not problematic for Darwin in relation to his theory of music's origins, having posited several sexually-selected traits present in both sexes. Miller (1998:) makes the important point that evolved courtship traits are relatively recent in evolution and that the dimorphism that is clear to see in the plumage of many bird species is most likely to be "quantitative" which I understand to mean that the difference is more of degree than kind. In many bird species the differences in male-female plumage is subtle if at detectable by human eyes. In some cases, like the peafowl, the difference is profound suggesting an acceleration of sexual selection that begs explanation. The theory of runaway selection is taken up a bit further along. Here we need to consider in some depth at least, what it is that could be underlying psychosocial gender differences that seem so strongly suggested by the examples in the preceding paragraph as well as by the gendered nature of most traditional musical cultures?

On sexual dimorphism

Given such different investment interests related to reproduction, it seems logical, if we accept Darwin's and Miller's theories of music's origins, to expect at least some differences in how males and females relate to and engage in musicking in its varied forms. In considering this possibility, it helps to have some understanding of *sexual dimorphism*, i.e., evolutionarily driven differences between males and females in how genetic traits get expressed. This understandably is a controversial subject when it enters into theorizing about psychosocial differences between men and women.

Given that a child inherits a copy of every gene contributed by both mother and father, the traits that it develops are a combination of those of its parents and this makes perplexing how it is that males and females diverge as they do giving rise to the dimorphism that is so obvious in the physiological differences between male and female gonads, genitalia, breasts, muscle mass, average height and body hair, to cite only the more obvious examples. The evolution of these differences requires that a common trait (a pelvis for example) be "uncoupled" at the genetic level which happens if the trait in question is, in its ontogeny, under the control of genes located on sex chromosomes or if the gene has evolved such that how it is expressed depends on chemical triggers that are gender specific. *Genetic correlation* is the term applied to dimorphous traits with the same genetic basis, and, as Simons (2003) emphasizes, it is the "evolutionary default." He makes this all much clearer in the following passage (with my emphases).

The uncoupling of male and female traits occurs if there is selection for it: if the trait is important to the reproductive success of both males and females **but** the best or "optimal" trait is different for a male and a female. We would not expect such an uncoupling if the attribute is important in both sexes and the "optimal" value is similar in both sexes, nor would we expect uncoupling to evolve if the attribute is important to one sex but unimportant to the other. The latter is the case for nipples. Their advantage in females, in terms of reproductive success, is clear. But because the genetic "default" is for males and females to share characters, the presence of nipples in males is probably best explained as a

genetic correlation that persists through lack of selection against them, rather than selection for them. ... In a sense, male nipples are analogous to vestigial structures such as the remnants of useless pelvic bones in whales: if they did much harm, they would have disappeared. (Simons 2003 – online article)

Apropos the inference that sexual dimorphism is more the exception than the norm, Pinker reminds us that where gene propagation is the bottom line, being male or being female are, on average, “equally good strategies” and natural selection thus tends toward an equal investment in the two sexes: equal numbers, an equal complexity of bodies and brains, and equally effective designs for survival” (Pinker 2002: 343). Miller is convinced that capacity for both the production and reception of music benefited both males and females in the mating game and he finds it not at all surprising that there is not a greater degree of sexual dimorphism in human cognitive capacities generally given “the mutuality of mate choice, the interactiveness of courtship behaviors, and the overlap between perceptual capacities for judging complex behaviors and motor capacities for generating complex behaviors” (Miller 1998: 117). In this regard, I have yet to locate any credible research in musical aptitude that indicates any significant difference between male and female in such specific capacities as are ‘measured’ by music aptitude tests.

Sexual division of labor

Mate procurement is not the only selection pressure that acted on our ancestors in ways different for male and female. Also having wide acceptance in Evolutionary Psychology is that sexual dimorphism was partly driven by a *sexual division of labor* that became exponential in its overall evolutionary impact when our distant ancestors acquired the means of hunting large game (Buss 2008: 82). In fact, it was the availability of quality protein that evolutionary psychologists such as John Tooby assume to have accelerated the increase in size and capacity of the human brain which made possible and which was driven by complex cognitive adaptations such as language and tool-making (Tooby and DeVore 1987). For Pinker this makes perfectly good sense and he supports the hypothesis with the observation that:

Across the mammals, carnivores have larger brains for their body size than herbivores, partly because of the greater skill it takes to subdue a rabbit than to subdue grass, and partly because meat can better feed ravenous brain tissue. (Pinker 1997: 195)

The assumption that is born out by studies of existing hunter-gatherer societies is that hunting was primarily the work of males who were and continue to be better suited to hunting by virtue of their larger size, higher level of upper body strength, increased running speed, and superior skill in throwing projectiles. Moreover, males unlike women are not diverted for extended periods by pregnancy, lactation and infant care. That this contributed to sexual dimorphism in psychosocial characteristics has been strongly suggested by research indicating sex differences in spatial abilities. The hypothesis that Silverman and others have tested empirically is based on the observation that hunting, which includes tracking, trapping, and ways of killing employs different kinds of spatial cognition than does foraging (Silverman & Phillips 1998) (Eals & Silverman 1994) (Silverman, Choi & Peters 2007) (Laiacina, Barbarotto, & Capitani 2006). If indeed hunting was a principally male task while foraging was done mostly by women, one would expect men to demonstrate higher levels of performance in those

spatial tasks where ability is key to success in hunting, e.g. being able to maintain one's orientation geographically while on the move (not getting lost) and to effect the mental transformations needed for accuracy in throwing projectiles. On the other hand, foraging is served by different spatial abilities which according to Silverman require superior peripheral vision as well as the ability to perceive and remember spatial arrays of objects that locate edible plants (Silverman & Eals, 1992: 489, 514-515) and one would expect women to perform better than men on tasks that employ these abilities. One would also expect differences in the way males and females might relate to such tasks as regard interest, confidence and the pleasures to be derived.

Quantitative differences between the sexes

Other psychosocial differences that Pinker considers to have been strongly indicated by research are discussed in his chapter on "Gender" in *The Blank Slate* (2002: 337-371). I have abstracted these as follows. Compared to women, men:

- are more inclined toward ~~no~~-strings sex with multiple or anonymous partners," the clear evidence for this being ~~the~~ almost all-male consumer base for prostitution and visual pornography."⁵⁶
- are, even as young boys, more physical and violent in their pursuit of status and in competition and conflict generally.⁵⁷
- are much more prone to dyslexia, autism, learning disabilities, attention deficit, emotional problems, and certain forms of mental retardation.⁵⁸
- place more value on status and its material markers and are more willing to take risks and undergo discomfort in the pursuance thereof.

Compared to men, women:

- ~~are~~ more sensitive to sounds and smells, have better depth perception, match shapes faster, and are much better at reading facial expressions and body language";
- ~~are~~ better spellers, retrieve words more fluently, and have a better memory for verbal material";
- are far less likely to resort to violence in matters concerning personal status, tending rather toward ~~derogation~~ and other forms of verbal aggression";
- are more solicitous toward offspring and sensitive to their discontents;⁵⁹
- with the possible exception of anger, experience emotions more intensely, are more intimate socially, feeling greater empathy toward friends;
- tend more toward humanitarian involvements and toward academic programs in the arts, medicine, law, and the humanities over math, science and engineering where males evidence greater interest.⁶⁰

⁵⁶ refers to: Salmon & Symons (2001)

⁵⁷ refers to work by Geary (1998) and Maccoby & Jacklin (1987) showing that young boys give much more time than young girls to ~~rough-and-tumble~~ play."

⁵⁸ refers to: Blum (1997); Geary (1998); Halpern (2000); Hedges & Nowell (1995); Lubinski & Benbow (1992).

⁵⁹ refers to: Hrdy, S. B. 1999. *Mother nature: A history of mothers, infants, and natural selection*. New York: Pantheon Books.

The fact that autistic males outnumber autistic females four to one is particularly significant.⁶¹ Autism, which is now understood to have a strong genetic basis, is the result of abnormal neural development resulting in deficits in ability to communicate, socialize and to engage in novel behavior. As many as 10% of autistic individuals display unusual, even extraordinary talents. Savantism is a related neurological disorder with at least half of savants being autistic, the rest usually having other cognitive disabilities. Male savants outnumber female savants six to one (Treffert 2009). Of the thirteen musical savants Leon Miller (1989) describes - all of whom had perfect pitch - ten were male. In noting the similar gender bias in respect of autism, Mithen (2005: 43) suggests that this —~~may~~ be a reflection of a general difference between male and female cognition which leaves the former particularly susceptible to deficits relating to language and the ability to empathize with other people's feelings.

On sexism and feminism

It cannot be doubted that definitions of what constitutes masculinity or femininity have changed through time and can vary in particular ways from one culture to another. But not to acknowledge the obvious commonalities or to not even consider an evolutionary approach to the issue seems irresponsible to me. Donald Symons is unequivocal in his conviction that female and male humans have psychological natures that —~~are~~ extraordinarily different,” because —~~throughout~~ the immensely long hunting and gathering phase of human evolutionary history the sexual desires and dispositions that were adaptive for either sex were for the other tickets to reproductive oblivion (Symons 1979: 461).”⁶² Pinker has noted the tendency in the Social Sciences and Psychology to dismiss Symon's two human natures as —gender stereotypes.” But, as Pinker suggests, even if they are, this provides no proof that they are false (1997: 461). The differences, if my reading of Symons is correct, are greater psychologically than behaviorally, which if true suggests strongly culture's capacity to homogenize and make compatible. As most would regard this in a positive light, it would seem incongruous that traditions of single sex education are maintained on the scale they are. My experience of South African boys schools points to a continued upholding of anachronistic Victorian ethos of muscular Christianity.

At a theoretical level at least, it seems entirely plausible that there could be at least some degree of dimorphism when it comes to musical sensibilities; there is nothing that can adequately refute such a strong possibility even though the tendency is to attribute any and all apparent differences to social conditioning. There is a sense that any concession toward sexual dimorphism when it comes to psychosocial traits is inevitably retrogressive politically and socially, that acknowledgement of psychosocial differences between men and women is too easily co-opted to grant a biological sanction to human institutions and policies that sustain gender inequality and a sexist status quo in general. I have yet to come across any credible research on innate gender difference that has been so co-opted and it is significant that women feature so prominently in EP and the

⁶⁰ refers to research done by Lubinski and Benbow (1992).

⁶¹ Just search “autistic males females four to one” with Google to confirm what is widely accepted.

⁶² quoted in Pinker 1997: 461.

Neurobiology of Sex.⁶³ The late sociologist and feminist, Miriam M. Johnson, acknowledged that research on sex differences in brain functioning made probable innate psychosocial differences. In her favourable review of Donald Symons' *The Evolution of Human Sexuality* (1979), she concluded with the following caveats.

As the pendulum in the old nature/nurture dispute swings back in the direction of nature, it need not herald a new conservatism, but instead can allow for a more exact and sophisticated understanding of the complex ways in which biological factors are related to psychological and social ones. As research continues in the biological sciences, the problem is likely soon to become not one of whether differences in psychic functioning between the sexes exist, but of how we are to conceptualize both the nature and the meaning of these differences. While Symons himself is neither a sociologist nor a feminist, the implication of his analysis for those of us concerned with achieving equality and justice for both sexes may well be that nothing is gained by denying sex differences. Sexism is not a result of male/female differences so much as it is of what we make of them. (Johnson 1980: 792-3)

Anne Campbell (1999), in her study of women's intrasexual aggression, is convinced that there are gender differences in this regard that are the result of natural selection and differing reproductive investment interests. But she is just as convinced that these evolutionarily based sex differences have been "enhanced" in patriarchal society, where "men have held the power to propagate images and attributions which are favourable to the continuance of their control" and where any expression of aggression by females is stigmatized as "gender-incongruent aberration" that is thus irrational (Campbell 1999: 203-214).

Gender differences in music and music education domains

While research has yet to show any significant differences in musical aptitude between the sexes, what has been suggested are differences in ***inclination toward*** and ***preferences for*** different forms of musicking. A study conducted by Lucy Green (2007) is notable in this regard. It entailed a questionnaire survey of 78 secondary school music teachers from different parts of England as well as tape-recorded interviews with 69 students. In both cases the questions were designed to tease out the "implicit assumptions, values and expectations" underlying their responses. With substantial tracts of Green's article it is easy to do a mind shift and imagine it to be a validation of the notion of sexual dimorphism in musical sensibilities. If Miller, Pinker, Symons and other Darwinists were reading the article, I can imagine them nodding their heads from time to time. Yet Green does not even consider the possibility that the significant differences she noted in her research might be rooted in differential gene expression such as accounts for the afore-mentioned morphological differences. In Green's view, femininity and masculinity in musical behavior and attitudes are social constructs with a long history and she regards common music education practices (in England at least) as complicit in their continued existence. Indeed, the purpose of her

⁶³ In *The Blank Slate* (2002: 342), Pinker names over thirty and the number of woman authors cited in this study suggests a growing awareness that innate gender differences are not problematic nor are they grounds for sexism and gender inequality. But neither are their grounds for portrayals of Sociobiology and EP as inherently sexist.

study, as her title makes clear, is “exposing the gendered discourse of music education” (Green 2002: 137).

Green does not speculate as to the origin of these constructs and in this regard we are reminded of the extent to which traditional music making cultures the world over are gendered in terms of musical roles and modes of engagement. There is no doubting that society and culture provide all kinds of stimuli that incline maturing males and females toward stereotypical dispositions and behavior. All learning requires innate mechanisms, as has been demonstrated, and it is clear that none of these are exclusive to one sex or dimorphic in the sense of one sex having it as a non-functioning feature like male nipples. But research in Evolutionary Psychology has shown to be highly likely that there are innate quantitative differences in proclivities and cognitive styles and it seems logical that they should manifest in differences in the ways in which male and female relate to and engage in behaviors that are interpersonal, which music so comprehensively is. If sexual selection has been the strong force in the evolution of our musicality, such differences are surely to be expected.

What emerges from Green’s article even though she doesn’t address it directly is that music education practices, in England at least, favor performance activity that does not demand the kinds of demonstrativeness and creative spontaneity that jazz does, especially where the focus is on improvisation. Neither do other dominantly male popular forms like Hip Hop feature as far as I can tell. Green interviewed 78 secondary school music teachers and what she found most remarkable about their responses was that boys surpassed girls in composition and that this was characteristically attributed to their being “more imaginative, adventurous and creative” (2002: 139). One of Green’s arguments is that because girls have been stereotyped as more perseverant, obedient and committed to work, they have accordingly been “constructed as failing” given that these attributes, Green argues, have been construed to imply a corresponding “lack of autonomy, creativity and initiative.”

In her USA-based study “Education, Gender and Participation in High School and College Instrumental Jazz Ensembles,” Kathleen McKeage (2004) found women to be significantly less confident with improvisation and generally less comfortable in jazz as opposed to other instrumental ensembles. Like Green, McKeage does not give any consideration to the possibility that such trends could be informed at least in part by biological predispositions. Indeed, as pointed out in Chapter One, I have come across very little in the Philosophy of Music Education that makes any allowance for adaptationist conclusions regarding our psychosocial commonalities and differences, and this, in the main, is the problem that I am most concerned with tackling in this study. In Chapter One I ventured to characterize a “blank slate” view of human nature as *errant nonsense*. I would not presume to categorize scholars like Green and McKeage accordingly, even though it cannot be denied that the theoretical constructs that are most friendly to feminism and to social constructivism are: —the Blank Slate — if nothing is innate, differences between the sexes cannot be innate — and the Noble Savage — if we harbor no ignoble urges, sexual exploitation can be eliminated by changing our institutions” (Pinker 2002: 339). Often coupled with the notion that psychosocial gender differences are entirely social constructs, is that the central and all-encompassing issue in our interactions with one another is *power* and how it is exercised by groups in their dealings with other groups, a thrust that is mainstream in postmodernism. Such thinking is what Pinker, borrowing from Sommers, calls *gender feminism* which he

distinguishes from *equity feminism*, the difference being that the latter is concerned more with how women are treated than with how they are understood epistemologically. At its extreme, gender feminism holds that we are born *without* a sexual identity in any psychosocial sense, that patriarchal society quickly transforms us ~~into~~ male and female gender personalities, the one destined to command, the other to obey” (Pinker 2002: 341 quoting from Sommers 1994).

In her review of McClary’s *Feminine Endings*, DeNora sums up the author’s position and that of many social constructivists regarding music as social discourse.

[B]eneath the technical consciousness of musicology, composers, analysts, and listeners share historically conditioned conventions of musical common sense - "semiotic codes" that are as much a part of the music that accompanies Saturday morning cartoons as they are of the symphonic repertoire. From here, her work develops the notion that musical habits provide structures within which experience-musical and otherwise - can be channeled and where, in other words, the work of social formation occurs. (1993: 117)

On social constructivism and music

It is noteworthy that she speaks of conventions as being historically conditioned (as opposed to constructed) and McClary offers cogent examples as evidence of the extent to and ways in which music is gendered. However, certain questions come to mind that EP and Gene-Culture Coevolution Theory would be, and in many cases, are concerned with addressing.

It would be impossible to pin down when exactly the history of social construction began, when it was that social arrangements began to exert a significant influence on how people think, feel and act. Steven Mithen (1996) suggests that it was relatively recently, between 100,000 to 50,000 years ago, when our species acquired ~~“~~“cognitive fluidity” meaning that different brain modules started accessing each other and working interactively, this prompting a blossoming of creative capacity as evidenced by the appearance in the archaeological record of tools requiring the assembly of parts as well as artifacts indicating spiritual belief and the capacity/inclination for elaboration through “artistic’ means. But it has to be assumed that whatever it was that comprised “society’ at that point had to have something to work on in order to kick-start the historical process that led to the ~~“~~“semiotic codes” that inform modern day musical sensibilities. The point that I find inescapable is that there *must* have been some initial, innate ~~“~~“musical common sense” that social conditions and contingencies subsequently worked with and shaped. In my discussion of cognitive adaptations which music taps into (e.g. language, auditory scene analysis, proprioception), it was suggested that musical perception is biased toward features in sound structures that are consonant with the way our hearing and psychomotor mechanisms have evolved as regards both tonal and temporal stimuli, these jibing with the physical attributes of sounds emanating from discrete sound sources (their overtone structure for example) and with the kinesthetic/proprioceptive mechanisms that allow us to be successfully bipedal and capable of tasks involving fine motor control, coordination, and the ability to synchronize movement.

As I posited right at the beginning of Chapter One, society is not a coherent, volitional entity. Rather it is what people do in their interactions with one another and it is only

when there is some pattern of commonality in the doing that we can begin to speak of a society. Apropos this conception is the definition of ‘culture’ given by Tooby and Cosmides, i.e. “the serial reconstruction and adoption of representations and regulatory variables found in others’ minds through inferential specializations evolved for the task” (Tooby & Cosmides 2000 – online source).

If one is to insist that musical sensibilities are social constructs, it seems expected that one must account for our social sensibilities (which have been argued to be quantitatively different for males and females), especially if music is taken to be an expression of these as well as an important structure for channeling and mediating experience and thus for shaping these sensibilities. The importance of music in this regard can, indeed must, have evolutionary explanations and it seems incongruous not to consider what they might be if the ultimate concern is to understand how music’s social function actually plays out and gets shaped by environmental constraints. Granted that it is still early days for Evolutionary Psychology (EP) and much is speculative, but an important caveat is that it is not speculation awaiting better speculation, but rather hypotheses that with increasing frequency and rigor are being subjected to empirical testing.

The other confounding matter for social constructivist understandings of music is music’s ubiquity. Differences from musical culture to musical culture do not obscure the commonalities, not only in the particulars of the sound constructions they produce, but in the ways people engage in music and the values they attach to it. Here I am thinking not so much of the rarefied realms of art music, but of music as it is and has been experienced and valued by the vast majority of people. Here it is apropos to consider McClary’s position on meaning in music.

Like any social discourse, *music is meaningful precisely insofar as at least some people believe that it is* and act in accordance with that belief. Meaning is not inherent in music, but neither is it in language: both are activities that are kept afloat only because communities of people invest in them, agree collectively that their signs serve as valid currency. Music is always dependent on the conferring of social meaning - as ethnomusicologists have long recognized, the study of signification in music cannot be undertaken in isolation from the human contexts that create, transmit, and respond to it. (McClary 1991: 21 - my emphasis)

Surely you don’t have to believe music to be meaningful for it to be so, anymore than you have to believe honey to be sweet in order to experience its sweetness. Indeed most people probably do not give the matter much thought. They just enjoy music and through it experience feelingful states that are pleasurable and that may even be emotionally profound and socially significant. Making music is a way of making experience meaningful and in many if not most cases, the experience is social insofar as through it we orientate ourselves in relation to one another and celebrate our relationships. But if asked, most people will say that they believe music to be meaningful in the sense of being an important if not essential dimension of life. How can it be that such a belief, even if tacitly held, is so evidently universal?

The argument that “meaning is not inherent in music” is for me a *non sequitur* for the simple reason that meaning cannot inhere in anything; it must be assigned by some assigning agent even if, as is most often the case, it is not done consciously. But are we not just playing with words here? Meaning is assigned, or at least meaningfulness is

experienced, largely according to the nature of whatever is being perceived. If it is something made by humans, its nature has been shaped so as to be meaningful, even if not in an explicit or even an intentional way. In any case, the point is that the experience *is* meaningful and one must expect some congruence in the ways people find it meaningful. If there was no such congruence, music could not convey anything and would likely not exist. This congruence is especially to be expected when there is a great deal of commonality in terms of the kinds of music and musicking people have experienced and the contexts in which they have experienced it. But then, how is it that music can be meaningful for people outside of the culture and who are perhaps oblivious to the music's 'original' context? Perhaps, it can be argued, that while meaningful to the outsider it is meaningful in fundamentally different ways. That may be true in respect of referential meanings associated with esoteric spiritual and ontological belief systems, but when it comes to the perception of ways in which tonal, timbral and temporal elements have been structured into aural and kinesthetic events, I believe we have more in common than not, as I intimated earlier when positing an innate musical sensibility.

Different cultures provide different contexts for music making and its reception and hence there are differences in the meanings that are conveyed. But each and every context is firstly a human context whose very possibility rests on the capacities and proclivities that we share and with which we achieve purposes and functions that are also shared: eating, raising offspring, acquiring and demonstrating status, courting, securing alliances, worshipping, celebrating, story telling, gossiping, and several others.

On „runaway selection'

The peacock's tail is ridiculous in terms of its obvious costliness in terms of energy expenditure and survival prospects (making the peacock more conspicuous and cumbersome), but perhaps not so ridiculous as a fitness-indicator for peahens to take notice of.⁶⁴ Surely evolution should select out traits disadvantageous to survival and thus to reproduction. But if a trait sufficiently increases a male's prospects for securing a mate, it may prove the stronger selective force. Moreover, males that can handle such costly extravagances and survive successfully are males that are most likely fitter and possessed of superior genes. Because the trait is heritable, a male offspring is likely to be similarly endowed and thus more successful in passing on his genes, half of which come from its mother who thus has her own genetic interests catered for by passing on her genes to such offspring. Over eighty years ago, the evolutionary biologist RA Fisher (1930) proposed that because assortative mating results when females favoring a trait become more numerous in the environment of selection than available males possessing the trait, a feedback loop is established that causes evolution to runaway with itself producing traits that seem anomalous from a survival perspective. This runaway effect will continue, according to Fisher's theory, until such time as the survival costs take

⁶⁴ The tail of the Long-tailed Widowbird (*Euplectes progne*) is another example with which fellow South Africans are likely to be familiar.

over as the stronger selective force and an asymptote is reached (Miller 2000: 342).⁶⁵
For Miller:

[t]he power of the runaway theory is that it can explain the extremity of sexual selection's outcomes: how species get caught up in an endless arms race between unfulfillable sexual demands and irresistible sexual displays. Most relevant for us, the preferences involved need not be cold-blooded assessments of a mate's virtues, but can be deep emotions or lofty cognitions. Any psychological mechanism used in mate choice is vulnerable to this runaway effect, which makes not only the displays that it favors more extreme, but makes the emotions and cognitions themselves more compelling. Against the claim that evolution could never explain music's power to emotionally move and spiritually inspire, the runaway theory says: any emotional or spiritual preferences that influence mate choice, no matter how extreme or subjectively overwhelming, are possible outcomes of sexual selection. (343)

Artificial selection vis-à-vis natural selection

Peafowl have been domesticated for at least two thousand years which suggests that the asymptote for the peacock's tail and the _turn on' the peahen experiences may have been pushed higher by virtue of having lived long-enough in environments less threatening than their natural habitat and thus more accommodating of such a spectacular but costly trait. This raises an issue worthy of at least a brief digression and concerns what is called *artificial selection*, which is generally construed as being something other than and apart from natural selection. For several millennia, humans have controlled the breeding of animals so as to produce offspring that are superior in some important way (e.g. more meat, milk, wool, docility, or even cognitive superiority in terms of hunting, tracking and shepherding as is valued in particular breeds of dogs) and this has over time brought about changes in the genome such that we have scores of domestic breeds that have to a large extent been engineered by humans.⁶⁶ Darwin was intent on showing how functional complexity in organisms can come about without any intentional, goal-directed engineering, but this doesn't mean that a domestic breed is not the product of the natural selection algorithm. As Dennett points out: "The short legs of dachshunds, and the huge udders of Holsteins are just as much products of natural selection as the wings of the eagle; they just evolved in an environment that included a particularly well-focused selective pressure consisting of human agents" (Dennett 1998 – online source). The exponential encroachment into natural environments by invasive alien species of plants, fish and animals, a problem the world over, is a result of human activity and has certainly altered - in many cases transformed – environments and the selective pressures they bring to bear on whatever is living there. And of course, our species continues to destroy natural habitats at an alarming rate, driving to extinction species at a rate thousands of times nature's norm.

⁶⁵ Though Fisher's startling idea was rejected for fifty years, it has recently been vindicated by mathematical models (Kirkpatrick 1982; Pomiankowski et al., 1991).

⁶⁶ It is interesting that the first chapter of Genesis has it that cattle were created before humans when it is the fact of having been domesticated and made into property that gives these ungulates their name, which is etymologically linked to _chattel' and _capital'.

Human ,created' environments of selection

What I see as most revelatory from Dennett's observation is that changes in the genome that produce significant changes in the phenotype can be accelerated through environmental constraints that influence who mates with who (as well as who survives long enough to do so). With dogs this happened with the domestication of the gray wolf in the Middle East less than 15,000 years ago. What is most significant is that eighty percent of distinct dog breeds that exist today evolved in the last few hundred years (Wayne 2010 – online source).

The question that interests me is whether artificial selection is and has been shaping human evolution. Most would be quick to point out that artificial selection equals controlled breeding, and humans just don't do that with members of their own species. But this is too facile an answer remembering Dennett's point that the only real difference with artificial selection is that selective pressure is applied by human agents and this surely does not limit the possibilities to a deliberate pairing off of a particular male with a particular female. And it does not, to my mind at least, require that human changes to environmental conditions be consciously designed to influence which genetic variations get passed on and helped to proliferate. Let us use the matter of gender difference as an example. Humans the world over have created environmental conditions that are gendered in ways that are both overt and covert. This is particularly evident in the ideational environments we call cultures. The ideas that dominate in a culture are selective forces in that they constrain human behavior (including sexual behavior) but it has generally been assumed that such forces are too mutable to have been able to influence natural selection at the genetic level. Yet, as I alluded to in Chapter One, there is growing evidence that this can happen. There I mentioned smaller teeth and decreased jaw size due to dietary changes brought about by *agriculture*, as well as the increased lactose tolerance of populations in high latitudes (where there is less vitamin D available from sunlight) who have for long engaged in dairy farming. But these are physiological traits. What, if anything, can be said of culturally driven changes in the genome that are expressed cognitively?

A study by the population geneticists Cochran, Harpending and Hardy (2006) posited that Ashkenazi Jews demonstrate higher levels of verbal and mathematical intelligences *because* the unique demography and sociology of Ashkenazim in medieval Europe selected for these intelligences. Scoring 12-15 points above the mean value of 100 was, according the authors, the achievement of less than nine hundred years of biological evolution, during which a fairly well defined population of Europeans were the victims of religious and racial apartheid; the only avenues for their socioeconomic mobility were in finance and trade, vocations needing higher levels of verbal and mathematical intelligences. Those who were more successful had more offspring according to the authors and hence the relevant genes⁶⁷ spread within a population strongly constrained to *'keep to their own kind'* in marriage.⁶⁸

⁶⁷ This apparently is the result when the genes are inherited from only one parent. But when inherited from both parents the result is one of a range of congenital diseases that are more common to Ashkenazim than to any other population (e.g. Tay-Sachs, Gaucher's disease) and which have in some cases been correlated with higher IQ and increased neuronal connectivity.

⁶⁸ What seems incontestable, whether it is more attributable to nature or nurture, is the disproportional representation of Ashkenazim in professions where high levels of verbal and mathematical

In this regard it is also worth noting a concern that Carroll raises regarding Pinker's postulates about music and arts' evolutionary origins, specifically the assumption that "only those functions that evolved in the distant evolutionary past have any particular adaptive status." (65) This is coupled with the idea that the *environment of evolutionary adaptedness* (EEA) in which our innate psychology evolved was fairly stable. Carroll finds compelling Mithen's theory of "cognitive fluidity" and its implicit assumption that cognitive evolution and the cultural evolution it spawned can be accelerated when already evolved cognitive adaptations begin to work together. Indeed, most psychosocial pathologies entail a breakdown somewhere in the neural networking that human brains are particularly adept at.

The upshot of such studies is that culture itself is adaptive and brings about changes in the environments of selection that over time can bring about genetic changes, one being a fine-tuning of the cognitive architecture involved in the storage of cultural information. Blackmore (1999) theorizes that what was in fact the greatest stimulus to the rapid expansion of the human brain was the emergence of our capacity to imitate, something we take so much for granted but which is a highly complex cognitive affair. It is also basic to all forms of mental cognition as Bloom claimed in setting out his well-known taxonomy. The adaptive value of being able to imitate is clear and Blackmore is likely correct in surmising that not only was there selection for it, but also "selection for imitating the best imitators, as well as selection for mating with the best imitators." Blackmore takes this further to suggest that brain encephalization may have been in part driven by "memetic sexual selection". What is most relevant here is the distinct possibility that culture has and continues to present selection pressures that natural selection has been able to take account of. But it is a two-way process of gene ↔ culture coevolution, a concatenation of feed-back loops that accelerate the process and that could help us better understand the nature of social and cultural change. Could the complex musical compositions that people esteem so greatly be the outcome of a runaway process? Quite possibly, indeed most likely, I would argue. This would not negate the fact that they afford rich experiences that are considered edifying, but it might provide some insight into why art music' (especially its more esoteric forms) fails to really catch on with the majority of people.

Taking stock regarding gender differences

The preceding discussions suggest that there are no apparent differences between men and women in musical aptitudes but that other psychosocial differences could quite easily manifest in differences in what I have referred to as musical sensibilities, which have more to do with inclinations, attitudes, and the attribution of value to particular forms of musical engagement. A theory of innate difference in this regard is well supported by sexual selection theory as espoused by Miller and others. But sexual

intelligences are indicated. In the USA, Jews comprise not more than three percent of the adult population and yet forty percent of American Nobel Prize laureates in science and economics have been Jewish, as have been twenty percent of professors at the top American universities and forty percent of partners in the top law firms. Their representation is similarly disproportional in the media and civil service and markedly so in the motion picture industry. (Lipset and Raab 1995: 26-27).

selection is not the only adaptationist theory that can be evoked to offer explanations as to music's origins and adaptive values. We can now turn to what are the most compelling alternative theories, ones that don't in any way negate the strong possibility that sexual selection was a significant force driving the evolution of musicality, but ones that are perhaps not as suggestive of sexual dimorphism. But first there is another contentious issue that requires an adaptationist consideration.

Cognitive fluidity, domain generality, cross-modality

Steven Mithen's theory of *cognitive fluidity* (1996) has been challenged by Howard Gardner and others because of its suggestion of a general learning capacity resulting from a general-purpose evolutionary adaptation. It is a suggestion that *blank slates* might find appealing, but it runs counter to most of what we know about evolution. As Merlin Donald points out:

Adaptations always occur under specific environmental pressures, and within the constraints of very specific brain designs. This results in specialized modifications, rather than general-purpose ones. This rule applies to apes and humans, just as it applies to other species. (Mithen & Donald 1998 – online source).

But, as Donald points out, this does not contradict the idea of ~~domain~~-generality, the notion that some mental faculties have a much wider reach than others."

This is an unassailable structural concept. The human mind has exquisite structure. One can imagine it as a set of pyramids, each with its own hierarchy of modules, each of which mediates some special skill. At the base of the pyramid stand many of the most basic reflexive functions. These are the specialists of the mind, narrow-band modules designed to carry out specific functions, such as focusing the eyes, or tasting food, with maximum efficiency. The mid-levels of the mind contain somewhat integrative functions, for instance, spatial maps of the environment, or images of one's own body, both of which require synthesis across a few modules. And at the top levels, there are the most powerful integrative systems, some of which approach true domain-generality in their reach. Language is one of these. The fact that we can talk about what we hear, smell, touch, or feel, and also describe our cognitive maps of the environment, testifies that our language brain has broad general access to the knowledge gleaned by the specialized modules dedicated to hearing, smelling, touching, and feeling, as well as those concerned with spatial mapping. In that sense, it is a domain-general capacity. (Ibid)

I should think it is quite clear that music is another of these powerful integrative systems which utilizes modules also used by other systems like language, auditory scene analysis and proprioception/kinesthesia. The multi-modularity of these top level integrative systems makes difficult their precise delineation as adaptations. The terms we choose are misleading to some degree; take language for example. Donald talks of ~~our language brain~~" and the fact that it has access to a range of specialized modules. But without such access, the language brain can obviously do little. It seems unlikely therefore that those brain areas and their neural systems that are language specific evolved on their own only to later acquire the capacity to integrate with others so as to achieve behavioral outcomes. So what are we talking about when referring to language as an adaptation: the dedicated brain areas or the whole system of interacting modules? This is by no means a trivial question especially for any theories concerning the origins

of domain-general capacities like language and music, including the question of which, if either, came first in human evolution.

Rethinking music as communication

Nobody to my knowledge refers to communication as an adaptation. It is too broad, too all-encompassing and general-purpose a capacity. Nonetheless, the ability to communicate is vital to nearly all fauna and perhaps even to some flora.⁶⁹ It is probably the dominant adaptive problem that drove the evolution of music as it most certainly must have for language. Miller (2000: 335) claims that for music the adaptive problem was mate selection/procurement, but this claim is based on the premise that music is a “set of signals emitted to influence the behaviour” of others, a means therefore of getting across some kind of message, ‘like choose me!’ Musical behaviors are fitness indicators, but are not ‘read’ in some cold-blooded assessment, e.g. “He dances well and from this I infer that his genes are more likely to contribute to offspring with high levels of innate proprioceptive, kinesthetic and aerobic capacity which means they are more likely to survive and produce similar offspring who also are more likely to survive” It is the emotions that are aroused that matter, and them alone, and the question, if in the unlikely event that one is formulated, would be: how does his dancing make me feel? And this would be subsidiary to the larger question: Does this guy turn me on? But surely the ability to manipulate the emotions of another, and thus to communicate had other uses and values for our ancestors as it continues to have for modern day *Homo sapiens*.

Once again, it is all about feeling

In Chapter One I made the audacious suggestion that education’s main purpose is to make people more successful in their pleasure-seeking pursuits. The point I was trying to make is the fact that pleasure, which encompasses a wide range of positive emotional states, is the omnipresent need motivating all behaviour, even behaviour that is not pleasurable in itself but that leads to outcomes that are and which make worthwhile the postponement of pleasure (the goals of Maslow’s self-actualization for example). Even those who erroneously equate pleasure with sin and choose to practice a strict asceticism do so because the pursuit of higher goals affords them some kind of satisfaction and there can be no kind of satisfaction that does not involve some positive emotional activation.⁷⁰ They forgo pleasure because it *feels* right to do so. The point is, as Mithen cogently puts it:

[W]e don’t have emotions for free or for fun: they are critical to human thought and behaviour, and have a long evolutionary history ... without them we would be entirely stymied in our interactions with the physical and social worlds ... we would be unaware of the complexities and subtleties of the social world around us, and would fail entirely in our social relationships.” (2005: 25, 87)

⁶⁹ When certain species of acacia trees are being browsed they emit a chemical that causes others of their kind downwind to increase their production of tannin which makes their leaves unpalatable.

⁷⁰ Even the destructive, antisocial behavior of sociopaths is motivated by how it makes them feel.

What predisposes one to act in ways contrary to one's immediate self-interest, which is often necessary to achieve longer term social success, are emotions like guilt, envy and love.

„Music and emotion' as an active interest in the Philosophy of Music Education

I have and will continue to draw on the work of Antonio Damasio which is by and large an exploration of the mechanics and significance of what Mithen speaks to above. What bears pointing out here is that the key connections between music, emotions and the feelingfulness of lived experience no longer seem to get much discussion in Music Education fora. It was the cornerstone of Bennett Reimer's *philosophy of music education as aesthetic education* (MEAE) (1970), but little attention is given it in current scholarship aside from what are generally refutations of or challenges to some of Reimer's precepts. Sadly, I perceive what might be a case of throwing out the baby with the bath water, but I believe that research in Cognitive Neuroscience, such as Damasio's (1994, 1999), may and should provoke a reconsideration of Reimer's work, in particular his support of Susanne Langer's tenet that the arts, including music, „educate feeling,“ a vital function assuming as true, as all three claim it to be, that feeling is the „essential underpinning of consciousness and mind.” Quoting Langer, Reimer remarks:

Over and over, in detailed language, she explains how feeling arises from bodily awareness and, at a certain point in evolution, enters a new phase: consciousness arises. —That is why I make feeling the starting-point of a philosophy of mind,” she says. —The study of feeling — its sources, its forms, its complexities — leads one down into biological structure and process until its estimation becomes (for the time) impossible, and upward to the purely human sphere know as culture.‘ It is still what we feel, and everything that can be felt, that is important.” (Reimer 2002: 81)

Emotional manipulation and internal organization

The problem that many recent Music Education philosophers seem to have with Reimer's philosophy concerns what educating feeling actually means and entails, in particular what its imperatives for music education practice might or should be. The latter is an issue that I will take up in the final chapter. But as to what might actually be going on internally in the experiencing of music and art that may be adaptive needs some elaboration in the present discussion. For Mithen, the answer is fairly clear: emotions are being „manipulated” in ways that induce reproductively advantageous behaviour either for the manipulator or the manipulatee. But perhaps emotion manipulation need not induce overt behaviour for it to be reproductively advantageous. As was suggested earlier, it could be enough that the experience of something human-made may induce synaptic reorganizations in the brain that are fitness-enhancing just because they help the brain to work more optimally. Tooby and Cosmides theorize compellingly in this regard, convinced as they are that:

the human mind is permeated by an additional layer of adaptations that were selected to involve humans in aesthetic experiences and imagined worlds, even though these activities *superficially* appear to be nonfunctional and even extravagantly nonutilitarian. (2001a: 11 - my emphasis)

But the manipulation of emotions certainly has a plethora of uses in the interpersonal realm as is so abundantly obvious when observing the behavior of other species. It is certain that the signaling that takes place when, for example, a bird issues a courtship or territorial call is not the sending of some kind of encoded message where fragments of the call refer to anything extraneous to the call itself, as words in sentences do. It is merely that the call induces neurochemical activations that predispose the recipient to particular responses. It is of course impossible to get any true sense of what any these kinds of activations feel like to the recipient bird, although given how much we share in respect of our nervous systems, brains and chemistry, there could well be some similarity in the subjective qualities (qualia) of experience, how a perception feels. The main problem is our seeming incapacity to have emotional experiences unmediated by conscious thought. Even when we ‘consciously’ decide to suspend conscious thought, when, for example, meditating or experiencing a work of instrumental music, it is almost impossible to pull it off, to go the distance without our internal dialogue kicking in.

Communication, verbal and nonverbal

Mithen distinguishes language from music on the basis that, while both are manipulative, language is also referential. But even if a bird’s call is only manipulative, it constitutes communication nevertheless. Something is conveyed through inducing particular patterns of compression and rarefaction of air molecules that increases the likelihood that recipients will alter their behavior in a way beneficial to the one doing the conveying. Ah yes, but this is not communication one might argue; a response is stimulated but no information is conveyed. But such an argument rests on a very narrow concept of what information is. If someone is speaking to me in a language I have no knowledge of, the words she or he utters will fail to stimulate in my brain what it would in the brain of someone fluent in that language. But this by no means implies that nothing is being communicated that is comparable or that might be information important to take in. Prosodic elements (tone, inflection, modulation, pauses, intensity) make it possible to infer many kinds of information with confidence, e.g. the speaker’s attitude toward me, her/his general mood, whether I am being asked a question, told something, berated, appealed to or perhaps even propositioned. Personality traits might be revealed such as introversion, unctuousness, a tendency to dominate, and so on. And of course I might also get more precise kinds of information, especially if gesture is being employed as it almost always is even when people who speak the same language converse. I might for example infer that I am being asked to stop doing something, to hurry up, to be quiet, to speak louder, to come closer, to pick something up, to give the speaker something, or to ‘bugger off’. And even without overt gestures, ‘body language’ can be quite explicit (e.g. ‘you are boring me’). Even certain vocal sounds that are not words can convey much, e.g. grunts, sighs, whistles, coos, ‘tch’ing, ‘shsh’ing, and so on. The notion that how you say something is as important as what you say is a recognition that much of what you are communicating would not be able to be inferred from the words themselves if for example they were written down (although exclamation marks, question marks, capitalization, italics, bold text, underlining and

inverted commas – the ‘so-called’ tweaks - can add a lot).⁷¹ The claim that 93% of communication is nonverbal is something I’ve come across more than once and apparently is based on the misinterpretation of research that has in any case been shown to be flawed.⁷² It is enough to recognize what is indisputable, that when it comes to interpersonal communication where the reading of intention, attitude, trustworthiness, empathy, interest and so on is important (and such readings can be crucially important), we rely more on nonverbal than verbal information. Moreover, we apprehend it directly without too much need for language mediated thought; such information does not emerge as a cold-blooded assessment but as a sense, feeling or intuition we have.

How much is universal?

What is also significant is the apparent universality of much nonverbal communication. Darwin himself studied commonalities in the way people express emotions facially, questioning people who had spent time among aboriginal populations around the world with particular attention to those that had yet to interact significantly with Europeans. Pinker quotes from *The Expression of the Emotions in Man and Animals* in presenting Darwin’s conclusion on the matter.

The same state of mind is expressed throughout the world with remarkable uniformity; and this fact is in itself interesting as evidence of the close similarity in bodily structure and mental disposition of all the races of mankind. (Pinker 1997: 365)⁷³

Darwin also observed, according to Pinker (366), that “children who are blind and deaf from birth display virtually the full gamut of emotions on their faces.” Pinker claims that, aside from some disagreement as to whether certain expressions are in fact universal, the corroboration of Darwin’s surmise by subsequent research has brought wide acceptance of the fact that a great deal of our nonverbal communication is pre-cultural. The best known research in this regard was that conducted by psychologist Paul Ekman in the 1960s in which he showed photographs of faces with different expressions to people from several cultures including the Fore of Papua New Guinea, a foraging group having had at that time little contact with outsiders. He also photographed the faces of Fore subjects as they acted out what their reactions would be to, e.g. meeting a friend, coming across a decomposing carcass or encountering an adversary where a fight is likely to ensue. What I find remarkable is the way his findings were received by academia of that time where it would seem that social constructivism was perhaps more an orthodoxy than it is all these decades later (or so I would hope). Pinker describes how it excited outrage and derision with one prominent anthropologist insisting that Ekman be stopped from continuing one of his presentations as his claims were ‘fascist.’ On a different occasion he was called a racist for pointing out the commonality of facial expressions across races, where Ekman had expected his work to be seen as a vindication of our common humanity and as grounds for greater intercultural understanding (1997: 365-6).

⁷¹ I have seen academics giving lectures and papers who tweak the air above their ears with two fingers on each hand when compelled to use an un-PC or otherwise problematic term.

⁷² See, for example, Borg 2008. The research in question was two studies conducted by Mehrabian and collaborators (1967).

⁷³ quoting from Darwin, C. (1872/1965: 15-17).

Coming back to emotional manipulation and communication

Returning to the example of bird vocalizations, we can be confident that in their communicating there is in the recipient *no* internal dialogue processing the altered emotional state that has been induced thereby altering it yet further through conscious cogitation, reflection or the weighing up of alternative possible responses. The recipient just responds (instinctively we would say), perhaps even by not overtly responding at all. It all depends on the emotional valence of the neural activity that the vocalization has stimulated. The kinds of information that can be communicated are thus limited, such as: Here I am; come check me out; stay away; predator nearby; I am the one for you, and so on. There are other species that can communicate something more like what we usually think of as information, the example that comes to mind being the different dances performed by honey bees when returning to the hive that ‘_inform’ the others of the location of productive sources of pollen or the warning calls of Vervet monkeys that vary depending on whether the danger is a Leopard, snake or a Crowned Eagle.

Language may be referential as well as manipulatory but it is never only one or the other. As important as is the ‘_objective’ meaning of a verbal utterance, its emotional [valence](#) is at least as important if not more so as has been shown in studies of subjects in whom injury or disease has caused a neural disconnection that prevents an utterance from meaning anything in any feelingful sense, and it is this feelingful quality of perception that is most crucial in terms of what kinds of cognition and behavior ensue.⁷⁴ The key point for education is that nothing is truly learned if significance has not been accorded it and significance is ultimately a matter of emotional valence. The same can be said of taking an interest in something. Waterhouse explains that —“emotional arousal enhances memory formation by positively influencing the period of neurobiological activity called consolidation that establishes a memory in the brain” (Waterhouse, 2006: 215).

The point that strikes me as inescapable is that our capacity for manipulating emotion through various expressive means such as vocalization, gesture, facial expression, and body language *had to* have preceded language in evolution as it provided a cognitive foundation without which language could not evolved. Once the mechanisms evolved necessary for the attribution of referential meaning to utterances and for grouping them into larger meaning structures, the abilities to name things and to form ideas would surely have induced a rapid burgeoning of language lexically, syntactically and semantically which would in turn have accelerated evolution in other cognitive domains, perhaps increasing the psychosocial need for expressive means that are more direct, unmediated, and emotionally manipulative.

At a cognitive level, the key advantage of language is that it provides additional levels of meaning and thus affords the possibility of communication that is more than just

⁷⁴ As a textbook case of this, Damasio gives lengthy treatment to the case of Phineas P. Gage (1994: 183 – 186), a railroad foreman who survived seemingly intact cognitively after an iron rod was driven completely through his head, but whose personality and ability to think rationally were profoundly changed.

manipulative. With language there are at least three orders of intentionality, one being that an individual can know what she or he is thinking; two, that one can know what someone else is thinking; and three, that one can know what a second party thinks that a third party is thinking. Chimpanzees, our closest relatives, handle the first and perhaps in limited ways the second, whereas humans use three or four orders regularly in their social interactions. But in all orders of intentionality, successful communication demands that the stimulus at hand acquires an appropriate emotional weighting or valence, be it something linguistically mediated or directly apprehended.

In a very real sense, music can be called the language of emotion in so far as it affords multiple orders of intentionality without the mediation of words and thus without need for referential meanings even though these can be and usually are in various ways part of the mix. Without words, music on a recording cannot tell one what a second party was thinking when composing, performing, or recording the music, but it can say much about *how* she/he was thinking when realizing intentions and emotional content in sound structures (even when not personally undergoing comparable emotional states at the time). The musician's own sense of how others have gone about doing this and what new can be made of it also comes through and connection with one or more traditions, styles or schools of practice and their associated milieus may be revealed. Most importantly, it could be argued, one has a virtual experience of what potentially (even if unlikely) one could oneself cognize and feel that amounts to some kind of an ideal, even if it is incapable of being verbalized explicitly. Improvising music is an amazingly complex act that engages the improviser on so many levels; and because it is open-ended, it admits almost unlimited applications of creativity, knowledge and skill. But playing music that was carefully composed and crafted by someone else allows one to play beyond oneself and experience at least one additional order of intentionality. When, improvising music in an ensemble (or even playing composed music with others), all three if not more orders of intentionality come into play.

Beyond sexual selection: music and socialization

Such a multilevel form of communication and the possibilities for social intercourse that it affords (even in the absence of abstract signs such as words) suggest to me that for our ancestors' musical exchanges must certainly have served purposes beyond courtship and the provision of information about one's own genetic fitness or that of a prospective mate. What most likely was a key function or purpose of musicking in the Pleistocene is what remains as a key function of music to this day, that it is a *social mediator*, a means by which people orientate themselves in relation to others (Robinson 1988), by which they establish bonds, mutual understandings and interpersonal hierarchies, in short, how they connect with one another. This is true of art generally, even that which purports to be autonomous or abstract, where personal statement and subjectivity of expression are considered all important as is the case with much so-called high art. Its essential nature remains social; otherwise there would be no desire or need on the part of an artist to abide by any stylistic norms whatsoever and thus to make her productions accessible to others. As the Marxist aesthetician Ernst Fischer explained it:

The social or collective element has become subjectivized in the I, but the essential content of personality is and remains social. ... Even the most subjective artist works on

behalf of society. By the sheer fact of describing feelings, relationships, and conditions that have not been described before, he channels them from his apparently isolated *‘I’* into a *‘we’*, and this *‘we’* can be recognized even in the brimming subjectivity of an artist’s personality. (Fischer 1963: 46)

Music as social mediator

The most conspicuous and revealing manner in which primates connect with one another socially is through mutual grooming. Strength of commitment (who an individual feels *‘closest’* to) is revealed by how much time is devoted to it. Anthropologist and evolutionary psychologist Robin Dunbar (1996) devoted considerable time to observing primate grooming behaviors and what they reveal about how alliances are built and the role played by them in effecting compromises and reconciliations. Its positive emotional valence comes from the increased production in the brain of endorphins. Dunbar had already theorized that language is an outgrowth of vocal grooming which evolved as a trait in our ancestors because of the difficulties in establishing and maintaining alliance networks in the larger groups that were formed to facilitate success in hunting large game and which were advantageous defense-wise.

Monkey business

Geladas (*Theropithecus gelada*), a threatened species of highland baboons found only in Ethiopia, seem to bear out Dunbar’s assumption, a logical one, that an increase in group size will force a transition from physical to vocal contact as a means by which alliances are managed within the group. Not only are Geladas unusual in forming troops of up to 400, but their vocal repertoire greatly exceeds those of all other non-human primates, not only in quantity, but in the complexity of the sequences they produce and the ways in which they entail synchronicity and attunement. The late Bruce Richman spent seven years studying these and was particularly intrigued by their rhythmic and melodic qualities and concluded that these served many of the same functions as they do in human speech and music, e.g. to indicate beginnings and endings, to make possible the parsing of a sequence into constituent parts as well as the development of syntax, the hierarchical arranging of elements in time into progressively higher and more inclusive levels of structure that make the gestalt meaningful in some or another socially significant way. They need not convey meaning in any referential sense, but need only be meaningful phatically in order to be socially efficacious as they so abundantly appear to be in Gelada community life which Richman describes as being *“immersed in sound”* (1980: 235).⁷⁵ Richman describes how in their interactions, geladas often engage in long vocal sequences combining several voices in rhythmically intricate patterns and regards these complex vocal productions as *“analogous to human coordinated singing”* where voices are also most assuredly *“in intimate and continuous phatic contact with each other”* (Ibid). It is in *hocket singing* such as practiced by some Pygmy groups that Richman finds the most salient analogue, where notes or small note groups are

⁷⁵ A phatic expression is a kind of speech act meant to achieve a social purpose only and as such any referential content is by and large superfluous. Much human verbal communication is comprised of *‘small talk’* which is arguably more phatic than informative, closer to grooming than it is to discourse.

contributed by separate voices in rapid rhythmic sequences causing a melodic gestalt to emerge provided an adequate level of attunement. Although Richman makes no mention of it, the same kind of attunement is achieved whenever different rhythmic riffs are layered and variously integrated into grooves as happens in percussion and dance-music ensembles the world over. It jibes with our innate kinesthetic predispositions and is hence eminently pleasurable, again remembering that whatever we find pleasurable is so because it induces neurochemical changes that have a positive emotional valence, and it does so because engagement in or with it was advantageous to our ancestors in some way related to survival and/or procreation (the former being the precondition to the latter).

Richman describes what he calls —the “Long Series” which are —long strings of alternations of expired and inspired sounds” that are commonly heard when the social context is friendly and relaxed, as when Geladas are engaged in the mutual grooming that occupies substantial portions of their day. These alternations are obviously what confer a rhythmic quality to the sequences produced. Nonhuman primates apparently lack the articulatory equipment needed for producing consonants, where the air flow has to be broken in various ways often involving precise tongue shape and motion, something we humans are superb at. But this does not in anyway imply that there is a corresponding ‘deficit’ in primate’s ability to cognitively parse strings of sounds into patterns that are meaningful. As important to auditory scene analysis as is the capacity to fuse overtones into single sounds is sensitivity to the way a sound begins, its attack or release, for this greatly impacts on how the whole sound is perceived and connected to some identifiable external source. As Dutton points out, it is what happens in the first tenth of a second that allows us to distinguish —ply” from —bay,” —ray,” —stray,” —day,” or —stay” (Dutton 2009: 215), further pointing out that if one were to remove the attacks of recorded notes played by instruments (which can be easily done with available technology) it would be impossible to distinguish an oboe from a violin. What I find interesting is that the articulatory equipment humans are endowed with seems to be far more than arguably is needed by language. Its evolution must have benefited more than just a capacity for conveying referential meaning.

Infant-directed speech

Mithen suggests that the analogues between human and Gelada vocal sequences are strongest in relation to the non-linguistic vocalizations of *infant-directed speech* (IDS), what he sees as one of the most compelling sources of evidence in support of Blacking’s theory that language was preceded in evolution by a —nonverbal, prelinguistic, —musical’ mode of thought and action” (Blacking 1984 – quoted in Mithen 2005: 5). Anyone who has spent any time with infants is aware that long before they begin to acquire any word knowledge, they manifest a keen interest in and sensitivity to spoken language especially when its melodic and rhythmic elements have been exaggerated as they so evidently are in IDS (—baby talk’, —motherese’) the world over. The most general and universal of these have been described by Fernald (1992: 391) as follows.

Mothers, as well as fathers and adults who are not parents, speak consistently more slowly and with higher pitch ... in smooth, exaggerated intonation contours quite unlike the choppy and rapid-fire speech patterns used when addressing adults. To praise an infant, mothers typically use wide-range pitch contours with a rise-fall pattern. To elicit an infant’s attention, they also use wide-range contours, but often ending with rising pitch. When

soothing an infant, mothers tend to use long, smooth, falling pitch contours, in marked contrast to the short, sharp intonation patterns used in warning or disapproval.

Even children of pre-school age adopt such prosodic exaggerations when speaking to infants and so do adults who have previously spent little or no time in the presence of infants. Fernald's research has further shown the distinct preference infants have to IDS compared to conventional speech as well their greater degree of responsiveness to voice intonation compared to facial expression (Fernald 1991: 43-60).

The adaptive value of IDS should be obvious enough, especially bearing in mind the extended period of immaturity characteristic of 'higher' primate species, humans in particular. Indeed, in all species where broods have to be cared for, parental behaviors have evolved that compensate for the general helplessness of neonates and hence improve their survival prospects. However, with longer periods of dependency during which different needs present themselves, parental behavior must be more flexible. Fernald refers to three studies demonstrating this flexibility in different primate species, e.g. where behavior modifications were called for because of infant disabilities.⁷⁶

Fernald argues that —these of prosodically modified vocalizations in early mother-infant communication may have had adaptive advantages extending beyond the infancy period over the course of hominid evolution” (1992: 420-421) and in support of this refers to research pointing to a strong correlation between the quality of attachment in infancy and levels of social competence later in life (Main, Kaplan, & Cassidy 1985). The role of IDS in language acquisition is quite clear. For one thing, it helps children to acquire syntax, that is, a sense of how language is structured. In order to parse a statement and make sense of it, one first must be able to break up what is for the most part a continuous stream of sound into meaningful units. For this we rely on some inbuilt mechanism that extracts statistical regularities in this stream. Mithen refers to research done by the developmental psychologist Jenny Saffran to gain an understanding of how infants are able to identify discrete words in speech (Saffran, Aslin, & Newport 1996) (Saffran, Johnson, Aslin, & Newport 1999). What is of greatest significance for Mithen's theory of a common ancestor to music and language is the evidence that Saffran's research offers of a general ability to discern patterns in auditory as well as visual stimuli. What she found to be the case in her experiments where infants were subjected to continuous strings of artificial syllables containing repetitions of certain three-syllable sequences (e.g. *pabiku* in the string *tibudopabikudaropigolatupabiku ...*) she also found when they were given a continuous sound stream of musical tones containing repetitions of three-note pitch sequences. What Mithen is convinced of is that this ability evolved not because it made language possible, but because of its broader value in making it possible for the very young to start to make sense of the world generally (Mithen 2005: 76). For him there is no more sense in claiming that it evolved for language only to be used incidentally for music (as Pinker seems to think) as to claim the converse.

⁷⁶ Fernald cites Rumbaugh 1965, Berkson 1974, Rosenblum & Youngstein 1974.

Laying the foundations for social competence

That it is in the intimacy between mother and neonate that the foundations are laid for later forms of mutuality essential in social species like ours is the core premise of Ellen Dissanayake's thesis as she develops it in *Art and Intimacy: How the Arts Began*.

Instilled as part of our biological nature, the *rhythms* and *modes* of infancy demonstrate and develop the psychological capacities that predispose humans to mutuality – the sharing of emotional states in patterned sequences with others. In the close early interactions between infants and their caretakers are the prototypes for what will become our later experiences of love, allegiance, art, and other forms of self-transcendence. (2000: 7)

Regarding love as something far greater and more organic than sexual attachment, she proposes adult expressions of it to be outgrowths of the “emotionally meaningful ‘rhythms and modes’ that are jointly created and sustained by mothers and their infants in ritualized, evolved interactions” (2000: xi). It is in this intimate emotional communion that Dissanayake proposes the arts to have their primary evolutionary root. In this regard it is important to note that she uses ‘rhythm’ and ‘mode’ in much more holistic and psychological senses than what the terms generally connote in relation to musical structures. They are “general terms for the admittedly indescribable – literally unverbalizable – sense of intermingled movement and sensory overlapping that characterizes infant experiences, as it also characterizes subsequent experiences of love and art.” (6)

Rhythm has to do with *an unfolding in time*, the patterned course of an experience; modes are *qualities* of that experience – its sense of swiftness, solidity, opening, closing, speed, forcefulness, fullness, barrenness, lightness, and so forth, on a dynamic scale of moreness and lessness. One might say that rhythms are something like verbs, whereas modes are like adjectives, except the two usually interpenetrate, coalesce with other senses (sight, sound, touch, smell, taste, balance), and change from moment to moment. The words “rhythm” and “mode” are meant to be polyvalent, then, suggestive of states of being and states of feeling. (6-7)

The education of feeling?

Dissanayake's elaborations on this broader, more psychologically rooted concept of rhythm recall Susanne Langer's portrayal of music as a “tonal analogue of emotive life.”

The tonal structures we call “music” bear a close logical similarity to the forms of human feeling - forms of growth and of attenuation, flowing and stowing, conflict and resolution, speed, arrest, terrific excitement, calm, or subtle activation and dreamy lapses - not joy and sorrow perhaps, but the poignancy of either and both - the greatness and brevity and eternal passing of everything vitally felt. Such is the pattern, or logical form, or sentience; and the pattern of music is that same form worked out in pure, measured sound and silence. (1953: 27)

In her earlier book, *Homo Aestheticus* (1992: 146), Dissanayake suggests that Langer's work anticipated that of later empathy theorists and regards it as capable of being “integrated smoothly into a biologically based view of aesthetic experience” (2000: 242 – end note). Where Langer's theory poses a problem is in its claim that ‘sentience’

(‘emotive life’) has a pattern or form that can be construed as ‘logical’ in the way that musical structures are. My own emotive life is what I would characterize as the near antithesis of this. Indeed, I would say that its fleeting and mercurial nature is what underlies the similarly erratic and illogical nature of my internal dialogue and what consequently makes sustained logical thought processes somewhat of an arduous affair, for me at least. It most assuredly is true that mental life is an unceasing interplay of tension and resolution in which there is –ontinual conative effort directed toward satisfaction in a goal which carries within itself a new want demanding further conative effort toward,“ but that is where its logic ends (Osborne 1984: 84).

Where I believe the mistake lies in Langer’s theory and in the ways that Reimer makes use of it is in its suggestion that the value of music and art lies in *what it replicates and gives form to*, where it seems to me all too obvious that it rather lies in what it is capable of inducing neurochemically that allows one to undergo feelingful experiences that are, in fact, *unlike* most of mental life and that are special and meaningful because of this. Undergoing such experiences, as I argued in Chapter One drawing on an article by Wayne Bowman, achieves to some degree, however minute, an internal re-organization of our ‘tacit interpretive schemata.’ In Piagetian terms, the art experience is ultimately a learning experience in that, through a process of assimilation and accommodation, some level of cognitive adaptation is achieved.

The art experience is accordingly a means of fine-tuning cognition and even though it may and usually does incite conscious thought and reflection, it can only do so because of what it is achieving at a pre-conscious level; it is tacit learning so to say. Langer understood this clearly enough. Far more than just pushing pleasure buttons, as Pinker suggests (though I doubt actually believes), what the art experience does:

... is to formulate our conceptions of feeling and our conceptions of visual, factual, and audible reality together. It gives us forms of imagination and forms of feeling, inseparably; that is to say, it clarifies and organizes intuition itself. (Langer 1953: 397)

Art and internal regulation

In my earlier discussion of kinesthesia and proprioception, I introduced what I see as a crucial realization for any Darwinian aesthetics, that cognitive adaptations have evolved not only to make possible behavior crucial to the satisfaction of basic survival needs (the four f’s - feeding, fighting, fleeing and fornication), but, as importantly, behavior that assists –the task of organizing the brain both physically and informationally” (Tooby & Cosmides 2001a:14).

[A] neurocognitive adaptation may operate in two different modes. The first is its *functional mode*, when it is performing its evolved function (e.g., the visual system performing useful scene analysis, the language system generating utterances for communicative purposes). The second is its *organizational mode*. This mode of operation is designed to construct the adaptation, to provide it with the correct weightings, information, and representations, and in general to develop a better organization for carrying out its function (e.g., babbling in order to develop a more effective language system). (16)

It may even be that the intensity of one's emotional response to something correlates with the nature and degree of cognitive re-organization that takes place, a theory that Dissanayake attributes to psychologist Gerald Clore (1994).

Clore points out that a musical or other performance, in which we are sufficiently involved to generate an elaborate model or expectancy of what is occurring and fully attend to it, progressively transforms its content, setting up and resolving ambiguities or problems and thereby restructuring the mental world of the perceiver. ... Clore wonders whether intensity of feeling is the experience of cognitive reorganization itself, or the experience of physiological arousal triggered by such change. (2000: 217-218)

As does Dissanayake, I too suspect that for all intents and purposes both are the one and same experience.

It bears reiterating here that in human ontogeny, as is the case with other animals, the reliable development of an adaptation, how genes ultimately get expressed, is dependent on the organism's interactions with the environments in which it lives out its life. As Tooby and Cosmides make clear:

This means that information and structure necessary for the proper development of an adaptation may be stored in the world as well as in the genome, and that selection will shape developmental programs to exploit information-rich features of the world. This allows adaptations, such as the language faculty ... to be far more elaborate than could be managed if all of the necessary information had to be supplied by the genome. What is genetically specified in adaptations is an economical kernel of elements that guides the construction and initialization of the machinery through targeted interactions with specific structures, situations, or stimuli in the world. (2001a: 15)

More on intimacy, infant-directed speech and ontogeny

The first and most crucial such stimulus is an infant's mother and it is now known that 'targeted interaction' with the mother begins prior to birth. Before the end of the first trimester of pregnancy, prenatals are actively hearing and responding to aural stimuli. At some point in the third trimester, they begin to discern their mother's voice. Using a specially designed 'dummy' (nonnutritive nipple), DeCasper and Fifer (1980) were able to show that a neonate less than three days old can distinguish its mother's voice from a recording of it juxtaposed with recordings of other mothers (all of whom had been recorded reading the same prose). Not only that, they learn within minutes to initiate sucking patterns that prompt the playback device to switch from non-mother back to mother (DeCasper & Fifer 1980).

It seems clear enough, as is the given upon which Dissanayake builds her theory, that intimacy between mother and baby has adaptive value beyond inclining the mother to attend adequately to her child's survival needs. Ultimately, it *is* the neonate's survival needs that are being attended to, but not the immediate needs of food and protection. Without being all that consciously aware of it, the mother or caregiver, through intimate interaction with the infant, is empowering her for later success in the survival game by guiding the unfolding and connecting up of foundational cognitive mechanisms. As the dominant element in the infant's psychosocial environment, she is engaging in the neural building, pruning, fine-tuning and integration of innate neural systems upon

which all subsequent cognitive development will depend. A mother does so without needing to understand the neuropsychology of it; she intuitively does what is appropriate unless deficits in her own development or some psychological abnormality cause her to do otherwise. This is because such a sensibility is itself an adaptation that is believed to have been selected for as a result of the evolution of large brains necessitated (initially at least) by our becoming a bipedal species. Larger brains required modifications of the female pelvis and it is conceivable that this could have happened quickly in evolutionary time, caught up in a process of runaway selection until an asymptote was reached and female survival interests (e.g. locomotion) were compromised too significantly. This created a selection pressure for earlier than optimal birthing and hence also for females *and* males better equipped for the nurturance of premature offspring. We are reminded here that men and children of both sexes demonstrate natural competence in IDS.

Intimacy is by definition a relational condition and necessarily a two-way affair. Newborns are anything but passive sensory-motor systems, reactive in rudimentary, involuntary ways. They ~~are~~ actively seeking for experience and for communication” and bring far more to the table cognitively than what Freud, Piaget or Skinner ventured to be possible without considerably more experience outside of the womb (Trevathan 2006: 20). But they require conversational intimacy for the mutuality that they are genetically equipped for to develop into the forms of interpersonal competence that adult life requires in a largely cultural environment. To say we are genetically engineered for culture means more than that we are possessed of the requisite computational capacities but that we are also emotionally predisposed to it.

On the Mozart Effect

The seemingly obvious and crucial importance of this conversational intimacy and its musical components lend support, on the surface at least, for two different but related cognitive theories that have garnered much attention in educational philosophy and that have informed a range of curricular reforms in the last two to three decades, they being: emotional intelligence (EI) (Salovey & Mayer, 1990) and the Mozart Effect (ME) (Rauscher, Shaw, & Ky, 1993). Perhaps the most comprehensive and up-to-date critique of these is by Lynn Waterhouse (2006) who considers them (together with Howard Gardiner’s theory of Multiple Intelligences) in relation to research in Cognitive Neuroscience and Evolutionary Psychology that clearly place all on shaky ground because of problems with their core assumptions about how the mind works. Here, I will only take up those of her conclusions that are pertinent to the present discussion and its concern with the ~~rhythms~~ “rhythms and modes” of communicative intimacy that characterize a child’s early encounters with the world of significant others.

The original Mozart Effect theory was that listening to Mozart’s music, or some of it at least, temporarily increased spatial IQ (Rauscher, Shaw, & Ky, 1993), this evidenced by tests done with university students in the USA. Notwithstanding that the findings of Rauscher, Shaw and Ky have not successfully been replicated and that there have been

several studies –disconfirming” the Mozart effect (Waterhouse 2006: 215-216),⁷⁷ the theory has been, largely due to the interest it sparked among educators and the general public, quickly transformed into a –scientific legend” that claims much more for the effect of Mozart’s music than ever was posited by the original researchers and that has spawned a plethora of popular texts and websites as well as a –small CD industry claiming mental improvement through listening to classical music” (Waterhouse 2006: 214). In *The Mozart Effect: Tapping the Power of Music to Heal the Body, Strengthen the Mind, and Unlock the Creative Spirit* (1997), Campbell suggests that an infant’s mental development will be enhanced by having specially chosen classical music as a frequent feature in her or his aural environment.

Waterhouse’s conclusion, after a thorough reading of numerous studies, is that whatever positive effect that exposure to Mozart and other music may have on spatial competence is the result of emotional arousal and what might at best be the case is that –cortical arousal stimulated by music can prime cortical circuits for spatial processing where the circuits for music and spatial processing overlap” (2006: 216). But this suggests only a temporary enhancement of a particular form of cognitive processing and no matter how important spatial intelligence is to human pursuits, this inordinate attention on it only serves a kind of music education advocacy that arguably does more harm than good when it is founded on pseudo-scientific works such as Campbell’s. Certainly it makes sense to provide infants and children (everyone for that matter) with aural environments that help achieve emotional regulation that is conducive to cognitive effort and health generally. In this regard, it is in the positive effects that Mozart’s music is reported to have in the treatment of various neurological disorders such as epilepsy or autism that should perhaps warrant more attention than its possible transfer value to improved academic skills.⁷⁸ If music has therapeutic value, as it so evidently does judging by the ever growing field of Music Therapy, this is something that education should be exploiting maximally. Whatever positive effect it may have in treating neurological disorders, it can only have because there are neural mechanisms that can respond to it and enact processes that organize, regulate or otherwise improve neural function in some crucial way. My assumption, which I will pursue further in the final chapter, is that such beneficial effects have corollary effects in ‘normal’ brains.

Active musicking and cognitive development

What has cast the greatest doubt on the claims that listening to Mozart has any long-term benefits is a report produced by the German Federal Ministry for Education and Research in 2006 that followed an analysis of over three hundred studies whose results had been published in reputable journals and which confidently concluded that even where a transient effect was found, it lasted no more than twenty minutes and could be as effectively induced by a wide range of music, or even by the reading of a story. But where the report found sufficient evidence and the need for further research was in what appears to be a definite positive correlation between practical musicking and IQ

⁷⁷ Among others, Waterhouse cites: Chabris 1999, McKelvie & Low 2002, and Nantais & Schellenberg 1999.

⁷⁸ A brief time spent at any of the websites of national and international [associations for Music Therapy](#) will provide evidence of this and cite relevant research.

development (Schumacher 2006). There is a significant body of research in cognitive neuroscience that shows conclusively that developing certain competences in music making effects structural changes in the brain, for example, increased gray matter in motor, auditory, and visual-spatial brain regions (Gaser & Schlaug 2003) and increased gamma-band responsiveness that positively affects oscillatory networks associated with the brain's executive functions (Trainor, Shahin & Roberts 2009).

From an adaptationist perspective, it would be expected that developing skill in doing something so cognitively complex as making music would induce neural changes of far greater consequence than would be the result of only experiencing what others have produced, especially when we consider what singing, dancing or playing an instrument requires kinesthetically or proprioceptively. But the suggestion coming from the research just cited is that there is enhancement of conceptual processing capacities such as spatial reasoning, propositional logic, abstract thought and scenario-building. In modern environments, these capacities are more crucial than they would have been in the Pleistocene, and it is worth considering what might have driven their evolution such that they are unquestionable universals in human cognition. We have already considered sexual selection and the fact that many kinds of prowess can make one more attractive as a potential mate and hence be capacities that natural selection would favor. But this does not seem adequate to explain such extraordinary capacities which other species lack or have in but rudimentary forms even though mate selection is as vital a concern for them as for us. In the discussion of the sexual division of labor theory it was suggested that improved hunting skill provided more ready supplies of protein needed by a large brain. But again, this does not suggest a need for attributes such as theory of mind, language, altruism, or a level of general intelligence that allows brain modules to work together (the g factor) although all of these would likely have facilitated and been promoted by cooperative hunting.

It's all about living in groups

Recalling the discussion around the grooming behavior of the gregarious Gelada baboons, one of the theories I find most convincing as regards what most stimulated the exponential increase in brain size and intelligence is the *ecological dominance/social competition hypothesis* (EDSC) initially formulated by Alexander (1989) and later developed by Flinn, Geary, & Ward (2005) among others. The success of our ancestors in mitigating the forces of nature (through, for example, securing food, shelter and clothing) allowed us to become ecologically dominant and together with increases in the size and density of populations, we became our own "principal hostile force of nature" (Alexander, 1989, p. 469) and social competition became the primary impetus to the evolution of communicative and other psychosocial capacities that allowed for greater success in anticipating and influencing social interactions with other humans. Given that the exercise of such capacities brought changes to the sociocultural environment and hence to the environment of selection, an "autocatalytic," "runaway" process was unleashed that caused a "atcheting up [of] the importance of social-cognitive competencies and supporting brain systems" (Flinn et al. 2005: 35). Evolutionary psychology has shown several of these competencies to be adaptations that evolved to solve problems presented by living in large groups, such as the forming of coalitions and the detection of cheating and other forms of deception. The upshot of the EDSC is

that our large brain is the result of a cognitive arms race set in motion by the Machiavellian intelligence of our primate forbears.” (Pinker 1997, p. 193)

Being the ardent adaptationist he is, Pinker perhaps does not use the adjective ‘Machiavellian’ lightly. EP has demonstrated convincingly, that underlying our social interactions are evolved mechanisms that calculate, for example, how much altruism is appropriate vis-à-vis the degree of apparent genetic relatedness, a calculation that Hamilton was able to express mathematically. Altruism was able to evolve according to Hamilton because the cost to the giver (c) was outweighed by the benefit to the receiver (b) multiplied by the degree of genetic relatedness (r); hence: $c < r b$ (Buss 2008: 231). Nepotism is thus an evolutionarily sound strategy. No such calculation takes place at a conscious level and one’s ‘calculation’ of degree of genetic relatedness can be flawed (e.g. when a husband has been cuckolded). The algorithm is playing out with what data is available to it, but all that is offered up to conscious thought are intuitions and feelings of attachment. And when such intuitions and feelings begin to incline one toward a particular behavior they often (perhaps always in humans) must contend with intuitions and feelings issuing from other calculations taking into account other interests. As Pinker puts it: —“the different parts of the mind struggle to engage or disengage the clutch pedal of behavior.” (1997, p. 518). There are invariably other preconscious calculations of costs and benefits based on other kinds of data and survival/reproduction issues, many if not most being the multifaceted issues and contingencies of living in large groups which requires cooperation and collaboration. Again, as has been emphasized repeatedly, it is the emotional valence of a perceptual focus that is paramount, in this case, how an interpersonal connection feels. Pinker makes the point cogently in respect of the love a parent feels for her or his child, showing as effectively irrelevant the fact that what underlies it all are impersonal calculations of cost vs. benefit vis-à-vis the propagation of her/his genes following algorithmic rules of inference. After all, our ancestors knew nothing of genetics and neither do most living people. —“People love their children not because they want to spread their genes (consciously or unconsciously) but because they can’t help it.”

When an animal behaves to benefit another animal at a cost to itself, biologists call it altruism. When altruism evolves because the altruist is related to the beneficiary so the altruism-causing gene benefits itself, they call it kin selection. But when we look into the psychology of the animal doing the behaving, we can give the phenomenon another name: love [the essence of which] is feeling pleasure in another’s well-being and pain in its harm.” (1997: 400)

Concordant with the EDSC in many respects is the *social contract theory* developed by Tooby and Cosmides (1992) to help explain the evolution of our capacity and inclination for cooperative exchange, this being essential for cohabitation in large groups. Central to their theory is the hypothesis that we have an evolved mechanism for detecting cheaters, those who receive but do not reciprocate. Without such a mechanism, cheaters enjoy an evolutionary advantage over cooperators and they would have come to dominate in populations bringing about a selecting-out of any cooperation instincts. Reciprocal altruism could only have evolved if cooperators were able to detect and marginalize cheating and favor interactions with other cooperators. The empirical support that Tooby and Cosmides have been able to muster is considerable and compelling. One only needs to note the preponderance of news items exposing corruption and other forms of cheating (especially among high-profile offenders) to confirm this. The obsessive interest that people take in the misdeeds of others is perhaps

only matched by the morbid interest they take in the misfortunes of others, for which there is the German word *schadenfreude*. These of course are the psychosocial traits that the news media thrives on; they are what sell newspapers. Most pertinent to the present discussion is Tooby & Cosmides' identification of the cognitive capacities which keeping cheating in check and cooperation generally require and which I suggest are examples of the capacities that were ratcheted up in the autocatalytic process theorized by Flinn et al, cited above. Buss (2008: 271-273) has abstracted these as follows:

- ~~the~~ ability to recognize many different individual humans". Buss cites a study showing as common a recognition rate of over 90 percent for individuals who have not seen for many, up to thirty-four years as well as research in prosopagnosia, 'the loss of this ability in people who have suffered damage to a specific place in the right hemisphere of the brain;
- ~~the~~ ability to remember the histories of interactions with different individuals." Although he is unable to cite any research that has directly explore this ability, Buss posits the necessity of some form of innate ~~accounting~~ "system" for keeping track of the costs/benefits of one's involvements with others;
- ~~the~~ ability to communicate one's values to others." By values, ' Buss is referring primarily to our senses of dissatisfaction or satisfaction in relation to the behavior of others, for example, approval, distress, entitlement, and censure;
- ~~the~~ ability to model the values of others." In other words, we need to be able to detect and understand these same senses as they manifest in the behavior of others so that we can optimize the nature of our exchanges to bring the greatest personal benefit, this being perhaps most important where the benefit is not immediately realizable;
- ~~the~~ ability to represent costs and benefits, independent of the particular items exchanged." Buss, in agreement with Cosmides and Tooby (1989), argues that given vast array of things that people exchange (even in hunter-gatherer societies) necessitates a mechanism or system of mechanisms that allows us to intuit costs and benefits in respect of a variety of exchange items.'

Bringing music into the mix

It is in communal activities that such abilities can best be exercised and most productively put to use and it is conceivable that this is why we have such a universal predilection for such activities. If the activity demands cooperation, collaboration and mutuality, it ~~manifests~~ "a relatedness for all to see" (Chernoff 1979, p. 144). Chernoff's surmise regarding this dimension of African musical traditions is worth quoting here.

Africans use music to mediate their involvement in a community, and a good musical performance reveals their orientation towards this crucial concern. As a style of human conduct, participation in an African musical event characterizes a sensibility with which the Africans relate to the world and commit themselves to its affairs. A cultural expression, music is a product of that sensibility, but, more significantly, as a social force, music helps shape that sensibility. The development of musical awareness in Africa constitutes a process of education."

I would argue that this is a sensibility that informs and manifests in many if not most traditions of communal music making throughout the world, where becoming successful as a participant is every bit as much a process of education ' by virtue of communal

music making's socializing efficacy. Remarks I made many years ago regarding making music in groups and our capacity for empathy bear repeating here.

Music is most socially efficacious in situations of collective music making where the individual becomes an active participant, interacting with others in the pursuit of common goals and in a context where individuality must to some degree be circumscribed. Music of course is not in any way unique as an activity that cultivates cooperativeness - the willingness to subordinate self interests to collective interests; team sport is at least as effective in this regard. What group musical activity is especially effective in cultivating is empathy - the capacity to enter imaginatively into the feelings and thoughts of others. Empathy involves much more than the subordination of self interests; it involves self transcendence - "going out of our own nature, and an identification of ourselves with the beautiful that exists in thought, action, or person, not our own" (Shelly 1819) - the precondition to an authentic social conscience. The extent to which empathy plays a role in collective music making varies from one context to another and is affected by the extent to which structural parameters ... are imposed. In group improvisation, for example, the participant is not provided with an explicit set of instructions to ensure that his contribution integrates successfully with what the rest are doing. Rather he has to imagine intensely so as to successfully anticipate where others are going, to know when to take the lead, when not to, when to be silent, where and when to effect changes, etc. (Robinson 1988:)

Why is music so often made in groups?

That music is so often made in groups has presented a challenge to adaptationist explanations, and it is apropos to consider some of the ways it has been met given the present focus on innate social sensibilities and why they have evolved. The hypothesis that I infer to be implicit in the EDSC and social contract theories is that, as important as such sensibilities are, just as important are the means by which they are acquired. Our predisposition for group music making may be like or even linked to our predisposition for play activity and sport. With all of these, not only do we fine-tune kinesthesia and proprioception, but we practice our social skills and calibrate their underlying neural mechanisms in contexts that are comparatively safe.

On group selection theory

When approaching the question why a predisposition for group music making would have evolved and become a universal human trait, Miller makes clear the need to "distinguish between behaviors done *in* groups, and those done *for* groups" (Miller 2000: 350). That what is good for the group is good for the individual seems like irrefutable commonsense and suggests that the evolutionary explanation for group music making is that it fulfills a *group-level function* as opposed to functions advancing the reproductive success of individuals, the latter being the case with sexual selection. It is however a theory which most evolutionary psychologists dismiss, at best only conceding group selection as a weak force in human evolution. The question that it does not seem able to answer is how it could work vis-à-vis the natural selection algorithm introduced in Chapter One, in which case there would need to be a replicating entity other than a gene. Groups do not replicate; they survive through generations (which are themselves constructs incapable of clear delineation) provided that environmental conditions are favourable. They could only be regarded as replicating units provided there has not been significant "intercourse" with other groups (of the social as well as

the sexual kind). Since the cultural revolution that followed upon our ancestors becoming competent at growing surpluses of food, it has become increasingly difficult to find populations of people that remain culturally insulated from other groups. In any case, group selection would require competition between groups within environments of selection where groups less successful in dealing with environmental pressures would be selected out as those better adapted would be selected in. At one level, this seems to be what has happened in the course of human history as evidenced by the almost complete disappearance of human communities that, by virtue of their isolation from others, could conceivably be regarded as discrete and cohesive units. Overexploitation of critical resources by ancestral groups whose members did not act in ways conducive to the interests of others and of the group as a whole quite likely would have perished, but then it seems implausible that such groups would have taken form to begin with, at least ones of any size. What is far more likely and what has been observed in recorded history is that groups were absorbed into larger, more heterogeneous groupings (bringing their genes with them of course) that are difficult if not impossible to define as any kind of 'tribe' where there is a high degree of homogeneity in how its members live out their lives. Even where people profess and genuinely feel a strong sense of ethnicity, this is really only an identification with a particular cultural 'heritage' that beyond a shared language is difficult to demarcate or define in any categorical way; they are not claiming membership in some cohesive, unstratified, and exclusive population that is able or inclined to remain in isolation from others.

Miller makes the salient point that other primates live in groups which, as was made clear in respect of Gelada baboons, are characterized by intricate and dynamic social interactions and yet primatologists have never to my knowledge ventured to invoke group selection in their attempts to explain their social behavior. Group music making is obviously social behavior and there can be no doubting that it benefits the group concerned, but presumably also those individuals who comprise it.

If musical behavior has no individual-level advantage but does have individual costs [as it most certainly does], it would be difficult for group selection to have an effect on the evolution of music. The same holds true for any other "altruistic" trait that has individual costs and *only* group benefits. No biologists ever made a good case for such an altruistic trait evolving in any vertebrate species, so it is not the kind of explanation one would wish to invoke for human music. (Miller 2000, 352)

Even with honeybees, where the case for group selection seems to be strong, kin selection can still be argued to be the dominant evolutionary force in that all of the bees in a hive share at least 25% of the same genes. Selection among groups might be possible theoretically but the conditions it would depend on have not been convincingly shown to exist in respect of any vertebrate species at least, in particular the demand for a membership of genuinely 'selfless' individuals that to a high degree are subject to a 'shared fate,' where the death of the colony would likely mean the death of any unique alleles in the genetic lineage that might have played a part in further genetic evolution. Pinker concludes that "natural selection could select groups with selfless members only if each group could enforce a pact guaranteeing that all their members stayed selfless" (1997: 397).

Humans are highly competitive within their respective groups where invariably one finds 'cheaters' and 'free-riders' who would come to dominate if the rest of the population were truly 'selfless.' Moreover, human groups are fluid collectives with

relocation to other groups through marriage, intergroup conflict or defection being common and this can logically be inferred to the case between hunter-gatherer groups in the Pleistocene. The possibility of group selection as a significant force in the evolution of our psychosocial traits is attractive as it seems to offer a “kinder, gentler, more cooperative, more humane form of evolution than individual level selection, more suited to the production of positive, enjoyable adaptations such as language, art, and music,” even though it too depends on competition and willy-nilly “replaces the logic of murder with the logic of genocide” (Miller 2000: 351 with reference to Williams 1966).

On the ‘Baldwin Effect’

The crucial point that needs to be made here is that there is *no need* for a theory of group selection in order to establish that group-level phenomena (behaviors) have been a critical factor in human evolution. Neither is it necessary for explaining the exponential ratcheting-up of the evolution of our psychosocial traits and the group-level behaviors that they have given rise to, including group music making. As has already been emphasized, living in a group dramatically alters the environment of selection in which its individual members survive and procreate. But there still needs to be some mechanism according to which behavior occasioned by living in groups brings about and expedites evolution at the genetic level.

The early Darwinist that is generally credited with discovering this mechanism was the American psychologist James Mark Baldwin who in 1896 described what has come to be called the *Baldwin Effect*. In a nutshell, it describes a process where as a result of interaction with its environment, an individual organism acquires a trait that gradually gets genetically encoded for within the individual’s group such that eventually in some generation down the line, all or nearly all members of the group are similarly able to acquire the trait because they are now innately predisposed for it. As Baldwin himself put it: “social adaptation sets the direction of physical phylogeny and physical heredity is determined in part by this factor” (Baldwin, 1896: 553 cited in [Baldwin Effect](#)).

Despite appearances, the Baldwin Effect is nothing like Lamarckian evolution, which in its notion that traits acquired by a parent can be genetically passed on to offspring was long ago debunked. In 1987, Hinton and Nowlan were able to verify the Baldwin Effect by way of a computer simulation that put to the test the following thought experiment which succinctly captures Baldwin’s theory.

Imagine an organism that contains a neural net in which there are many potential connections. Suppose that the net only confers added reproductive fitness on the organism if it is connected in exactly the right way. In this worst case, there is no reasonable evolutionary path toward the good net and a pure evolutionary search can only discover which of the potential connections should be present by trying possibilities at random. The good net is like a needle in a haystack. The evolutionary search space becomes much better if the genotype specifies some of the decisions about where to put connections, but leaves other decisions to learning. This has the effect of constructing a large zone of increased fitness around the good net. Whenever the genetically specified decisions are correct, the genotype falls within this zone and will have increased fitness because learning will stand a chance of discovering how to make the remaining decisions so as to produce the good net. This makes the evolutionary search much easier. It is like searching for a needle in a haystack when someone tells you when you are getting close. The central point of the

argument is that the person who tells you that you are getting close does not need to tell you anything more. (Hinton & Nowlan 1987: 495-496)

Thus, if an organism, as a result of a genetic mutation, has more connections innately placed in an on position, it will stand a better chance than others that the other connections necessary for the trait to become operational (e.g. using a stick to extract termites from their nest) will get turned on by what the organism encounters in its environment. The chances are increased exponentially as each additional connection comes under genetic control. Having half of the connections under genetic control increases the chances one-thousand-fold compared with an organism with no connections under genetic control or which does not have the capacity to turn on connections in response to environmental stimulation. In his discussion of Hinton and Nowlan's simulations, Pinker emphasizes that while networks did evolve more and more such connections, they never became completely innate.

As more and more of the connections were fixed, the selection pressure to fix the remaining ones tapered off, because with only a few connections to learn, every organism was guaranteed to learn them quickly. (1997: 179)

The key conclusion of this is that ~~learning~~ leads to the evolution of innateness, but not complete innateness." (Ibid)

The Baldwin Effect can only work however provided that connections not under genetic control are able to be placed into the on position by environmental stimuli, that there is sufficient plasticity in the network for this to happen. The capacity to learn is wholly dependent on such plasticity which humans sadly tend to regard as unique to our species, an absurd notion for anyone who has taken even a little time to observe the behavior of some of our fellow Earthlings, for example, tool using birds and primates.

As regards the ratcheting-up of cognitive capacity that so evidently has taken place in species that have for long lived in groups, the explanations for this that I have found most convincing are those put forward by David Papineau in his article ~~"Social Learning and the Baldwin Effect"~~ (online source – year of publication not provided). Most important of all is his explanation for how, with socially learned behaviours, ~~we~~ get Baldwin effects twice over." When we live in groups we necessarily form a niche that changes selection pressures, the most important here being the increased likelihood of contact with one or more conspecifics who have already acquired the trait, this stimulating one to acquire it for oneself. Without social learning, every individual would be in the position of the first lucky one who got it by serendipity. But with social learning, only one individual need acquire the trait non-socially to get the ball rolling. Thus, for species that live in groups a feedback loop can come into play between genetic assimilation and niche construction that accelerates the rate at which the former occurs. Combining these two Baldwin effects produces an especially powerful mechanism that natural selection is bound to exploit.

Neural plasticity is extraordinary in our species by comparison with even our closest genetic relatives, chimpanzees, as is the cognitive fluidity of our brains, both of which allow for more complex and sophisticated neural networks and a significantly higher level of inter-modularity and cross-modality in cognitive functioning. This is what has allowed us to evolve highly complex psychosocial adaptations such as underlie our capacities for acquiring language, music and art, social practices that in turn have

become vehicles for learning that have sped up the feedback process yet further. Looking at it this way, cultural evolution can be seen as modifications of cognitive niches that necessarily must increase in frequency as culture accumulates. As was pointed out in the first chapter, the event that more than any other caused cultural evolution to runaway with itself was the agricultural revolution that took place around twelve thousand years ago and which gave a whole new meaning to niche construction. Being able to grow a surplus of food such that not everyone had to occupy themselves with basic subsistence prompted social transformations through urbanization, trade, commerce, war, religion and rapid technological development. As if this were not enough, literacy and the later invention of media such as books, audio and visual recording, radio, television and the Internet caused an even more dramatic telescoping in the rates of cultural change and accumulation. How much of this remains adaptive in the sense of bettering the chances of survival for our species is very much in question. We no longer actually have to learn all that much to survive and procreate given the world as it has come to be where we can rely on experts to sort everything out and provide for our needs such that, provided even a modest income, we can have children and consume in blissful ignorance of where it all is inevitably leading given the exponential increase in our numbers, the exponential depletion of our planet's resources and the exponential degradation of the environments we rely on for our continued existence.

Covert processes of socialization

In fact, activity that is not *overtly* social may nonetheless be efficacious in helping achieve an optimal expression of the social capacities that are encoded for in our genes. There are various kinds of experience that we find intrinsically rewarding, that afford pleasure without any apparent utilitarian benefit and that we seemingly pursue as ends in themselves (as implicit the cliché – Art for Art's sake). These should be and are of interest to EP for the simple reason that such experiences –would not be possible unless the mind contained elaborate reward systems that produced them in response to some stimuli and not others.” I quote here, as I have already, from what I consider a seminal work in Darwinian aesthetics, Tooby and Cosmides' 2001 article –Does beauty build adapted minds?” (8). One of its central findings is that –humans have evolved specialized cognitive machinery that allows us to enter and participate in imagined worlds” (9). Tooby and Cosmides point to the obvious example of pretend play which –is now recognized as so fundamental an expression of the human cognitive architecture that its absence in a toddler is seen as diagnostic of a neurological impairment,” autism for example (9).

Behaviorally, pretend play appears in all normally developing children *in all cultures* around eighteen months of age, about the time that infants become maturationally equipped to engage in sophisticated social activity that acknowledges the existence of other minds. The cognitive machinery underlying pretend play includes specialized forms of representation (metarepresentations), which decouple the pretense from one's store of world knowledge. These decoupling mechanisms appear to be adaptations, whose function is to protect our knowledge stores from being corrupted by the flood of false information ("fictions") that the ability to engage in imaginative activities allows. (9, my emphasis)

One of the things that mark humans as different from other species is that we can process information that is true in particular circumstances (in this moment and place,

but not necessarily so in others) and which allows us, in those circumstances, to act propitiously, to improvise advantageous behavior. Social information is by its nature contingent and our capacity for making use of contingently true information allows us to access worlds that are seemingly inaccessible to other species.

These are the ... worlds of the might-be-true, the true-over-there, the once-was-true, the what-others-believe-is-true, the true-only-if-I-did-that, the not-true-here, the what-they-want-me—to-believe-is-true, the will-someday-be-true, the certainly-is-not-true, the what-he-told-me, the seems-true-on-the-basis-of-these-claims, and on and on. (Tooby & Cosmides 2001: 20)

Adaptations for decoupling and metarepresentation

Tooby and Cosmides give the name ‘_scope syntax’ to the specialized set of cognitive adaptations that allow us to navigate, negotiate and act in these worlds by ‘_tagging’ and tracking the parameters within which any given set of representations can reliably and safely be employed in making inferences and thus in considering alternatives, planning and taking action. Keeping track of the scope of the conditions in which the representations are ‘_true’ and applicable is essential to avoid data corruption and potentially harmful or fatal misapplications of the information outside of the scope of these conditions. Acquiring the computational machinery needed to extract and make use of information that is local, transient, and contingent marked a quantum leap forward for humankind and allowed our ancestors to become sole occupants of a “cognitive niche” (Tooby, L., & DeVore, I. 1987) which was a boon for our species though ‘_anything but’ for the rest of life on our planet.

It is this ‘_scope syntax’ that is seen to operate in play activity, as suggested above, and which logically suggests why children of *all* ages are predisposed to play activity. It exercises and fine-tunes those essential mechanisms that allow us to “cognitively quarantine sets of representations from each other, so that they do not interact with each other promiscuously – that is, without respect to the scope boundaries within which they are applicable” (Tooby & Cosmides 2001: 20). Without such mechanisms we would not be able, as was already pointed out, to plan, reflect, anticipate, draw conclusions, have language or any other sophisticated integrative cognitive system such as those that underlie music and the arts.

The fact that we can distinguish and keep track of what is imaginary vs. what is real does not mean that the imaginary is less potent in terms of emotional valence and, hence, meaningfulness, rather that what is imaginary generally does not prompt *overt* behavior. It is nevertheless valuable as it may and mostly likely will prompt advantageous behavior at some point, perhaps behavior of a kind that is only in part related to a particular representation and which is more than just a response to it. It utilizes the same kinds of information and representations but is able to do so without having to undergo the actual experiencing of something, which may be dangerous or otherwise costly.

A real lion actually lunging at us would evoke terror *and* flight - the emotion program *and* behavior are linked. But while a cinematic version of the lion may evoke terror, the flight behavior that terror is ordinarily designed to produce is disengaged: We do not run from the theater. The experience may give us new weightings on the fearfulness of lions or the dark,

but these weightings express themselves in real behavior elicited by real situations subsequently, not in behavior directed toward the fictional event. (Tooby & Cosmides 2001: 9)

How we perceive objects, their movement and their interactions is constrained by “a rich set of interlocking principles” that are innate. We come wired with a “theory of bodies” (Leslie 1987 & 1994) that constrain both what we experience directly as well as our mental simulations of real situations, including the creation of scenarios that *might* or *could* be. What is critical of course is that “simulations of objects and their movement are constrained *in the same way* as real objects” (Tooby & Cosmides 2000 – online source). But it is important to consider the computational mechanisms that simulation requires that perceptual representation does not. Tooby and Cosmides cite five of these which I have condensed below (Ibid).

- “*Decoupling.*” This is required so that a simulation is not stored as something that actually happened but as something that *could* happen given how things *do* happen in the real world.
- “*Source tag.*” A simulation is in effect “an internally driven hallucination” whose source is in the mind of the individual concerned and which needs to be “tagged” accordingly.
- “*Credal [creedal] value and memory requirements.*” A simulation is a *potentiality* that needs to be weighted as to its level of certainty or factuality to determine whether and how it gets encoded in memory. Where it corresponds with unchanging physical laws of cause and effect, or where its truth value is otherwise implicit (e.g. because it derives from experiential repetition or from something someone you trust told you) will get tagged with a high level of certainty, considered “timeless” and not in need of a “past, present, or future tag.”
- *Restricted scope inferences.* Simulations “depict hypothetical transformations of objects in space and time, and so sequential transformations are suppositions with ordered hierarchical relations, describing states of the system at various points in time.”
- *Relationship to other representation systems.* A simulation requires the retrieval of stored object representations and their placement into some form of working memory. Although the retrieving mechanism controls the simulation in terms of what interacts with what, it requires a mechanism such as the postulated “theory of bodies” to determine how the interaction proceeds.

Bringing music back into the discussion

The above remind me of what was discussed early on in this chapter, that *mentalese*, the “language” of cognition, operates with a surprisingly limited set of innate “metaphors,” even where abstract and nondiscursive “thought” is concerned. Musical perception is clearly a cross-modal affair, drawing on and perhaps modifying innate concepts that inform visual and physical experience, e.g. high/low, short/long, continuous/discontinuous, smooth/rough, light/dark, symmetric/asymmetric, light/heavy, thin/thick, homogenous/heterogeneous and so on. It is so very easy and worthwhile to re-read the above requirements for simulation as descriptive of what is required by musical cognition in many if not most of its myriad forms. Certainly music, like other pursuits of the imagination such as constitute the arts (fiction perhaps being

the most salient), employs, exploits and exercises simulation systems to the hilt and this must serve to modify them (advantageously it is assumed) and at some level achieve (recalling Bowman and Polanyi) an internal re-organization of our ‘tacit interpretive schemata’ that realign the ‘lenses’ through which we perceive and make sense of the worlds we inhabit.

On „ somatic markers’

The ‘tagging’ of simulations is undoubtedly a matter of the brain assigning them particular emotional weightings. Without these, the entire cognitive system can be compromised as has been evidenced by studies of individuals in which there has been, due to injury, disease or congenital abnormality, some degree of disconnection between the ‘rational’ prefrontal cortices and those more primitive parts of brain (e.g. the hypothalamus and the amygdala) that charge neuronal activations with emotional valences and accordingly ‘mark’ them and in various ways ‘fix’ them. These resulting ‘somatic markers’ are crucial to preconscious sorting whereby innumerable alternatives are reduced and conscious thought consequently biased by what surfaces for it to work on. Damasio’s [*somatic marker hypothesis*](#) (1994) provides an intriguing account of how this happens. Suffice to remark here that the emotional weighting of any representation is obviously in large part determined by how it was assembled originally and subsequently altered, this depending on the nature of the stimuli concerned and how intense they have been in their stimulatory effects. We may consider for example how the feelingfulness (and, hence, the meaningfulness) of a lyric and its long-term impacts on us can be dramatically enhanced by putting it to music. If we regard a perceptual stimulus as, for example, beautiful, profound, or even terrifying, it is because there has been a ‘cognitive co-registration of deep valuation with the perceptual representation of the object of the valuation’ (Tooby and Cosmides 2001: 18).

“Beauty is in the adaptations of the beholder”

This is the title of an article by Donald Symons (1995) and his use of the plural is noteworthy. It must be remembered that what constitutes fitness-enhancing behavior in a gregarious species such as ours is a vast and diverse set of behaviors oriented toward different crucial outcomes such as cooperation, collaboration, the detection and marginalization of cheaters and freeloaders, status acquisition and success in the mating game. Perhaps most important from an educational perspective is the complex and highly interactive process of nurturance required of human parents, for when it comes to complex social behaviors (language and music for example), the optimal expression of what is encoded in genes requires far more than just nutrition and protection.

For an adaptation to be functionally efficacious at the behavioral level, it must be appropriately organized and this, as has been said, requires ‘targeted interactions’ with information-rich features of the environment, this being most critically important in the first years of life, when the adaptation is operating more in an organizational mode than an overtly functional one, which it can be given that a young child is by and large not having to provide for its own needs. Each adaptation must be provided with the appropriate weightings relative to different forms and sources of information and their representations. The neonate targets particular features in its environment because, in its organizational mode, each adaptation has its own aesthetic component that motivates

such targeting. These are the “motivational guidance systems” adaptations require if they are to develop properly. Optimal ontogeny demands that the young “live according to behaviorally imperative aesthetic sensibilities in an aesthetics-drenched world” (Tooby & Cosmides 2001: 17).

Initially, even prior to birth, this is the world of intimacy between mother and child with the former innately willing and able to ensure an environment that is “drenched” aesthetically, rich in the “rhythms and modes” Dissanayake speaks to and that characterize mother-child interactions. That we have arts like music could well be because they keep alive such a world and continue through life to contribute to the optimal organization of our cognitive architecture, especially where it promotes higher levels of social competence. But what must be emphasized again is that the environments we occupy in the modern world, which are largely of our own creation, often do not jibe with the kinds of information and stimulation our developmental adaptations evolved to target.

Just as we now culturally engineer foods whose flavors signal the presence of nutrients that may have been artificially removed, it is certainly possible that many modern recreations, entertainments, and aesthetic activities do not actually improve or ready our adaptations - although many undoubtedly do. Moreover, the process emphasizes forms of preparation appropriate to the ancestral world, regardless of whether this prepares one for life in the modern world. This explains the overrepresentation in popular media of such things as attacks by predatory nonhumans, chase scenes, physical violence and blood revenge. (Tooby & Cosmides 2001: 22)

Maladaptive worlds

We may also note the *underrepresentation* in popular media of productions aiming at “higher,” “loftier” cognitions and “deeper” aesthetic sensibilities. Of course, a profit-driven entertainment industry is not inclined to target such “esoteria” and gives us instead a world drenched in *schlock*. It presses innate pleasure buttons but does not cultivate them in ways that make possible pleasures that are more worthy and edifying by virtue of the internal processes they manifest with their higher levels of complexity and integration (how much, for example, they invoke and demand imagination). What should be a matter of greatest concern is that the worlds the popular media and the entertainment industry construct for us are ones that children of tender years spend more and more of their time in. They also worlds that are negligibly interactive and the inordinate time children spend in them equals time *not* engaged in activity where they are active and interactive agents. This is not all bad given that children can be physically passive while still achieving beneficial internal adjustments at a neurological level, but on a psychosocial level it cannot compare to engagements with strong elements of mutuality and intimacy such as when parents hold their little ones on their laps and tell them stories.

There is a short video that the South African *Films and Publications Board* has produced and which comes on before the main movie on many DVDs rented or purchased in this country that is outrageous in what it blindly conveys about what is sadly becoming the norm in home after home in South Africa (a society seemingly obsessed with appropriating the dubious indulgences of the “developed” world). It shows a boy of four or five sitting *alone* in front a TV on which some unidentified video

is playing, presumably one with disturbing content judging by the soundtrack. *Still alone* as the video finishes, he gets up and puts himself to bed. His mother later appears at the door, smiles at her already asleep darling and then just turns off the light and walks away. But the only point that the FPB video is trying to make is that we should be attentive to what videos/DVDs we allow our children to watch. That such lack of familial intimacy is widely the norm for the children of our global village is further suggested by the frequency with which I've heard televisions euphemistically referred to as American babysitters.⁴ Dissanayake points out that —modern children ...

most of whom have inoculations and antibiotics, safe homes, and more food than they can eat – may nonetheless suffer from parental neglect or abuse, a sense of meaninglessness, social vulgarity and violence, and general indifference from the institutions that control and direct their lives. The simple fact that suicide is the third highest cause of death in American teenage youth (and that the teen suicide rate is 95 percent higher today than it was in 1970) is evidence to me that something is awry in the way we live. (2000: 13)

It is undoubtedly true that Pleistocene ways of life selected for, or at least promoted, some psychosocial traits that are inappropriate in modern, pluralistic democracies, such as unthinking conformity, unmitigated allegiance to authority, nepotism, and xenophobia. But as with sex differences, there is nothing to be gained by denying that we retain Paleolithic psychosocial presets and that they continue to bias our cognitions significantly, aided by a culture industry that understands their economic value and accordingly exploits them. What matters is what we make of and do with these presets. After all, our ability to transcend them and embrace loftier principles is only possible because our innate psychology comprises far more than base instincts; it also provides the computational systems that principled, socially ameliorative behavior relies on and that makes such behavior pleasurable even if the pleasure is delayed and must be worked for.

Education as brain organization: to what ends?

When Tooby and Cosmides portray “the task of organizing the brain both physically and informationally over the course of the lifespan [as] the most demanding adaptive problem posed by human development,” they are in essence defining *the* overarching task of education as I believe Piaget might himself have conceived it. And once again, I am not referring only to what takes place in schools, but even more importantly to what happens, or should happen, in the years leading up to school. And as for schools: sure, they are engaged in organizing the brains of their charges, but to what ends? With their market-driven curricula, they very much remain “reproductive organ[s] of a consumer society,” as Ivan Illich portrayed them four decades ago (Illich 1974: 77) and are pathetically inadequate in developing the critical consciousness the world now demands of its citizenry as it edges nearer the brink of ecological collapse. The Portuguese word that Paulo Freire used for this is *conscientizacao*, preferable perhaps because of its allusion to the fact that critical consciousness is more than cold-blooded assessments of what is wrong with society. It is nothing without a well-grounded social *conscience* that makes the best use of our innate capacity for moral reasoning (Hauser 2006) because it is a conscience that is empathetic and geared to mutuality and *felt* concern for the good of others, possible because such mutuality has been personally experienced. Critical consciousness can sometimes be a predominantly cerebral affair, but conscience is always a matter of the heart.

Persons deprived of mutuality or belonging, whose inborn tendencies toward affiliation and sympathy have not been answered and activated, easily become selfish, insecure, unable to make or sustain close relationships, perhaps violent and self-destructive, even sociopathic; they lack a sense of identity and self-esteem and are defective in the “social emotions” ... of love, shame, guilt, remorse, and sympathy with others. Conversely, persons whose mutuality and belonging needs *are* met will be more easily generous, sociable, sympathetic, and secure. It sounds simplistic but it makes sense, since we evolved to be one way and not the other. (Dissanayake 2000: 67)

On human universals

I have emphasized repeatedly the absurdity of the claim that, aside from basic instincts, perceptual apparatus and a kind of general learning capacity, humans are ontologically blank slates. Nearly everything in this chapter has been in part meant to validate my dismissal of this “errant nonsense,” as I have styled it already. One method of approach, common among evolutionary psychologists looking for adaptive explanations for psychosocial behaviors, is to identify universal features in the behavior as it manifests across cultures and time. I have already presented the conclusions of some leading evolutionary psychologists and Darwinian philosophers regarding what appears to be universal across musical cultures as well as what seems evidently true worldwide in respect of gender differences. Indeed, every aspect of behavior, cognition and predisposition that I have explored is one I assume to be universal and for which there are compelling if not entirely convincing understandings of their adaptive underpinnings, some examples being language, body language, infant-directed speech, altruism, scope syntax and metarepresentation, and play. Drawing from the work of several evolutionary psychologists,⁷⁹ Dutton (2009) compiled a list of what he sees as “features and capabilities of the human mind” that seem incontestably universal. From that list, I have selected, paraphrased (to better connect them with discussions in this chapter) and elaborated briefly on the following, which I see as most pertinent in relation to what has been discussed in this chapter, particularly those discussions concerning music and the arts.

- ***an “intuitive physics”*** that allows us to track and predict the movements of objects (earlier referred to as a “theory of bodies”). We are certainly not the only species to possess this, but owing to our inter-modularity and cross-modal capacities, we employ its algorithms and innate concepts to cognize aural phenomena (like music) as well as “objects” of the mind (as when we imagine scenarios).
- ***a “folk biology”*** (Pinker 1997: 323) consisting of intuitions about natural phenomena such as animals, plants, and minerals, based, according to Pinker, on an “intuitive essentialism.” (325) Again, thanks to our inter-modular and cross-modal capacities, these intuitions inform and influence our cognitions of phenomena that are not natural but which are organic in their constitution (including ways in which we cognize the products of imagination).

⁷⁹ Dutton acknowledges Donald E. Brown (1991), Tooby and Cosmides (1990, 1992, 2001), Pinker (1994, 1997, 2002), and Carroll (2004).

- **a „theory of mind,’** i.e. intuitively grasping that others have minds such as one’s own but with beliefs and intentions that often are different.
- **a spatial intelligence** that allows us *inter alia* to do mental rotations and to construct and modify internal maps of our surroundings. As Pinker puts it, we come wired with —**an internal dead reckoner, which updates coordinates of the body’s location as it moves and turns**” (Pinker 2002: 220).
- **an innate number sense** that is precise with small numbers but capable of useable **„guess-estimates’** with quantities that are large.
- **a probability instinct** that works according to how frequently events with consistent outcomes are experienced, again an attribute critical to musical cognition as it allows one to anticipate musical outcomes based on what one has already experienced.
- **an ability to read mental states** in others on the basis of bodily, especially facial, expressions, as well as vocal intonation and prosodic elements (as has been evidenced by research on infant-directed speech).
- **an intuitive economics** that we employ when exchanging goods and favors that is based on an innate understanding of reciprocity.
- an innate array of **logical and causal operators’** that allows us to build up databases of mental representations and to make inferences from them applying operators such as: *and, or, not, all, some, necessary, possible, and cause*. Again, this is a part of our innate cognitive equipment that is vital to musical cognition.
- **a language instinct** consisting of an innate grammar that provides the combinatorial rules with which we use vowels and consonants to form words and then organize these into phrases, sentences and other meaningful wholes. From what has been discussed earlier in this chapter, this most likely evolved out a precursor ability which was less **„referential’** in what it communicated though likely more emotionally manipulative, a kind of **„musilanguage’** such as Brown (2000) and Mithen (2005) have theorized. Logically, this instinct is what underlies our predilection for sequences of sounds organized tonally and temporally and perhaps musical cognition relies on a more ancient generative grammar. That there has been a process of co-evolution between language seems evident enough given their similarities as combinatorial systems with commonalities in their phrase structures, phonological properties and use of recursion, which as was pointed out already is what makes possible a limited set of elements to yield countless meaningful, communicative outcomes.
- **a proclivity for bodily adornment**, e.g. **„makeup’** (body **„painting’**), styling of hair, tattoos and jewelry.

„Making meaningful’: our universal proclivity for elaboration

The last of these merits some discussion as it relates to a more general innate proclivity which Ellen Dissanayake (1992) has given comprehensive treatment and made central in her Darwinian aesthetics, that being our universal bent for *elaboration*, for making things and experiences meaningful even though there seems no utilitarian justification for doing so. But first let it be emphasized that the above list is but a sampling of human attributes that are universal, universal because they, to some degree at least, are instructed for by our genes. Dutton addresses innate dimensions of human sociality, positing that people everywhere are **„curious about their neighbors, like to gossip about them, pity their misfortunes and envy their successes”** (2009: 45). On a more cynical

note, we must also acknowledge the universal human capacity for lying, for believing as individuals that we are more competent and benevolent than we objectively are, for rationalizing and justifying our individual behavior, and for favoring one's 'race' or 'ethnic group' over the rest of humanity. Also, we all seem to take pleasure in exposing false pretensions in others and mocking them. A penchant for games and sports is another apparent universal as are the pleasures people take in joke telling and the poetic use of language. And of course we all feel grief when we lose loved ones, feel chagrin when we fail at something or have been defeated by another just as we feel elation when we prevail in conflicts with enemies and pride when we successfully achieve goals and solve problems.

The seven plots of fiction

Our universal love of narrative fiction is also noteworthy, in particular the striking similarities in the kinds of stories that people favor the world over as regards their thematic content. The British literary critic Christopher Booker (2005) has posited the following seven basic plots abstracted from his investigations of stories from the folktales of preliterate peoples and the epic poems of the past to the novels, librettos and movies of more recent times.

- ***Tragedy***: a fatally flawed hero meets with a tragic end (e.g. *Macbeth*);
- ***Comedy***: stories with happy endings (usually of the romantic kind) that have fun with human foibles and interpersonal intrigues, Jane Austen's novels being good examples;
- ***Overcoming the Monster***: the stuff of James Bond films, where a hero undergoes all kinds of ordeals but prevails against and saves the world, nation or community from some kind of evil being, human or otherwise.
- ***Rags to Riches***: where somebody downtrodden but possessed of virtue or some special talent wins out against the odds and achieves fame and/or fortune (e.g. *Cinderella*, *David Copperfield*);
- ***Voyage and Return***: a protagonist leaves home, enters an alien and challenging world, and returns a changed person, most often after a harrowing escape (e.g. *Robinson Crusoe*, *The Rime of the Ancient Mariner*, or *Alice in Wonderland*);
- ***Quest***: the hero, usually accompanied by one or more sidekicks, embarks on a danger fraught journey to defeat some evil entity or secure some priceless item like the holy grail or a kidnapped child (e.g. the myth of 'Jason and the Golden Fleece,' and *The Lord of the Rings*);
- ***Rebirth***: the central character experiences some major kind of personal transformation, finding a new reason for living (e.g. Dicken's *A Christmas Carol* or the film *It's a Wonderful Life*).

Booker invokes Carl Jung's theory of archetypes and symbolism to explain this universality of plots. This seems a sensible approach in that Jung believed his archetypes to be part of a universal human nature. As Dutton puts it: "Against the prevailing social constructionist givens of the last few generations, Jung looks downright prescient" (2009: 129). While Dutton lauds Booker for providing strong evidence that the universal themes in storytelling cannot be explained by cultural transmission, he argues that Jungian theory is inadequate because it offers no explanation for why we have these innate archetypes to begin with. The key question

that needs to be asked regarding Booker's plots and Jung's archetypes is: What motivates them? —A character's motivation ... involves the expression of will, normally toward the fulfillment of a desire, and against resistance or obstruction of some kind" (131). Instead of Jung, Dutton invokes Aristotle who he claims understood clearly that a plot is a causal structure, —an arrangement of motivations" that essentially are variations of —desire against obstruction," (131) and that when developing a plot around a character, there are only a relatively few logical alternatives if the plot is to have resonance with people. What resonates are themes and situations that issue from —fundamental, evolved interests human beings have in love, death, adventure, family, justice, and overcoming adversity" (132). In fiction, our genetic imperative — reproduce and survive:

... is translated straight into the eternal themes of love and death for tragedy, and love and marriage for comedy. Stories are populated with character types relevant to these themes: beautiful young women, handsome strong men, courageous leaders, children needing protection, and wise old people. Add to this the threats and obstacles to the fulfillment of love and fortune, including bad luck, villains, and mere misunderstanding, and you have the makings of literature. (132)

Landscape preferences

Because Pleistocene interests continue to be our interests, it is not surprising that there is also a marked degree of commonality from culture to culture in other forms of expression, in other arts that is to say. For our Pleistocene ancestors, habitat choice was obviously far more a life-and-death issue than it is now. Orians and Heerwagen (1992: 556) invite us to imagine what it must have been like to be on —a camping trip that lasts a lifetime" where there was no possibility of buying supplies, where we would have had to find, gather or hunt them ourselves. What would have been advantageous if not essential on such a camping trip would have been predispositions for — and higher levels of sensitivity to — perceptual cues indicative of a potentially bountiful and comparably safe environment. Orians and Heerwagen theorize compellingly that our aesthetic reactions to landscapes derive, in part at least, from an evolved psychology that functioned to assist our hunter-gatherer forebears in deciding when to move and where to move to. Some of these cues would be for conditions that are transitory and needing urgent attention, evaluation and response (changes in weather, for example), while others signal more slowly occurring changes (e.g. seasonal changes) or relatively permanent features (e.g. geomorphological features such as topography and the presence of lakes, rivers, and streams).

Again, it is a question of what motivates cognitions and their subsequent behaviors. The —Savanna Hypothesis" advanced by Orians and Heerwagen is that —natural selection should have favored individuals who were motivated to explore and settle in environments likely to afford the necessities of life but to avoid environments with poorer resources or posing higher risks" (557). The hypothesis gets its name because of the authors' perceived level of correspondence between what would seem optimal conditions and the savannas and mixed bushveld of East Africa where the splitting off of the Homo line took place as well as most of its subsequent evolution. Dutton has summarized these as follows:

- –open spaces of low grasses interspersed with thickets of bushes and groupings of trees;
- the presence of water directly in view, or evidence of water nearby or in the distance;
- an opening up in at least one direction to an unimpeded vantage on the horizon;
- evidence of animal and bird life; and
- a diversity of greenery, including flowering and fruiting plants.” (Dutton 2009: 19)

Dutton regards as strong support for this hypothesis the results of a research project done in 1993 where two artists studied the artistic preferences of people from ten countries (Komar, Melamid & Wypijewski 1997). The results showed an overwhelming preference for landscapes along side a pronounced dislike for abstract art. Not only was there a preference for landscapes but for ones composed largely of the elements summarized by Dutton above. The two artists, Vitaly Komar and Alexander Melamid thereafter actually painted pastiches based on their findings.⁸⁰

Musical preferences

It is worth giving at least some attention to a subsequent project Komar and Melamid undertook in 1996, in collaboration with composer Dave Soldier, even though its scientific credibility is far less secure. An Internet survey was conducted in which around 500 took part and indicated their musical likes and dislikes in respect of, for example, instrumentation, vocal range and quality, duration, and style. From the results, Soldier and Nina Mankin wrote music and lyrics for the ‘_Most Wanted’ and ‘_Most Unwanted songs.’ As Soldier sees it:

This survey confirms the hypothesis that today’s popular music indeed provides an accurate estimate of the wishes of the *vox populi*. The most favored ensemble, determined from a rating by participants of their favorite instruments in combination, comprises a moderately sized group (three to ten instruments) consisting of guitar, piano, saxophone, bass, drums, violin, cello, synthesizer, with low male and female vocals singing in rock/r&b style. The favorite lyrics narrate a love story, and the favorite listening circumstance is at home. ... Most participants desire music of moderate duration (approximately 5 minutes), moderate pitch range, moderate tempo, and moderate to loud volume, and display a profound dislike of the alternatives. ... The most unwanted music is over 25 minutes long, veers wildly between loud and quiet sections, between fast and slow tempos, and features timbres of extremely high and low pitch, with each dichotomy presented in abrupt transition. The most unwanted orchestra was determined to be large, and features the accordion and bagpipe (which tie at 13% as the most unwanted instrument), banjo, flute, tuba, harp, organ,

⁸⁰ None of these landscapes actually resemble African savanna at all and call into question the aptness of the name Oriens and Heerwagen chose for their hypothesis. The optimal environment for our African ancestors would not have been the wide open plains of the Serengeti even if it was this kind of environment where they would have ventured in search of game. Rather, the ideal habitat would have been (as per Komar & Melamid’s paintings) where there was an abundance of water and this suggests a quite different topography, one that is hilly if not mountainous (where rainfall patterns are accordingly made more consistent and where runoff into natural depressions is made more likely). Africa has an abundance of such environments and it seems it had them in even larger supply during the Pleistocene when large tracts of what is now the Sahara were well watered and teeming with life.

synthesizer (the only instrument that appears in both the most wanted and most unwanted ensembles). An operatic soprano raps and sings atonal music, advertising jingles, political slogans, and “levator” music, and a children's choir sings jingles and holiday songs. (Soldier 1997 – online source)

Acknowledging that the project was more tongue-in-cheek fun than scientific research and that the majority of site visitors that took part were Americans, its ‘findings’ nonetheless confirm what I am sure has been the experience of music educators the world over as regards the musical leanings of the majority of people, what they are inclined to give an ear to. In this regard, it is worth noting that the website concerned is not some populist site. The *Dia Foundation* is a highly respected and influential contemporary art institution that provides funding and infrastructure for a large number of “visionary artistic projects that might not otherwise be realized because of their scale or ambition.”⁸¹ So it is unlikely that the survey participants were adolescents or from the lumpenproletariat.

High vs. low art

I draw attention to both of Komar and Melamid’s ‘most/least wanted’ projects mostly because of what they reveal relevant to our *innate* aesthetic sensibilities and the questions they force us to engage with around the age-old issue of high vs. low art. I have already entered into this issue in earlier discussions related to our innate musical proclivities and the supposition that musical works that challenge these too radically, even to the point of deliberately thwarting them, are unlikely to ever attract much of an audience. Such works are esoteric in the truest sense of the word. The Komar-Melamid-Soldier project suggests that we cannot even expect broad public interest in and affection for the ‘masterpieces’ of pre-twentieth century European art music. In this regard, I find it quaintly ironic that so many of my colleagues who are music academics seem both perplexed and vexed by the reality that while they give so much attention to this music and the even more challenging oeuvre that followed it in the twentieth century, it features negligibly in the private listening activity of their students who study it so assiduously and even become proficient in its performance and/or composition.⁸²

Conspicuous consumption and status

Being esoteric does not automatically imply that something is elitist, but it cannot be denied, indeed it should be expected, that art can and often does serve what is one of our oldest and deepest instincts, *the drive for status*. Apropos this, Pinker cites a conclusion arrived at by the late sociologist/anthropologist, Pierre Bourdieu (1984), that “connoisseurship of difficult and inaccessible works of culture serves as a membership badge in society’s upper strata” (Pinker 2002: 407). This resonates well with the notions of ‘conspicuous consumption’ and ‘invidious consumption,’ the first of which was central to the theory of ‘institutional economics’ developed by Thorstein Veblen at the

⁸¹ from the webpage ‘About Dia’ at <http://www.diacenter.org/contents/page/info/102> (12 January 2011)

⁸² I grant that my evidence for this surmise is anecdotal, but I am nonetheless quite confident as to its truth value.

end of the 19th century as well as the critique of capitalism he presented in his classic, *The Theory of the Leisure Class* (1899/1979). Conspicuous consumption is the term Veblen coined in reference to the acquisition of expensive goods and services motivated by our status instinct and having the purpose of displaying wealth as well as a capacity for squandering resources on extravagances that are seemingly pointless in any utilitarian sense. What motivates *invidious consumption* is the pleasure of making others envious, again a human attribute that seems incontestably universal. In this regard, it is worth recalling what has been discussed regarding runaway selection and the extraordinary traits it has produced in other species, the peacock's tail being the example most often cited.

In “Pecuniary canons of taste,” the sixth chapter of his book, Veblen shows how one's estimation of the aesthetic worth of a work of art can be inextricably bound up with its monetary value. Apropos this, Dutton gives considerable attention to artistic forgery, discussing among others the case of Han van Meegeren (1889-1947), a Dutch painter famous for his *Christ and the Disciples at Emmaus*, which from its unveiling in 1937 until 1945 was believed to be an early work of Johannes Vermeer, at one point selling for what would be four million US dollars in today's currency, not surprising given that it had been verified a genuine Vermeer by a leading authority on Dutch painting who praised it highly, remarking that “in no other [Vermeer painting] do we find such sentiment, such a profound understanding of the Bible story – a sentiment so nobly human expressed through the medium of the highest art.” That it was a forgery might never have come to light had it not been for Van Meegeren confessing after being arrested, not for forgery, but for having sold a national treasure to the Nazis, in this case another of his Vermeer forgeries that was rescued from the personal collection of none other than Reichsmarschall Hermann Göring (Dutton 2009: 177-180).

Of course, Van Meegeren's paintings lost nearly all of their monetary value once they were shown to be forgeries, but the salient point that Dutton does not address is that nothing had changed in respect of their artistic *worth*; they continued to present to the eye the exact same qualities they did when thought to be the work of a “master”, and yet they almost overnight became worthless as far as art dealers and the cognoscenti were concerned. Indeed, I am perplexed when Dutton claims it to be “the rare beauty of a Rembrandt portrait that causes it to be worth a lot of money, rather than its market price causing it to be beautiful” (160), perplexing given that much of his *The Art Instinct* can be read as a validation of Symon's aphorism: “beauty is in the adaptations of the beholder” and not in the thing beheld. I do not doubt that most people would find a Rembrandt portrait beautiful without knowing who painted it, but probably no more beautiful than a portrait by one of his more gifted students.⁸³

Symon's aphorism is obviously a reworking of the old adage “Beauty is in the eye of the beholder.” But they say very different things. Symon has reworked the adage as a clever way to drive home the essential point (which much of the forgoing discussions have

⁸³ A Dutch project in the late 60s subjected Rembrandt's supposed oeuvre to detailed analyses on the basis of which an initial tally of 630 paintings alleged to be by Rembrandt was reduced to around 300. For more on this and on the issue of market driven aesthetic values, I recommend Charlotte Mullins' article —ReaGood, Fake Bad (But Why?) article for *the Financial Times (UK)* (16 April, 2005, available online at <http://www.djerassi.com/phallacy/reviews/review6/index.html>)

tried to make) that beauty is not entirely or perhaps even mostly an individually subjective phenomenon. As was made clear right at the beginning of this chapter, when we speak of adaptations we are speaking of biological mechanisms found in every normal human being. Some of these adaptations predispose us to find certain visual, aural and olfactory phenomena more attractive than others, and hence the experiencing of them more pleasurable and meaningful, but our preferences, especially when it comes to things made (or being made, as in performing art), are seldom based wholly on what is presented to the senses. Our interest and attention may be as much due to our awareness of something's value in the eyes or ears of others and this can fundamentally alter the motivational dynamics informing such experiences, for example, from aesthetic elevation to status enhancement. We need only think of how for adolescents, the music one is into can be as important as one's clothing, hair style or manner of dress in establishing status among peers.

That the psychology of the arts is in significant measure the psychology of status seems obvious to the point of banality. Steven Pinker is surely right in suggesting that a great many people ~~would~~ lose their taste for a musical recording if they learned it was being sold at supermarket checkout counters or on late-night television" (1997: 522). And while many academics, intellectuals and artists might deny this connection, they would seem to validate it in their behavior, according to Pinker at least.

In a gathering of today's elite, it is perfectly acceptable to laugh that you barely passed Physics for Poets and Rocks for Jocks and have remained ignorant of science ever since, despite the obvious importance of scientific literacy to informed choices about personal health and public policy. But saying that you have never heard of James Joyce or that you tried listening to Mozart once but prefer Andrew Lloyd Webber is as shocking as blowing your nose on your sleeve or announcing that you employ children in your sweatshop, despite the obvious unimportance of your tastes in leisure-time activity to just about anything. (1997: 522-3)

Pinker cites no research in support of this claim and he is likely speaking from his own experiences in academia and in the social contexts academics tend to inhabit. It certainly jibes with what I have experienced and rings true with colleagues I've spoken to in this regard. This form of status consciousness is harmless enough when it comes to personal tastes in music and leisure time activity, but it is another matter completely when it comes to an academic's ideological and ontological identity, where it influences, for example, one's position on human nature or one's willingness to seriously consider scholarship that is seen to be politically tainted, where one's academic identity (one's creds) could be jeopardized. We would be naïve not to acknowledge that the desire to be in-step with what is deemed *de rigueur* is as strong among academics as it is among society's rank and file, perhaps more so. It would be even more naïve not to recognize how potent a dynamic it is in the world of elite art.

This brings to mind Hans Christian Andersen's classic children's story, The Emperor's New Clothes, in which a status obsessed despot who gives more attention to his wardrobe and accoutrements than to his subjects is duped by some clever shysters into buying and donning a suit of clothes they claim to have made that is invisible to anyone of dubious competence or who is just plain stupid. The emperor himself cannot see the garment but pretends to for fear of appearing unfit for his position, as do his ministers and his subjects except for a child in the crowd who, during a procession to show off the new suit of clothes, cries out: —**B**t he isn't wearing anything at all!" Andersen

apparently took pleasure in presenting himself as such a naively precocious child and intended the story as an exposé of the hypocrisy, snobbery and pretentiousness he found prevalent among the Danish literati.

Radical chic

What sadly seems to have underscored so much of the production of avant-garde art in the twentieth century and which plagues so much of the scholarship around it is a potent penchant for *radical chic* that perhaps finds its strongest expression in the unintelligibility of much postmodernist writing. The following excerpt from page 50 of Felix Guattari's *Chaosmosis: An Ethico-Aesthetic Paradigm* (1995) is a case in point. Notwithstanding that it has been taken out context this surely is nothing other than deliberate obfuscation.

We can *clearly* see that there is no bi-univocal correspondence between linear signifying links or archi-writing, depending on the author, and this multireferential, multi-dimensional machinic catalysis. The symmetry of scale, the transversality, the pathic non-discursive character of their expansion: all these dimensions remove us from the logic of the excluded middle and reinforce us in our dismissal of the ontological binarism we criticised previously. (quoted in Sokal & Bricmont 1998: 166 - my emphasis)

Such inaccessibility seems an end in itself and one wonders who is supposed to get it (or pretend to get it?). A century earlier, when the trend against realism and widely accessible art was just taking off, Cailleux (1841 - 1909), a French poet and critic, lamented its manifestation in literature, sensing its appeal to status and portraying the new aesthetic thusly:

Today one writes for a charming aristocracy. 'To be a member of the charming aristocracy, you have to appreciate things that the great mass of your fellow citizens are unable to appreciate.'⁸⁴

Radical chic such as Guattari seems to exemplify so convincingly, which Pinker suggests grew out of a militant denial of human nature, finds its expression in art works that are deliberately ugly, baffling, and insulting and Pinker cites as examples: Robert Mapplethorpe's photographs of sadomasochistic acts, Andres Serrano's *Piss Christ* (a crucifix in a jar of the artist's urine) and Chris Ofili's painting of the Virgin Mary smeared in elephant dung. These are instances of what Quentin Bell (1992), following on Veblen, has categorized as conspicuous outrage (Pinker 2002: 414), where shocking the bourgeoisie has become the primary artistic concern. In the realm of music Pinker refers to remarks by composer Karlheinz Stockhausen following the 9/11 attacks which surely must win the prize for conspicuous outrage.

"What happened there is -- they all have to rearrange their brains now -- is the greatest work of art ever. ... That characters can bring about in one act what we in music cannot dream of, that people practice madly for 10 years, completely, fanatically, for a concert and then

⁸⁴ Quoted by Tom Wolfe in an interview by Ben Wattenberg aired on PBS in 2007, [Tom Wolfe and the Derriere Guard](http://www.pbs.org/thinktank/transcript1294.html). Transcript available at <http://www.pbs.org/thinktank/transcript1294.html>

die. That is the greatest work of art for the whole cosmos. ... 'I could not do that. Against that, we, composers, are nothing. (Kershner & Landler 2001)

Even when the possibilities of a genre have been far from exhausted, it seems the wont of people in the know to avail themselves of a new and different canon of status, perhaps in part motivated by an awareness that conservatism in one's artistic ventures is taken to imply more than just a disinclination to abandon art that continues to satisfy or a reluctance to embrace something significantly different that simply does not satisfy. In the arts and the academic institutions that help sustain them there has been a conflation of aesthetics and notions of human nature *with* ideology and political philosophy, where, for example, one who eschews the radical chic of the avant-garde and postmodernism is assumed to be on the political right while those who laud it are presumably progressive and on the left.⁸⁵ As has already been intimated, this polarizing is in varying ways and degrees found in academia with those in the natural sciences construed as conservative if not reactionary (or even fascist), while those in the Social Sciences are seen as politically progressive with their researches far more likely to be deemed politically correct.

As with nature-nurture, we have here another simplistic and counterproductive dichotomy. I grant that if one were to quantify the political ethos of academics from both sides,⁸⁵ and this can to some degree be done,⁸⁵ the resulting bell curves would overlap substantially but not completely, *and* based on my readings, I would say it is almost a sure bet that the natural sciences curve would indeed be on the right (where right = right). If status (or anxiety about political identity) is genuinely *not* a concern in directing one's quest for understanding and truth, this cannot be a problem and the work of philosophers like Henry Plotkin (2002) demonstrates the substantial common ground and scope for research based on a well-founded understanding of how genes and culture co-evolve, as will be the focus of the next chapter.

What the Social Sciences provide are insights into what is actually going on in people's interactions and their use of time that reveals what they share and what they do not. Where there are enough people having something in common, we can speak of a sociocultural phenomenon and we can then attempt to explain it. Here again the Social Sciences provide essential input by revealing the connections between sociocultural phenomena, particularly between what is going on at a micro level vis-à-vis what can be observed as broader and less transient (where we can, for example, speak of ideology) and from this, theories of cause and effect can be arrived at. This is obviously what is needed for all kinds of reasons and purposes and is what education, perhaps most of all, needs to take serious account of, BUT only provided the theorizing has taken stock of what is understood about our universal human nature and how it biases what is going on in people's interactions and use of time wherever one finds them. The upshot for me is that *every phenomenon that is social is firstly and always psychosocial* and we can only progress so far in our understanding of it without a psychology that can adequately explain human agency. In several places I have drawn attention to the myriad of ways in which commercial interests exploit our innate psychology and I really cannot believe that any social scientist would refute them, and yet there seems a reluctance to accept

⁸⁵ Marc Hauser's [Moral Sense Test](http://moral.wjh.harvard.edu/index2.html) could be used in this way given the clear connection between political leanings and moral sensibilities. Online at <http://moral.wjh.harvard.edu/index2.html>

that it also our innate psychology that makes it possible, with educational help, to become optimally free of profit's machinations, for our better nature to call the shots.

Looking both ways?

Retro Style would seem, on the strength of its name, to be something quite apart from the conspicuous outrage of the artists cited earlier. Yet its aesthetic seems fully postmodern and smacks of radical chic if we are to agree with Elizabeth Guffrey's take on it (2006). Retro, as she explains it, does look back and draw from the past but is not motivated by any yearning for aesthetic riches, for art that moves one emotionally and that, dare one say, is beautiful. Retro does not attempt to revive any style or tradition, to bring it back and build on what was previously successful. Its use of the past is informed by a kind of cynicism or angst, its intention being to —~~d~~mythologize" the past, drawing from modernism so as to challenge the notions of progress that are associated with it, for example, its —~~p~~ositivist views of technology [and] industry." As Guffrey sees it, Retro —~~q~~uotes past styles with an *unsentimental nostalgia*" (2006 - cover description). Such an oxymoron does not seem problematic for her (I can but shake my head.) and is in line with what I see as a postmodernist penchant for enigmatic, contradictory, even nonsensical formulations that we are supposed to believe convey real insight.

If retro art really is as Guffrey portrays it, I cannot help but wonder what one is supposed to do with it beyond using it as some kind of —~~m~~embership badge," yet another demonstration of radical chic that allows yet another cognoscenti to distance itself from art that satisfies more organic yearnings, yearnings which issue from a psychology that is ages old and universal. If indeed it has the power to demythologize the ultimately suicidal notions of progress that drive the globalization of consumerism, who can but applaud it? But the question that must then be posed is: who is it that gets the message, or is likely to? Most likely it will be those who have already grasped it, that Retro is art that preaches to the choir, and the choir is not likely to gain in size and influence if it is art that fails to do more than provoke critical thought processes, as important as these may be.

Trust the hippies!

We need rather to get the message across to those who have yet to be nudged out of their comfort zones and made to confront the —~~m~~adness" "that's goin' on around here," that David Crosby suggested —~~s~~urely, surely won't stand the light of day" but with the caution: —~~It~~ appears to be a long time, such a long, long, long, long time before the dawn."⁸⁶ These lyrics are from a song that reached millions and was one of the anthems of the Woodstock generation; *and* it was able to do so because of the eminently popular musical idiom that Crosby, Stills and Nash employed to convey them, music that rocked and that was nothing other than beautiful in its crafting and delivery, superb vocal harmonizing being what stands out the most, and music that drew upon and celebrated

⁸⁶ David Crosby's —~~It~~ng Time Gone" from the 1969 album *Crosby, Stills and Nash*.

traditions meaningful to a rank-and-file interested in something other than cynical savoir-faire.

'Long Time Gone' provided the soundtrack for the opening sequence of the 1970 Academy Award winning film, *Woodstock*, which documented the massively successful 1969 music festival, an event that encapsulated an ethos that was genuinely promising even if it ultimately failed to achieve the critical mass needed to really save a world gone mad (for which the Vietnam War and the proliferation of nuclear weapons were then seen as most symptomatic). Joni Mitchell captured this ethos in her tribute to the festival, a song that also reached millions and whose lyrics are worth quoting from here because, among other things, they underline humankind's unbroken connection with a primordial past and speak to an ecozoic vision consonant with what was discussed in the first chapter. Knowing Mitchell's lyrics as thoroughly as I do convinces me that she in no way was trying to invoke a 'Noble Savage' ontology such as Pinker debunks in *The Blank Slate*. And, notwithstanding the confessional character of so many of Mitchell's lyrics, they are never about angst. They certainly explore her discontents and the darker sides of our nature, but always with an eye to how they can be mitigated when our better nature is activated and allowed to prevail.

By the time we got to Woodstock
We were half a million strong
And everywhere there was song and celebration
And I dreamed I saw the bombers
Riding shotgun in the sky
And they were turning into butterflies
Above our nation



(my own PowerPoint compilation)

Adaptationism vis-à-vis socialist realism

Even though he embraced a political philosophy that was fully blank slate and used it to justify oppression and genocide, Stalin did grasp that art which fails to connect with innate dispositions stands little chance of educating the masses in ways conducive to progress toward a utopian ideal. Indeed, he took exception to work that seemed more intellectual than sensual in its aesthetic intentions. After its premiere in 1934,

Shostakovich's modernist opera, *Lady Macbeth of Mtsensk* was hailed by the Soviet press as another "success of Socialist construction, of the correct policy of the Party." Labrecht (1982: 51-52) suggests that this never would have happened if it were not that Stalin only got to see the opera and, more importantly, to hear it quite some time later. Labrecht suspects, as others have, that Stalin wrote (or instructed the writing of) the newspaper piece that, two years after the premiere, denounced the opera as "petty-bourgeois formalist cerebration" and which no doubt contributed to its being banned for almost thirty years.

The 'correct policy of the Party' was in fact *socialist realism* and was in large measure a reaction against the departures from realistic art that abounded in the early twentieth century and which were seen as *Belle Époque* bourgeois indulgences and accordingly 'decadent.' More importantly they were regarded as having little prospect of being grasped by the proletariat and hence having little value as propaganda. It is claimed that Lenin himself eschewed the premise that what is beautiful should be rejected because it happens to be old, and admonished that art must call on and exploit its heritage. "Proletarian culture must be the logical development of the store of knowledge mankind has accumulated under the yoke of capitalist, landowner, and bureaucratic society" (quoted in Sopontsinsky 1978: 6).

But then art must, through its content, instruct people, causing them to viscerally *feel* the values, ideals and conceptions of the human condition that it seeks to engender and cultivate, and it can only effect the required emotional manipulation if it is in a 'language' people understand and that resonates with their pre-cultural nature as well as with what they have experienced and come to value. In the view of the eminent cultural-historical psychologist, Lev Vygotsky, whatever is going to succeed as learning must position the learner in a zone of proximal development, which in essence is the commonsense principle that education must work with a learner as she or he *is*, where the educational input must be such that the learner is able and inclined to make sense of and work with it. In this regard, it bears repeating what was said in the first chapter, that Vygotsky clearly understood that any attempt to comprehend the human mind must be located within an evolutionary framework and thereby must understand mind as something that unfolds according to species-general psychosocial processes.

The Derriere Guard

The ethos of breaking bonds and overthrowing orthodoxies may during the course of the last century have become orthodoxy in its own right. If so, it is one that could be loosing ground in the arts as well as in the discourses that attend them. In 1997 the widely-read novelist and social satirist Tom Wolfe shared his surmise that the world of art was in the waning years of a cultural epoch and that a "regime shift" was imminent comparable to what took place in the years crossing the nineteenth and twentieth centuries. What the previous regime change required in the visual arts was a decial of the sumptuousness of the *Belle Époque* that was under "the near total cultural power" of an elite of realist painters who are now by and large forgotten, none of them having come to be hailed as 'a master,' but who nonetheless were predicted by art dealers, critics and curators in an

1897 survey to be the most likely to still be giants of art in the year 1997.⁸⁷ What is important in relation to the ongoing discussion is that the regime change that came with modernism was underscored, even if unwittingly, by a belief that humans are sufficiently pliant in their tastes to embrace forms that lack realism or that are significantly abstract (people who are blank slates aesthetically). The result was art that increasingly stood aloof from the ‘plebeian’ tastes of the masses even if its creators professed a strong sense of identity with them.

The festival at which Wolfe was speaking was staged by the *Derriere Guard*, a loosely organized group of painters, poets, and composers, founded [in 1996], who celebrate technique as artistically liberating, and beauty as a universal value.” The group’s founder, Stefania de Kenessey (a classical composer) describes its membership and ethos in the following way.

A new generation of artists are actively re-engaging history. ... They neither regress to the distant past nor yearn for a now vanished world; instead, they strike out in an altogether different direction. By fusing tradition with innovation, the Western with the Eastern, they offer a radically new alternative for the art of the new millennium. (Limaye 1997 – online source)

It is an alternative the notion of which predates the *Derriere Guard* by at least a decade. It has been provided a theoretical and historical argument in the writings of Frederick Turner whose words painter Steven Assael used in a debate with the director of the Whitney Museum of American Art following a protest by artists who reject the new orthodoxy which they accused the museum of embracing to the disadvantage of artists such as de Kenessey describes. Turner’s explorations of art history have for him confirmed that while “sometimes the present created the future by breaking the shackles of the past,” just as significantly “sometimes the past created the future by breaking the shackles of the present” (the European Renaissance for example) (Turner 1996: 32). Wolfe, Turner and the *Derriere Guard* sensed this to be happening as we were rolling into the twenty-first century. The problems bequeathed by modernism to artists like those of the *Derriere Guard* have been articulated by Turner as follows (27-28):

- The human person had been denatured; we had been taught to reject our animal nature, our sex, our genetic lineage.⁸⁸
- As artists we were expected to dismiss the constraints of nature itself- this at a time when the planet urgently required human beings to accept their ecological responsibilities as part of a larger ecosystem not created by social fiat.
- We had lost the great forms and disciplines of the arts, the biopsychic technologies of meter, representation, and melody, and were thus alienated from our own shamanic tradition.

⁸⁷ The artists so rated were (1st) William-Adolphe Bouguereau, (2nd) Jean-Louis Ernest Meissonier, and (3rd) Léon Gérôme. Bouguereau’s paintings are definitely worth checking out and there is a revival of interest in them, one of which is used as the backing for the logo of the Art Renewal Center on their website at <http://www.artrenewal.org/>

⁸⁸ By genetic lineage, Turner is making no allusion to race. He is emphasizing our condition of connectedness with all life, back through an ancestral ‘Eve’ to a common ancestor with chimpanzees and further back to less and less complex organisms to the very beginning of life on the planet or perhaps beyond to stardust Mitchell sings of.

- The political separatism and cultural fragmentation that had been encouraged had dangerously attenuated that sense of human fellowship that is the womb of artistic creativity.
- In a time of staggering and marvelous scientific discovery, when nonlinear dynamics and chaos theory were suggesting a vital rapprochement between the two cultures, avant-garde art and criticism were assailing science with a remarkable combination of malice and ignorance.
- Hope, and all the other positive emotions that inspire the arts, were sneered at and dismissed; snideness and rage were the dominant signs of the artist.

Turner is one of a growing number of mavericks in aesthetics who have turned to Evolutionary Psychology in their attempts to once again place human nature at the center of research into the arts and how people engage in and through them.⁸⁹ For artists and arts educators with whom his conclusions resonate loudly (and I include myself here), Turner presents what could be a manifesto. I have extracted the following which I find most apropos the discussion at hand.

- Art should direct itself to the general public, and should grow from and speak to the common roots and universal principles of human nature in all cultures.
- Art should deny the simplifications of the political Left and Right, and should refine and deepen the radical Center.
- The use of art, and of cheap praise, to create self-esteem is a cynical betrayal of all human cultures. *Excellence and standards are as real and universal in the arts as in competitive sports.* [my emphasis]
- The long enmity between emotion and intellectual depth needs to be ended
- Art must be reunited with science. ... The experience of truth is beautiful; thus, the artist's experience and the scientist's are at bottom profoundly akin. (Ibid: 31-32)⁹⁰

The claim that standards and the pursuit of excellence are universal concerns in artistic activity is one that cultural relativists might well be inclined to challenge, but I believe Dutton and others have adequately demonstrated its validity in so far as establishing that cultures everywhere engage in and esteem artistic activities where craftsmanship (proficiency, skill) is valued and aspired to. It is apropos to recall what was discussed earlier regarding our universal predilection for demonstrations of prowess. High levels of skill and virtuosity are a source of pleasure and are admired everywhere one goes and are sought in a range of regularized human activities, sports being the most obvious, where it can confidently be said to be the *raison d'être*. We are accordingly predisposed to set apart and elevate elites of especially skilled and virtuosic individuals and to honor their accomplishments.

⁸⁹ That the appellation 'maverick' is still apropos is suggested by absence of a webpage for *Darwinian aesthetics* at Wikipedia, even though it is a rubric, coined by Dennis Dutton I believe, that is being used more and more and that encompasses work that is over ten years old. Besides Dutton, other art historians and theorists for whom it is applicable include Mark Turner (1991, 1996), Nancy Easterlin (1993), Joseph Carroll (1995, 2004), Robert Storey (1996), Brian Boyd (1998), David Evans (1998), Patrick Hogan (1997), and Paul Hernadi (2001).

⁹⁰ Ibid. pages 31-32.

But given our innate penchant for novelty, it is understandable that notions of excellence and virtuosity, and the standards that are to apply, change over time. When we consider the rapidity of change in the art world of *fin de siècle* Europe and America, it seems clear that it can happen quickly and the change can be radical. But the truth is of course that the sudden change in question took place, not in *the*, but in *an* art world. *The* art world is nothing other than that world in which art takes place, where it is created and experienced, and that of course is a huge - indeed, the whole - world comprising plebs, cognoscenti and the vast majority who occupy the middle ground, a world with more inertia than those esoteric art worlds more concerned with challenging or even overthrowing the status-quo. It is albeit a concern that is in so many cases justified and necessary unless one is satisfied with or oblivious to all that is status-quo and content to just go with the flow. Of course, there is nothing inherently wrong with a status-quo. Something that is widely shared by way of belief or behavior can be genuinely good and worthy and is so in many cases. Or it may be something of little consequence and not worth much fuss. The statuses quo that certainly must be challenged, that constitute the ‘madness’ of consumerism and globalization, are not the notions people have about art, but the notions of entitlement and privilege that underscore rampant, unsustainable consumption, exponential population growth and all manner of social injustice. Art can and should challenge such madness, but its best chances of success lie in being accessible.

On accessibility

Whatever the content of art, its accessibility is clearly a matter of the form that conveys it; form is what —aises content to objectivity in art” and much of its content may not be of the overt and discursive kind. The words in quotes are Christopher Ballantine’s, from his *Music and Its Social Meanings*, a collection of texts that influenced me profoundly when first I read them in the 80s, and which demonstrate ways in which music without words or other clear referents can nonetheless be read as social texts. Its intention was to provide what Ballantine saw as urgently needed, and which clearly still is, i.e. critical awareness of —the choices, evaluations, and discriminations that we make about music, and objectively of why we make them” (Ballantine 1984: 27). Ballantine’s understanding was sociological and conspicuously Marxian. The need for this kind of critical consciousness in relation to music is what many modernist and postmodernist composers and artists would say they are responding to, arguing that their art is their way of intervening in these choices, evaluations, and discriminations and helping to rescue them from ideology. This is all well and good provided one’s theory acknowledges that these choices, evaluations, and discriminations are not entirely socially constructed, but are informed and biased by innate predilections and perceptual predispositions from which it is extremely difficult to be rescued were such rescue necessary or even desirable. Though prominent as a Frankfurt School social theorist and thus commonly thought of as Marxian, Herbert Marcuse clearly understood the absurdity of blank slate-ism, as he made clear in his *The Aesthetic Dimension* (1978: 29).

By virtue of its transhistorical, universal truths, art appeals to a consciousness which is not only that of a particular class, but that of human beings as *species beings*, ‘developing all their life-enhancing faculties.

What is universal in art?

That art embodies transhistorical and universal truths is difficult to substantiate because truth is epistemologically problematic, i.e. what is truth? That which is transhistorical and universal in art is a set of qualities that mark particular kinds of doings and their outputs as art. In the absence of any such qualities, the word begins to lose its meaning. Sociologists and anthropologists use the term and have done so in respect of all human cultures, because in all of them can be observed doings that manifest certain qualities. Dutton (2009: 52-59) has identified twelve such universal signatures. As a way of concluding this chapter, each of these will be discussed in turn, drawing on and hopefully making more cogent the adaptationist theories and explanations that I have attempted to give credence to in this wide-ranging chapter.

1. Direct pleasure

The apprehension of the outcomes of artistic effort, be they art works, performances of works or improvisations, must excite an immediate experience of pleasure according to Dutton. I would concur but with the caveat that pleasure must be understood as something that can be far more wide-reaching than just the fact of having been entertained. I still favor Langer's term significant import and here recall what I pointed out in Chapter One, that pleasure:

can take innumerable forms from subtle to intense, some ephemeral, some lasting, some libidinal or carnal, some intellectual or cerebral, some sadistic, masochistic or otherwise self-serving (e.g. status driven), while others entail empathy, compassion and self-giving, some are passive while others require engagement, commitment and effort, some are regarded as base, while others are esteemed as virtuous and edifying, some common, some esoteric.

What this chapter has argued is that for any perceptual experience to be meaningful, the representations that are formed in the brain must be weighted emotionally (marked somatically) if they are to have any significant role to play further along. This means that whatever the object of perception, it must have something in its form that renders the brain's representations feelingful (that gives them emotional valences) and that sets about structuring and giving pattern to the experience of sentience that unfolds. It does so by activating neural mechanisms that have been instructed by genes but that have been expressed phenotypically and been shaped through one's interactions with the physical and sociocultural world one inhabits. In modern global society, I have argued, one inhabits several such worlds, each shaping one's sensibilities and cognitions in different ways, to the extent that describing one's own culture becomes difficult when culture is taken to mean the beliefs, norms and values that manifest in observable behavior as opposed to those that characterize an ethnic identity that one may profess identification with. Just as we have universal norms and values that speak to an innate moral sense, so do we have universal predilections in terms of the kinds of sensory experience we find pleasurable even though culture works on these in different ways giving rise to the rich diversity of artistic expression that constitutes the world of art (in contradiction to what people tend to regard as the art world). Our universal predilections and biases kick in without conscious awareness and are no doubt most potent in their effects in the moment of apprehension, before one's intuitive grasp of

what is being perceived starts to be mediated through cognitive links with what has already been imprinted in memory through experience and learning. Through repetitions of features in what one experiences, these links get connected up and internalized as ideologies that bias which subsequent linkages are made and which are not and for the most part do so under the radar of conscious awareness.

Dutton makes the important point that the experience of meaningfulness or significant import (the enjoyment of beauty for example):

derives from multilayered yet distinguishable pleasures that are experienced either simultaneously or in close proximity to each other. These layered experiences can be most effective when separable pleasures are coherently related to each other or interact with each other – as, roughly put, in the structural form, colors, and subject matter of a painting, or the music, drama, singing, directed acting, and sets of an opera. (2009: 52)

As to why we innately favor certain stimuli over others, taking more *direct pleasure* in them, several adaptationist explanations have been offered and differ according to the art form in question. Music provides experiences that are highly proprioceptive and kinesthetic, but only if its temporal organization is such that regularities can be perceived from which ever larger and more complex patterns of regularities can be apprehended and cognized in various ways, as patterns that are, for example, melodic, harmonic, timbral, textural or purely rhythmic. Expectations that innate mechanisms induce in response to what is happening in the moment can of course be met, delayed, ignored, tricked or thwarted depending on what the music presents to the ear; therein lies much of the explanation of how music achieves aesthetic effect.

What is immediately apprehended very quickly undergoes processing on many computational levels and involving different neurocognitive domains and accessing different memories, but always engaging older parts of the brain that imbue cognition with emotional content, without which even dryly rational thought is impossible. This develops the experience and makes it more meaningful. Structures in music that are most accessible are those that resonate neurologically because they are in some way or degree isomorphs of or in part analogous to structures already residing in the brain, structures that may be and probably are in most cases shared by different integrative systems and at other times employed toward different behavioral outcomes: language, mathematics, the other arts, courtship, grooming, and so on.

The pleasure that motivates attention and participation in the arts are the results of reward mechanisms that evolved in the Pleistocene because of the value of particular behaviors in courtship, finding optimal habitats, not getting lost, avoiding danger, locating food, hunting cooperatively, the establishing and tracking of social relationships, the nurturing of offspring, or the acquisition of status and rank. There are also reward mechanisms that predisposed our ancestors' attention to and participation in activities that organize the brain both physically and informationally, but that do not place one in danger or demand too much energy expenditure (even though they may demand much in this regard as in play, sport and dancing). The brain demands such reorganization, of putting things where they belong, because of our unique capacity for processing information that is contingent, provisionally true, potentially true, or likely to be true depending on its source. And from Dissanayake we understand the omnipresent need for intimacy and its reassurances in modes of interaction that begin with life for a child and are critical to how successfully genes get expressed

phenotypically such that the child becomes a socially competent adult capable of finding fulfillment, meaning and purpose in life. That musical events are such potent means of exploring, revealing and celebrating our intricate social connections has perhaps best been explained by Christopher Small in his celebrated *Musicking* (1998) and he has done so in ways eminently concordant with an adaptationist (Darwinian) understanding of music's social efficacy, such as Dissanayake offers, even though Small is identified so strongly as a sociologist of music (or music anthropologist) and does not ever invoke evolutionary explanations or draw from EP.

2. Skill and virtuosity

Artistic doing always requires skill at some level, usually a repertoire of skills that in the case of performing arts like music, must be integrated in time, and this requires well developed proprioceptive and kinesthetic ability. Natural selection has provided for this amply because it so comprehensively advantaged our ancestors' survival and reproductive prospects. As importantly artistic doing *demonstrates* such skill or skills and we are innately predisposed to finding demonstrations of prowess and virtuosity intensely pleasurable. Not only can one learn from them in ways advantageous for one's own skill development, they provide ideals of what is and what might be possible. And, importantly, we gain from them in terms of what the experiencing of them can induce internally that promotes improved cognitive functioning without engaging one in energy sapping and possibly injurious activity.

Sexual selection has predisposed us to such demonstrations because they are information rich fitness indicators and signal genetic quality in a potential mate or a rival suitor. Add to this the need for status that became a strong selective force when our ancestors started living in sizeable groups. That the pleasure of witnessing prowess can be so intense – that it “can cause jaws to drop, hair to stand up on the back of the neck, and eyes to flood with tears” (53) - suggests a runaway process in evolution, where a feedback loop between selection for prowess and selection for finding prowess attractive fed an exponential increase in the speed of evolution at the genetic level. But it also suggests that there should be a degree of dimorphism in how males and females respond to such demonstrations, the nature of the pleasures derived, and what motivates interest in the first place. It has been explained, however, that such differences as there are will be quantitative and not qualitative. That the psychology of art is in significant ways the psychology of status has also been discussed at length and is another dimension of an adaptationist understanding that suggests gender differences that manifest in one's inclinations for and responsiveness to different forms of artistic engagement. They also manifest in the gendered nature of so much of the world's musicking. This is problematic when exploited to sustain gender inequality or to rationalize sexist behavior, and sadly it continues to be so exploited in societies and cultures around the world.

3. Style

‘Style’ can mean many things, but whether it is a reference to how an artist (or anybody) works, to the formal characteristics of what is being or has been created, or to how one chooses to dress, wear one's hair, walk or talk, it always at some level implies

mutuality and shared meanings. It also implies that among some group or groups of people, even if only a handful of cognoscenti, what is being produced, has been produced, or is being displayed is accessible (graspable) and has been determined to have value. In urban slang, *to style* or *stylin'* is generally a complement applied to someone who in their look or behavior is impressive. In the parlance of some Hip-hop emcees (rappers), it can also denote superiority in what one is able to verbalize spontaneously, as in the free-stylin' which is the focus of emcee battles. Not only does it imply skill and virtuosity but, just as importantly, a command of linguistic idioms (including prosodic and gestural elements) that are understood and identified with by those listening, those who ultimately decide who wins.

Apropos the earlier discussion around modernism and postmodernism, Dutton remarks on the proclivity of much modern and postmodern art and scholarship to treat style —as a metaphorical prison for artists, determining limits of form and content.” What a style does rather is to provide a familiar frame of reference within which artists meet their audiences and communicate with them. Without some such frame, there is little chance of much being accomplished as far as any real level of exchange or shared meaning. In this regard, the deliberate avoidance of form and style is in a sense just another style insofar as the exercise in avoidance is taking place in some kind of artistic act or production for which there is expected to be some kind of artistic audience, usually one that is *in* on what is going on and whose expectations have been accordingly prepared. In such an act or production, one might argue that there is less freedom precisely because of what one cannot or should not do. How ‘free’ for example could a musician (or any performing artist) be if not allowed to employ a ‘language’ in which she or he has acquired fluency and which others understand? Musicians ‘performing’ Stockhausen’s —E’ (—H”), for example, are anything but free even though no restrictions whatsoever have been placed on what they might produce with their instruments. According to the jacket notes of the 1971 *Deutsche Grammophon* recording of the ‘work,’ —Es”

... reaches an extreme of intuitive playing in the instruction to play only when one has achieved the state of non-thinking, and to stop whenever one begins to think ... As soon as a player thinks of something ... he should stop, and only start again when he is just listening, and at one with what is heard. (Jacket notes)

Style permeates human life to the extent that Dutton sees style and culture are —virtually coterminous.”

Virtually all meaningful human activity above the level of autonomic reflexes is carried out within stylistic framework: gestures, language use, social courtesies such as norms of laughter or body distance in personal encounters. (54)

4. Novelty and creativity

Dutton does not clearly qualify his inclusion of *novelty* as a criterion. When we call something a novelty, including an experience, it is because it stands out as being new and original in ways that capture one’s interest and, in many cases, induces pleasure. We, like so many other species, are innately wired to be on the look-out for and attentive to anything that has not been experienced and processed previously. Dennett believes our penchant for novelty to be a formidable selective pressure in cultural

evolution, which as we have seen has all the hallmarks of a runaway process, —a positive-feedback escalator” as he puts it (2007: 88).

Our predisposition for novelty is a Paleolithic button that media, advertising and commercial art have learned to push relentlessly and to ideologize as an acceptable means to personal status in consumerist society where it is just accepted that having all the *latest* stuff is important. But no matter the delight we naturally take in novelty, I do not consider it a vital quality of art. After all, the art that we cherish is art that we revisit from time to time, if not frequently, and the richness of experience it affords is maintained even though there is nothing in it that remains novel even though there might remain riches yet to be discovered. Originality is another quality that ties in with the criterion —expressive individuality” that will be taken up further along. It is part and parcel of the more complex quality: creativity, to which some discussion is necessary given the importance of its development through education.

Creativity most surely is vital to art and is often argued to be what distinguishes art from craft even though they are substantially overlapping pursuits and a great deal of creativity can go into the making of something that others may hardly take note of. Creativity, in fact, is vital to the lives of all humans and is one of our most distinguishing characteristics as a species. Everyone has to solve problems that they have not solved before and that require cognitive divergence, where the problem induces a neural searching out of memory for what is potentially relevant. The solution is not found, only information that might be useable. The solution requires cognitive convergence, where the brain weaves together disparate threads of mentales and an idea, if not the solution itself, emerges in consciousness. And if the actual solution is novel in its conception, clever or even ingenious, *and works*, the cognition of it brings immense pleasure and it can also do so for those who witness the result (and perhaps the process even). It need not however be productive in the sense of some physical doing with an artifactual result. The problem could be entertained and resolved entirely as a process of mind motivated only by the pleasure afforded as, for example, when reading literature and trying to anticipate how the plot will unfold, or trying to make inferences regarding a character’s or perhaps the author’s intentions. Grasping the workings of a creative mind, I would argue, requires a creative mind.

Technology, from stone axes to nano-technology, is the product of human creativity and is the means by which we have dramatically altered the environments of selection not only for our own species but for almost every other. What culture has accumulated is a vast store of creative outcomes, each providing material on which creative minds continue to work and from which new, more sophisticated outcomes ensue. The encephalization of the human brain, as has been already been theorized, was no doubt driven by and made exponential by gene-culture co-evolution such that it tripled in size with extraordinary rapidity by the standards of biological time (Buss 2008: 396). The next chapter will explore this further with particular attention to cultural evolution.

Cognitive divergence and convergence are processes that evidence the inter-modal and cross-modal capacities of the brain and which make problematic Gardner’s Multiple Intelligences theory. On the other hand, they provide support for the proposed existence of general intelligence (the g factor) that reflects overall brain efficiency and fluidity. The theory of g posits a unitary general intelligence that can be quantified by IQ tests. It is one of the most contentious of theories because of how it can be and has been used

in formal education and in processes of selection in higher education and in the world of work. It has moreover been applied to posit differences in average intelligence between populations defined by race and gender, thus providing theoretical support to those who would use such differences to justify programs of social engineering that are morally problematic if not reprehensible. It is another discussion that the next chapter takes up.

A question that is pertinent here is whether or not there is any correlation between *general intelligence*, as measured by IQ tests, and *creativity*, as measured, for example, by the *Tests of Creative Thinking* designed by Paul Torrance in 1966 (see Torrance 1974). These tests have since then been taken by millions worldwide, administered in 50 languages, and the resulting data scrutinized in several studies. Such a correlation is to be expected given that creativity and intelligence manifest the same cognitive processes. Creativity may be nothing more than intelligence that gives rise to novel outcomes. Torrance has hypothesized that there is a correlation between low creativity (CQ) and IQ but that it is unlikely to be found among those possessed of above average or high creativity. The most surprising findings have been those of Kyung Hee Kim after analyzing nearly 300,000 Torrance scores from over four decades of testing (Bronson & Merryman 2010). He found that up until around 1990, scores increased for both IQ and CQ in keeping with the [Flynn effect](#) whereby more enriched environments have led to an increase in IQ of as much as 10 points per generation (which is evidence in itself that IQ is not wholly innate) (Flynn 1999). From 1990, according to Kim's findings, creativity scores have been falling, in America at least.

The July 2010 *Newsweek* article reporting on this purports that there are no conclusive explanations for why this is happening but cites as likely culprits the inordinate time kids spend in front of TV or playing videogames instead of engaging in creative activity as well as the inattention to creativity development that has come to characterize American schooling since the Reagan years with its focus on standardized curricula, rote memorization, and nationalized testing. Kim's findings are particularly disturbing if one believes, as I do, that critical consciousness is always and at once creative consciousness. Being able to "read the world" (Freire & Macedo 1987) requires a capacity for problematizing it and then making the best use of what one knows and what one can access such that the solutions are products of a complex and creative process of synthesis.

5. Criticism

Dutton claims that "wherever artistic forms are found, they exist alongside some kind of critical language of judgment and appreciation, simple or, more likely, elaborate." (54). The employment of such a language can be a creative performance in itself and my readings of art criticism suggest strongly that many art critics would wish their critiques/reviews to be so regarded. Dutton notes that Anthropology has found a culture of criticism to be at best rudimentary if at all existent in small, nonliterate societies, even those with developed art traditions, but he does not address this as an argument against including criticism as a universal attribute of art even if so few small, nonliterate societies remain. It is what can be observed in such societies that EP uses as primary data in many studies and if criticism is negligible in such societies, this challenges its being part of an innate artistic sensibility. My hypothesis is that the absence of a culture of criticism should be expected in a society where status hierarchies are fairly simple

and straightforward, even more so when access to memory that has been externalized is circumscribed by not having the forms of literacy that access to such memory demands, being able to read for example. The mass media has created and made widely accessible other forms of literacy that are more easily and pleurably acquired, but which nevertheless afford access to worlds upon worlds of externalized memory and which accordingly make some kind of critical culture inevitable even if it is limited and superficial in its purview.

An adaptationist take on criticism seems fairly straight-forward even though it may not be adequate for explaining the complex cultures of criticism and critical discourses that we have in the 21st century. The ability to read and rate fitness-indicators and to assess perceptual qualities is not unique to humans of course. However, the more thorough and penetrating the ability, the more successful an organism will be in negotiating its environment and meeting its needs. Living in large groups and negotiating different and changing environments, as has been discussed in this chapter, ups the ante for competence in assessing what is going on given that so much more goes on in large collectives than in small. Managing complex social relationships requires complex cognitive machinery that makes it possible not only to assess, but to make inferences and arrive at judgments. Languages (including musilanguages) facilitate this by making available what has not been directly experienced that can better inform one's judgments but which at the same time radically increases all that there is for judgments to be formed in respect of, as does the accumulation of cultural knowledge that is ever increasing and which literacy and media make increasingly more accessible. Indeed, the declining scores in creativity Kim noted could also reflect the sensory and informational overload that is inescapable in modern global society and which no doubt dulls people to creative productions and disinclines them from creative engagement with them.

Critical judgment is a skill (or cluster of skills) and there is pleasure to be taken in the proficient exercise of any skill. When the judgment is shared and made compelling to others, it becomes overt and can be admired, appreciated, envied, decried or otherwise contemplated and thereby has meaning in relation to status. Skill in critical judgment is important in most art traditions, obviously so for the artists who seek to learn from others (and perhaps thereby gain some competitive edge), but also for those who are not practitioners, for whom it affords a mode of engagement that is creative as it too must consider how materials may best be used to achieve artistic intentions and form judgments in respect of this, perhaps also in respect of the intentions themselves. A disposition for criticism might not manifest overtly in the artistic activities of small, nonliterate societies (and there could be several explanations for this) but the very fact of having developed art forms suggests correspondingly developed critical skills. And one must not overlook the likelihood of a social etiquette markedly different from that of modern, urbanized society in a global village of highly interactive citizens who never meet face to face. Internet blogs give would-be critics a chance to test their critical chops in a public forum without having to have been invited and with the option of remaining anonymous, conditions that certainly did not exist in hunter-gatherer societies.

6. Representation

Crediting Aristotle with having first observed it, Dutton points to the incontestably universal attraction that astute representations and imitations of real and imaginary experiences have for people. I have spoken to this indirectly in the earlier discussions on the ‘new realism’ of the *Derriere Guard* as well as the ‘Most Wanted’ projects of Komar and Melamid and what they suggest as being innate preferences based on Paleolithic interests. Dutton suggests that our delight in such imitations and representations constitutes two kinds of pleasure: (1) in how well the representation has been accomplished and (2) in what the representation itself portrays. The representations that for me have always been most absorbing are maps. They let me see what cannot be seen except from space. And even then, the image is not a smidgeon as informationally rich as a map. Old maps are especially absorbing because they represent such an awesome accomplishment considering what was involved in gathering all the necessary data, i.e. all of the meticulously recorded coordinates that allowed dots to be connected to reveal coastlines, the courses of rivers and the position, shape and size of land masses, their geographical features (lakes, mountains, etc.) and boundaries set by humans. Many old maps also reveal a captivating flair for elaboration with their portrayals of sea monsters, aboriginal peoples, exotic flora and fauna, weather phenomena, as well as a general sense that the map was meant to be more than just a factual representation.

Of course a representation can be engaging because of what it does not show but rather suggests or anticipates, or the way it represents something such that depth and meaning is signified that one would likely have missed were it not for the representation. Such is the art of photography as I understand it. All art might be argued to be representational if only in the obvious sense that it is giving form to something. Giving form to something is not the same as representing it, or so it can be argued, but it has the same function of making it available for the consideration of others even though the ‘it’ may remain obscure or ambiguous and may be something more in the way of a concept or a condition. Edvard Munch’s expressionist painting *The Scream* gives us anything but a photograph, the figure on the bridge is sexless and mummy-like in its vague features aside from the elongated ‘O’ of a screaming mouth. But as a representation of anguished exasperation, it is unexcelled.

What can be said of music, particularly music without words? It can employ sounds and structures that resemble natural aural phenomena like bird calls, thunder, rain falling, the movement of waves, and so on, but when it does (infrequently according to my experience), it does not do so with the representation of nature as its aim. Rather they are means to other ends and it does not seem on the face of it that representation has much if anything to do with the intentions that inform music. There is certainly little value in making a case for it simply because Dutton includes it on his list of cluster criteria for art.⁹¹ But it is not problematic when a more general notion of representation applies.

⁹¹ The cluster concept is an intriguing philosophical device the intricacies of which do not warrant discussion here. What about it that appertains here is that a criterion is seldom hard and fast and it need not be ‘necessary’ or essential when considering whether something should be included in a concept like art.

Because human cognition is cross-modal, music can represent a phenomenon or quality by offering something analogous. Ascending through the tones of a scale is like climbing a ladder. One example that comes to mind is the jumpy melody that accompanies the lyrics “I’m as jumpy as a puppet on a string” and is key to the mood of anticipation and impatience that characterizes “Spring fever” in the Rogers and Hammerstein song “I Might as Well Be Spring” ($s_1 . s_1 \mid s_1 . m : s . d \mid m . s_1 : d . s_1 \mid ta_1$). The fact that particular sound configurations can stand for dimensions of lived experience in ways that are widely apprehended is obvious to film composers who probably make the most productive use of it.

Even the most representational art has as its purpose to induce an experience that resonates emotionally and that hence makes special and aesthetically significant whatever might be considered its content. Representational art may succeed by drawing on images and metaphors we are innately disposed to find pleasing or otherwise significant, but it has to do more than just provide a facsimile of what the senses would perceive, which in many cases could never happen because the content is fictional or perhaps polemic and has to be accordingly constructed to get across the point with which it means to instruct. Whether or not it can be said to represent it, music provides an experience of patterned sentience through emotional manipulation which is achieved by the activation and connecting up of related neural structures or threads of mentales, as happens with and which makes possible language and rational thought. Emotional resonance is experienced in most cases because, in how it structures time, music activates kinesthesia and proprioception in ways that we are wired to find engaging and pleasurable, often because of the way it creatively plays with anticipation and expectation. The explanations offered by Tooby & Cosmides for why we are so wired have been given ample consideration already. In disagreement with Langer, I do not see music as an analogue for emotive life as it is actually lived but for emotive experience as it can be imagined.

We must also not forget the high likelihood that a strong force in the evolution of human musicality was sexual selection, where musical displays were courtship displays that had to impress and for which there needed to be a capacity for being impressed. Of course, one would not have been well served by presenting a display that was so new and different as to be inaccessible although some novelty could well have been important as a demonstration of the displayer’s creativity. But a facsimile can also be impressive because of how closely it matches another’s production, as this represents highly developed imitation skill. Anyone like myself with experience as a gigging musician is aware of what seems a universal love for “covers,” note for note reenactments of classic recordings and symphony goers can be markedly conservative in the kinds of departure from canonical performances they will tolerate.

I have already made reference to the centrality of imitation in Memetics and in Blackmore’s theories regarding brain encephalization and the favouring by natural selection not only of general imitative capacity, but also the ability to identify and imitate exemplary or extraordinary imitators. The acquisition of imitative capacity by our ancestors, as Blackmore, Dennett, Dawkins and others understand it, opened up a Pandora’s box unleashing runaway processes in the evolution of beliefs, belief systems and customs that may well be maladaptive in the world of 2011. That this understanding should be considered in relation to what we do in music education, in the music

academy and in education generally is what I hope to demonstrate in the following chapter.

7. *Special focus*

Art achieves its effects and intentions when it has in some way been “bracketed off from ordinary life, made a separate and dramatic focus of experience.” (55) This may be more a philosophical ideal than a reflection of how people actually engage with art even though they may set aside and especially construct dedicated venues (including virtual spaces) where such separate and dramatic focus is made more likely (e.g. galleries, concert halls, broadcasts, recordings). But bracketing off art experiences in this way does far more than facilitate dramatic focus, it marks them as special and deserving of attention.

Even where it fails to be an exclusive focus or where it takes place outside of such special places, art is always a way of “making special” as Dissanayake puts it and she argues that “making special” is an evolved need and hence a universal need of humans. Art is only a special instance of this need finding gratification behaviorally. With art it has become rarefied and made especially worthy of attention and participation. There is of course no clear dividing line between what does and does not qualify as such a special instance and there need not be. Children’s fantasy play is quintessentially *artful* and is every bit a special instance that involves nearly all of the qualities that Dutton speaks to: direct pleasure, skill, style, creativity (including imagination), representation, expressive individuality, intellectual challenge, and even criticism. Their predisposition for such play is innate because of its efficacy in achieving crucial forms of synaptic selection while the brain is still markedly plastic and aptitudes have yet to reach their full phenotypic expression and become essentially fixed.⁹² Play is not however where the need for making experience meaningful is first gratified; it is in the *rhythms* and *modes* of infancy that Dissanayake describes so well in *Art & Intimacy* (2000).

The need for making special stays with one throughout life although obviously the artistic and other means we employ to gratify it change and are shaped by other needs that get fore-grounded at particular stages along the way, e.g. the need for status, for employment, for novelty, for attracting a mate, for knowledge, or for self-actualization. What remains constant throughout, however, are our needs for mutuality and cohesion within the social groupings we occupy, or at least within those we care most for and identify most with. There is of course art that “makes meaningful” (perhaps a way of perceiving or conceptualizing experience) *but* which is not motivated by any felt need for mutuality and social cohesion. Some is even an outright challenge to it or ostensibly so. Such art may gratify other needs, some of which have arisen in human society because of the challenges of living in large groups and in rapidly changing

⁹² The computer metaphor I would offer (crude perhaps) is that of a hypothetical disk operating system (DOS) whose design specifications require the input of data at every step in the operationalizing of its functional capacities. The DOS begins as a set of instructions and some rudimentary computational systems, but unfolds and becomes more complex in its functional possibilities, provided appropriate data is inputted. It only has so long to do this however and what it ends up with in terms of operational capacity is pretty much what the computer is stuck with even though ways can be found to make more optimal use of it.

environments, ones that point to the need for critical consciousness as it has been conceptualized along the way in this and the first chapter. Statuses quo in behavior become entrenched even where they are or become antithetical to real human progress and art can be a potent means of demystifying, demythologizing, refuting, or overthrowing them. But, as has been argued, it must make special and meaningful its purpose in ways that are accessible, that accommodate our natures not only as they have been shaped by life's experiences but as they have been equipped functionally and predisposed to function in particular ways by our genes, which is to say, by a process of evolution that began with the first replication event around four billion years ago.

It is apropos that what are understood to be to the most essential brain systems for making and experiencing specialness are the oldest, those systems that mark neural representations somatically and give them relevant emotional content such that behavior is predisposed in advantageous ways, systems such as exist in the brains of so many other species. Male bowerbirds construct elaborate nests which they caringly make special with bright colored flower petals, beetle casings, berries, snail shells and such like. They do not do so because they have consciously worked out that this is a good ploy for attracting a mate. It just feels right to do so and by happy coincidence the results manipulate the emotions of a female and induce her to stick around. For species that started living in groups larger than the immediate family, other needs came to inform and make advantageous *'making special'* behavior, foremost being the needs to cooperate, collaborate and communicate. What is so eminently clear is that natural selection has fed the evolution of our artistic sensibilities in myriad ways and it is difficult if not possible to accurately pin down what the motivational dynamics are informing instances of making meaningful. Dutton expresses this quite well:

Our aesthetic tastes and interests do not form a rational deductive system but look rather more like a haphazard concatenation of adaptations, extensions of adaptations, and vestigial attractions and preferences. They evolved to delight and captivate human eyes, ears, and minds – not to form a logical system or make intellectual life easy for aesthetic theorists.”
(219)

There is one need that long ago became a powerful selective force in the evolution of culture and its arts that has not yet been considered from an adaptationist perspective, that is, the need for beliefs and systems of beliefs with which to make sense of and find purpose in lives that are full of mysteries. Religion and the means it employs to foster belief and to intensify it emotionally (to make it special and meaningful) are phenomena that have come under the microscope of Darwinian science, most productively in the framework of gene-culture coevolution as will be taken up in the next chapter.

8. Expressive individuality

No matter what form it takes, communication is always about externalizing what is within and making it accessible to others and this allows a window into who you are, who you would like others to think you are, or perhaps who you aspire to be. Its value in meeting the needs of a gregarious species such as ours has been the subject of much discussion in this chapter, such needs being: basic survival requirements (e.g. success in hunting, gathering, finding suitable habitats), acquiring status, attracting mates, assessing potential mates, experiencing intimacy and a sense of belonging, grooming, tracking and managing social relationships, nurturing offspring and sharing

constructions of sounds, images and words, the experience of which is beneficial if not essential to a highly plastic and complex brain that has to work with information that is only contingently true.

Language caused a quantum leap in terms of what could be communicated but it was a double-edged sword in that it engendered a consciousness so greedy in its neurocognitive demands that it dulls us to and impedes the direct apprehension of qualities that are informationally rich and significant or that at least make special experience unmediated by language. This sacrifice is captured in Robert Graves well known poem, —The Cool Web” (1927).

Children are dumb to say how hot the day is,
How hot the scent is of the summer rose,
How dreadful the black wastes of evening sky,
How dreadful the tall soldiers drumming by,

But we have speech, to chill the angry day,
And speech, to dull the roses's cruel scent,
We spell away the overhanging night,
We spell away the soldiers and the fright.

There's a cool web of language winds us in,
Retreat from too much joy or too much fear:
We grow sea-green at last and coldly die
In brininess and volubility.

But if we let our tongues lose self-possession,
Throwing off language and its watery clasp
Before our death, instead of when death comes,
Facing the wide glare of the children's day,
Facing the rose, the dark sky and the drums,
We shall go mad, no doubt, and die that way.

Perhaps here lies one of music's most salient values, that it is the communicative means least mediated by language (and least dependent on visual references), where significant import is embodied in the medium without need for clear referential meaning or direct representation. In its performance, the individuality of the performer is similarly apprehended directly and can be experienced vicariously unimpeded or distorted by discursive thought processes. Even in word art (especially performance poetry), it is its form and style, its use of metaphor, hyperbole, alliteration, pun and other means (which in performance poetry are many) that bespeak the expressive individuality of the artist more than her or his verbal explicitness.

Art that makes special experience is often art that marks as special individuals (creators and performers), setting them apart on the basis of some prized capacity, be it extraordinary kinesthetic skills, aerobic capacity, fine motor control, vitality, mental dexterity, mind-eye coordination, imagination, creativity, problem-solving skill, know-how, confidence, language use, mimicking skill, and so on. Usually it is some combination of these. Expressive individuality arises inevitably in art because unlike activity with a defined output and set procedures for achieving it (such as is much vocational activity), what counts as achievement in art is open-ended and amenable to novelty, creativity, mystery, and surprise. Of course, art has no special claim to

creativity or to expressive individuality. Successful lawyers, teachers, preachers and politicians are generally credited with both.

9. *Emotional saturation* (56-57)

Whatever its content, intention or psychosocial function, art only succeeds in realizing them (in raising them to objectivity) when it is successful in activating and manipulating emotions. Enough has been said as to the different ways in which different forms of artistic expression achieve this. What perhaps warrants reiteration here is that art does not communicate emotions as some kind of informational units or packets, it induces changes in one's internal milieu that are experienced emotionally even though the feelingful states that emerge may not and perhaps most often do not correspond neatly to basic emotion types such as fear, joy, sadness, anger, disgust, contempt or surprise. Rather it is the poignancy of such emotions that art captures and structures into experiences of sentience that magnify and deepen whatever kinds of discursive or representational content it may be intended to convey. The obvious point is that what we find most salient and memorable are experiences shot through with emotion. Our recollection of minutiae is extraordinary when they were attendant on an emotionally traumatic event. We can recall all kinds of particulars about where we were and what we were doing when first getting the news of the 9/11 events.

Something can be informationally rich *and* emotionally bland or, conversely, something can be emotionally rich and informationally impoverished. Recalling what Tooby and Cosmides have theorized so compellingly regarding art's adaptive value, emotionally rich (aesthetically drenched) experiences can be beneficial and are most likely needed in order for the brain to achieve the neural reconfigurations needed for it to be efficacious cognitively, better adapted to environmental conditions, and better tuned for subsequent experiences and tasks. The emotional packaging of discourse is what distinguishes a best seller that is 'impossible to put down' from the bulk of academic writing the reading of which requires high levels of discipline and perseverance, given what is almost a complete lack of emotional tone or suggestion that the author is actually a sentient being. In fact the deliberate and meticulous avoidance of 'personality' (let alone 'expressive individuality') seems to be what is expected of academics in their writing. *I* have even been admonished not to make use of the first person in work such as this on the premise that I might thereby achieve more academic 'distance' which is presumed to imply greater objectivity. I find this kind of pretentiousness in academia to be not only silly but counterproductive. Writers like Pinker get fobbed off as pop-science even though they meticulously cite credible scientific studies in support of theories, suppositions and claims that they present cogently. Pinker, Dawkins, Dennett, Blackmore, Dutton, Dissanayake and so many other Darwinian writers, besides being so eminently 'clear,' write with elegance and eloquence, not in the least reluctant to employ wit, irony, humor, the first person, or even some *chutzpah* in 'making special' what they hope to get across to the reader. *Radical chic* is definitely not their bag. With postmodernist writing of the kind cited earlier (from Guattari's *Chaosmosis*), if I find myself smiling or chuckling it is only at the absurdity of what seems nothing other than intentional obfuscation and I fancy myself as the precocious child in the crowd who exclaims when the emperor parades by in his new clothes, —*Bt* he isn't wearing anything at all!"

10. Intellectual challenge

Art, whether in its production or apprehension, is behavior that exploits a myriad of perceptual and intellectual capacities. Art that is profound is art that stretches these capacities beyond normal limits. Profundity, as has already been made clear, is but a special kind of pleasure, but one that because of what it requires cognitively, *needs* to be experienced in the acquisition of critical consciousness, which is really just creative consciousness that is principled. Profundity is an intense pleasure, but does not emerge from an apprehension of surface qualities only. There must be the meeting of some kind of intellectual challenge; a searching *into* and *below*, this involving the inter-looping of cognitive divergence and convergence such as was suggested earlier as being the essence of creative behavior. In this regard, profundity is enhanced when it is attendant on an *insight* of some kind, a realization of something not obvious but nevertheless of significant interest and valuable to future experiences and cognitions. Art makes intellectual application an aesthetic affair and increases the prospects for experiencing profundity. It is true that any exercise of intelligence and knowledge can be pleasurable and most often is, but one does not as a rule experience profundity in a game of Trivial Pursuit, a video game, a TV game show or in completing one's tax return.

11. Art traditions and institutions

I will postpone a more thorough consideration of this criterion until the next chapter on gene-culture coevolution. It is doubtful that we are genetically predisposed to establishing, maintaining and cherishing institutions and traditions in the sense of there being some special adaptation or integrated brain system dedicated to such, even though the proclivities and competencies that such cultural phenomena manifest are in large measure innate and genetically constrained. The traditions and institutions that have evolved around artistic activity, and that appear as being part and parcel of what art by definition is, are emergent phenomena and could well be examples of 'positive-feedback escalators' that take innate capacities and predispositions and create with them extraordinary and complex social customs and practices which we come to regard as natural, obvious or how it was meant to be even though the contingencies of life in the 21st century raise serious doubts as to whether it is appropriate to sustain them unchanged. The evolutionary psychology of what predisposes people to embrace traditions and schools of thought and practice has been explored in some depth in this chapter, as have possible adaptationist explanations for the thwarting or breaking of tradition such as characterizes much art of the 20th and 21st centuries.

12. Imaginative experience

Dutton's final criterion provides a welcome route to the conclusion of this long and somewhat convoluted chapter, where hopefully can be drawn together what might still be some loose threads. Let us begin by recalling the Baldwin Effect and its explanation for how learning is possible and how learning and culture can ultimately direct genetic evolution unleashing a myriad of ratcheting-up processes that account for the multifarious customs, institutions, traditions, arts, discourses and ideologies that comprise culture as we know it, these processes being the subject of the next chapter.

From this and from earlier discussions on innate learning mechanisms, it seems clear that learning a skill or acquiring knowledge requires that some minimum number of constituent skills (sub-skills with their own mechanisms) and informational representations have already been installed neurally and can be accessed. However, the kinds of learning that humans are capable of requires much more than just having a series of neural networks in an *_on_* position, each performing its function independently and informing behavior without reference to the others. At the micro level, basic algorithmic structures function in precise ways but are linked up into larger structures that evolution over time put under genetic control because they made possible behavior or internal processes advantageous to our ancestors. Several of these became components (preadaptations) in yet larger structures that in turn came under genetic control but with increasing reliance on environmental stimulation in their ontogeny. Recall Donald's concept of the human mind as —a set of pyramids, each with its own hierarchy of modules, each of which mediates some special skill” and each of which can be accessed and integrated into more complex structures such that —at the top levels ... are ... powerful integrative systems, some of which approach true domain-generality in their reach” (Mithen & Donald 1998)

As Dennett (1991) conceives it, the outcomes of integrative processes converge at different loci in the brain and coalesce into what he calls *_drafts_* which may ultimately emerge in consciousness and be experienced (in a split-second revision engaging language mechanisms) as a coherent thought, a kind of story we stitch together and tell ourselves that is ongoing even though it jumps around a great deal, veering off on different tangents, sometimes taking a rest, but generally capable of being spontaneously and instantaneously regimented and woven into streams of coherent discourse be it through verbal extemporization or some other communicative act such as making music. Apropos verbal extemporization, Donald reminds us of how our use of language testifies to an adaptation that has broad access to the workings of a number of more domain specific modules. Some of these handle the processing of different classes of sensory perception (hearing, smelling, touching and feeling) and some allow the brain to construct and work with spatial and other representations. The evidence is in the fact that —we can talk about what we hear, smell, touch, or feel, and also describe our cognitive maps of the environment.”

Let us also consider how memory feeds into all this using musical memory as an example. But first, what is meant by a memory? We know that it is not some discreet cluster of neurons arranged to be a precise isomorph of what induced the memory originally, be it a statement, scene, event, or sense perception. A memory is *recreated* every time it is recalled and obviously the brain cannot store every particular. Think of what would be required if every bit of information in even a short melody had to be meticulously recorded in mentalese and retained as a coherent unit. And yet we can remember a huge repertoire of songs, including their lyrics, and can even sing them matching closely the stylistic idiosyncrasies and vocal tone of the singer whose version we remember best. That we can and often do sing it in a different key suggest that the brain has not retained a spreadsheet detailing precise frequency values. Neither is it likely that there is an internal spreadsheet that has recorded values for every pitch interval, rhythmic relationship, or timbre. In other words, it is almost a certainty that nothing resides in the brain that could, provided a program for converting mentalese to digital code, be exported as an MP3 file. Or if it could, it would not sound anything like a facsimile of the song as it was originally heard. And yet what comes out of one's

mouth when singing back from memory can be a very close approximation, even for someone without musical training. How this is possible has been theorized, but at best what we have is only a rudimentary understanding.

Levitin (2006) provides such an understanding, stressing the need to “reject the intuitively appealing idea that the brain is storing an accurate and strictly isomorphic representation of the world.” (115). Here let us recall what was discussed at the beginning of this chapter under the heading “Perception and its illusory nature.” With a memory as with perception, the brain actually *computes a reality* that is based *only in part* on data provided to it either through the senses or from what is stored in memory which can be quite amorphous, distorted, fragmented and patchy. It has to make inferences so as to fill in many gaps and get things in their right place and order and the brain can do so because it is able to employ logical inference systems that are innate although they have been shaped and given content by learning. It can employ some learned system (e.g. common practice music theory) but only if it jibes with and can co-opt innate mechanisms that have been instructed by our genes, in other words, a system that can employ the innate concepts of space, time, causation, containment, etc. which are the “metaphors we live by” (to borrow the title of George Lakoff’s 1980 book) and which comprise the “level of fine-grained conceptual structure which we automatically and unconsciously compute every time we produce or utter a sentence” (Pinker 2005 – online source) or tune, or dance, or mime, or rhyme.

I cannot but marvel at the complexity of design that all of this attests to and can easily appreciate people’s seeming inability to grasp how it could have come together as the result of a mindless, purposeless, algorithmic process. What is crucially important is that everything that I have described here is what all normal human beings do naturally and with relatively little effort. **But** where we have the inclination, we can apply effort and go further in exploiting our inter-modular and cross-modal capacities and make it possible to come up with novel ways of conceptualizing and solving problems, of representing perceptual experience, of using words, sounds, or gestures, and of visualizing and conceptualizing things that have never been, may never be, and perhaps never could be seen or experienced directly. This is when we speak of imagination and I would agree with Dutton that it is likely the most important of all his criteria. In this regard, he invokes Kant’s concept of art as “a presentation” offered up to an imagination that appreciates it irrespective of whether it corresponds to existing, “real” things. Art can succeed in decoupling imagination from practical concern, something which an orthodox Marxist might denounce or decry as bourgeois mystification, but perhaps, as Tooby and Cosmides might well suggest, something that needs to happen fairly regularly if the massively parallel computer which is our brain is to be optimally wired-up and rendered best able to keep track of, manage, and optimally utilize all that is available to it.

Imagination is thus only an *enhanced utilization* of what is constantly and naturally going on in the brains of everyone when awake and when dreaming and there can be no clear demarcation point at which commonplace cognitive acts become acts of imagination. And yet all that we marvel at in terms of human cultural, scientific and technological achievement (even where we should rather feel disquiet) would never have come about without countless instances of such enhanced utilization. This can also be said of creativity which seems to me to be by and large coterminous with imagination. Both are implicit in aesthetic experience where they operate intuitively and

generate pleasure because natural selection has provided us with reward mechanisms that incline us to seek out such experience.

The pleasure that most manifests imaginative and creative processes is profundity, that physically felt sense of awe, the sense that something eminently worthwhile has been grasped, that marks an experience as deeply significant, even if no benefit or explicit meaning has been gained in any practical or discursive sense. A work of art can evoke such a sense of deep significance because, again using Langer's words, it ~~formulate[s]~~ "our conceptions of feeling and our conceptions of visual, factual, and audible reality together" making them inseparable internally and by doing so —it ~~clarifies~~ and organizes intuition itself." Even when it elicits no conscious reasoning, it can have ~~the~~ force of a revelation, and inspire a feeling of deep intellectual satisfaction" (Langer 1953: 397).

As has hopefully been made clear, creativity and imagination encapsulate and integrate a host of cognitive processes and capacities that have been given names such as intuition, cognitive divergence/convergence, synthesis, empathy, mutuality, attunement, entrainment, proprioception, kinesthesia, emotional intelligence, and insight. These should be core concepts realized as *action ideals* in Education but sadly seem little more than peripheral concerns, perhaps not when talking to educational philosophers, policy makers and administrators, but when observing most of what is actually going on (and not going on) in classrooms, homes and the virtual worlds media provides us with and which people spend more and more of their lives inhabiting. Art gives us virtual worlds where these concepts are core and manifest as praxis.

Chapter Three: *Darwinizing Culture: The case for Gene-Culture Coevolution Theory*

Introduction

Chapter Two was by and large devoted to setting out an adaptationist understanding of the human mind and how natural selection has equipped us for and predisposed us to music and other forms of artistic engagement. A great deal of Darwinian theory was discussed, this being necessary in terms of the overarching purpose of this dissertation, to demonstrate how this body of theory and the sciences it informs have relevance to questions that the Philosophy of Music Education is or should be concerned with answering, many of these being questions pertinent to education through the arts, and several concerning issues of broader educational significance. A theory cannot be of much relevance or use if its premises are flawed or if it does not yield hypotheses that are testable. I accordingly was compelled to make the case for Evolutionary Psychology and the related sciences that I explored (e.g., Biomusicology and Evolutionary Aesthetics), to argue for the plausibility – if not the incontestable validity – of conclusions they have reached and to demonstrate that these have important implications educationally. Several points have emerged from this that deserve more consideration in educational thought including the Philosophy of Music Education, for example:

- the adaptive importance of aesthetic experience in organizing the brain both physically and informationally (Tooby & Cosmides 2001);
- the need for more attention to early childhood education and to how the extra-curricular life of a typical child in a consumerist, media driven society is not only inadequate in meeting the requirements of optimal ontogeny set by natural selection, but is too often inimical, as indicated, for example, by a lowering of creative capacity in recent decades;
- apropos the above, the need for education to attend more assiduously to kinesthetic and proprioceptive development;
- the ways in which innate ‘reward systems’ affect the motivational dynamics of an individual’s participation in sociocultural life and how these change over the course of life, in particular, those related to sex and status (Miller, Pinker);
- the scope that Evolutionary Psychology and related sciences have for productive reassessments of important theories of psychosocial development (Piaget, Kohlberg, Erikson, Vygotsky, Maslow) as well as theories of human cognition that have been influential in education (e.g., Multiple Intelligences, Emotional Intelligence and the Mozart Effect);
- that natural selection has given us innate preferences that inform the ways we value different kinds of visual and aural experience and hence influence our tastes in art and music;
- that natural selection has predisposed us in terms of how we think about artistic behavior and production generally, what it is that we esteem in art and what criteria we intuitively feel should be satisfied (Dutton, Pinker, Carroll, Dissanayake);
- that there are quantitative differences between the sexes that should be expected to manifest in educational and artistic contexts of effort (Pinker, Symons);

- the nature of the adapted mind as a complex and massively parallel computational system and how our increasing understanding of its workings and the mechanisms natural selection has equipped it with render erroneous a Blank Slate concept of human nature, as it does several of the premises that continue to have currency in the Social Sciences concerning mind and culture and that significantly inform educational philosophy and the Philosophy of Music Education (Dennett, Pinker, Tooby & Cosmides, LeDoux);
- the primacy of emotion and feeling in everything cognitive (Damasio) and the need to reconsider work in Aesthetics (the Philosophy of Art) and the Philosophy of Music Education that has fallen out of favor in the last two or more decades (e.g., Langer, Reimer);
- (especially relevant to this chapter) that extraordinary adaptations such as human intelligence, musical ability and language are, like the peacock's tail, the products of runaway evolution which has been accelerated by rapid changes in the environments of evolutionary adaptedness (EEAs) brought about by humans - that culture has created selection pressures that have affected biological evolution for our species as it has for domesticated species (Fisher, Miller, Dennett);
- that we are not innately predisposed to critical consciousness, but that we have been empowered by our genes in ways that allow us to develop it in conducive environments.

I also attempted to show how insights into our innate psychology that Darwinian Science offers can help us to better understand what we observe in our present world in the ways people relate to and involve themselves with music and the arts and to see how much of artistic behavior and culture generally might still be on the leash of genes. We could assume it to be little given the exponential rate at which culture changes and accumulates, clearly a runaway process that genes could never keep pace with. Of course they *do not need* to keep pace with cultural evolution to continue to significantly influence how people think, feel about and involve themselves in music and the arts. There is truth in Jean-Baptiste Alphonse Karr's oft quoted epigram - "*plus ça change, plus c'est la même chose*" - "the more it changes, the more it's the same thing" (usually translated as "the more things change, the more they stay the same"). But Evolutionary Psychology can take us only so far in understanding how humankind has managed to become so culturally diverse given that we all share the same innate psychology. This does not mean, however, that Darwinian Science cannot have anything more to say on such matters. The fact is that culture evolves and evolution is what Darwinian Science is concerned with explaining.

The Philosophy of Music Education is concerned with what music education should be doing to achieve educational and social outcomes in the here and now, in environments that are as ideological as they are physical. The Philosophy of Music Education is charged with providing music education with *ideals* to guide the work of music educators and ideals are only *ideas* that are judged to be appropriate and worth embracing. Many ideals have come and gone as to what should count as important and worth pursuing in music education and it may be that the falling into obscurity of some of them was not simply a matter of their having had their time or that it was the inevitable consequence of good ideas pushing out not so good ideas. Ideas are the currency of culture and if Darwinian Science has anything to offer to understanding how we come to have ideas it is incumbent on us to consider carefully what it has to say, especially regarding ideas that are not direct expressions of genetic imperatives,

that are counterintuitive and/or that conflict with what makes sense when one's view is ecozoic.

I believe that Gene-Culture Coevolution Theory has much to offer and the main purpose of this chapter is to consider its main assumptions, assertions and hypotheses. As will be seen, some of its claims and hypotheses are ideological ‘hot potatoes’ and are easily co-opted to serve nefarious social and political agendas. And while there seems a growing openness to what Evolutionary Psychology and Cognitive Neuroscience have to say about our universal human nature, there is still strong *resistance* to attempts to Darwinize culture; I might even say *antagonism*, based on some of my own experiences in trying to argue for it, especially where I have voiced support for the conclusions of Gene-Culture Coevolution theorists like Dennett and Blackmore.

I will postpone discussion of what I see as the pedagogical significance of this body of theory and its relevance to matters of concern to the Philosophy of Music Education until after the case has been made. The final chapter is given over to weaving together the many Darwinian ‘threads’ that have been followed in this dissertation and reaching conclusions as to how Darwinian perspectives might best be taken account of in deliberations around what we should be teaching, why we should be teaching it, and how best to do so.

Darwin's dangerous idea revisited

Let us begin by recalling what Dennett gives as ‘Darwin's dangerous idea’: “that all the fruits of evolution can be explained as the products of an algorithmic process” (1995: 60). Music and art, as we experience them in all their many forms, can certainly be called fruits of evolution if we consider culture as something that evolves, that grows out of and builds upon what has gone before, as obviously we must. Virtually every item we call cultural has a lineage although it may be difficult or impossible to trace. And given how much cultural intercourse has taken place since the Neolithic, most of modern culture has a very mixed heritage. I already alluded to the point in the last chapter that when someone refers to her or his culture; it is generally more to some idealized notion of heritage than to the beliefs, norms and values that actually manifest in one's behavior and life style, which for increasing numbers is the global culture of consumerism.

Music and art as fruits of genetic evolution

We can even consider music and art as fruits of genetic evolution when we regard them not as cultural artifacts but as behaviors or capabilities. We are wired for both just as we are wired for nurturance and its expression in culture: *education*. Hopefully the previous chapter has made this clear, as well as the more likely reasons for why we are wired thusly and how, as powerful integrative systems in our brains, music and art (as does language) involve synthesis across a wide array of modules and subsystems, each of which evolved to meet a different adaptive need in a particular environment of evolutionary adaptedness (EEA).

Surely, the immeasurable variety of what has been produced through the exercise of these capabilities cannot be accounted for by the Darwinian ‘if, then’ algorithm. *Or can it be?* That is the question that much of this chapter will try to answer as it is a foundational question in Gene-Culture Coevolution Theory, particularly Memetics which gets a thorough going over because of its radical but compelling claims. The answers surely must have significance to our thinking *in, around* and *through* music and the arts, the institutions that sustain and shape them, and how they should best feature in the kind of ‘education for an ecozoic era’ that was philosophized in Chapter One (around which more will be said in the final chapter).

PART 1: Culture as an Environment of Evolutionary Adaptedness (EEA) for genetic evolution

Before giving full attention to considering *how culture evolves*, I feel it necessary to deal with the other primary research thrust in gene-culture coevolution theory, that is, *how culture has and continues to shape genetic evolution*, or put differently, how culture has created selection pressures that have resulted in changes to the genome and hence to our innate psychology. What is coming forth from research on this question is adding to what is already a *minefield* where one must tread with care because of how such findings can be and have been co-opted by and used to serve racist political ideologies and agendas that are morally reprehensible. Let me now tread at least some of this terrain so that certain clarifications can be made as to the conclusions of recent research and so that some possible misconceptions may be corrected. It is a discussion that is necessary to establish if there is anything in the findings of credible research in this area that could or should have any consequence in and for education. We can then direct attention to those gene-culture coevolution theories most germane to educational philosophy, those that help us understand how we have come to think the way we do about education and its purposes, how different ideas and beliefs have come to dominate the ways in which education is transacted, in particular, through music and the arts.

Hereditary lineages and genetic differences

What makes this a minefield is quite simple. It is the undeniable fact that there are genetic differences between people from different hereditary lineages; and unless we hold to a Blank Slate conception of mind, we must accept that there are differences that are more than skin deep. Chapter Two demonstrated this to be the case with gender differences although with the important caveat that psychosocial differences between men and women are quantitative only. The differences between men and women cannot of course be attributed to them having evolved in different EEAs. They co-inhabited the same natural and physical environments with the same resources and threats. Differences did arise however once there was a significant division of labor (as discussed in Chapter Two). This brought differences in the ways male and females tended to interact with the environment (hunting vs. gathering for example) and qualitatively different selection pressures (e.g. for the care of helpless neonates) that promoted the evolution of quantitative differences in various aptitudes, proclivities and innate sensibilities (e.g., the nurturing instinct).

Lineage and race

What of differences between people from different genetic lineages? Even if true that around 140,000 years ago, there lived a woman ([_Mitochondrial Eve_](#)) and, around 60,000 years ago, a man ([_Y-Chromosomal Adam_](#)) to whom all living humans can trace their ancestry, from that time there have been long periods during which different populations of ancestral humans lived in different EEAs and in varying degrees of isolation from other populations. This accounts for the phenotypic variations that are clear to see and which humans have used to generalize different racial groups, even though the criteria used to differentiate them has for the most part been scientifically dubious. For example, dark pigmentation of the skin only bespeaks evolution in equatorial and tropical EEAs where the protection from UV radiation afforded by melanin is a distinct advantage. All humans had dark skin before they began to migrate out of Africa between 50,000 and 45,000 years ago. Those that migrated further away from the equator evolved genes for skin with less melanin as dark skin blocked UV radiation too effectively in latitudes where it was in shorter supply and still needed for the manufacture of vitamin D. As such, skin pigmentation can only go so far in telling us about someone's ancestry. It can tell us that everyone who is 'white' has a lineage that for at least 40,000 years evolved in EEAs outside of the African continent and some distance from the equator. But of course, the UV index was *but one* of many selection pressures that were different in the new environments that humans migrated into in the [Upper Paleolithic](#). Some of these could have influenced the evolution of psychosocial traits, though to what extent would depend on the nature and degree of difference encountered, here remembering that one's group itself constitutes an EEA and the size of the group is of great importance. I will come back to the issue of race further along where I consider whether it is a concept that, given its history, has any utility sufficient to justify its application in research and the discourses of educational philosophy.

Size is important!

When our ancestors began to live in larger groups, new selection pressures were introduced giving rise to a fairly rapid evolution of psychosocial adaptations such as those identified and discussed in the last chapter: a hunger for status, reciprocal altruism, cheater detection, imitation skill, grooming, information decoupling, and so on. Most important of all was the evolution of language and other communicative abilities. The importance of population size in this regard cannot be stressed enough. Human populations started increasing significantly around 50,000 years ago, an increase that became exponential when our species acquired agriculture. Since the industrial revolution, the entire human population has increased nearly seven-fold with over half of it living in urban environments. Increasing the size of any population of sexually interbreeding members is going to willy-nilly increase the rate of new adaptive mutations. But they are not likely to be selected in and become widespread in the population if its members are already well adapted to a relatively stable environment.

Here let us recall from Chapter Two the Baldwin Effect and in particular Papineau's explanation of how with living in groups, we get it twice over. This is for the simple reason that living in groups invariably creates a *niche* which, with organisms able to

learn from one another, will necessarily change and evolve and hence there will be changes in the environmental pressures that influence what mutations do and do not get selected in. Thus, a feedback loop comes into play between ‘genetic assimilation’ and ‘niche construction’ that accelerates the rate at which the former occurs. The key question, of course, is: How fast? Many gene-culture coevolution theorists seem in agreement that it can happen remarkably fast and science appears to be bearing them out, even though this is at odds with what has for long been an assumption about evolution. Even though his own position on the matter may have shifted somewhat since, in a 2006 interview, Pinker stated that he “would rather believe that significant human biological evolution stopped between 50,000 and 100,000 years ago, before the races diverged, which would ensure that racial and ethnic groups are biologically equivalent” (Douglas 2006).⁹³

„*The psychic unity of mankind*’

Pinker’s take on recent evolution and the unlikelihood of significant cognitive differences between different genetic lineages is in line with the ‘psychic unity of mankind’ position taken by Tooby and Cosmides (1989: 34).

[T]he complex architecture of the human psyche can be expected to have assumed approximately modern form during the Pleistocene, in the process of adapting to Pleistocene conditions, and to have undergone only minor modifications since then.

Elsewhere, they claim that because innate psychological traits are complex adaptations, they necessarily are monomorphic in *Homo sapiens*, that is, they comprise an underlying architecture common to all members of our species. With a sexually reproducing species such as ours, genetic recombination rules out any significant variation in the genetic basis of traits as this apparently leads to the corruption of favorable genotypes. Tooby and Cosmides explain it as follows.

The genetic shuffle of meiosis [cell division] and sexual recombination can cause individuals to differ slightly in quantitative properties that do not disrupt the functioning of complex adaptations. But two individuals do not differ in personality or morphology because one has the genetic basis for a complex adaptation that the other lacks. The same principle applies to human populations: from this perspective, there is no such thing as “race.” (1997- Online source)

Tooby and Cosmides admit a slight difference in quantitative properties as they seemingly must do. There can be no doubting that people vary from one to another quantitatively in their aptitudes/talents (intelligences), appetites (e.g. hunger for status, sex drive) and innate dispositions (e.g. fear of heights, altruistic leanings). What is

⁹³ Kenneth Krause (2009) regards *equivalency* as ~~a~~ concept better left to mathematicians. ... In any other, less antiseptic context, ... the notion is utterly bankrupt. That we have had to work so hard in recent centuries to construct and maintain political equality among individuals and classifications of individuals should tell us how persistent and pervasive inequality really is. We should never confuse the social construct with the scientific reality. Denial is the least mature and, certainly, the least progressive response to fear” (Online source).

necessary is to determine what they would include as ‘quantitative properties’ and what they regard as ‘slight.’ It also would be necessary to ascertain how the ‘same principle’ would apply to populations between which there was little interbreeding. I would presume that they are using quantitative in the usual sense of relating to the amount or number (the quantity) of something, even where it may not be amenable to precise quantification (measurement). Elsewhere in their ‘EP primer’ they point out how stomachs ‘vary a bit in quantitative properties, such as size, shape, and how much [gastric acid] they produce.’

Just as we are unable to clearly delineate complex adaptations such as language and music, we are far from being able to break one down to an algorithmic level (though we can discern algorithmic processes such as Hamilton expressed mathematically in respect of altruism and kinship). This, as I see it, suggests that there can be no clear line between what is qualitative and what is quantitative when it comes to cognition. Two computer programs may be the same in terms of their ‘underlying architecture’ but one may be considerably more ‘powerful’ in its functioning because of what it is able to access and incorporate informationally, or perhaps because of the speed at which it can do so. We again may recall that complex cognitive adaptations are built up of many parts just as is the eye, which itself is part of a larger integrative system: vision. And it is not as if the content a mental adaptation is given by environmental input in its ontogeny is kept apart from an unchanging underlying architecture in some kind of database or external hard drive. The underlying architecture develops by assimilating and accommodating the input such that it effectively becomes part of the architecture.

Quantitative differences manifest in differences in how efficiently and effectively a biological/cognitive adaptation functions, for example, in how well it achieves behavioral ends, what conditions (environmental stimuli) activate it, how successfully it integrates subroutines and makes use of information, and ultimately the benefits that may be derived through its functioning. Whether there could be significant differences when it comes to complex psychosocial adaptations, Tooby and Cosmides considered it to be unlikely given complexity as a limiting factor. Complex adaptations require more genes and it would seem logical to assume that they would require far longer time frames in order to coordinate the evolution of the many genes involved. Canadian anthropologist, Peter Frost (2008) points out the flaw in this line of thinking by reminding us that ‘complex traits do not arise *ex nihilo*.’ They have developed out of predecessor structures and arise as a coherent trait through modifications, deletions, or additions to them. ‘And such changes can occur through a single point mutation at a regulatory gene’ according to Frost.

Time frames

As to the time frames involved, Frost quotes Harpending and Cochran (2002).

Even if 40 or 50 thousand years were too short a time for the evolutionary development of a truly new and highly complex mental adaptation, which is by no means certain, it is certainly long enough for some groups to lose such an adaptation, for some groups to develop a highly exaggerated version of an adaptation, or for changes in the triggers or

timing of that adaptation to evolve. That is what we see in domesticated dogs, for example, who have entirely lost certain key behavioral adaptations of wolves such as paternal investment. Other wolf behaviors have been exaggerated or distorted.⁹⁴

John Hawks, professor of Anthropology at the University of Wisconsin (Madison), is convinced that at least ten percent of human genes have been modified by natural selection in the last 40,000 years. This is his conclusion after conducting ‘genomic surveys’ the findings of which were published in 2007 in the *Proceedings of the National Academy of Sciences* (Hawks, Wang, Cochran, Harpending, & Moyzis).⁹⁵ The conclusion of Hawks and his fellow researchers is entirely consistent with Papineau’s double Baldwin effect as it would be expected to play out in larger, denser populations.

Larger populations generate more new selected mutations, and we show the consistency of the observed data with the historical pattern of human population growth. We consider human demographic growth to be linked with past changes in human cultures and ecologies. Both processes have contributed to the extraordinarily rapid recent genetic evolution of our species. (20753)

Forty thousand years is a very short period in evolutionary time or so was for long assumed. In this regard we should recall from Chapter Two the study by three of the population geneticists who later collaborated with Hawk: Cochran, Harpending and Hardy (2005) which concluded that in less than one thousand years, genes for higher verbal and mathematical intelligences (12 – 15 points above the mean) were selected for in a lineage of Jews (Ashkenazim) in Europe who were discriminated against, isolated, forced into vocations needing high levels of such intelligence, and who, because of religious beliefs, were in any case disinclined to marry outside the fold (the downside of which is an increased incidence of highly debilitating and fatal congenital conditions such as Tay–Sachs disease). We should also recall what Dennett had to say about artificial selection as it makes clear that although there must be variation through genetic mutation, it is the pressures that are confronted in a population’s EEA that determines what mutations take hold and spread through the population. Humans have for millennia been a primary selective force in the evolution of domestic species, even where it has not always been intentional or done with any knowledge of the mechanisms involved beyond a folk biology that understood that traits get passed on to offspring. The point which once more bears reiteration is that humans have also been a selective force in their own genetic evolution. For the most part, they have not exerted this force deliberately or with foresight as in controlled breeding (except perhaps in the case of royal lineages).

What is a race?

One does not have to investigate the literature too intensively to conclude that race is a concept that does not correspond with any discrete biological entity. There are in fact many species that are not easy to delineate precisely. *Homo sapiens* happens to be a

⁹⁴ We may remember from the last chapter that the differences between a Chihuahua and a Great Dane are the result of less than 15,000 years of evolution.

⁹⁵ Hawks has a website (<http://johnhawks.net>) and blog that is the quickest and most fecund route to a massive body of research in gene-culture coevolution.

distinct species because of the extinction of other *Homo* lineages for which there seems little consensus as to whether they were separate species or, as seems quite certain with the Neanderthals, a ‘subspecies’ or ‘race’ with which there was interbreeding with out-of-Africa *Homo sapiens* before the former became extinct about 22,000 years ago. This has been strongly suggested by research on genetic material that was able to be extracted from 38,000 year old Neanderthal bones (Callaway 2010).⁹⁶ Even if we are to take modern day Africans whose lineages have not crossed with any out-of-Africa lineages, they in no way comprise a distinct population that could be called a race without the term having limited meaning. The evidence for this is in the phenotypic variation visible for all to see, for example, between a Khoisan and the other African peoples of southern Africa who migrated down from the north during the last millennium and whose lineages mostly trace back to a population that was confined to an area in West Africa (modern day Cameroon and Nigeria) and spoke a language that later diversified into the many Bantu languages of present day Africa. At least one study has suggested that the Khoisan were the first population to diverge from the most recent common ancestor of all humans and is thus the one that best preserves ancient lineages genetically (Soodyall & Jenkins 1998).⁹⁷ And yet, nowhere have I found the Khoisan denoted as a race.

The utility of the concept

The problem of clear delineation does not negate the usefulness of a concept and we can note that people, including academics, do not refrain from talking about *societies* and *cultures*, concepts that also do not correspond neatly or in any clear-cut way with discrete phenomena in the real world. To say that race is a social construct does not say much for the simple reason that nearly every concept we employ discursively is a social construct, in some way or at some level at least. Words like race, species, culture, art, music, and so on, may better be regarded as cluster concepts. Dutton certainly regards art as such. With a cluster concept there is some weighted list of criteria where no individual criterion can be considered absolutely necessary or sufficient for membership. And yet when it comes to race, it does seem that there is at least one criterion for who is who, that being, *where* in the world most of the genetic variation has taken place since groups of *Homo sapiens* started moving away from the EEAs of ‘Mitochondrial Eve’ and ‘Y-chromosomal Adam.’

The fuzziness of racial definitions does not negate their utility. To define terms, based on genetic analysis, roughly speaking, *Blacks* (Africans, Negroids) are those who have most of their ancestors from sub-Saharan Africa; *Whites* (Europeans, Caucasoids) have most of their ancestors from Europe; and *East Asians* (Orientals, Mongoloids) have most of their ancestors from Pacific Rim countries. Although he eschewed the term *race*, Cavalli-Sforza’s (2000: 70) [maximum likelihood tree](#) made on the basis of molecular genetic markers substantially supports the traditional racial groups classification. Of course, in referring to population or racial group differences we are discussing *averages*. Individuals

⁹⁶ This and other research has contributed to Neanderthals being reclassified from *Homo neanderthalensis* to *Homo sapiens neanderthalensis*.

⁹⁷ Mark Schoofs (2000) gives an overview of the study in question as well as a thoughtful and apropos consideration of the findings that flies in the face of racists notions of genetic inferiority.

are individuals, and the three groups overlap substantially on almost all traits and measures. (Rushton & Jensen 2005: 237-238)

Racial categories such as these are used in medical research. Mathew Herper reported in Forbes in 2005 that: –A flood of studies has emerged showing racial differences in how patients suffer from disease - or benefit from drugs - in ailments ranging from osteoporosis to cancer. And several more have looked at the effects of drugs on particular racial groups” (online source). Again, the differences seem to be quantitative, but they are nevertheless significant at least in relation to medical research and progress in the treatment of diseases and congenital conditions.

Racist science?

When it comes to differences between different populations of humans, no matter how they have been delineated, one has to work with averages and percentages based on data collection and calculation procedures, methods, tests, surveys and so on, and disagreements invariably arise as to their validity. Perhaps the most controversial and yet widely used is the Intelligence Quotient (IQ) which has been used to posit differences in intelligence between different populations identified as races, the most famous instance (or infamous perhaps) being the 1994 ‘bestseller’ *The Bell Curve* by Charles Murray and the late Harvard psychologist Richard J. Herrnstein. Their data on differences between African-Americans, Asian-Americans and European Americans vis-à-vis certain socioeconomic indicators⁹⁸ have not been challenged. But what was and what continues to be hotly contested is the extent to which the authors appeared to support a genetic explanation for the differences, that is, that the average African-American is by nature less intelligent than the average European-American who is less intelligent than the average Asian-American as evidenced by their scores on the [Armed Services Vocational Aptitude Battery](#) which includes measures of cognitive aptitude comparable to standard IQ tests. The authors attempted to appear equivocal on the nature-nurture question saying in the introduction to Chapter 13, that –the debate about whether and how much genes and environment have to do with ethnic differences remains unresolved.” While true, this says nothing as to where they stand/stood (Herrnstein died before publication of *The Bell Curve*) in the debate. Where they were unequivocal was on the correlation between IQ and socioeconomic success. Putting aside whether or not IQ tests are measuring what they purport to measure; the statistical correlations cannot summarily be dismissed as meaningless.

As to racial differences in IQ, the question of why research in this area has been pursued needs addressing, even if only briefly. The work of Herrnstein, Murray, Jensen and Rushton is clearly tainted by association and for three of them at least, there seems little concern about who funds and/or takes the most interest in their research. Rushton currently heads the [Pioneer Fund](#), an American non-for-profit foundation –to advance

⁹⁸ For different IQ ranges (<75, 75-90, 90-110, 110-125, >125) percentiles were calculated according to the following indicators: married by age 30; out of labor force more than 1 month out of year (men); unemployed more than 1 month out of year (men); divorced in 5 years; percent of children with IQ in bottom decile (mothers); had an illegitimate baby (mothers); lives in poverty; ever incarcerated (men); chronic welfare recipient (mothers); high school dropout.

the scientific study of heredity and human differences.”⁹⁹ While it claims that it ~~is~~ neutral on political and social issues and avoids grantees with social agendas to push,” it does not appear ever to denounce or disassociate itself from such agendas, such as are so blatant in the contents of *American Renaissance*, a website and magazine. Even a cursory visit to AmericanRenaissance.com will reveal its strong racist leanings and Rushton has been a keynote speaker for at least one of their annual conferences.¹⁰⁰

What is perhaps the most oft-heard evidence of the intellectual superiority of particular races are the racial demographics of civilization and technological advance. It bears noting in this regard that the treatise on the spread of civilization that I have found most compelling and most often cited positively in Darwinian Science is Jared Diamond’s classic, *Guns, Germs and Steel* (1998), e.g. Pinker (2002), Dennett (2007) and Blackmore (1999). Diamond explains differences in cultural and technological advances as not having anything to do with differences in innate aptitudes and proclivities, but everything to do with the serendipity of certain populations having come to inhabit environments in which there were a variety of domesticables, that is, species of plants and animals that could be domesticated. Being able to do so meant that a surplus of food could be grown and/or raised and this meant that those not farming could give their time and effort to doing and making things that had value for others and with which one could make a living. How this led to cities, states, nations, culture (including technology) and religion is well understood and need not be elaborated here. The point is that civilization grew and spread among certain populations, not because of their having higher levels of innate intelligence, but because of what was available in the natural environment. Moreover, the spread of agriculture was not a matter of pre-agrarian cultures appropriating an idea (we all have an innate drive to adopt the innovations of others) so much as the vicissitudes of geography and climate that allowed the translocation of crops and domestic livestock to some but not other regions. Climate and geography also were the main determinants of how much inter-population interaction took place and explains the rapid growth of civilizations across the huge landmass of Eurasia. As Pinker points out:

Eurasia conquered the world not because Eurasians are smarter but because they could best take advantage of the principle that many heads are better than one. The ~~“culture”~~ of any of the conquering nations of Europe, such as Britain, is in fact a greatest-hits collection of inventions assembled across thousands of miles and years. The collection is made up of cereal crops and alphabetic writing from the Middle-East, gunpowder and paper from China, domesticated horses from Ukraine, and many others. But the necessarily insular cultures of Australia, Africa, and the Americas had to make do with a few homegrown technologies, and as a result they were no match for their pluralistic conquerors. (2002: 68-69)

The work of those who style themselves as *race realists*, Rushton and Murray being most noteworthy, has unfortunately inclined many to paint with the same tar brush other work in population genetics and intelligence that is undeserving of being so associated

⁹⁹ From the foundation’s website at <http://www.pioneerfund.org/>

¹⁰⁰ To get clearer notion of its agenda, it is worth checking the program for the American Renaissance upcoming conference in February 2011, available at <http://www.amren.com/conference/2011/index.html>

and which is crucial to furthering our understanding of human cognition and its evolution.

On Multiple Intelligences

Howard Gardner developed his theory of *Multiple Intelligences* (MI) in part as a refutation of a unitary general intelligence, the „g’ factor that IQ tests are designed to measure. As first set out in his *Frames of Mind* (1983), Gardner postulated the existence of seven distinct intelligences: linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, intrapersonal, and interpersonal. He later added two more: natural and existential. The particulars of these need no discussion here. The enthusiasm with which MI theory was received is well understandable and I was for long similarly enthused and made it a cornerstone in my teaching.¹⁰¹ For me, and for others I presume, it offered a broader view of human agency and challenged the inordinate attention to particular abilities in formal education as well as its tradition of inflexibility in accommodating different learning styles. It also seemed concordant with a multimodular understanding of the mind and suggested the way forward for education to become more holistic and attentive to cognitive dimensions that have been marginalized in curricula. Perhaps best of all, it suggested an educational context in which more learners could experience success and have their achievements acknowledged. Unfortunately, MI theory has very little empirical support, both in respect of the soundness of the theory itself as well as its success as a curricular and methodological framework in education (Waterhouse 2006).

Support for the „g’ factor

On the other hand, there has been increasing empirical support for the „g’ factor although there is a lack of consensus on how „unitary’ it is. It has been suggested, for example, that it has two forms: –a *fluid intelligence* that reflects mental ability independent of culture and a *crystallized intelligence* that reflects both fluid intelligence and learning” (Waterhouse 2006: 210). Whatever the „g’ factor consists of at the neurological level, it does seem evident that there is something which accounts for overall brain efficiency in the handling of cognitive tasks, such efficiency being a matter of making connections and then making sense of them. What seems most crucial in this regard is what is called *working memory*, the capacity for holding information in the mind such that it can be worked on in tasks requiring higher-order cognition: comprehension, application, analysis, synthesis and evaluation (cf. [Bloom’s Taxonomy](#)). This entails some level of executive control in maintaining task-relevant representations against irrelevant information and distraction although this does not necessarily suggest some specialized adaptation for this control. However, it may be that „g’ is working memory, –a function of the frontal lobe of the brain that maintains and manipulates information in a limited timeframe” (Waterhouse 2006: 210).¹⁰²

¹⁰¹ Waterhouse (2006) did a comparison between the increase in education (.edu) websites representing MI and the increase of professional journal articles on MI between 2003 and 2005. Whereas websites increased almost ten fold, journal articles increased by only 22%.

¹⁰² In support of this, the author cites: Colom et. al. (2004)

Waterhouse cites the research of Toga and Thompson (2005) and McDaniel (2005) which shows a significant positive correlation between brain volume and IQ scores. McDaniel's study indicated a higher correlation in the case of women which may be linked to differences in male and female brains. While men, on average, have larger brains, women have larger volumes of white matter. One study claimed that, in respect of brain matter associated with general intelligence, men have around 6.5 times as much gray matter as do women who have nearly ten times as much white matter.

Gray matter represents information processing centers in the brain, and white matter represents the networking of – or connections between – these processing centers. This, according to Rex Jung, a UNM neuropsychologist and co-author of the study, may help to explain why men tend to excel in tasks requiring more local processing (like mathematics), while women tend to excel at integrating and assimilating information from distributed gray-matter regions in the brain, such as required for language facility. These two very different neurological pathways and activity centers, however, result in equivalent overall performance on broad measures of cognitive ability, such as those found on intelligence tests. (U of California 2005)

Differences in the average brain volumes of different races has been indicated by research (something Rushton has given particular attention to), but I refrain from saying more on the matter here because, besides serious concerns regarding the purpose or value of such research, I cannot see it as relevant for reasons that will be given presently. My interest in general intelligence, or whatever capacity that allows for “integrating and assimilating information” from distributed brain systems, should require little explanation here given all that I have hitherto had to say on the subject of critical consciousness and the cognitive capacities it assumes. About this, I will have more to say in the last chapter.

What to make of this?

What was quoted in the last chapter that bears repeating here is Miriam Johnson's remark regarding the psychosocial differences between men and women that Symons argued to be innate in his *The Evolution of Human Sexuality*.

[T]he implication of his analysis for those of us concerned with achieving equality and justice for both sexes may well be that nothing is gained by denying sex differences. Sexism is not a result of male/female differences so much as it is of what we make of them. (1980: 792-793)

The same might be said in respect of racial differences. One thing that we can and *must* make of them, in both cases, is that they do not have - and *can never have* - any bearing on how we go about educating people. The main reason why was made clear in the last sentence of the extract from Jensen and Rushton above: “Individuals are individuals, and the ... groups overlap substantially on almost all traits and measures.” The placement of the bell curves on the author's graph show how substantial is the overlap and accordingly how insubstantial would be any assumption based on race as to an individual's potential or her/his suitability for particular kinds of employment and educational provision. Just as important is the fact that the differences portrayed are in respect of one set of attributes only. Bell curves for other vitally important attributes

could well give a different picture. Two things are problematic, however: (1) that global society generally accords greater status and higher remuneration to professions requiring higher levels of verbal skill, logic, spatial intelligence, numeracy, analogical reasoning, propositional thinking, cognitive synthesis and so on, abilities for which IQ has been shown to be a reliable indicator, and (2) that there seems such a strong correlation between IQ and how well people function interpersonally in heterogeneous social contexts such as more and more people willy-nilly find themselves.

The crucial point that is found again and again in the literature (and which Herrnstein & Murray's graph makes eminently clear) is that the differences in the average intelligence of different races is inconsequential vis-à-vis the differences that exist within any racially defined population. In this regard, what might more justifiably concern is the way that societies tend to stratify 'intellectually' even though, and perhaps to some degree because, they have become more just, egalitarian and integrated. Pinker (2002: 106) takes this up in a discussion around a 1971 article in the *Atlantic Monthly* by Herrnstein (who later collaborated with Murray on *The Bell Curve*). It is worthwhile quoting Pinker at some length.

Herrnstein's argument ... should have been banal ... that as social status becomes less strongly determined by arbitrary legacies such as race, parentage, and inherited wealth, it will become more strongly determined by talent, especially (in a modern economy) intelligence. Since differences in intelligence are partly inherited, and since intelligent people tend to marry other intelligent people, when a society becomes more just it will also become more stratified along genetic lines. Smarter people will tend to float into the higher strata, and their children will tend to stay there. The basic argument ... is based on a mathematical necessity: as the proportion of variance in social status caused by nongenetic factors goes down, the proportion caused by genetic factors has to go up. *It could be completely false only if there were no variation in social status based on intellectual talent ... or if there were no genetic variation in intelligence.* (106-107. my emphasis)

It may also be banal to again point out that there is a strong correlation between socioeconomic 'success' and general intelligence. Moreover, for there to be no genetic variation in intelligence would "require that people be either blank slates or clones." (107)

Ontogeny makes the nature-nurture dichotomy a non sequitur

In my view, what complicates everything is that every biological adaptation is *ontogenetic*; how completely and optimally functional it becomes in its phenotypic expression is crucially dependent on the environmental conditions encountered in life, particularly in the 'formative years,' when the brain is comparatively more plastic and innate aptitudes capable of being enhanced in their functioning. That the 'g' factor is *crystallized intelligence* (and in part 'learned') seems to be an implicit assumption in the design of many IQ tests judging by how much they rely on assimilated knowledge and, perhaps more importantly, cognitive orientations and predispositions that different cultures value and promote in different ways. What also suggests this strongly is the [Flynn Effect](#) (Flynn 1999): the substantial increase in IQ scores that has been noted worldwide, as much as ten points per generation, a phenomenon that simply *cannot* be the result of changes in the genome.

The crucial role of working memory in higher order thinking was highlighted earlier and research (Kail 2007) has shown that a child's information-processing speed and capacity for retaining information in working memory increases as they develop, this increase being the strongest predictor of inductive reasoning capacity later in life. An earlier study (Gathercole et al. 2004) investigating the structure and development of working memory in children between four and fifteen years of age indicated ~~that~~ the basic modular structure of working memory is present from 6 years of age and possibly earlier, with each component undergoing sizable expansion in functional capacity throughout the early and middle school years to adolescence" (from the article's Abstract).

Child development and Evolutionary Psychology

The above is the title of an article by Bjorklund and Pellegrini (2000) which investigates the relevance of EP to an understanding of how epigenetic programs get expressed over the course of ontogeny. What may be most pertinent here is the support they give to the *developmental systems approach* which has as its core premise that all development in an organism is the product of *epigenesis* and hence of processes of interaction between biology and environment. Someone inclined toward biological determinism might argue that while it is true that genes are expressed differently in different environments, all humans (all organisms actually) develop in a species-typical pattern. But the simple explanation for this is that during hundreds of millennia, our ancestors inherited ~~not~~ only a species-typical genome but also a species-typical environment. ... To the extent that an organism grows up under conditions similar to that in which its species evolved, development will follow a species typical pattern" (1691). Can it not logically be argued from this that: to the extent that an organism grows up under conditions different to that in which its species evolved, development will follow an environment typical pattern? Only to a degree of course; After all, epigenesis is about how genes get phenotypically expressed and that must always be in significant measure constrained by the information they encode - *constrained but not determined*.

For virtually every other species, development in an environment too dissimilar to its EEA is unlikely for the simple reason that the survival prospects of its members are too severely compromised and they are not sufficiently able to adapt; they become extinct. The intelligence that allows us to adapt to different environments surely cannot be an intelligence that is under total genetic control. Its epigenesis is necessarily far more dependent on environmental stimulation, something which again points to the vital importance of early childhood education, in particular, the quality of parental investment that characterizes it. This is doubly important in the first years of a child's life where, beyond sustenance and protection, the quality of this investment is (or should be) realized in intimate interactions between caregivers (parents most importantly) and the child, the ~~rh~~hythms and modes" that Dissanayake (2000) has explored so productively. It is the nature and quality of this intimacy that matters most in terms of how the child's potential unfolds thereafter. Here it should be noted that a child's brain more than triples in size in the first few years of life (Blackmore 1999: 71). If key sensory-motor experiences do not acquire appropriate emotional weightings (get somatically marked), the optimal unfolding of all one's psychosocial capacities becomes much less certain. Of course, the need for mutuality and intimacy remains with

one for life and it is in contexts of intensified mutuality that our cognitive potentials unfold most easily and naturally. This is where the arts play what is perhaps their most important role.

All of our psychosocial adaptations came about because of fitness benefits they conferred on ancestors, which means ultimately that they in some way enhanced the prospects for their genes getting replicated in succeeding generations. The last chapter made clear that such adaptations do not always manifest in overt fitness-enhancing behavior (e.g. securing food, shelter, or a mate or avoiding injury and death). Some evolved to serve internal functions related to emotional regulation and the organization of information in the brain needed to make it optimal in its functioning. The article by Bjorklund and Pellegrini also highlights the often overlooked fact that the survival needs of a sexually immature human are different in significant ways from those of an adult and that certain adaptations evolved to serve adaptive functions specific to different stages in an individual's life history. Certainly, further research into this will allow us to make more productive sense of the developmental theories that were advanced before EP began to offer explanations for this. In the stage theories of Piaget, Erikson and Kohlberg is implicit the understanding that the efficacy and scope of psychosocial functioning in subsequent stages is crucially dependent on the achievement of similar levels of functioning in earlier, more foundational stages.

The understanding of human psychosocial epigenesis that EP and Cognitive Neuroscience are building up has, I believe, already demonstrated that measures of human intelligence (and of more specific aptitudes such as music, spatial intelligence, etc.) are only in part measures of genetic endowment. Further research will undoubtedly bring more clarity in this regard, but the research that has the most importance to education is that which helps us to better understand what is needed by way of nurturance to ensure the most optimal expression of this endowment. But let us not forget that what may now be regarded as the most optimal expression is something quite different from what it would have been in the EEA in which the relevant genes evolved. Parental investment strategies that served well in the Paleolithic may not, and in many cases, will not deliver what is needed for a child growing up in modern global society. While there are differences in genetic endowment that may be accounted for by differences in the EEAs encountered by different ancestral populations, they are quantitative and when it comes to intellectual endowment, the differences *within* modern day populations are far greater than any differences between groups based on average levels of intelligence. Moreover, the explanation for the latter may well prove more ontogenetic than genetic. I suspect that it will. Where decency and equity are living ideals in a society, these differences cannot in any case be considered of consequence, a point well made by Noam Chomsky, the theorist most responsible for launching the cognitive revolution in the 1950s that laid the groundwork for the cognitive sciences including Evolutionary Psychology.

Consider ... the question of race and intellectual endowments. ... [I]n a decent society there would be no social consequences to any discovery that might be made about this question. An individual is what he is; it is only on racist assumptions that he is to be regarded as an instance of his race category, so that social consequences ensue from the discovery that the mean for a certain racial category with respect to some capacity is such-and-such. Eliminat[e] racist assumptions, the facts have no social consequences whatever they may be, and are therefore not worth knowing, from this point of view at least. If there is any purpose to an investigation of the relation between race and some capacity, it must derive

from the scientific significance of the question. It is difficult to be precise about questions of scientific merit. Roughly, an inquiry has scientific merit if its results might bear on some general principles of science. One doesn't conduct inquiries into the density of blades of grass on various lawns or innumerable other trivial and pointless questions. Likewise, inquiry into such questions as race and IQ appears to be of virtually no scientific interest. Conceivably, there might be interest in correlations between partially heritable traits, but if someone were interested in this question he would surely not select such characteristics as race and IQ, each an obscure amalgam of complex properties. Rather, he would ask whether there is a correlation between measurable and significant traits, say, eye color and length of the big toe. It is difficult to see how the study of race and IQ can be justified on any scientific grounds. (1978 – online source)¹⁰³



PART 2: The case for Memetics

We can now turn our attention to the other and more pertinent thrust of Gene-Culture Coevolution Theory, its attempts to identify and explain the mechanisms by which culture evolves, mechanisms that in turn can explain cultural diversity as well as how complex social and cultural institutions have come to dominate how people think and live out their lives in the EEA that is modern global society, such understanding having important implications for how we might best go about transforming society through education. This transformation may ultimately be to our genetic advantage, but the more particular and urgent concern lies with the ideational environments with which our innate psychology interacts and which incline us to believe the things – and behave in the ways – we do.

Memetics

The belief that cultural evolution is in part - or even wholly - a playing out of the natural selection algorithm is being embraced by an increasing number of theorists whose work can be subsumed under *Gene-Culture Coevolution Theory*. Here I will give the greatest amount of attention to *Memetics*, the nascent science which posits units of culture (ideas roughly) as replicating entities that mutate and evolve in the cognitive environments of evolutionary adaptedness (EEAs) provided by human brains and culture. As Memetics has it, these informational units, like genes, replicate not because they should, but merely because they *can*. This is not to suggest that humans exercise no control over which units get selected and often the information in question is beneficial. As in the artificial selection of breeds and varieties of animals and plants, humans are foci of selective pressure and through intentional acts (controlling which sperm fertilize which ova) influence the direction of genetic evolution giving rise to breeds/varieties that are superior in some ‘profitable’ way. But as was made clear in Chapter Two, the genes of domesticated species are nonetheless evolving according to the natural selection algorithm.

¹⁰³ Chomsky, Noam (1978) Language Development, Human Intelligence, and Social Organization. In Walter Feinberg (ed), *Equality and Social Policy*, Urbana: University of Illinois Press. Available online at <http://www.chomsky.info/articles/1978----.htm>

Memetics argues that the same is the case with memes, the name Richard Dawkins (1976) coined for these units of culture.¹⁰⁴ Ideas certainly can be considered informational units even if it is difficult or impossible to be explicit as to the information that comprises them. But the problem with explicitness is only because we rely on the information acquiring some perceptible form to get at the information itself. Before we were able to isolate the gene-form as a sequence of DNA, the same problem confronted but *did not confound* work in Evolutionary Biology. It was well understood that there had to be unit of selection for Darwinian evolution to work, but the inability to pin it down to something with a perceptible form did not prevent a great deal of important scientific work getting done laying the basis for current Darwinian Science in all its incarnations.

Memes replicate in human brains, according to Memetics, and this is how they spread. For this to happen, there must be some way whereby the informational kernel that defines the meme gets from one brain to another. There are innumerable ways in which this can happen thanks to the many information transmission media we have at our disposal, including what is surely the most important and extensively used medium, language. The fact that we can externalize information in materials that last (books, recordings, databases, art works, and other *artifacts*) accounts for the incredible breadth and depth of information that has accumulated and that is so easily available now that we have the Internet. But of course we do not need language or information transmission technologies to move information around from brain to brain. You need only observe what someone else is doing to get information and if she happens to be doing something that strikes you as a good idea (e.g. a way of building a mousetrap), you can, in most cases at least, copy her behavior and achieve the same outcome, or later use the idea/skill to achieve some other outcome.

On imitation

Our ability to imitate is perhaps the most underrated of human capacities even though it is so fundamental to human intelligence, knowledge acquisition and communication, perhaps because we do it so easily and are not alone among species in being able to do it. Dawkins and Blackmore use *imitation* in the broadest sense to cover any act (overt or covert) whereby one acquires a representation of an informational whole because someone else or some group of people have done something that communicates it, whether deliberately or not, whether directly or indirectly, whether in the moment or at an earlier point in time, whether verbally, iconically, gesturally or through other means of demonstration. When it comes to something spoken or written you do not have to recount it word for word for the idea of what was said or written to have taken hold and induced processes in your own brain that capture the idea's essential informational content. If you are able to remember the gist of what you heard such that you can pass it on, there has been imitation in the broad sense that something has been copied. Getting the gist means that in whatever was said or written you have isolated what is essential and comprises its informational kernel. This like imitation is a vastly underrated ability.

¹⁰⁴ Lumsden and Wilson (1981) later coined the term *culturgen* but it did not succeed well as a meme in the meme-pools of Sociobiology or Gene-Culture Coevolution Theory.

A computer can easily ‘remember’ a twenty digit number while we struggle to, but a computer cannot compute the gist of a children’s bedtime story (as children so easily do).

Sociobiology vs. Gene-Culture Coevolution Theory and Memetics

In Chapter Two I presented my understanding of Adaptationism and how it helps us to understand our capacities and predispositions for artistic behavior. I also tried to use some of the insights of Evolutionary Psychology and related disciplines to better understand how we learn and develop cognitively and what predisposes us genetically in this regard. Appropriately, three of the most eminent proponents of ‘the adapted mind’- John Tooby, Leda Cosmides, and Steven Pinker – feature prominently in that chapter and elsewhere. When it comes to culture, however, they manifest what can be considered a *sociobiological* stance which places culture very much on the leash of genes.¹⁰⁵ All three have made clear what they are ‘against’ and have set it out explicitly in what they style as the *Standard Social Science Model* (SSSM), the defining premises of which I elucidated in Chapter One. The SSSM characterizes what Pinker calls a *Blank Slate* orthodoxy, a dogma that I have rarely come across in my academic experience even though I have more colleagues than not who either downplay or just somehow ignore that we have an innate psychology that is complex and multitudinous in how it influences thought and behaviour. They tend to see genes as being on the leash of culture. To a significant degree, I believe they are correct. They must be correct if we are to account for two things: cultural diversity and the extraordinary pace of cultural change.

My take on gene-culture coevolution is consistent with what Dennett articulates as his model in *Darwin’s Dangerous Idea* (1995) and he does so in a way that shows both the SSSM position and the sociobiological stance to have valid premises which I believe Gene-Culture Coevolution Theory and Memetics take account of and employ productively. What Dennett does first is to quote from Pinker’s portrayal of the SSSM (1994: 406):

Whereas animals are rigidly controlled by their biology, human behavior is determined by culture, an autonomous system of symbols and values. Free from biological constraints, cultures can vary from one another arbitrarily and without limit. ... Learning is a general-purpose process, used in all domains of knowledge. (quoted in Dennett 1995: 490)

Dennett then amends this to present his “only Slightly Nonstandard Social Science Model” which is the model for which his book is by and large an argument. The italicization is his.

Whereas animals are rigidly controlled by their biology, human behavior is *largely* determined by culture, a *largely* autonomous system of symbols and values, growing from a biological base, but growing indefinitely away from it. *Able to overpower or escape* biological constraints in most regards, cultures can vary from one another enough so that important portions of the variance are thereby explained. ... Learning is *not* a general-purpose process, but human beings have so many special-purpose gadgets, and learn to

¹⁰⁵ Recall that Pinker was placed at 9 on the nurture-nature scale of 0-10. See page 39.

harness them with such versatility, that learning *often* can be treated as if it were an entirely medium-neutral and content-neutral gift of non-stupidity. (491)

Dennett will continue to feature in this discussion as he offers what I have found to be some of the most compelling arguments for Memetics and in his *Breaking the Spell* (2007) demonstrates how valuable it can be in understanding “religion as a natural phenomenon” (the subtitle of the book). A religion is more than just a set of beliefs that a group of people embrace. It is a complex social system or institution composed of a diversity of phenomena, emerging from different circumstances and influencing thought in multitudinous ways, many not specifically related to belief in a supernatural agent. The institutions that sustain and promote the arts are similarly complex social systems in which certain ideas have proliferated and come to be status quo ideas that inform arts institutions around the world, some of which, in what they communicate and how they communicate it, help to promote and sustain the institutions themselves. An institution might rightly be considered a memplex, an assembly of ideas that is robust as a coherent informational whole. So also is the case with education and the memplexes we identify with words like curriculum, methodology, ‘the university,’ philosophy, policy and so on. But, before considering a memetic take on such entities, a more thorough and convincing case for Memetics must be made.

The selfish gene vs. the selfish meme, similarities and differences

A key point regarding biological evolution that was made in Chapter One is that the organisms that comprise life on Earth are not *inevitable* outcomes of genetic evolution. What now exists biologically is not as it was meant to be according to some design or natural unfolding process where it is possible to predict evolutionary outcomes. It is the result of innumerable chance occurrences and even though the laws of physics and chemistry can be assumed to have remained constant throughout Earth’s history, the evolutionary outcomes could have been very different. Another key point was the fact that it is genes that replicate, not organisms. Genes are the units of selection. They work together to build survival machines that in the case of humans happen to be constructed so as to have a perspective that ascribes purpose to things including themselves, when the only real purpose they have is to ensure that their genes get passed on. Genes have no volition of course and the idea of the *selfish gene* is misleading to a degree. Genes are only selfish in the sense that whatever they bring about phenotypically has a function (or functions) that increases their fitness, i.e. the likelihood that they will be copied in offspring. Could it be the same with memes? What would be the meme equivalent of a phenotype? A phemotype?

Distin (2005) points out that memes “do not build survival machines. Their replicative mechanisms, and the means of their variation and selection, lie in genetically determined human faculties, not in vehicles that they themselves build.” Moreover, “memes are not bundled up in a comparable way,” rather, “they are peppered freely throughout the cultural environment.” (206) This is true to a point, but what Distin seems to overlook is that “the means of their variation” also lie in what has already been taken on board, the memes one has already acquired, many of which constitute one’s notion of self (one’s *selfplex*). I would also contest her view that our “faculties” are genetically “determined.” What has been genetically instructed interacts with what has not, and what gets taken in informationally actually shapes these faculties and weights

aspects of their functioning in key ways. The ‘idea’ that the interests of one’s offspring are always paramount is, like the incest taboo, less an idea than an expression of something genetically instructed. Nepotism, on the other hand, is an idea that in its formulation and application is generally intended as a challenge to this innate idea and the term is always used pejoratively. The idea of fairness, which is also in part rooted in our innate psychology, calls for behavior preferential toward offspring to be named and shamed when it compromises the interests of others or of the collective to which one identifies, one’s community or nation. That we could come up with such a counterintuitive notion is remarkable, but even more remarkable is that it can become widely shared and realized as a principal enshrined in all manner of artifact (constitutions, declarations of human rights, employment policies, etc.). Natural selection working on genes alone cannot adequately account for this, or such is the firm conviction of memeticists and gene-culture coevolution theorists generally.

Hard-line Memeticists: Dennett and Blackmore

With good reason, Distin identifies Dennett and Blackmore as memeticists that take Universal Darwinism to the limit. Distin’s claim that memes do not build survival machines is one they challenge and if we concur with their lines of reasoning, we must conclude that —~~there~~ is no conscious self inside,” a conclusion that accordingly must influence how we think about human agency. The title of Blackmore’s book is clear in suggesting that a human brain is as much a *meme machine* as it is a gene machine. Instead of a conscious self, there is only —a complex interplay of replicators and environment” (Blackmore 1999: 246). Distin thereupon makes what is surely an erroneous assumption in saying that Blackmore and Dennett are thereby claiming that this —is ~~it~~ there is to life” (2005: 206). What Blackmore actually says is something quite different.

Memetics thus brings us to a new vision of how we might live our lives. We can carry on our lives as most people do, under the illusion that there is a persistent conscious self inside who is in charge, who is responsible for my actions and who makes me me. Or we can live as human beings, body, brain, and memes, living out our lives as a complex interplay of replicators and environment, in the knowledge that that is all there is. Then we are no longer victims of the selfish selfplex. In this sense we can be truly free – not because we can rebel against the tyranny of the selfish replicators but because we know that there is no one to rebel. (1999: 246)

We became meme machines when we acquired the capacity to imitate. But we are not meme machines in the sense that we have no say in what we choose to imitate (appropriate, believe, be influenced by, act upon), that our genes have instructed an organism that can *only* work with ideas in a mechanistic way even though it involves mechanisms at every step of the way. But these mechanisms are not cogs in a machine, rather they are processors whose outputs may or may not have much to say in what emerges as a choice. People make choices that are counterintuitive, that fly in the face of ideology even where it is one embraced readily by those with whom one shares much the same artifactual and informational world.

What Blackmore presents us with is an epistemology that may well be correct, but even if so, can this make any difference in how we understand human agency? If free will and consciousness are really illusions, the question might be asked: who is having the

illusion? Who is being deceived? The fact that we are discrete, physically independent organisms, that make decisions, even counterintuitive ones, is the only fact of value. That we tend not to employ our ‘faculties’ fully to the enterprise, that we rather ‘go with the flow’ or ‘follow our instincts’ does not mean that we cannot act in ways that run counter to these, that we are prisoners of our ideas or our genes. The sad reality is that we allow ourselves to be prisoners (some of the time at least) by not subjecting our ideas to rigorous interrogation. Instead of treating ideas as hypotheses, we treat them (often unwittingly) as indicative of how things really are, how things should be, or how they were meant to be. Critical consciousness may also be an illusion, but is certainly one that people (as complexes of brains, bodies and memes) can use to put both genes and memes on a leash. But we still haven’t answered the question posed at the beginning of this paragraph. I am utterly convinced that the understanding of consciousness that Dennett and Blackmore have elucidated, if properly grasped and embraced, must alter one’s notion of agency in fundamental ways. It also makes much more plausible the memetic theories they espouse.

„The Grand Illusion of Consciousness’

For both Dennett and Blackmore, consciousness and agency are not two separate entities. They are epiphenomena resulting from countless memes (Dennett would say meme-effects) engaged in collaborative interplay that generates the illusions that naturally give rise to the notion of mind as a coherent entity existing apart from the physical brain and its electro-chemical activity, a mind that is the cause of the activity (not the activity itself) and which controls one’s behavior. This is how it certainly seems, but the evidence is overwhelming in showing that it is not like this at all. Over twenty years ago, [Benjamin Libet](#) devised an ingenious experiment whose findings have been corroborated by more recent studies, the key finding being that the neural activations (readiness potential) giving rise to a deliberate behavior begin more than a third (as much as half) of a second before the conscious decision is taken (and one stands up, for example). In other words, it is not the conscious decision that initiates the neural activation. We perceive it as being otherwise because the illusion works so well.

In this regard, it is crucial *not* to think of an illusion as something that does not exist or that is contrived to deceive. *Websters* offers what is perhaps the most apropos definition of illusion to be found in a standard English dictionary: “the perception of something objectively existing in such a way as to cause misinterpretation of its actual nature.” Indeed, our visual sense relies on an illusion, that being of a detailed and accurate representation of what is before our eyes that has been assembled in the brain and is the equivalent of a photograph or film clip. Blackmore (2005) demonstrated the illusory character of vision brilliantly in a lecture/demonstration given at Caltech where through visual exercises she conducted with the audience she leaves no one in doubt as to how much of what is clearly there before our eyes we do not perceive. She also explores some of the most plausible theories for how the illusion of ‘seeing all that is to be seen’ is achieved. I already made the point in Chapter Two that when watching television one is actually hallucinating a three dimensional world behind the screen.

It is hard to think that we could conceive deliberate behavior as having to be under the control of conscious thought when so much of our behavior is kinesthetic and thus reliant on cognitive processing that is for the most part pre-conscious (even though we

would regard the behavior itself as deliberate). If someone jumps out of the bush as I am walking by, I can hardly consider the response it would provoke to be the result of a conscious thought, not initially at least. But that cannot be considered a deliberate behavior, one might contend. The argument here is that there is no conscious, deliberate behavior that is not the result of pre-conscious processing and that therefore whatever initiates the process cannot be a conscious decision. The only thing that can be said is that what one becomes consciously aware of can and obviously does influence what happens next, but this does not mean that there is, nor does it require, a central controller in the brain that is a coherent self with free will. What does often happen is that when conscious thought kicks in, the readiness potential can be vetoed, stopping the process such that no behavior ensues. In this regard, there may be a lot of truth in what the psychologist Richard Gregory suggested with tongue-in-cheek, that there is no free will, only ~~free~~ won't" (Blackmore 2005).

For any true cognitive materialist there should be nothing striking about what Libet discovered and which has been validated by subsequent studies (Blackmore 2005). It is only striking because it is counterintuitive or because one still holds to the notion of an internal self (homunculus) that takes conscious decisions. When there is no such homunculus, there exists nothing to take a decision; rather it is just what happens when our cognitive machinery is stimulated in a particular way. A representation that is formed in the brain does not require ~~a~~ "a little man in the head to look at it." Pinker remarks on how metaphors are commonly used by computer programmers and others working in Artificial Intelligence when talking about the workings of computers, metaphors that intuitively makes sense but which are inaccurate and misleading as regards what is actually going on.

Data structures are read and interpreted and examined and recognized and revised all the time, and the subroutines that do so are unashamedly called ~~agents,~~ "demons," ~~supervisors,~~ "monitors," ~~interpreters,~~ and executives." (Pinker 1997: 79)

We obviously need to have ways of talking about processes be they in a computer or brain and I made a point in the last chapter about how language relies on metaphors even when talking about the most mundane things. If it helps us to think that there is something inside a computer or a brain that does the reading, interpreting, etc., then we should rather think in terms of *a host of homunculi with no-one in charge*. What Dennett has said in this regard is insightful and worth quoting in total.

Homunculi are *bogeymen* only if they duplicate entire the talents they are rung in to explain. ... If one can get a team or committee of *relatively* ignorant, narrow-minded, blind homunculi to produce the intelligent behavior of the whole, this is progress. A flow chart is typically the organizational chart of a committee of homunculi (investigators, librarians, accountants, executives); each box specifies a homunculus by prescribing a function *without saying how it is accomplished* (one says, in effect: put a little man in there to do the job). If we then look closer at the individual boxes we see that the function of each is accomplished by subdividing it via another flow chart into still smaller, more stupid homunculi. Eventually this nesting of boxes within boxes lands you with homunculi so stupid (all they have to do is remember whether to say yes or no when asked) that they can be, as one says, ~~replaced~~ by a machine." One *discharges* fancy homunculi from one's

scheme by organizing armies of idiots to do the work. (Dennett, 1978d, pp. 123-124. Quoted in Pinker, 1997: 79)¹⁰⁶

Consciousness only kicks in after things are already in motion and it probably never can be known where precisely it is in the brain that the process actually begins. Portraying the brain as a massively parallel computer is not only a way of saying that the brain is complex but that it comprises multiple streams of information processing that are going on simultaneously and largely independent of each other. Let us try to understand this analogy in more detail.

A massively parallel computational system

Imagine a system of many interconnected computers, directly connected (wired to each other) and/or indirectly connected via intermediary computers that pass along data with or without effecting changes in it. There is a high degree of interconnection and joint processing between the computers in the system though this obviously does not involve any kind of mutual awareness. Some work more independently, perhaps handling some specific function vital to the system as a whole (e.g. temperature regulation). The kinds of processing that each computer in the system is capable of is mostly hard-wired, i.e. based on how it was made, including its essential operating programs. Some are more plastic in this regard and their processing capacity can be enhanced depending on how active they are in coextensive processing involving other computers in the system. The increase in possible outputs for the system may be rapid because of the establishment and refining of feedback loops that build up new, more complex informational wholes that can be stored, accessed and processed variously.

Different computers in the system may receive the same information but work on it in different ways specific to their respective functions without necessarily looping it through any other computers where it can be edited. Nonetheless, the results of their independent processing become data that others in the system can access. Indeed, others may or will be accessing it on a continuous or near continuous basis, using it to update existing informational drafts that can become the primary data for coextensive processing involving all or nearly all the computers in the system. Being computers, they are not in any way aware of what they are doing so, or aware of the extent to which the accessed data has been put to use in their own processing activity, influencing their outputs. They are not even aware of the system itself even though the processing they accomplish independently may be vital to the working of the whole, and hence its survival as a functioning system.

Some of the computers in the system are able to receive and decode information from outside the system. They can then send it on to other computers in the system after they have processed it and represented it some system of symbols (code) that the other computers can read. How optimal the whole system becomes in its functioning is dependent on information that it is able to take in from outside. But not all of this

¹⁰⁶ Dennett, D. C. (1978) "Artificial intelligence as philosophy and as psychology" in Dennett, D. C. *Brainstorms: Philosophical essays on mind and psychology*. Cambridge, Mass.: Bradford Books/MIT Press.

information is salient vis-à-vis the functioning of the system. A data set may be entirely superfluous but something in how it encodes information causes one or more of the computers in the system to process it, even though it is not and might in fact be injurious to the system (a computer virus for example). Though superfluous, this information can become active in processes and their outcomes and thus influence the outputs of other computers in the system including those with the capacity to pass it along to computers in other systems which can then become similarly infected.¹⁰⁷ (This last point is germane in meme theory.)

The last and perhaps most salient characteristic of the system needs careful attention for it is what allows the whole system to function as an integrated whole, as a parallel system whose outputs are outputs of the whole even though there is no single computer in the system that coordinates everything. A problem with the computer analogy is that computers as we know them are serial systems that do one thing at a time (despite appearances) whereas brains are parallel systems doing innumerable things at the same time.¹⁰⁷ Consciousness emerges as a serial phenomenon of one thing after another. How are the computers in our imaginary system able to work together such that the whole system functions as a single computer that appears to have agency rooted in some executive center that makes sense of, stitches together and serializes the varied outputs of its component computers? One thing for sure: it is impossible that there be a single computer in the system that puts everything together and issues commands as it would have to be a parallel system itself and this leads to an infinite regress conundrum (as we encountered with the homunculus myth in Chapter Two). Dennett has offered a way out of this as well as a plausible explanation for consciousness itself.

Just as you can simulate a parallel brain on a serial ... machine [as in a computer], you can also, in principle, simulate (something like) a [serial] machine on parallel hardware ... Conscious human minds are more-or-less serial virtual machines implemented – inefficiently – on the parallel hardware that evolution has provided for us. (1991: 278)

It is these virtual machines that make it possible for the data structures constructed by different components of the system to be assembled into the more complex data structures that we call ideas and which we can call memes if they are able to maintain their informational integrity when their syntactic form changes and they take the form of words, actions, melodies, recipes, instructions, or whatever is capable of being transmitted to other brains. That the brain requires some kind of symbol system that makes possible its inter-modular behaviors seems evident and it was suggested in Chapter Two that we have such a language of thought, the mentalese that Pinker speaks to. More will be said about this further along.

Chasing the elusive meme: a musical example

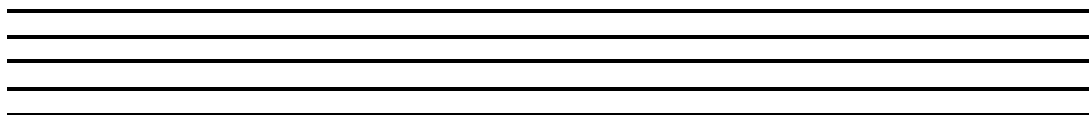
The biggest problem with a meme is that it can and most often does acquire multiple forms, forms that in most cases encode information superfluous to what might be

¹⁰⁷ Pinker points out other problems with the brain-computer analogy. —Computers are fast; brains are slow. Computer parts are reliable, brain parts are noisy. Computers have a limited number of connections; brains have trillions. Computers are assembled according to a blueprint; brains must assemble themselves.” (1997: 26)

considered the core idea, its informational kernel. It is this kernel that is, in fact, the meme. Let us take as an example a musical meme, the phrase from “It might as well be Spring” that was quoted in the last chapter and notated in Curwen’s tonic sol-fa as:

$$s_1 . s_1 \mid s_1 . m : s . d \mid m . s_1 : d . s_1 \mid ta_1.$$

I could have easily written in staff notation as below.



But are these two representations of the same meme? With the second the notes have specific pitches, and, provided you are conversant with tonic solfa notation, you might also have noticed that the rhythm has been altered. So if we are looking for a meme, what information is essential and what is superfluous? Firstly, ‘musical meme’ is too broad a denotation. More specifically, it is a *melodic* meme and this implies that we are looking for a series of ‘notes’ that assume a pattern by virtue of two kinds of relationship: pitch and duration.

The sequence of pitch intervals are the same in both examples and while there are differences in the series of note durations, the disbursement of the notes metrically (where they fall relative to ‘downbeats’) shows the two renditions to be essentially the same rhythmically. The fact that the staff version specifies the pitch of the notes is of no consequence. If I were playing it on my alto saxophone I would get a different set of pitches than what I would get playing it on my clarinet (as they are both transposing instruments), different still from what I would get playing on my flute (a non-transposing instrument). But the intervals would stay the same and that is what matters informationally and which allows one to hear all three as the same melody but in different ‘keys’.¹⁰⁸ The sol-fa version presents the rhythm as it is probably most often notated (with even eighth-notes) even though the staff version might be closer to how it is more likely to be performed because of other ideas coming into play (e.g. a concept of and feeling for ‘swing’). But the informational kernel stays the same for the most part. We might say that the differences are phenotypical (phenotypical), that both are expressions of the same informational kernel. The example here is simple and straightforward. Stephen Jay takes the identification of musical memes to many different levels in his *The Memetics of Music* (2007) which is well worth reading if one wants to better understand the evolution of compositional ideas (forms, structures, styles, etc.).

While we have isolated a melodic phrase with a particular tonal and rhythmic pattern, it can only really be considered a meme if there is something in the phrase’s informational

¹⁰⁸ Changing the ‘key’ will increase or decrease the size of each interval in terms of the frequency difference between each pair of notes, but it will do so proportionally. For example, playing it an octave higher would double the frequency of every note and thus double every interval as measured by frequency (hz).

kernel that could *cause* its replication. The information that a gene encodes induces gene-effects (protein syntheses) in chemical environments that through a long, complex and cumulative process bring about phenotypic results (e.g., a physiological or cognitive organ in some organism) that increase the likelihood of that gene getting copied (e.g., the organism survives and produces offspring). So it should follow in the case of a meme: the information it encodes must induce meme-effects in its environment (the neural-chemical environment of a brain) that through a cumulative process brings about phenotypic results that influences its chances of getting copied, for example, that its informational kernel gets instantiated neurally and stored, later to be reconstituted and employed in behavior that gives the informational kernel a form external to the brain (e.g. a visual or aural representation as in the notating or performance of the phrase). This in turn makes it possible for the kernel to be transmitted to another neural-chemical environment (another brain) where similar phenotypic outcomes may ensue.

The informational kernel must be marked as salient if it is to stand a chance of being replicated and this will depend in large measure on information that attends it and that weights the informational kernel by virtue of its inclusion in a larger informational whole, a *memplex*. With the example at hand, the range and complexity of memplexes is seemingly unlimited. If I was trying to get the “It might as well be Spring” meme to take hold in your brain, I could do any of the following. They are approaches which vary considerably in how informationally rich they are and how successfully they might predispose you (your brain that is) to marking the informational kernel as salient, worth remembering and making use of.

1. I could make my notation of the meme richer by, for example:
 - writing out the entire melody
 - adding chord symbols
 - adding accompanying parts on additional staves
 - providing the words of the song
 - adding expression symbols and other instructions (e.g. play with a swing feel).
2. I could perform for you:
 - the entire melody
 - the melody with some accompaniment
 - singing it with the words
 - as part of an ensemble playing an arrangement of the song
3. I could let you hear the meme in contexts where I have no active part. For example, I could play you a recording of a great singer backed by a great band/orchestra performing a great arrangement of the song. Perhaps even better, I could show you a DVD of the 1945 film musical *State Fair* and let you experience the beautiful Jeannie Crain singing it wistfully while gazing out of her bedroom window.¹⁰⁹
4. Lastly, I could treat you to a short seminar on the song in which I highlight, among other things, how that particular phrase captures the *idea* of ‘jumpiness’ in its

¹⁰⁹ It wasn't actually her voice but she did a superb job of lip-synching.

intervallic construction as is metaphorically appropriate given the words: “It’s as jumpy as a puppet on a string.”

But perhaps none of these ploys are necessary. After all, the phrase has other qualities than jumpiness. Even someone without musical ‘training’ would be likely to sense the poignancy of how the phrase ends, intuiting without consciously apprehending the effect of making a tonic triad (s . . . m s d m s d s) into a dominant seventh by ending the phrase on a lowered leading tone (ta instead of ti). I have heard others – and have myself – employed this meme in improvisations; and given how prominent the harmonic device is in tonal music, I’ve had innumerable opportunities to do so.

Phenotypic mutability

Of course, what you would get from a DVD or CD is information that has been encoded in the digital sequences on the surface of the disk. In the case of a CD recording of “It might as well be Spring,” this representation, when decoded and made to move speaker cones in specific ways, realizes an audio event homologous to what was originally recorded. The point that is important here is that somewhere in the megabytes of data inscribed in the ridges and gaps read by the player’s laser is a pattern that encodes the same, or nearly the same, pitch and duration relationships as I represented in my basic notations above. Of course, what the listener actually gets is a stream of informational bits that her or his brain must divide up in particular ways if anything salient is to be perceived and this process involves arrays of representations and mechanisms for working with them that are already on board in the brain, that have been ‘inscribed’ there on the basis of both genetic and epigenetic information (genes and memes).

With an MP3 player you could listen to the same recording as you could on a normal CD player as you could on a device that plays analog recordings (a record or tape player). That there is only a negligible loss of sound quality when going from the CD to the MP3 player is remarkable given that the amount of information being read by the MP3 player has been reduced by something like 90%. The missing information (or a substantial amount of it) is ‘resurrected’ by virtue of a clever algorithm that preserves enough of the essential structure of the original wave pattern that speaker cones are induced to vibrate in virtually the same way and what reaches the ear is virtually the same series of compressions and rarefactions. The information has been copied with sufficient fidelity to make the realized aural event a close enough facsimile, at least close enough to make worthwhile the substantial saving of disk space that the MP3 format makes possible.

Our vision system allows us to do an analogous ‘filling in’ when we perceptually blend an array of pixels of illuminated light into a coherent, seemingly seamless scene, as we do when watching television. As will be discussed further along, there is a great deal that is missed in visual perception and much has to be supplied by the brain to create the illusion of looking out on the world through the windows of the eyes. What makes this possible are algorithms working on neural-chemical data, that is, representations of light intensity (or acoustic energy in the case of auditory perception) that have to be assembled into bigger, more complex representations that ultimately produce illusions that are consistent with the data originally provided. In other words, the illusions are adequately congruent with what exists and is going on in the environment one finds

oneself in. And thanks to technologies such as a CD player, the illusion can be congruent with what happened decades ago in a recording studio somewhere.

Memes and the ‚culture‘ of songbirds

With something as precise as a short melodic phrase, it seems entirely plausible to call *it* a meme. In the calls of numerous songbirds are distinct patterns (that can be isolated and treated as memes) that others learn by imitation and employ variously. There are several bird species that copy memes from the calls of other species, even non-bird species. I have heard an Australian Lyrebird (*Menura novae*) that renders perfectly (like a tape recording) the sound of a camera with motor drive as well as chainsaws firing up, axe blows and other sounds it at some previous time came across when in the vicinity of some lumberjacks busy destroying its habitat. Indeed, it is in the study of bird calls that Memetics has perhaps best demonstrated some real scientific value.¹¹⁰

The Red-capped Robin Chat (*Cossypha natalensis*) in my garden not only can mimic forty or more other bird calls (plus a few other sounds like dog yapping and a car alarm) but can build these into long improvised strings of slurred whistles. In the case of the Lyrebird, the male’s incredible vocal productions are clearly a type of courtship display. That its prowess is so extraordinary relative to other bird species suggests, as with the peacock’s tail, that it is the product of runaway evolution as was discussed in Chapter Two. This is what Blackmore (1999) theorizes happened when our ancestors started to become good imitators. Genes for imitative capacity and genes for a predisposition for good imitators produced a feedback loop that she argues to be the explanation for our extraordinarily large brains and our language capacity.

Words as memes

Through memetic analyses of their calls, ornithologists have been able to map the interactions and movements between and among populations of different species, much as the linguist Joseph Greenberg did in his studies of African languages, finding that Africa’s approximately 1500 different languages fall into just five main language groups spoken by racially distinct peoples (Diamond 1997: 381). In *Guns, Germs and Steel* (1997), Diamond uses language as one of the ways he traces the spread of humanity and civilization arguing, for example, that the almost complete disappearance of a Pygmy tongue was the result of the Pygmies having been overwhelmed by migrating farmers and pastoralists from other parts of the continent. The speed with which languages are becoming extinct throughout the world indicates that this was not an atypical phenomenon. Nowhere has Diamond, to my knowledge, considered a memetic take on the phenomena he explores, considering, for example, that words and other linguistic elements are replicators evolving as per the Darwinian algorithm. It seems evident to me that the spread of musical and other artistic culture should avail itself well to memetic analyses.

¹¹⁰ for example: Lynch & Baker 1993; Burnell 1998; Matessi et al. 2001.

Darwin himself may have pointed the way forward for Memetics when he remarked in the *Descent of Man* (1871: 59): “The formation of different languages and of distinct species, and the proofs that both have been developed through a gradual process, are curiously the same.” He further along concluded that: “The survival or preservation of certain favoured words in the struggle for existence is natural selection” (quoted in Dennett 2007: 341-342). Words are perhaps the most obvious examples of memes. Dennett points out that virtually all of the billions of words spoken every day are replicas of words that have been heard or read.

Replication is not perfect, and there are many opportunities for variation or mutation in pronunciation, inflection, or meaning (or spelling, in the case of written words). Moreover, words are roughly segregated into lineages of replication chains; for instance, we can trace a word’s descendants from Latin to French to Cajun. Words compete for airtime and print space in many media, with words going obsolete and dropping out of the word pool, while other words spring up and flourish. (342)

What is information?

Given that both genes and memes are informational units, it is worth considering what should be understood by the elusive term information (which has already appeared over sixty times in this chapter). It is one of the most widely used words in the English language and yet no one seems to be able to say what *it* actually is. I believe, and hope to show, that in getting closer to the root of the problem by taking it to the neural-chemical level, the plausibility of Memetic theory becomes more strongly indicated. Standard English dictionaries do not assist much, the relevant entries tending to portray information as *knowledge* acquired or supplied about something. Sometimes the term is used to denote one or other kind of signal or code that represents *data*. But then, data is really just another name for information (as is knowledge) and we are really no closer to defining what *it* is. Richerson and Boyd define ‘information’ as “any kind of mental state, conscious or not, that is acquired or modified by social learning and affects behavior” (2005: 5). This is not any more helpful. A ‘mental state’ is presumably the *result* of – or the effect produced by – some synaptic activation that in its patterning instantiates a representation of information, but neither the representation nor the mental state *is* the information itself anymore than a gene *is* the information it encodes. Moreover, one cannot *acquire* mental states; they must be constituted neurally and chemically even though the result will be very much influenced by the input in question. This point was made clear in respect of visual and audio perception in the last chapter. The data that the brain gets to work on in both cases is not the raw data of light and/or sound; what it gets, rather, are values for different intensities of light and acoustic energy that have been ‘digitized’ as patterns of synaptic firings between neurons, representations analogous to the number values in a spread sheet.

Merriam-Webster Online points us in what may be a more profitable direction by defining it (among other things) as an “attribute inherent in and communicated by” how something is arranged that produces specific effects. Information, as I conceive it, is a condition of relatedness or interconnection that manifests in some kind of organization, a pattern that, potentially at least, can influence the formation of other patterns, perhaps in other substrates. Pinker makes this even simpler by defining it as “a correlation between two things that is produced by a lawful process (as opposed to coming about by sheer chance).”

We say that the rings in a stump carry information about the age of the tree because their number correlates with the tree's age (the older the tree, the more rings it has), and the correlation is not a coincidence but is caused by the way trees grow. Correlation is a mathematical and logical concept; it is *not defined in terms of the stuff that the correlated entities are made of*. (1997: 65, my emphasis)

Pinker is making a key point about information, that being what might be called its *syntactic mutability* and which is evident even at the level of two connected neurons where the smallest units of information are being processed.

The axon (the long output fiber) of a neuron is designed, down to the molecule, to propagate information with high fidelity across long separations, and when its electrical signal is transduced in a chemical one at the synapse (the junction between neurons), the physical format of the information changes while the information itself remains the same. ... [T]he tree of dendrites (input fibers) on each neuron appears to perform the basic logical and statistical operations underlying computation. Information-theoretic terms such as ~~—~~ignals," ~~—~~odes," ~~—~~representations," ~~—~~transformations," and ~~—~~processing" suffuse the language of neuroscience. (Pinker 1997: 83)

Information inheres in matter itself and it is the decoding of such information that is in a sense what Chemistry and Physics are all about. It can be something as specific as a chemical bond that causes molecules to arrange themselves in particular ways (as in a crystal, snowflake or nucleotide) or it can be something far more complex and particulate, such as the information according to which nucleotides are organized into strings of DNA. According to physicist Jacob Bekenstein, there are a growing number of scientists who are coming to regard the physical world as being comprised of information ~~—~~with energy and matter as incidentals."

Ask anybody what the physical world is made of, and you are likely to be told "matter and energy." Yet if we have learned anything from engineering, biology and physics, information is just as crucial an ingredient. The robot at the automobile factory is supplied with metal and plastic but can make nothing useful without copious instructions telling it which part to weld to what and so on. A ribosome in a cell in your body is supplied with amino acid building blocks and is powered by energy released by the conversion of ATP to ADP, but it can synthesize no proteins without the information brought to it from the DNA in the cell's nucleus. Likewise, a century of developments in physics has taught us that information is a crucial player in physical systems and processes. (2003 —online source)

Information may also inhere in the behavior of matter, when an object is in motion for example. Our innate capacities for apprehending and computing such information are uncanny and do not require any knowledge of Newtonian physics although they, like many of our innate capacities, need to be exercised through interactions with the environment to develop optimally. As was pointed out in the last chapter, one of the adaptations which natural selection has provided us with (as it has many other species) is an innate *intuitive physics* that allows us to track and predict the movements of objects. It almost defies comprehension in its sophistication when we consider what is required computationally in order to catch a ball that someone has thrown and yet we can do this so easily and without thought. Dogs do it particularly well. Bats are even more impressive in the speed with which they compute the trajectory of a flying insect and do so only with information picked up by their ears.

What is remarkable about the human brain is that it can work with information that has not come to it through direct sense perception (personally acquired) but that has been conveyed by some communicative, representational means, by something spoken, written, or otherwise created that encodes the information (e.g. a photograph or video clip). This allows us to transcend time, place and perceivable reality itself (e.g. to gain knowledge about things you will never nor ever could see, smell, hear, taste or touch). The human brain can work with information that is only contingently or provisionally true and information not based on anyone's direct experience. And as can the brains of many animals, it can work with information already stored in the brain, either abstracted from sensory experience or which has been 'inscribed' genetically (e.g. the innate concepts described as metaphors of the mind in the last chapter and which are encoded in *mentalese*). Most importantly, it can assemble different informational units into a cohesive amalgam such as we call an *idea* and thereafter give it representational form in something that can be shared, a spoken utterance, a series of gestures, a demonstration (playing a musical phrase for example), a written text, an illustration, or a string of binary code transmitted across the world in a few seconds that allows a representation to appear on any number of computer screens that is virtually identical to what was on the screen of the computer from which it was sent. And of course it is possible for another brain to make sense of what has been communicated such that the idea is once more constituted neurally. Whether it dissipates, gets stored, gets broken down with some but not all of its constituent information retained, or modified into something different or new depends on its salience (emotional weighting) in relation to existing ideas in the brain and to cognitive orientations and proclivities that are part of our innate psychology.

So what is an idea?

An idea is a mental construct, a pattern of representations in mentalese that constitutes an informational whole and may be used as such. It may or may not emerge and inform a conscious thought and it may or may not get encoded in some form external to the individual, an utterance or artefact of some kind. We may here recall Dennett's surmise about consciousness that was highlighted in Chapter One, that without language (and here I suspect he might include other symbol systems like music and art) there would be no consciousness —in the strong sense of there being a subject, an I." Such representational systems are necessary to —engage the contents of events in one's nervous system that would otherwise leave no memories in their wake and hence contribute to one's guidance in ways that are well described as unconscious" (Brockman 2006: 126, 129, my emphasis). That an idea consciously apprehended and formulated in thought can influence subsequent thought without it being consciously invoked is a fact of great importance in understanding how ideas spread. It is what makes it possible and fruitful to speak of ideologies and provides a means to better understand how they shape humans psychosocially and thereby influence cultural evolution in particular ways and in particular directions. What strikes me as a key question is how it might be possible that an idea that initially had to be articulated in words could become something 'tacit' and nondiscursive that can influence subsequent thought without us being consciously aware of it. *If an idea is anything other than a conscious idea (thus couched in some externally derived symbol format), it must employ something other than words as its currency of exchange.*

On mentalese

The term *mentalese* was introduced in Chapter Two where it was defined as the “language of thought,” the “level of fine-grained conceptual structure which we automatically and unconsciously compute every time we produce or utter a sentence – that governs our use of language” (Pinker 2005). It is crucial to the present discussion that we explore the matter further. Firstly, we should note that Dennett’s surmise about consciousness being dependent on some kind of learned symbol system was in no way a suggestion that ‘thought’ itself requires language. If language is dependent on something like mentalese, which I believe has been established beyond doubt, this has huge implications for how we understand ideas and how they move around from brain to brain. Also, it surely must follow that music too is dependent on something like mentalese. I had much to say in Chapter Two in support of this, citing, for example, Jackendoff & Lerdahl’s generative theory of tonal music. I am convinced, largely based on my own experiences of different musical traditions, that there are ways in which we process sound and are inclined to organize it temporally that are species-typical and hence pre-cultural. The inter-modular sophistication of our brains allows the computational structures of mentalese to be employed cross-modally. I am also convinced that language and music (which so often intermingle) have a common ancestor, as are a number of theorists as noted in the previous chapter. If this is true, music must in large measure employ algorithmic structures homologous to those employed by language, even if they reside in different modules in the brain (as suggested by studies of amusia). These algorithmic structures are what can be called innate ideas or concepts and are what to some degree keep culture on the leash of genes.

“Mentalese” is the title of Chapter 3 in Pinker’s *The Language Instinct*, this chapter providing the most cogent and digestible account of the concept that I have come across. The following is a much abbreviated version of those of Pinker’s assertions and explanations that appertain here. The overarching purpose of his chapter, which he achieves skilfully, is to demonstrate that thought is not dependent on words, that thought instead is the algorithmic processing (computation) of neural patterns representing different categories of information: procedures (e.g., if-then conditions), classes of things, and information that has been assembled into chunks that can be used in further computation without the need for recalling the particulars that have been chunked together. Pinker doesn’t employ the chunking concept of information processing but I see it as implicit in what he refers to as a “eo-reference.”

Say you start talking about an individual by referring to him as *the tall blond man with one black shoe*. The second time you refer to him in the conversation you are likely to call him *the man*; the third time, just *him*. But the three expressions do not refer to three people or even to three ways of thinking about a single person; the second and third are just ways of saving breathe. Something in the brain must treat them as the same thing: English isn’t doing it. (79-80)

In his modelling of mentalese as the language of thought, Pinker not only challenges, but shows as “wrong, all wrong,” theories that place thought under the control of the language or languages one has learned and which one speaks. Such theories are ostensibly plausible given how ideologically loaded many words and word combinations are. A concept can acquire a significantly different meaning through word

substitution even when the referent remains constant. Such is the stuff of euphemism which politicians use adroitly to adjust ‘their peoples’ thinking in particular ways.¹¹¹

There is no doubt that language influences many kinds of cognitive processes in ways that are anything but trivial. Words are linked to ideas and make them efficiently available for conscious thought so that it becomes possible for one ~~to~~ muse, to rehearse, to recollect, and in general to engage the contents of events in one’s nervous system.” Pinker does not challenge what is so obviously unchallengeable, it is just that he is concerned, as we need to be here, with what it is that makes it possible for words to work in such ways. This is important given that languages are the representational systems that are most used in communicating ideas and most responsible for the exponential evolution of culture. A word is a meme supreme.

The Sapir-Whorf hypothesis

Linguistic relativity was formalized as a theory in the well-known Sapir-Whorf hypothesis which asserts that people’s thoughts are strongly influenced by the cultural and cognitive categories that language encodes and that people who speak different languages think differently in significant ways. Pinker is clearly dismissive of the hypothesis and gives over several pages in his chapter to unpacking it and showing how its premises derived from erroneous inferences based on data that was questionable to begin with (Pinker 1994: 59-67). However, that there is a degree of relativity in how people think that can be attributed to the lexicons, syntaxes and pragmatics of the languages they use has been indicated by research (as if such research were necessary to establish what is so obviously true).¹¹² However, this research only lends support for weak versions of the hypothesis and I doubt that Pinker would challenge their findings. Pinker uses Whorf’s own words to convey the assumptions of the *strong version* of the hypothesis which he finds insupportable.

We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds. We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way – an agreement that holds throughout our speech community and is codified in the patterns of our language. The agreement is, of course, an implicit and unstated one, but its terms are absolutely obligatory; we cannot talk at all except by subscribing to the organization and classification of data which the agreement decrees. (Whorf/Carroll 1956 quoted in Pinker 1994: 59-60)

¹¹¹ Former South African president, Thabo Mbeki, came up with ‘quiet diplomacy’ for what was virtually the same approach to diplomacy as the ‘constructive engagement’ pursued by the Reagan administration in the 1980s in its relations with apartheid South Africa. The referent in both cases was the principle that there should be no aggressive intervention (e.g. sanctions) to change an undemocratic regime with a despicable human rights record (South Africa before 1994 and Zimbabwe more recently) when such intervention was perceived as not being in the interests of one’s own nation. Mbeki needed to make palatable what was reviled a decade earlier when the beneficiary or such diplomacy was the Pretoria regime.

¹¹² The Wikipedia article on ‘Linguistic Relativity’ cites, among others, the following articles: Casanto 2008; Drivonikou et al. 2007; Fishman 1982; and Gilbert et al. 2008.

No word for ‚music‘

The essential idea of linguistic relativity is attractive in that it seems to offer an explanation for the apparent differences in the ways people think about things. The same might be said about music of course. Musical ‚relativists‘ would have it that different musics (approaches to and systems for creating sound structures) not only manifest different ways of thinking in and through sound but are in different ways and degrees *responsible* for epistemological differences. For example, we could reword one of the sentences above as follows: –We organize sound into music, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way – an agreement that holds throughout our music community and is codified in the patterns of our music.” Whorf surely assumed that those hearing/reading his words understood that the ‚agreement‘ to which we are a ‚party‘ is abided by unwittingly most of the time. But as regards both language and music, the argument seems circular: The people of population ‚A‘ speak/make music differently, so they must think differently. And the evidence that they think differently is manifest in how they speak/make music.

That there has been an inclination to take linguistic relativity more than a bit far is indicated by Pinker in his discussion of –The Great Eskimo Vocabulary Hoax” (1994: 64-65). As he tells it, it began in 1911 as an observation of anthropologist Franz Boas that ‚Eskimos‘ have four distinct word roots for snow. Whorf subsequently inflated the number to seven and suggested that there were more. Whorf’s claims became widely known and stimulated the evolution of an urban legend that now has the number as high as 400. Talk about runaway memetic evolution!

Of interest to me is the question of what motivates linguistic relativity of this kind. I have to admit to previously finding it inviting because of the wish to believe in and come to appreciate epistemological differences, for example, that there are people and cultures who maintain a more organic connection with the world around them, who are more in touch and capable of perceptual experience far richer than what is available to someone like me whose perceptual acuties have been dulled by the sensory overload characterizing life in modern global society. This may have in part informed my interest in African musical traditions and influenced my decision to go to East Africa in 1975 as a Peace Corps volunteer. It struck me as extremely poignant when I came to learn that ‚many African languages have no word for music,‘ thinking this to suggest a whole different epistemology, at least in respect of musical and artistic behaviours. But the lack of a term that has precisely the same meaning as another does not automatically imply the absence of a concept of the phenomenon in question. Perhaps I should have asked myself why it is we tend to employ words from other languages as much as we do, obviously because they more effectively capture the concept we have in mind. There is not an English equivalent for the German *schadenfreude*, but all English speakers have a concept of the smug pleasure people often take in the misfortunes of others. And all Africans that I have talked to about ‚music‘ understand the concept in much the same way as people everywhere. In fact, I have not always found it easy with my African students to get them to conceptualize music *not* as a product (a thing created) but as behavior or process. This seems ironic given that African languages apparently have no paucity of terms for different forms of musicking.

Nothing but algorithms

What is now incontestable is that a vast range of information can be represented in the brain without need of externally derived symbols like words. Other species manage a great deal of information processing without the need for language. And language is not required for the brain to engage in reasoning, even human reasoning. This was demonstrated by the British mathematician and philosopher, [Alan Turing](#) (1912-1954) who hypothesized a device that could deduce new pieces of information (ideas) from old ones by applying a set of rules to the manipulation of symbols on a strip of tape. Any symbols can be used provided they are used consistently. While elegantly simple in how it works, it can handle virtually any algorithm and provides an explanation for the functions of a computer's Central Processing Unit (CPU).

It is beyond the scope of this discussion to take the reader through the steps of a typical Turing reasoning process. Pinker does this in a clear and eminently accessible way (1994: 73-78). The point here is that there is a great deal of reasoning going on in the mind that we are at best only vaguely aware of and this is because the brain forms and works with representations that are nondiscursive and not reliant on an externally derived symbol system. This is mentalese and it is a 'language' common to all normally functioning human brains. Working out the kinds of representations and processors that the brain comes hard-wired for occupies many research programs in Cognitive Science and Neuroscience, all of which, according to Pinker have to follow the same ground rules if it is to accord with a computational theory of mind: —no *lite* men inside, and no peeking.”

The representations that one posits in the mind have to be arrangements of symbols, and the processor has to be a device with a fixed set of reflexes, period. The combination, acting all by itself has to produce the intelligent conclusions. The theorist is forbidden to peer inside and “read” the symbols, “make sense” of them, and poke around to nudge the device in smart directions like some *deus ex machina*. (1994: 78)

It is pertinent here to recall the assertion made in Chapter Two that everything cognitive is algorithmic. —The whole cognitive science game is to take the high level capacities that we intuitively grant to minds - such as consciousness, agency, flexibility, context-sensitive interpretation, and so on - and to see what programming steps they are built out of.” This is how Tooby and Cosmides see it (2001b: 199) as must anyone who endorses the computational theory of mind discussed in the last chapter. Taking account of all that has been said thus far regarding mentalese and how the brain represents information, the definition of 'culture' that Tooby and Cosmides give elsewhere is apropos: Culture is —the serial reconstruction and adoption of representations and regulatory variables found in others' minds through inferential specializations evolved for the task (Tooby & Cosmides 2000 – online source). That they speak of 'reconstruction' instead of 'replication' could be seen as significant and it might be argued that they are not the same thing, although in my understanding of the terms, if a reconstruction of a representation is to be successful, it must replicate some substrate-neutral informational kernel.

Sperber's critique of memetics

The issue of what qualifies as replication is one that Memetics has been taken to task on, most notably by Dan Sperber (2000). In his view “most cultural items are re-produced in the sense that they are produced again and again – with, of course, a causal link between all these productions – but are not reproduced in the sense of being copied from one another.” (164) Nonetheless, Sperber suggests that there are “clear cases of actual memes” and gives chain-letters as an example.

The very content of these letters, with threats to those who ignore them and promises to those who copy and send them, contributes to their being copied and sent again and again. Chain-letters do not benefit the people who copy them, they benefit their own propagation. (163-164)

I would argue that a chain-letter itself is not a meme, but yet another kind of replicating entity that can evolve according to the Darwinian algorithm. My experience of chain-letters is that most do not contain information that stands much chance of becoming instantiated as ideas and taken on board in the minds of the recipients or that has much consequence in what they might subsequently think or do. The *idea* of a chain-letter (which uses the prospect of good or bad fortune to get itself passed on) is the meme as I understand it, one that e-mail has proved a boon to the propagation of. What should be of interest is the kind of psychology that induces so many people to pass the letters on. There are a few chain-e-mails that contain something potentially noteworthy, often a spiritual or religious message that could be considered a meme, one that has the advantage of riding along with an effective replicator, the letter itself.

The crucial question concerns what we mean by *replication*. Sperber argues, erroneously I believe, that when memeticists speak of replication, they necessarily mean that information has been copied from one brain to another. In most cases, he argues, what happens is that the information triggers the production of an idea in the receiving brain where “the information provided by the stimulus is complemented with information already in the system.” This seems a non sequitur considering that the same could be said of the replication of genes, where something has to happen whereby atoms and molecules get commandeered and connected up in ways that result in a replica (B) of the source gene (A). But strictly speaking, it cannot be said that all of the information required was taken from A. A is a stimulus that triggers the production of B making use of information that inheres in the chemical environment from which it derives its materials.¹¹³

¹¹³ If by chance it is an environment where there is a significant amount of gamma radiation, the result may well turn out to be something other than an exact replica. It may bring about a mutation that makes it virulent and which produces cancerous cells. The difference is not the result of chance mutation, but of replication in an environment that is informationally different; its energy dynamics are different in a highly significant way.

Are prions replicators?

We should also consider the case of prions? A prion, like a virus, is an infectious agent, but a virus contains DNA or RNA which encodes information needed, though not on its own sufficient, for replication. A prion is composed of protein that has assumed a three-dimensional structure that is not biochemically functional but which takes up space nevertheless. This would not be a problem were it not for the fact that its protein structure induces functionally normal protein forms to rearrange themselves such that they replicate the rogue form. In the environment of a healthy organism, a chain reaction is triggered that leads to an exponential increase in prion population. This is a disaster when it takes place in a brain and is the cause of BSE (‘mad cow disease’) in cattle and Creutzfeldt-Jakob disease (CJD) in humans, both invariably fatal (which does at least help to keep its spread to some degree in check).

Sperber gives as another condition that true replication must satisfy, that in order for B to be a replication of A, “the process that generates B must obtain the information that makes B similar to A from A” (2000: 169). In the propagation of prions a functional protein becomes a nonfunctional prion because of a change to its informational state but strictly speaking it has not ‘obtained’ the information from prion A, and yet replication has been achieved. Fortunately it is not every normal form of protein that will do this; there must be something in its own informational state (its structure or pattern of organization) that is necessary to the replication event. For prions to be subject to natural selection, there of course needs to be mutation or something equivalent that produces a variant form (thus setting the stage for competition between variants). Prions do vary slightly in their structures and thus comprise a number of strains. And while they tend to replicate with total fidelity, they are subject to occasional epimutation ([Prion](#) on Wikipedia).

The crucial point for me is that something in one structure induces changes in another structure that brings about the replication of some informational whole. The particulars of how the information got from ‘A’ to ‘B’ is not really of importance. All that matters is that there has been informational replication. Memes, like prions, replicate in the brain by inducing changes in what is already there such that the information encoded in the meme gets encoded in another entity and replication is thus achieved. In the case of a prion, this is another protein whose structure has been induced to assume the precise same form. It becomes a prion. In the case of a meme it is a pattern of neural activity that ‘realizes’ the essential data of an informational whole.

If we think of an artifact as a meme, as Dennett (e.g. 1995, 2007) and Benzon (2001) do, this can be problematic in so far as an artifact is likely to encode information that could induce more than one idea. Even the simplest ideas that the mind can give form to in most cases comprise yet more specific ideas. Take for example the simple formulation: —“Plato was a man.” Understanding the idea requires that the symbols employed (letters and words) are understood in terms of what they represent, i.e. a name, a condition of being (of having existed but no longer around), and a category of being – the kind of thing that Plato was. The statement: —“Plato was full of shit!” is far richer and more complex informationally and yet we can call it a coherent idea even if we might choose to render it more diplomatically, e.g. What Plato professed as truth was in fact false. Of course, I am not suggesting anything of the kind. Plato proposed that there is a realm of forms that exists independent of human thought. [True.] What is

available to our senses is constantly in a state of flux and thus imperfect and transient instantiations of these forms. [True.] Real knowledge is not knowledge of the instantiations, but knowledge of the forms. [True to a point.] Plato's student, Aristotle, challenged his teacher's notion that these Forms were beyond human understanding, suggesting rather that they are manifest in nature and discoverable therein. Since then, science has been able to penetrate layers of form down to the subatomic level and have developed models ever closer to the essential forms underlying everything in the universe. And yet, what information ultimately *is* remains a mystery and we are resigned to working with its instantiations. Perhaps all that there is ultimately are correlations and algorithms acting on them.

Meme mutation

But while arguably a non sequitur as regards what constitutes replication, Sperber's point about 'triggered reproduction' challenges meme theory in another more potentially serious way. Each brain presents a different EEA comprised of different information acquired through different life experiences. This is not problematic; it only means that the chances of memetic transmission may be affected (positively or negatively) and that the ways in which a meme is assimilated and accommodated by the brain will be different as will be the ways in which it is invoked and employed in conscious thought and action. The problem lies in the fact that the natural selection algorithm requires more than just replication. There must be mutation (variation) and Sperber would argue that the complementing of received information with what is already in the system causes mutations to be absorbed and corrected, the upshot being that the mutations do not get passed on. I would in fact see this as *support for* meme theory in that the "proofreading" a meme usually undergoes when being replicated in someone's brain may help to maintain the fidelity of the meme, fidelity being another essential attribute of a replicating entity if the algorithm is to work. Willy-nilly mutations occur that do get selected in. Dennett gives the example of a cooking recipe containing an error: "Separate three eggs and beat the yolks until they form stiff white cones" (2007: 352). Such an error is almost invariably going to be corrected. But other mistakes might not be so obvious and may not give rise to a problem fatal to the recipe's outcome (as would beating egg yolks). It might even produce a superior outcome and get 'selected in'. Many culinary innovations are probably the results of mistakes or misreadings of recipes.

It is perplexing that Sperber elsewhere suggests that in cultural transmission the mutation rate is so high that "the very possibility of cumulative effects of selection is open to question" (Sperber 1996: 102). This is what for long kept me in doubt as to whether memes are evolving according to the natural selection algorithm. But, as Distin (2005) makes clear, memes leave genes in the dust when it comes to their respective replication rates. As such they can accommodate a far higher mutation rate than genetic evolution. She also points to a seemingly overlooked point apropos the meme-gene analogy.

Mutations may indeed be rare in relation to the rate of genetic replication, but the variation that arises through recombination is not. Indeed, sexual reproduction results in the recombination of genetic material every time that it is replicated, and yet genetic content is still replicated —well enough to undergo effective selection." (Distin 2005: 103, quoting from Sperber 1996)

Closing the case for Memetics

I could easily continue the debate on the validity of meme theory as embraced by Dennett, Blackmore, Distin and others, each of whom have their own particular takes on the theory, each with its own idiosyncrasies and ways of applying the theory to explain cultural phenomena as arising from interactions of genes and memes. I have taken as long as I have hoping to have given sufficient substance to my position in favor of Memetics. It has also been an opportunity to explore and delve deeper into what the computational theory of mind has to say about the mechanisms with which our brains process information which at root are hosts of algorithms inducing representations that other algorithms act on. They do so in computational systems (modules) that are to varying degrees independent in their functioning, but that together comprise a parallel system with a remarkable ability to pull out and make coherent sense of the myriad data drafts issuing from separate data streams and does so without the benefit of a central processor. I hold to this as the most probable explanation for how brains work and how it is that brains are such superlative meme machines.

How far can Memetics take us?

One might be prepared to concede that Memetics has some truth value and can be put to use where memes are clearly discrete units of information that have a chance of being tracked in the ways they spread, as for example can be done with specific musical patterns and patterns that can be isolated in the calls of songbirds. But what value can it have with more complex, abstract and mutable ideas? The other question that confronts us is whether being able to trace the origins and spread of an idea has any consequence when it comes to judging its merits and its potential as an ideal to guide praxis. Perhaps both questions can be dealt with in a way that points to a potential place for Memetics in addressing questions more germane to the Philosophy of Music Education.

Bringing Memetics into the Philosophy of Music Education

In 2002, Marie McCarthy wrote a discussion paper as a contribution to the “Sociology Session” of a colloquium of the *Institute for Music Teacher Educators* entitled “Re-forming Music Teacher Education: Recent trends and new directions for foundations.” She offered the following regarding her particular interest in the session and what it was that gave rise to her discussion paper “Sociological Perspectives in Music Education.”

As a historian interested in the *evolution of ideas* and practices over time, I began to wonder why philosophy and psychology and history were so well established as foundations for music education, but that sociology had never really gained that status or found a similar role in our professional discourse. Was it not an important perspective for music educators to help them deepen their understanding of music teaching and learning? Did nobody think of making those connections? That led me on a journey through numerous sources back to early twentieth-century American music education. (2002 – online source - my emphasis)

The history of sociological perspective in music education that she assembles is one of ideas competing against other ideas in environments of evolutionary adaptedness (EEAs, meme-pools) in which different selection pressures influenced what took hold and with whom. She identifies as significant pressures various research agendas and theoretical and philosophical schools such as Dewey's pragmatism, the philosophy of music education as aesthetic education (Mursell, Earhart, Reimer), Ethnomusicology (Blacking, Merriam, Nettl), the Sociology of Music (Shepherd, Small), Social Psychology (Farnsworth, Hargreaves), Functionalism (Durkheim), Structuralism, Marxism, Interaction Theory (Mead), Praxialism (Elliot, Regelski), Critical Theory (Habermas, Marcuse), and others.¹¹⁴ These of course are not memes but instead vast memplexes (theories) as well as meme-pools ('schools') in which they evolve and change, giving rise to new memplexes (theories, philosophies, paradigms). But each has some idea or set of ideas that it takes as founding premises and these are what hold the memplex together. Being given phenotypical expression in theories and philosophies obviously increases the salience of these core memes by making them ideals, theorems, maxims, and so on and setting them down artifactually in published treatises, mission statements, regulatory ideals (e.g. those of the MayDay Group) and other methods of improving the survival of these memes by getting them into more and more meme-pools.

McCarthy's paper is available at the MayDay Group Website and even a perusal of it will show that she does not take anything like a memetic approach to answering her question. Neither does she ultimately come up with an answer as to why the meme-pools of Psychology and History have been more successful in getting their constituent memes replicated in the meme-pools of music education philosophy and practice. As to their replication in the minds of music teachers and the realization of this in what they do in their teaching, it seems clear that McCarthy understands (even if she does not say so directly) that the problem with bringing theory and practice together lies in the kinds of selective pressures for memes that obtain in the EEA of *music teacher education*. Working out how best to change that environment ideationally is surely what the colloquium was about and the upshot of the session of which she was part was that teacher education programs need to give over more curricular attention to what Sociology has to offer ideationally.

This study is arguing for the same as regards Darwinian Science and the many ideas it has to offer, including the 'meme' meme. These ideas have not featured at all in the meme-pool of the Philosophy of Music Education and some possible reasons for this have already been suggested, namely that the theories (memplexes) that have taken hold have memes that help to sustain them in the face of competition from memes that are incommensurate with them. Dennett gives several examples of memes that fortify a memplex and help ensure its survival. These are the survival memes that feature commonly in religious dogmas, perhaps most common being some kind of prohibition or effective entreaty against questioning the dogma. Dennett gives what seems an absurd proposition, but one that is an effective survival meme for many Abrahamic religions nonetheless.

¹¹⁴ The authors in parentheses are as named by McCarthy in her paper.

If anybody ever raises questions or objections about our religion that you cannot answer, that person is almost certainly Satan. In fact, the more reasonable the person is, the more eager to engage you in open-minded and congenial discussion, the more sure you can be that you're talking to Satan in disguise! Turn away! Do not listen! It's a trap! (2007: 207)

Other survival memes for religions that come to mind include:

- the idea that particular individuals and texts are to be entrusted as caretakers and diviners of ultimate truth and that what they proclaim is sacrosanct;
- a belief in eternal damnation for transgressors of the dogma;
- a belief in an afterlife that is only available to keepers of the dogma;
- the belief that adherents of the dogma are a chosen and favoured people.

Belief in free will is something that nearly all religions must espouse given their common belief that we are and will be held to account for our choices and actions, but free will is a belief with wide currency in the non-religious world as well, even if its neurobiological status is so very uncertain. Perhaps the only beliefs that are more strongly embraced are that life has a purpose (beyond gene propagation) and that things really do matter (beyond what matters in the solving of life's problems). In Chapter One and in other discussions along the way, it has become evident that if we accept Darwinism's bottom-line, that natural selection is the playing out of a mindless, purposeless algorithm, we *have* to see these beliefs as ultimately groundless. I attempted to show why this does not naturally lead Darwinists to nihilism (or suicide), that, no matter what we ultimately *know* to be true, we continue to sustain these illusions because they make it possible for us to have lives worth living, or that at least *feel* that way. We really have no choice but to.

I would argue that beliefs in free will and purpose to life are not memes any more than are the beliefs that incest is wrong or that the human mind is a blank slate. Rather, we are talking about conclusions people naturally and independently arrive at because of how we are wired by natural selection and because of what perceptual experience seems to make so incontestable (e.g. that the sun orbits the Earth). We do not come by these beliefs through learning or other forms of memetic transmission even if beliefs that we acquire reinforce what are essentially innate ideas. Indeed it takes powerful memes (e.g. ones backed by a whole lot of empirical evidence) to get us to let go of our natural intuitions or cherished ideas, and humans are not disposed to let go of them without a fight. Consider the inquisitions that the Roman Catholic Church embarked on in times past to prevent such memes from posing a threat to its dogma. And consider also how the conclusions of Darwinian Science have from time to time been received in the Church of the Humanities as has been remarked on in the course of this dissertation.

Reductionism: a survival meme?

Reductionism can mean different things, but the term is seldom used to express approval even though its core idea seems commonsensical if one is trying to get at an understanding of something, i.e. simplify it by analysing it into simpler parts. But it is usually used as an accusation that a theorist or theory has gone too far and oversimplified something to the extent that it undermines a proper understanding of the

phenomenon in question. Pinker may be accused of oversimplifying reductionism (as well as overstating his case) in the following excerpt from *the Blank Slate*, but he does strike a note of truth as to the resistance that Darwinian thinking has encountered in the Humanities, Arts, and Social Sciences. The excerpt comes after his having made a point about the difference between the Standard Social Science Model (SSSM) and Evolutionary Psychology in how they explain the varied fortunes of human societies. Both offer explanations that are ‘cultural’; the difference lies in seeing culture as “a product of human desires” as opposed to culture as “a shaper of them.” It seems evident to me that Gene-Culture Coevolution Theory and Memetics finds truth in both positions and offer real opportunities for consilience in this regard, recognizing as they do that every branch of knowledge studies a subset of reality that depends on factors studied in other branches. Chapter One made clear my belief that such consilience is urgently called for in our philosophizing around questions of what education should be achieving and why, and it is the quest for this that has forced this study to be so wide-reaching in its purview. But such consilience is nonetheless resisted because of a fear as to where it could lead and ‘reductionism’ is the meme that is invoked most often in arguments against it. With such consilience :

[h]istory and culture ... can be grounded in psychology, which can be grounded in computation, neuroscience, genetics, and evolution. But this kind of talk sets off alarms in the minds of many nonscientists. They fear that consilience is a smokescreen for a hostile takeover of the humanities, arts, and social sciences by philistines in white coats. The richness of their subject matter would be dumbed down into a generic palaver about neurons, genes, and evolutionary urges. (Pinker 2002: 69)

What is in fact feared is what both Pinker (69-72) and Dennett (1995: 80-84) have called ‘greedy reductionism’ and they demonstrate more than amply that Evolutionary Psychology and Gene-Culture Coevolution are in no way guilty of it, that the greedy reductionist is in reality a straw man.

Wrapping things up

In my discussion of McCarthy’s history of sociological perspective in music education, I pointed out that the ‘schools’ of thought that she highlights are memeplexes held together by core memes (often helped along by survival memes). In the next and final chapter I will engage with some of these memeplexes and the memes that comprise them and will subject them to the Darwinian perspectives that have been argued for in the body of this dissertation. What McCarthy shares as to her hope and intention for sociological perspective “in the large scheme of things” is precisely what I believe should happen with Darwinian perspective, that it will “develop across all areas of study and ... penetrate the very assumptions on which [their] foundations are built.”

Chapter Four: *Darwinizing the Philosophy of Music Education*

It is all about ideas

What is Philosophy beyond an interrogation of ideas so as to arrive at ‘better’ ideas? This study has been such an interrogation, primarily of ideas coming forward from the range of sciences that I have collectively termed Darwinian Science. My hypothesis is that these ideas provide a perspective with which to engage ideas central to the Philosophy of Music Education, many of which are pertinent to Arts Education and Educational Philosophy generally. In the course of the research for - and the writing of - this dissertation I have gone beyond believing such perspective to be useful, to seeing it as crucial.

The logic is simple. We are the agents and catalysts responsible for society and culture as we know it in its innumerable forms; we are the ones who *realize* ideas cognitively and behaviorally. Surely any interventions aimed at guiding this ‘self’-realization should be grounded on the best possible understanding of human agents, *not as products of society and culture, but as makers, shapers and doers of them*. One cannot change what is past and what is past significantly shapes who we are here and now. But the ideas that have accumulated and which comprise culture and society as we normally conceive them do not write themselves on blank slates. As much as we are shaped by these ideas, so also are we shaped by our genes, far more profoundly than the Social Sciences have yet been willing to concede. How much we are on the leash of ‘selfish replicators’ is a question of how far we are willing to go with ‘Darwin’s dangerous idea.’ The upshot of the last chapter on gene-culture coevolution was that biological evolution has equipped us such that we have brains that can access and process information of many kinds and that are thus environments of evolutionary adaptedness (EEAs) for the ideas and complexes of ideas, memes and memeplexes, which come to define us in key ways.

The acquisition by our ancestors of capacities for formulating, communicating and assimilating ideas cracked the lid of a Pandora’s box that agriculture opened further and which was flung wide open by communication technology (writing, printing, photography, sound recording, and all the many forms of telecommunication). We might question the appropriateness of this metaphor given that, as the story goes, it was *evil* that was unleashed when the first woman, Pandora, disobeyed Zeus (‘God’) by opening the ‘box’ (eating from the tree of knowledge) and that it is to that original sin that can be attributed all that is wrong in the world. (Myths are memes and the obvious similarity between this and the ‘Eve and the apple’ myth may suggest that they are branches off the same memetic lineage.) The point is that in gaining imitative capacity, our ancestors set in motion something that can never be undone and which seems to have a life of its own. It spawned cultural evolution by releasing a new replicator – the meme.

We embrace ideas because they make sense to us and seem appropriate according to some standard or set of criteria; but many - probably most - of these criteria we apply without being consciously aware that we are doing so. Ultimately we embrace an idea because it *feels* right. Even though we may subject it to rigorous interrogation, taking account of arguments and counter-arguments, and applying rational processes to it as

objectively as possible, this only explains why one now *feels* secure in its truth value; evidence and the application of reason have led one to believe with confidence that it *is* right; it is no longer just a matter of intuition. But this does not mean that it is right in any intrinsic sense, that it is consistent with some transcendent purpose or design. If like genes, ideas are replicators caught up in the natural selection algorithm, they can have no purpose or meaning in some ultimate, cosmic scheme, only in schemes of our own making.¹¹⁵ It is these ‘schemes’ that need to be subjected to rigorous scrutiny, to become the foci of critical evaluation not only for philosophers and sociologists, but for everyone. Music education is one such scheme as is ‘the school,’ schemes we take for granted and treat as obvious and natural even though they have such a short history relative to the time since our distant ancestors became a distinct species – *Homo sapiens*. Indeed, all of the ‘institutions’ that we tend to unquestionably uphold as beneficial and important to the greater social good need to be so scrutinized. Some of these are clearly in the throes of a legitimation crisis and critical engagement is urgently needed if we are to reform or transform society and bring the world into an ecozoic era.

Even if one is not convinced by Memetics’ radical thesis, there is nonetheless value in treating an idea as a free-floating, intrinsically neutral entity that will replicate if conditions permit. Indeed, we might consider the maxim that ‘ideas replicate only because they can’ as something of a *non sequitur*. Putting aside the question of whether ideas are copied or are recreated (an inconsequential question as I tried to argue in the last chapter), there is no doubting that they spread from brain to brain. So obviously they can and do get ‘replicated,’ this ‘replication’ being necessary if they are to survive. What seems the only significant point is that *we* are the means by which this happens. *What we bring to bear on the process is the real issue.*

The key question that I have returned to repeatedly is whether we bring *free-will* to the process, an ontological and epistemological category that I have explored in some depth. I have been convinced by Dennett and Blackmore that free-will, like consciousness, is an illusion. But I do not consider this a problem even though it has important implications for our understanding of mind; and I would never argue that someone should not be held accountable for their actions on the basis of free-will’s illusory nature. Having said that, it occurs to me that what makes dire the straits we are now traversing is precisely that people are not being held, or more importantly, not holding themselves accountable for their actions beyond what is legally required and socially acceptable in a world governed by corporate interests. In the ‘60s we blamed all of this on the ‘system,’ a loose amalgam of interconnected ideas and values that people abided and which they continue to abide without ever really considering their

¹¹⁵ I have thus far in this chapter used the term ‘idea’ (or ‘ideas’) seventeen times and this might seem inordinate given the idea that long ago became established in the meme-pools of English literature and academic writing, that words should not be repeated unless one is doing so for rhetorical effect. But this may not be just some antiquated idea that somehow has survived and that writers embrace unnecessarily. As was made clear in the last chapter, many ideas feel right because they resonate with something in one’s innate psychology. The ‘don’t repeat’ meme survives perhaps in part because it is a ‘convention’ and we tend to stick with status quo ways of doing things. But perhaps it became a convention for a good reason, because repetition causes semantic satiation with the result that meaning suffers.

consequences and ultimate validity vis-à-vis some vision of a better world and of a more organic, ecologically sound notion of what constitutes “good life.”

I have delved deeply into some of Dennett’s key works, but surprisingly it was only when putting together my thoughts for this final chapter that I happened to end up on the Wikipedia [Daniel Dennett](#) webpage. There under the subheading “Free will” the author(s) quoted from *Brainstorms*, Dennett’s 1978 collection of essays he wrote that comprise a comprehensive theory of mind. It is clear from this that Dennett had already worked out that his theory, despite what it shows to be illusory, is not problematic or intrinsically disposed to nihilism.

The model of decision making I am proposing has the following feature: when we are faced with an important decision, a consideration-generator whose output is to some degree undetermined produces a series of considerations, some of which may of course be immediately rejected as irrelevant by the agent (consciously or unconsciously). Those considerations that are selected by the agent as having a more than negligible bearing on the decision then figure in a reasoning process, and if the agent is in the main reasonable, those considerations ultimately serve as predictors and explicators of the agent’s final decision.

The fact there is no central controller, no inner agent (homunculus), or no center of narrative gravity does not alter the fact that the organism as an integrated totality arrives at decisions and develops beliefs about things. So what can it matter whether there is a control center or if there is only some kind of “serial virtual machine” running on “the parallel hardware that evolution has provided for us” (1993: 218)? Dennett was speaking to the making of moral choices when he set out his model above, going on to suggest that, besides providing an “account of our important intuition that we are the authors of our moral decisions,” this model ...

... points to the multiplicity of decisions that encircle our moral decisions and suggests that in many cases our ultimate decision as to which way to act is less important phenomenologically as a contributor to our sense of free will than the prior decisions affecting our deliberation process itself: the decision, for instance, not to consider any further, to terminate deliberation; or the decision to ignore certain lines of inquiry. [Gregory’s “free won’t?”] ... These prior and subsidiary decisions contribute ... to our sense of ourselves as responsible free agents, roughly in the following way: I am faced with an important decision to make, and after a certain amount of deliberation, I say to myself: —“That’s enough. I’ve considered this matter enough and now I’m going to act,” *in the full knowledge that I could have considered further, in the full knowledge that the eventualities may prove that I decided in error, but with the acceptance of responsibility in any case.* (my emphasis and insert)

Educating for praxis

The last sentence in the above quote is apropos a key point that I have emphasized from the very first chapter. It is a cornerstone of my educational philosophy which I have encapsulated in the formulation: *education for praxis*. The sad but inescapable reality is that most people do not take decision making to the level of consciousness Dennett alludes to, what I spoke to in Chapter One as *critical consciousness* and what I posited as the *sine qua non* for meaningful social reform and for the achievement of the ecozoic vision that is so urgently called for. The sad truth is that people *do* allow ideas to *have them*, a point that Marx understood well. An ideology is a coherent amalgam of ideas (a

memeplex), but seldom is it the result of a rigorous exercise of critical consciousness. Rather, it is implicit in socioeconomic realities and something people acquire and abide unwittingly in what Engels coined false consciousness.⁶ What he wrote in a letter to Franz Mehring in 1893 has a decidedly memetic ring to it.

Ideology is a process accomplished by the so-called thinker consciously, indeed, but with a false consciousness. The real motives impelling him remain unknown to him, otherwise it would not be an ideological process at all. Hence he imagines false or apparent motives. Because it is a process of thought, he derives both its form and its content from pure thought, either his own or that of his predecessors. He works with mere thought material which he accepts without examination as the product of thought, he does not investigate further for a more remote process independent of thought; indeed its origin seems obvious to him, because as all action is produced through the medium of thought it also appears to him to be ultimately based upon thought.

Where Marxists and memeticists part company is in respect of the “remote process independent of thought” that Engels spoke to. Marx’s bottom line was that —its not the consciousness of men that determines their existence, but, on the contrary, their social existence that determines their consciousness” (Marx, in the Preface to *A Contribution to the Critique of Political Economy*, 1869). Memeticists would agree up to a point. But what Marx claimed could only be true if humans are essentially blank slates. The fact that we are not blank slates does not, however - by any stretch of the imagination - imply that we are innately possessed of or disposed to critical consciousness. We are anything but.

If we are the meme machines that Blackmore claims us to be, then critical consciousness is but a particular kind of “interplay of replicators and environment,” (Blackmore 246) involving a self-plex comprised of memes that are largely counterintuitive and thus not easily assimilated. The problem with consumerist society is that profit is the main driver of memetic evolution, a condition that would undoubtedly be overthrown in a population of critical, ecologically intelligent thinkers. Humans are on two leashes – one of genes and one of memes. When they are pulling in the same direction, there is less internal dissonance to be sure, and the world of mass media and advertising try to keep things this way; their profits are more secure with a population of torpid consumers. Critical consciousness connotes a different scenario; memes and genes are firmly on their respective leashes, sometimes pulling in the same direction, sometimes pulling in opposite or oblique directions, but with the human subject well in control. Critical consciousness is what empowers us thusly. As Richard Dawkins put it: —We have the power to defy the selfish genes of our birth and, if necessary, the selfish memes of our indoctrination ... We are built as gene machines and cultured as meme machines, but we have the power to turn against our creators” (1976: 215).

It warrants mention here that the title I originally mooted for this study was —Educating for praxis through the musical arts.” What concerned me then remains the concern informing this study: that the Philosophy of Music Education suffers from a kind of misorientation and insularity evidenced by a failure to engage adequately with the “bigger picture,” to properly consider the implications of Dewey’s maxim that society should be a function of education rather than the other way around. Accordingly, it was and remains my view that the Philosophy of Music Education needs to position itself within the broader goal structures of Critical Pedagogy and Ecopedagogy. My original

intention was to infer on the basis of a critical reading of key works in these areas what would be appropriate ‘action ideals’ for music education where the paradigm is education *through* music (instead of *in* or *for* music) and where critical consciousness is assiduously cultivated. What prompted the change-of-course leading to this dissertation was a growing awareness that the bodies of theory under consideration are rooted in a conception of human nature that I find inadequate, which seems to be missing the points that (as I put it in Chapter Two) *every phenomenon that is social is firstly and always psychosocial*; and that we cannot progress far in our understanding of it without a psychology that can adequately explain human agency. Thus I turned to Evolutionary Psychology and Gene-Culture Coevolution Theory, but the paradigm remains the same: music education must always *be a context of effort wherein all that takes place is accountable to overarching, interdisciplinary educational goals which in turn are accountable to social and ecological needs and goals*.

I am frankly in doubt as to the degree that other music education philosophers share my despair with how inadequately education is achieving the function Dewey set for it, taking account of the current state of affairs on Planet Earth, in particular its social injustices and precarious ecological state. I agree with Elliott, as undoubtedly does any music educator, philosopher or musician, that *music matters*, at least in the sense that different forms of musical involvement – musicking – engage us in ways that make possible richer, more meaningful lives. But for quite some time now I have felt an unsettling diffidence when advocating for music education on this basis alone, more and more feeling like I am Nero playing his ‘fiddle’ while Rome burns.

Regelski on ‘education for praxis’

Thomas Regelski is a music education philosopher for whom I have great respect and I have derived tremendous value from his contributions to the literature. Of particular value to my teaching of the Philosophy of Music Education has been a five-part article he wrote in 1998 and which has been required reading for my senior students for some years now: —Critical Theory and Praxis: Professionalizing Music Education.” Apropos Dennett’s earlier remark, Regelski entreats music educators to consider every idea concerning what and how to teach as a hypothesis to be tested in action and evaluated according to the ethical criterion: *phronesis*. This, in Regelski’s view, is what is required for one’s work as an educator to qualify as authentic praxis thus deserving to be called a profession.

Professions, properly understood . . . , are not just specialized or skilled types of employment. A profession is a praxis and, in distinction to just any 'practice' or 'doing', a praxis is characterized and guided by a condition Aristotle called *phronesis*. This is the ethical criterion for "good results" that guides a professional practitioner to a primary concern with the pragmatic benefits experienced by the typical client. In the case of music education, individual students in music classes and ensembles are the clients served (i.e., not the class or ensemble as a collectivity). (1998 – Online source)

For Regelski, music education satisfies Aristotle’s criterion *only* if good results are achieved at the individual level and the only evidence for this that Regelski regards as valid is that students —want to and [are] able to engage themselves in musical praxis in ways and to a degree they find rewarding and empowering in life outside and after graduation from school.” In many respects I agree, and I would argue that it has been a

failure to take account of this common sense that has undermined music education the most. The benefits that music education programs seem too often concerned with are ones accruing more to the teacher/director and her program than to the students who are - in perhaps unconscious ways - seen as means to ends rather than ends in themselves, ends such as prize winning choirs/bands or classrooms of seemingly content, behaviorally unproblematic students. These are the measures of 'what works' that Regelski rightly has a problem with given that graduation seems in most cases to be the point at which students become musically *disengaged*. Of course, not everyone can be expected to remain musically active in overtly practical ways, as performers or composers. Is it not enough if someone has acquired understandings, sensitivities and aesthetic predispositions that allow them far richer engagements as listeners, such that listening to music becomes praxis and is pursued avidly whenever the chance arises? Perhaps, but there seems little evidence that music education has succeeded in achieving this to any significant degree.

As pointed out in Chapter Two, Reimer's philosophy of *music education as aesthetic education* (MEAE) (1970) which was so influential in the '70s and '80s, now gets short shrift and not a few music education philosophers have made a point of trying to discredit it. Regelski argues that any philosophy needs to be subjected to a process of "immanent critique" (a concept he derives from Critical Theory), where it is evaluated vis-à-vis its own claims. Regelski contends that MEAE fails to pass muster in this regard judging by what he perceives a negligible level of "aesthetic responsiveness" among those who have come through MEAE based programs, ...

whose musical tastes and habits remain virtually unaffected by such musical schooling. It is not even clear that graduates of school-based ensembles have received an "aesthetic education" since few remain musically active after graduation and since the listening tastes and habits of most have not been turned in more aesthetic directions.

I have argued (Chapter Two) that the MEAE philosophy is grounded on epistemological assumptions that are eminently plausible according to the understanding of mind that Evolutionary Psychology and Cognitive Neuroscience affords us and I will argue this in more depth further along. What Regelski does not seem to consider is that the failure of any educational intervention to achieve the goals implicit in its underlying philosophy does not in itself render the philosophy invalid and citing such evidence is not sufficient as an 'immanent critique'. As I took pains to argue in Chapter One, a utopian ideal is not any less valuable because it has not been nor is likely to be fully realized. I have met comparatively few people in life who are true self-actualizers as portrayed by Maslow, but this does not render his ideal invalid or inappropriate. The same is true of Kohlberg's 'principled conscience' and Freire's '*conscientizacao*'. Similarly, Illich's '*deschooled society*', Dewey's '*embryonic community*', and O'Sullivan's '*œozoic era*' continue to have value as articulations of what we should be striving for.

I have already made clear my surmise regarding education's failure to achieve such goals, namely that the school (formal, institutionalized, curricular education) has lost too much of its potency as a shaping force in the lives of youth and society generally. Perhaps the forces that schools are up against render just as unlikely the achievement of the musical praxis that Regelski has in mind. And yet formal schooling seems to do so little to exercise what agency it has toward challenging the status quo of the world outside the school. Indeed, Illich would undoubtedly find public schools in 2011 to be

even more so the “reproductive organ[s] of a consumer society” than he found them to be four decades ago (Illich 1974: 74).

I find it not a little perplexing that Regelski has rooted his notion of praxis in Critical Theory and yet seems only concerned with the degree to which students are empowered and predisposed *musically*. Even if students, as a result of educational interventions, remain active as musical doers after completing their ‘schooling’ and even if they are more aesthetically responsive, is this enough? Could music education have any function or responsibility beyond this? Perhaps not, but I would argue (as I have already) that the musical praxis that Regelski and others esteem (myself included) must be shown to have value beyond providing for what Regelski terms “good time” and “good life.” The “pragmatic curriculum” that he argues for is one ...

... guided by a phronesis of "personal action" with music. Music in this praxial sense is "for" personal praxis or agency -- that is, for creating or experiencing "good time" in life through music. "Good time" is well spent -- the expression "worthwhile" literally means "good time" -- and thus musical agency is an important means by which humans make a life worth living. In other words, a curriculum for musical praxis is first and foremost concerned to insure that students want to and are able to avail themselves of a wider and altogether richer variety of musical choices for enriching their lives than would have been the case without formal schooling. For Critical Theory, then, the ethical criterion of successful, professional teaching praxis in music education -- i.e., the phronesis of a curriculum predicated on authentic praxis -- will be to empower students to improve the quality of their lives through music.

Regelski does not say, in this article at least, how students thus empowered contribute to making society better. Perhaps Nero was a paragon of musical praxis even if his reign as emperor was one of tyranny, extravagance and corruption.

Enter the Mayday Group

The need for a greater degree of sociological perspective in deliberating music education’s purposes and values has for some time been a concern to music education philosophers and the Mayday Group is testimony to this. Founded in 1993 by Regelski and Terry Gates, the group functions:

as an international think tank, connected through email, the Internet and by regular mail. They are concerned to identify, critique, and change taken-for-granted patterns of professional activity, polemical approaches to method, and social, musical and educational philosophies, educational politics and public pressures that have threatened effective practice and stifled critical and open communication among music educators. The ongoing debate about these matters resulted in a more formal two-fold purpose: [a] to apply critical theory and critical thinking to the purposes and practices of music education, and [b] to affirm the central importance of musical participation in human life and, thus, the value of music in the general education of all people. (www.maydaygroup.org)

Woodford on education for „social intelligence’

While much of the Mayday Group’s work has been directed toward making music education more socially and politically accountable, it has not to my knowledge

attempted to articulate - and position its work within - a broader philosophy of education. One Mayday Group member who has tried to move things in this direction is Paul Woodford who invokes Dewey's "social intelligence" and posits it as an essential goal for music education. As do I, Woodford senses that discussions around music education goals and the ideals that should guide them do not sufficiently address the question: "—to what end?" (80). If social intelligence is to be an important end, music education must be more than "the pursuit of musical knowledge and skills." As important is "inculcating in children and music education majors moral imagination and those kinds of personal skills, dispositions, virtues, and attributes needed to mindfully engage in public criticism of *musical values*" (86). It is these last three words that I find to some degree problematic. As I expressed myself in Chapter One:

[T]he 'social intelligence' that music education needs to foster should be of the broadly applicable kind, not limited to musical values, but concerning *ideology* generally, that is, the assumptions that people accept as 'how things are and should be' and that inform 'who they are' and 'how they act' not only in relation to music but to life as a whole.

Educatorship

Woodford is particularly concerned with what is lacking in the pre-service education of music educators. One does not want to over generalize and I have not investigated the matter in any systematic way, but I am nonetheless confident in my surmise that 'social intelligence' and 'critical consciousness' are not matters of serious concern in teacher education and I am absolutely convinced this is the case with 'ecological intelligence.' Our concept of what constitutes *educatorship* needs to be radically revised and I am in full agreement with Woodford that much music teaching (most I would say) "has more in common with training than with education" (80). In Chapter One, I intimated what I see as a status quo in formal education, that teachers see their profession:

... firstly as *teaching a subject or discipline* as opposed to *teaching students*, i.e. helping them to become 'better' people. They are drawn to the profession more by their passion for the subject/discipline than by their commitment to education or social amelioration. The standard line one hears from Music Education majors is that their curricular choice is an insurance policy, something to fall back on if they don't crack it as a professional musician.

And sadly, the teaching profession does not tend to attract the most 'switched-on' individuals. Estelle Jorgensen (2003) says the following regarding the situation as she finds it in the United States.

Despite the fact that teachers face some of the most urgent and important challenges in society, the field draws relatively few intellectuals, lovers of wisdom, or outstanding practitioners of their particular specialties. Instead of attracting the best and brightest students, education often interests those who cannot get into other fields. In the university at which I teach, the academic achievement of incoming future teachers is among the lowest of the incoming undergraduate population, and this is all too common. A pervasive anti-intellectualism in education manifests itself in such problems as lack of interest in scholarship, uncritical acceptance of ideas and practices, idolizing of science, and obsession with instructional and research methods. (x)

I fear that this problem is even more pronounced in South Africa. Most of the student teachers I have worked with over the years come from grossly deficient educational backgrounds where they were seldom if ever engaged in learning activity aimed at higher order cognitive processes such as analysis, synthesis, evaluation, or creativity. The first task that I give incoming Music Education students (2nd and 3rd year university students) is to compose a one-sentence definition for ‘education’ without referring to a dictionary or other text. The results have been telling. In the several years that I have done this, perhaps only two or three students have offered anything suggestive of an educational ideal such as self-actualization, citizenship, critical thinking skill, moral conscience, creativity, etc. In but a very few of the definitions offered do the words ‘process,’ ‘skill,’ or ‘develop(ment)’ appear. In most cases, education is defined either as a condition of ‘having information’ or ‘knowledge’ or as a situation where someone who has information/knowledge imparts it to someone who does not. As to what they seek to get from my course, the prevailing expectation can be summed up in one word – *methods*. What they get instead is a protracted subversion of this ideology, which Regelski rails against with terms like “what works” and “methodolatry.” But I try not to merely supplant it with just another ideology. Developing critical consciousness is more about engaging people with questions than it is with supplying answers. Socratic teaching is something it seems my students generally have had little experience of, and my penchant for it is something they initially are uncomfortable with and even find threatening.

Without reluctance I admit that I frequently take my students outside of the scope of the typical course in Music Education and that I do not refrain from allowing my ‘æzoic vision’ some prominence in discussions and tasks in which I engage them.¹¹⁶ It strikes me as irresponsible not to do so if my educational ideal is as per Dewey’s, where in ‘music education,’ education (the noun) is the end for which music (the modifier) is the means and where education is in all instances accountable to some broader vision of a better world. I had enough to say about this in Chapter One. Where I see it as relevant to the present discussion is in relation to the insularity that so often seems to manifest in the writings of prominent music education philosophers. Symptomatic of this is their seeming resistance to interdisciplinary and integrated arts approaches in education. This matter will be pursued in depth further along, but for now let us give more consideration to the issue of educatorship, for it is the lack of true educatorship in the teaching profession that more than anything confounds education’s prospects for bringing about a critically conscious world citizenry.

Regleski and Elliott (also a Mayday Group member) are very much on the same page when it comes to their understanding of teaching as praxis as a particularly demanding form of thinking-in-action. A good lawyer may be seen as an exemplar in this regard. She must come to court well prepared in terms of evidence to be presented, cases to be cited, and familiarity with whatever documentation and other evidence the opposing

¹¹⁶ Raising their almost non-existent awareness of the environmental crises we face is something I feel obliged to do given that nowhere else are they being encouraged to become aware of and confront them. It is generally done parenthetically in discussions, but I do arrange viewings of video material (e.g. *An Inconvenient Truth*, *The Story of Stuff*, *Eleventh Hour*, [Crude](#), *Home*) and draw their attention to matters of crucial environmental concern within South Africa’s borders (e.g. its inordinate carbon footprint and the complicity of multinational corporations in this regard, the infestation of natural environments by alien invasive species, recycling and waste disposal, etc.).

legal team has discovered.⁶ But it is the capacity to think-on-one's-feet that matters the most given that what comes forth from a witness during questioning cannot be easily predicted and planned for. Elliott's remarks regarding educatorship are apropos in this regard.

Educatorship ... is not a skill, nor a habit, nor a knack, nor a science, nor a collection of facts about educational psychology or philosophy. Educatorship is the flexible, situated knowledge that allows one to think-in-action in relation to students' needs, subject matter criteria, community needs, and the professional standards that apply to each of these. ... Music teachers are not merely intermediaries in an educational delivery system. They are reflective practitioners who can think-in-action and know-in-action in relation to highly complex and fluid teaching-learning situations. (1995: 252)

Appropriately, Elliott emphasizes the improvisatory nature of teaching as praxis.

[E]xpert teaching is much closer to improvising over ~~changes~~ than rendering an accurate reading of a score (a step-by-step lesson plan). Teachers ~~trade~~ feedback with students in a kind of call-response pattern characteristic of jazz improvising. An expert music teacher, like an excellent improviser, deals with moment-to-moment problems and opportunities on the fly. These problems and opportunities are both musical and educational in nature. The professional music educator is well prepared to solve musical and educational problems in action because he or she possesses two complementary forms of expertise: musicianship and educatorship. (251-252)

In *Music Matters*, Elliott does not have much if anything to say about the extra-musical kinds of knowledge that a music educator should be possessed of. In a critical review of Woodford's book (in which Woodford takes *Music Matters* to task on various points), Elliott states that educatorship, in his view, implies ~~several~~ forms of knowledge: for example, philosophical, sociological, psychological, historical, and other forms of liberal education" (2008: 52).

I agree fully and through my professional life have become increasingly appreciative that I was able to do my BMus degree at a university that embraced a liberal arts ethos and required that a substantial proportion of credit hours be given over to courses outside of music and music education; and while I was able to choose specific courses, I had to ensure an adequate disbursement across major academic domains, e.g. Psychology, Philosophy, Anthropology, Sociology, Literature Studies, Science, and other Arts. Environmental Studies was not yet a course offering but I was able to take one elective – Critical Issues of Human Ecology – that planted many of the seeds that later blossomed and informed my environmental activism as well my deep interests in nature and its protection.

Such a grounding in the liberal arts⁶ sadly does not seem to be considered important in the pre-service education of teachers in South Africa and this I believe makes not only more justified, but more urgent the interdisciplinarity that characterizes my work as a university lecturer⁶. My caveat regarding Elliott's concept of educatorship is that it demands more than knowledge in and of these subjects⁶; it requires genuine sociological/philosophical/ecological/psychological/etc. *perspective*. In other words, such knowledge must manifest in one's thinking-in-action as an educator; it must *become* praxis.

What about Darwinian perspective?

Demonstrating the critical importance of Darwinian perspective in the discourses of Education has been the *raison d'être* of this study. Here I will go further to propose that such perspective should be actively cultivated in students and people generally. If natural selection is accepted as being a law of nature (as it generally is), it is not enough that it be left at that - just another scientific fact to be learned and likely forgotten without consideration of its implications for matters of importance. If it is accepted that human beings are products of evolution by natural selection, surely we should consider what this suggests about why we are the way we are, why we have the aptitudes and predispositions that we do, and how these can help us understand how culture and society have evolved and continue to evolve.

No one contests the crucial relevance of Psychology to Education, but the situation is quite different as regards *the relevance of Evolutionary Psychology to Educational Psychology*. Though still in its infancy, Evolutionary Psychology has already delivered penetrating insights into the nature and workings of mind and of human ontogeny that are supported by credible research and experimentation and yet these insights have negligibly if at all taken hold in Educational Psychology as it features in teacher education programs. And so it is not surprising that students down the line graduate from High School without any informed understanding of the nature they share with one another and that shapes how they think and feel about things and how they come to embrace the ideas and ideals that they do. How grateful I would have been to have had teachers who could and would have helped me in this regard; how greatly it could have lessened my anxiety about urges and impulses I felt alone in my contestations with.

That any significant level of Darwinian perspective has yet to inform teaching praxis is understandable *but not acceptable*. Cultural evolution has been a continuous series of ideas and beliefs being challenged, modified and in many cases overthrown in the face of new discoveries and theories. Nowhere in public education does one find students being taught that the Earth is flat, that it is the center of the universe, or that epileptic seizures are the result of demonic possession, and yet the law of nature most pertinent in understanding *what being human means*, natural selection, is almost nowhere thus considered in public education. If the acquisition of such understanding throws up challenges to existing ideas and beliefs, is this not *what education should be promoting*? If we are teaching for praxis and critical consciousness, are we not obligated to provide students with the best available tools with which to read the world?

Many would answer yes to both these questions, but would draw the line at introducing through teaching ideas that run counter to deeply held religious and/or cultural beliefs. We can agree that one must be respectful of and sensitive to the beliefs people hold, but it is possible to teach an idea, not as a refutation or decial of another idea, but as something to be considered on its own merits, leaving the individual to draw her own conclusions. Dennett is a great believer in religious education and feels that it should feature prominently in everyone's education. But it should be an exploration of ~~all~~ "all the world's religions, in a matter-of-fact, historically and biologically informed way" as we teach students in geography and history.

Let's get more education about religion into our schools, not less. We should teach our children creeds and customs, prohibitions and rituals, texts and music, and when we cover the history of religion, we should include both the positive – the role of the churches in the civil-rights movement of the 1960s, the flourishing of science and the arts in early Islam ... - and the negative – the Inquisition, anti-Semitism over the ages, the role of the Catholic Church in spreading AIDS in Africa through its opposition to condoms. No religion should be favored, and none ignored. And as we discover more and more about the biological and psychological bases of religious practices and attitudes, these discoveries should be added to the curriculum, the same way we update our education about science, health, and current events. (2007: 327)

As an environmentalist, what I find particularly valuable about Darwinian thinking is how it challenges the vanity of our selfish anthropocentrism which Abrahamic religions have sadly encouraged to the disadvantage of all other life on our planet, teaching that humans have been divinely favored and entitled to subjugate and exploit all else that lives. The evolutionary tree of life connects our species to every other species that exists or has existed on this planet, taking everything back to a single replication event in the early history of Earth. Grasping this is a boon to the cultivation of ecological intelligence and biophilia. We have progressed far in ridding the world of racism and sexism and it is arguably time that specie-ism should become a cause of disquiet and a target for activism. That we may find such a notion so counterintuitive (many would say ridiculous), is explicable in terms of how natural selection has made us. Most people just can't get their minds around such an idea, but the same was once true regarding sexism, racism, and ethnocentrism. They, like specie-ism, 'intuitively make sense' and seem natural according to our evolved psychology, but we have succeeded in transcending our innate insularity and predisposition for 'sticking to our own kind' and this could be achieved with specie-ism I would argue. Just as we must contest with the selfish-genes of our birth, so also must we contest with the selfish-memes of our indoctrination, that have exploited our innate proclivities and produced a kind of 'civilization' that cannot be sustained.

As I hope this dissertation has placed beyond question, Evolutionary Psychology and Memetics provide valuable insights into the human condition and implicit in these are explanations for why we are such easy prey in the 'memosphere' of consumerist global society. The ideals that people must take on and actualize behaviorally if there is to be much hope for the future are in large measure memes that are counterintuitive as far as our evolved psychology is concerned (e.g., *Consume less!*); and if in the curricular and extracurricular worlds youth inhabit the memes are more resonant with what is intuitive, they are naturally going to win out. How can they not if each of us is nothing more than "a massive memplex running on the physical machinery of a human body and brain – a meme machine" as Blackmore claims (1999: 235)?

Critical consciousness revisited

Critical consciousness, a capacity for 'reading the world,' is what is required and is arguably what is not being developed in our schools. I fear that too few educators are themselves possessed of it. Of course, it is not just a matter of transmitting laudable ideas to students. Teaching for praxis requires that students are regularly engaged in activity that is praxial by nature, where they have to formulate ideas as hypotheses to be tested and evaluated scrupulously, taking account of alternative ideas and subjecting

them to the same. It is not so much the specific ideas that get entertained that matter as what one makes of and does with them, how they are processed and assimilated, and ultimately the extent to which they inform praxis. Critical consciousness is not a matter of having (or being had by) the right ideas; it is a developed capacity for engaging with ideas generally. In Chapter Two I posited that “critical consciousness is always and at once creative consciousness. Being able to “read the world” (Freire & Macedo 1987) requires a capacity for problematizing it and then making the best use of what one knows and what one can access such that the solutions are products of *a complex process of synthesis*,” a process that actually defines what creativity is. If such a process does not underpin one’s assimilation of ideas, they never can really become one’s own as important constituents of one’s self-plex. As such, it is unlikely that they ever come to inform real praxis.

Darwinizing the Philosophy of Music Education

To conclude this dissertation I will consider some of the precepts and ideals espoused by established philosophers of music education and see how they hold up in light of what has discussed in this dissertation. These relate to certain matters that I believe most to be in need of critical examination if not contestation, for example, how we conceive and theorize:

- the nature of the praxis that music education should be teaching for;
- the positioning of the Philosophy of Music Education within a broader philosophical framework that makes music education accountable to social and ecological needs and goals;
- what is unique or at least preeminent in different forms of musicking that makes them worthy of curricular provision;
- the advantages vs. the disadvantages of interdisciplinary education through music;
- forms of creative, holistic praxis that are musical only in part but worthy of greater curricular attention;
- forms of musical praxis in popular culture and how they engage participants as “reflective practitioners”;
- the nature of aesthetic experience and the philosophy of music education as aesthetic education (MEAE);
- what is universal and what is contextual in musicking and the relevance of this to music education.

While it is by now clear that I have found the Philosophy of Music Education to be insufficiently outward looking in its considerations of music’s nature and value, I have also found much that is insightful as regards the possibilities music education offers to an *education for praxis*. I recently re-read key texts in the field to see what more I could make of them equipped with the “interpretive schemata” that have been developed and modified through my explorations of Darwinian Science, but also evaluating them vis-à-vis my philosophy of *education through music* as well as the ecozoic vision I have

espoused.¹¹⁷ What was an encouraging revelation is the extent to which many of the theories, claims and conclusions of the authors jibe in significant ways with the conception of ‘the adapted mind’ that has emerged from Evolutionary Psychology and Cognitive Neuroscience. But it also became evident that while there seems considerable scope for consilience, none of the authors have considered what an adaptationist and/or memetic understanding of the mind and of human agency can contribute to answering questions such as: *why do we have music and the arts?* This is not the same as asking why music and the arts are important; all of these writers have had much to say in this regard. More so it is a question of how it is that we have music and the arts to begin with, a related question being: how have they come to be deemed important in the ways that they have? For absolute certain, none of the authors have even entertained the idea that the importance of music and art *has perhaps been overstated*. One thing that seems incontestable is that *music does not need music education*. The question that the Philosophy of Music Education must treat as primary is whether education really needs music.

Chapter Two made abundantly clear that we come wired for musicking. Evolution has provided all that is necessary by way of mechanisms and predispositions. But this is not evidence that we *still* need music or that what ‘music’ has come to be satisfies genuine human needs and here we must again remember that what we come hard-wired for are adaptations that were selected for in Pleistocene and Paleolithic environments. They became part of the massively parallel processing system which is the brain because they somehow enhanced the reproductive prospects of our distant ancestors. The fact that culture has evolved complex and elaborate ‘arts’ and arts institutions is no evidence that the behaviors concerned, musicking for example, are still vital to our lives. If they are, it is for reasons other than gene propagation. It is also entirely possible that other cultural productions and practices have come to more efficiently and effectively satisfy our innate yearnings and psychosocial needs. And we must not forget the distinct likelihood that what we now enjoy and that we have professionalized and institutionalized, are products of runaway evolution and that are perhaps excessive in relation to our ‘real’ psychosocial needs.

What is more, the over-stimulation of our aesthetic sensibilities in a world of media has inured us to what would have held our attention easily even just one hundred years ago. Apropos Regelski’s conclusion regarding the success of MEAE as measured by people’s extracurricular musical lives, let us consider the aesthetic responsiveness of typical Americans as suggested by an intriguing (and discouraging) experiment organized by the *Washington Post* in 2007.¹¹⁸ What happened was that the *WP* engaged a violinist to busk for about 45 minutes in a bus/train station in Washington DC (where most of the commuters passing through are employees of the U.S. Federal government). While over a thousand people passed by, only six stopped to listen for a short while. About 20 put money in the busker’s open violin case, this totaling \$32. Weingarten

¹¹⁷ In Chapter One I quoted O’Sullivan in this regard. –The fundamental educational task of our times is to make the choice for a sustainable planetary habitat of interdependent life forms over and against the dysfunctional calling of the global competitive marketplace” (1999: 2).

¹¹⁸ The [WP article](#) on the experiment won a Pulitzer Prize for Feature Writing for the journalist Gene Weingarten.

(2007) makes a telling point as to the demographics of who it was who paid any heed to the performance.

There was no ethnic or demographic pattern to distinguish the people who [paused to listen/watch], or the ones who gave money, from that vast majority who hurried on past, unheeding. Whites, blacks and Asians, young and old, men and women, were represented in all three groups. But the behavior of one demographic remained absolutely consistent. Every single time a child walked past, he or she tried to stop and watch. And every single time, a parent scooted the kid away.

What made the experiment particularly interesting was that the busker was Joshua Bell, ranked as one the world's best concert violinists. He was playing recognized masterpieces for solo violin on a Stradivarius worth \$3.5 million and three days earlier had played to a packed house at Boston's Symphony Hall (where \$100 secured merely "petty good seats"). This is not in itself evidence of a lack of aesthetic *capacity*, that the commuters are unsophisticated "boobs". I am certain things would have been different if the year was 1900, when music still could be experienced *only* by making it oneself or by hearing someone else doing so. Whatever becomes too persistent in our soundscapes, we become inured if not oblivious to. Ubiquity has become music's worst enemy and its value now lays more and more in what it can help to sell than in how it can edify. When music is encountered outside of contexts designed and set aside for attentive engagement, it fails to command our focus because of what has neuro-cognitively been "tuned-off" by the sensory overkill of modern global society.

Interdisciplinary and integrated arts approaches to music education

I earlier intimated my endorsement of interdisciplinary and integrated arts approaches to music education, a position which is seemingly at odds with prevailing thinking in the Philosophy of Music Education. Elliott (1995) is quite clear as to where he stands regarding integrated arts approaches, claiming that the assumption underlying them (which he sees MEAE as championing) "is not only philosophically invalid, it is practically and politically counterproductive" (248-249). His firm belief is that education in the arts should be domain specific:

For each performing and nonperforming art is a specific kind of human practice that rests upon an independent form of situated thinking and knowing. Hence, each kind of artistic knowing needs to be taught and learned in its own context through active involvement in artistic making. Musicianship, for example, involves an *entirely different* kind of cognition than the knowing required to understand visual art, dance, or poetry. Learning to notice the qualities of visual textures in painting *will not* advance one's ability to compose, improvise, or listen for musical textures any more than learning to watch hockey will help a person understand cricket. The development of musicianship depends on inducting children into musical practices and on targeting their conscious powers on progressively more subtle aspects and dimensions of musical works. Neither condition is present when the attention of learners is being directed to nonmusical matters such as balance and focus in painting or gesture in dance. (249, my emphases)

This take on the arts is inconsistent with my experience and certainly is not congruent with an adaptationist understanding of music among the arts. I can to some degree sympathize with Elliott's concern about an integrated arts approach being *politically* counterproductive, though *strategically* is the word I might have used. He warns that:

as soon as administrators suppose that music is being taught and learned along with all the other arts, or *that something called aesthetic sensitivity exists* and can be developed by teaching any art whatever, then music educators will become dispensable and music education will be removed from the program. (250, my emphasis)

Regarding the situation in North America, Elliott tells of ~~many~~ directors and supervisors of music education” having been replaced by ~~interdisciplinary arts~~” teachers and music education programs being supplanted by multi-arts courses. It is no doubt true that the amount of time available for developing high levels of performance skill and knowledge specific to music will be reduced with such curricular changes of emphasis. But how much time does it deserve? And is it not possible that such interdisciplinarity is productive in ways that Elliott fails to or is not inclined to recognize?

Elliott advocates for music education as a domain-specific enterprise on the basis of his assertion that —~~musi~~ making and music listening are *unique* forms of thinking and unique sources of the most important kinds of knowledge human beings can gain” (14, my emphasis). It does not ever become clear to me what these ‘most important kinds’ are. Nevertheless, Elliott does an excellent and thorough job of examining how music-making involves different modes of knowing — *formal, informal, impressionistic, and supervisory* — all of which feed into activity — musicking — that is — essentially a matter of *procedural knowledge*” (53, my emphasis).

On procedural knowledge

What for Elliott makes musicking procedural in essence is that it is a kind of practical doing in which language-mediated thought is very much in the background if at all present.

During the continuous actions of singing or playing instruments our musical knowledge is in our actions; our musical thinking and knowing are in our musical doing and making. Thus, it is entirely appropriate to describe competent musical performers as thinking very hard and very deeply (but tacitly) as they perform (or improvise) — as they construct and chain musical patterns together; as they vary, transform, and abstract musical patterns; as they judge the quality of their musical constructions in relation to specific criteria and traditions of musical practice; and as they interpret the emotional expressiveness of musical patterns. In other words, a performer’s musical understanding is exhibited in the quality of what she gets done in and through her actions of performing. (56)

But I could just as easily say that a speaker’s linguistic understanding is exhibited in the quality of what she gets done in and through her actions of talking. Linguistic understanding is not revealed by *what* one says but in how well one says it. Quite rightly, Elliott eschews ~~the old dualistic view,~~” where ~~actions follow from verbal thoughts,~~” but seems to overlook the fact that every kind of doing is underpinned by and begins with neural processing that does *not* employ externally derived symbols like words, but rather employs the language of mentalese (see last chapter). When I am extemporizing, the words just bubble up and take their place in series of words that make sense (most of the time at least) without having to have been worked out consciously ahead of time.

Even when reciting someone else's words, a poem for example, what Elliott says regarding an artistic performance holds true just as much as it does in a musical performance. In both cases it:

... requires many forms of thinking and knowing, ranging on a wide continuum from the most convergent to the most divergent, from the most tacit to the most verbally explicit, from the most practical to the most abstract. [Also] Performing musically [linguistically] in relation to the standards and traditions of a musical [linguistic] domain engages a person's entire system of conscious powers: attention, awareness, cognition, emotion, intention, and memory. [Lastly] although competent music making [talking] demands many types of thinking and knowing, it is *nonverbal* and procedural in essence. (60, my emphasis)

Talking is obviously *verbal*! But the *thinking* it requires is not. It is just that in the case of talking, words are the informational output whereas with music it is patterns of *notes*. Procedural knowledge is undoubtedly the most important kind of knowledge for human beings, but this is just as true for sheepdogs who also must *think-in-action* if they are to keep sheep from running amok. By and large, procedural knowledge is not something that we *gain*, but rather something that we are innately capable of but which needs particular kinds of environmental stimulation (learning) to develop in ways such as are required by highly evolved *domains of effort* such as music and the arts have become. The *procedural essence* of linguistic ability, like that of musicianship, has been provided for by natural selection (as Chomsky made clear decades ago). This should come as no surprise given that music and language so evidently share the same evolutionary root and make use of many of the same cognitive mechanisms. Music making is obviously not *unique* in having a procedural essence. If in referring to it thusly, Elliott means that it is unique in terms of what it brings into the mix of a thinking-in-action process, then he needs to be more explicit.

The experience of ,flow'

It surprises me that Elliott has nothing directly to say about the neuro-cognitive capacity that is core in music making and which such doing-in-action is particularly well-suited to the development of, what was discussed in Chapter Two as *kinesthesia* and/or *proprioception*. And this surprises me even more given the attention that he appropriately gives to Flow Psychology as developed by [Mihály Csíkszentmihályi](#).

In Chapter One I made clear my contention that pleasure is life's bottom-line and that education's real purpose is to help people to be more successful in their pleasure-seeking pursuits. This is not some hedonistic philosophy, but rather a commonsense recognition of the primacy of feeling in everything we can call cognitive. There are innumerable pleasures that range from the immediate and ephemeral, that come from the gratification of our most basic needs and the satisfaction of our most basic and oldest reward systems (those that I associated with the Four Fs in Chapter One: feeding, fleeing, fighting and fornicating), to those that are longer lasting and more complex, but also more demanding of concentration and focused effort. In Chapter Two, much discussion was given over to another reward system which natural selection provided us with because it inclined our ancestors to invest time and effort in activities that *appear* to be nonfunctional and even extravagantly nonutilitarian" (Tooby & Cosmides 2001a: 11) but which are crucial to the optimizing of our brain's functioning. And the capacity

that most needed to be functionally optimal in ancestral environments was bodily-kinesthetic intelligence. We thus find pleasurable activity that is kinesthetic in essence.

Csikszentmihályi gave the word flow to the satisfying mental state that accompanies activity in which there is optimal engagement, where one is intrinsically motivated, highly focused and completely absorbed in what one is doing to the extent of self-forgetfulness. Csikszentmihályi has identified several conditions characterizing typical flow experiences.

- A goal that is clear and appropriate to one's ability. The experience of flow is more likely where both the challenge and skill level are quite high.
- A high level of concentration focused on a limited field of attention.
- Action and awareness seem to merge and one's feeling of self-consciousness recedes.
- One's sense of the passing of time is altered or distorted.
- One is aware of how things are progressing and behavior is adjusted accordingly.
- The activity presents an appropriate level of challenge vis-à-vis one's abilities. (One is in what Vygotsky called the zone of proximal development.)
- One feels in control, without anxiety or self-doubting.
- Though being challenged, there is a kind of effortlessness in one's actions and the process seems more important than the product.
- The activity is absorbing to the point that one loses awareness of other bodily needs and states such as hunger or fatigue. (abstracted from ["Flow Psychology"](#) at Wikipedia.com)

Such conditions characterize what musicians and others have styled as being in the groove, in the moment, or in the zone. For Elliott, flow is more than just pleasure; it is enjoyment; and he is keen that the two should not be conflated. (The citations are for Csikszentmihályi 1990)

When biological and social needs intrude into consciousness, the result is disorder. Order is restored in consciousness by satisfying these needs. When consciousness tells us that our biological needs or social expectations are satisfied, we experience pleasure (1990: 45). Pleasure can occur with little or no conscious effort; enjoyment cannot. Pleasure can be stimulated electrically and chemically in the brain; enjoyment cannot. Enjoyment results not from satisfying basic biological and social needs but from *moving forward in psychological growth and complexity*. Enjoyment arises only from unusual investments of our conscious powers (1990: 46-47). (Elliott 1995: 115 – my emphasis)

Firstly, there is never an instance where biological needs do not intrude into consciousness and even though a need is something always felt, it does not necessarily have to be intrusive in a disruptive way. We find flow experiences pleasurable and/or enjoyable precisely because of a biological need, the need for activity that engages the brain in ways conducive to its optimal reorganization; and this most definitely entails the stimulation of electro-chemical systems in the brain whether one is really enjoying oneself or just experiencing a transient pleasure. Secondly, consciousness does not *tell us* when our biological needs are satisfied. If consciousness is telling me something, it must be a volitional entity of some kind, which it most assuredly is not. There is no center of narrative gravity or homunculus capable of making such pronouncements. In

any case, to whom is it communicating? Rather, we just intuitively know when needs have been satisfied because of how we feel. What our internal dialogue has to say about things can be quite beside the point or even misleading.

In contrast to Elliott, I see the difference between pleasure and enjoyment as being quantitative rather than qualitative; they are different in degree, not kind. Enjoyment, flow or any other state we find pleasurable, we do so because of innate reward systems. Genes have instructed the ontogeny of an organism that finds pleasure in activity where there is a ~~moving~~ forward in psychological growth and complexity.” If there is no conscious awareness of the pleasure, there nevertheless are motivational mechanisms at work in the brain. The administrative organization of the brain, getting information appropriately tagged (e.g., vis-à-vis its truth value) and stored, is as vital a biological need as are the biological needs that I assume Elliott to be thinking of, our need for status and the sex drive for example.

One such motivational mechanism activates our brains while we sleep and we have dreams. It has been estimated that an individual spends about six years of an average lifespan in dreaming. It obviously performs some vital function in organisms with complex brains.¹¹⁹ Here let us recall (from Chapter Two) Tooby and Cosmides’ assertion that ~~the~~ task of organizing the brain both physically and informationally over the course of the lifespan is the most demanding adaptive problem posed by human development” (2001a: 14). They claim that ~~humans~~ have evolved specialized cognitive machinery that allows us to enter and participate in imagined worlds” (9). Dreams are such worlds, as are the worlds of children’s imaginative play, as are the fictional worlds of novels, plays and movies. Dreaming may well be employing the same scope syntax that in waking life allows us to deal with information that is only contingently true by tagging and tracking the parameters within which any given set of representations can reliably and safely be employed in making inferences. This is essential to avoid data corruption and potentially harmful or fatal misapplications of the information outside of the scope of these conditions.

Even though the difference is also quantitative, I often make a distinction between entertainment and enjoyment and, apropos the last sentence in the quote from Elliott above, what distinguishes enjoyment is the level of investment in the activity at hand and we would both agree that the greater the level to which one is really engaging in what one is doing, the greater the level of ~~psychological growth and complexity.~~” Elliott has it that ~~enjoyment~~ arises only from unusual investments of our conscious powers.” Aside from the problem with what might be meant by ~~conscious powers,~~” I do not agree that one enjoys oneself *only* when there is a cognitive investment that is ~~unusual.~~” If a behavior is motivated by an innate reward system, there is nothing unusual about it, even if different kinds of thought-in-action vary in how they stimulate these systems such that enjoyment is achieved.

¹¹⁹ Other mammals dream, no doubt for the same reason. A study by Louie and Wilson (2001) which demonstrated that temporally sequenced firing patterns in a rat’s hippocampus while awake are reproduced during REM episodes lasting the same amount of time, this suggesting to the researchers that multineuronal activity suggestive of episodic memory traces are reactivated during REM sleep. Their theory is that such reactivation may play a crucial role in memory processing.

When I consider the flow factors in the list above, I find that they obtain in a wide range of activities, some which educators might be expected to eschew as candidates for curricular attention. Playing ‘video games’ (e.g., on a SONY PlayStation) is an example that comes to mind. There is generally a clear goal (winning) and most games are designed to accommodate different skill levels so that one is always appropriately challenged. Playing requires a high level of focused concentration and one becomes absorbed and is ‘in the moment’, and though challenged, there is a kind of effortlessness in one’s action. Winning seems important, but it is in the playing of the game itself where the real pleasure lies.

It can be argued that playing a video game represents an unusual investment in-so-far as our Pleistocene and Paleolithic ancestors had nothing comparable to test their skills on, but the same would then have to be argued for those flow experiences that we favor and consider worthy of curricular attention. I might go further to suggest that many popular video games more than amply fit Elliott’s portrayal of musicking as —a multidimensional form of thinking” that is —procedural in essence” and that engages formal, informal, impressionistic and supervisory knowledge.

Darwinian perspective in Music Matters

Music Matters was published in 1995 and it is quite conceivable that Elliott has since updated his concept of consciousness and has clarified what he had in mind when speaking of “conscious powers.” I am inclined to believe that the differences in our understandings as intimated here are more semantic than epistemological. It was only when rereading *Music Matters* recently that I picked up on just how much Elliott was in touch with Darwinian understandings of consciousness and culture when they were still relatively new and not widely known. He certainly seems to embrace cognitive materialism and cites Dennett’s fundamental tenet that —the mind is the brain” (51). But Elliott seems to have misunderstood Dennett when it comes to what consciousness is. Elliott claims that —human consciousness is parallel and distributed; consciousness consists in many simultaneous streams of processing that operate throughout the brain” (51). It is the brain’s processing that is parallel and distributed. Consciousness is an illusion, an epiphenomenon that comes after the fact, a kind of story we tell our self. It is not and cannot be an entity with agency and volition, which is capable of telling the self (another illusion) something. Elliott eschews Cartesian dualism and yet seems to invoke it unawares.

Another thing that evidently didn’t stick with me when first reading *Music Matters* several years ago was Elliott’s apparent support for Memetics. His treatment of it was brief and he said nothing to indicate whether he subscribes to its core premise — that memes are also selfish replicators caught up in a mindless, purposeless algorithm and thus having no *intrinsic* value or meaning. Nevertheless, what he has to say is entirely congruent with the understanding of Memetics I presented in the last chapter.

Because of its predilection for information of all kinds, and because of its marvelous plasticity, human *consciousness* [should perhaps rather have said ‘mind’] grows and adapts in relation to memes. As Dennett suggests, memes are what turn brains into minds. Memes cohere and replicate in the brains of humans by being taught, learned, and passed around via languages, schools, books, artifacts, performances, and tools. *Human beings grasp, generate, and modify memes.* (111, my emphasis and insert)

The last sentence is only true to a point. At some level, every human being comes up with original ideas or modifications of existing ones. But for the most part, we rely on others to do the work in this regard and many of the memes that get replicated in brains and passed on are never really grasped in the sense that they have been consciously engaged with and evaluated. Critical consciousness is far from being a social norm. And even when we have considered an idea thoroughly and think we really grasp it, the possibility remains that we have overlooked something vital, perhaps because of what has fed into the preconscious processes that we are unaware of but that nevertheless bias our cognitions. I frankly sense a degree of *a priori* reasoning in the Philosophy of Music Education. Most music education philosophers, it can be assumed, are individuals who feel, as do I, that their lives have been enhanced through intimate experiences of musicking. They intuitively know that music is important and then attempt to explain this importance so that others can grasp it. The same, of course, can be said of religious philosophers, most of who take the existence of an omniscient, Supreme Being as self-evident.

Let us recall Pinker putting the cat among the pigeons with his assertion that music is “~~auditory~~ cheesecake” and “~~pleasure~~ technology” (like pornography) and the incredulity and derision that this provoked. *How could someone say such a thing?* Yet when we take the time to dispassionately consider his arguments, we find some measure of truth or at least assertions that cannot easily be dismissed. Because the capacities that we employ in musicking (including listening) are adaptations, this does not mean that the activities themselves are adaptive. They afford us great pleasure and enjoyment, but this is not evidence that they are necessary, that the Paleolithic reward systems they excite (the buttons they push) can not just as successfully be gratified by other means or that such gratification is still vital given the environments of evolutionary adaptedness (EEAs) that we currently occupy and that are consummately *un*-Paleolithic.

Whether or not a flow experience moves one “~~forward~~ in psychological growth and complexity” it does afford enjoyment and that on its own is sufficient to justify indulgence in activities where flow is experienced, *provided* that there are no significant costs to others. If life has no ultimate purpose beyond gene propagation, it is still worth living if we are enjoying ourselves enough of the time, if we are finding satisfaction and fulfillment in life’s activities. Our health and cognitive well-being depend on it and that should be reason enough to ensure that our students are experiencing happiness, satisfaction and fulfillment in the activities we engage them in during their school years. In this regard, it is unfortunate that therapy is so commonly considered as something for people to undergo *only* when there is something wrong with them. Most parents and teacher would scoff at the suggestion that time should be given over in the school day for therapeutic activity: yoga, meditation, *T’ai Chi* or drum circles for example. Kids are in school to learn! But when learning and all else that is educative is conceived as an optimization of brain function, the experience of flow, which is so conspicuously therapeutic, should become a curricular priority.

Eurhythmics?

Elliott speaks to such optimization as “~~binging~~ order to consciousness” and holds that “~~dynamic~~ musical practices provide the conditions necessary to attain optimal

experience, ‘flow’ or enjoyment” (116). I have argued that bringing order to consciousness is a matter of what is achieved in the fine-tuning of preconscious processing. For me, it is the manner in which one is engaged kinesthetically that is the most crucial of “the conditions necessary” to attain flow through music. And it is such engagement that I suggest as the mechanism according to which most music therapy achieves its beneficial effects. Even where activity does not involve overt movement, the body-in-mind is engaged proprioceptively, ‘reading’ and adjusting to internal, bodily states.

I do find it surprising that Elliott makes no mention of Eurhythmics in *Music Matters*. The originator of Eurhythmics as a methodology, Emile Jacques-Dalcroze, gets but one parenthetical mention in the short paragraph extracted below. It appears in a critique of MEAE and its perceived prioritization of listening over actual music making in music education.

[I]f the body is in the mind, then it makes perfect sense (as Dalcroze, Orff, and Kodály specialists maintain) that the kinds of moving involved in music making ... are essential to improving musical understanding ... (103)

I heartily agree. Dalcroze made clear that authentic musical understanding requires musical concepts and processes to be physically internalized to the extent that they can be realized intuitively and effortlessly, involving the physical self holistically and without conscious awareness. In developing his methods he was motivated by his concern that, while many of his students intellectually understood music, they did not really grasp it at a kinesthetic or proprioceptive level (Robinson: 2005: 3-7). Where I do not agree with Elliott is in his implicit suggestion that ‘musical understanding’ is the ultimate end for which kinesthetic development is but a means. I believe he has it the wrong way around. Musicking should rather be a means to kinesthetic ends. It is a means to other ends as well, but it should not be regarded as an end in its own right when curricular time is given over to it, not according to the philosophy of *education through music* that I have espoused and which I have argued to be implicit in Dewey’s educational philosophy.

An adaptationist perspective on the matter has it that our capacities for music evolved because of how they advantaged the reproductive prospects of our ancestors for whom kinesthetic prowess was a vital survival need; and demonstrations evidencing the possession of such prowess would surely have featured prominently in courtship (cf. Chapter Two on ‘sexual selection’). This can only in part account for the evolution of musical aptitude, but whatever else may have contributed, we are all innately inclined toward activity that fine-tunes kinesthesia and proprioception even if we are not consciously aware of what is being achieved neurologically and even though we no longer need the level of psychomotor coordination and prowess that for our ancestors was a matter of life and death.

Indeed, if it were somehow possible to go back to the Paleolithic and closely observe our ancestors, I am certain we would find in them levels of perceptual acuity and general kinesthetic capacity way beyond what remains to us now. We might recall here the claim made by Harpending and Cochran (2002) that 40 or 50 thousand years is ample time for a population to lose an adaptation which means that even less time is needed for it to atrophy significantly, or for a population to develop an exaggerated

version of it because of particular selection pressures in its EEA. Anyone who has seen the 2008 animated film *WALL-E* must find disturbing the thought that our species might end up like the obese and almost totally incapacitated humans the film portrays, who live in space in fully automated starliners having had to evacuate Earth after mass consumerism had left it covered in trash and lifeless.

Eurhythmics education is important in general education, not because it produces more rhythmically stable musicians, but because it activates and helps to optimize kinesthesia. And even if higher levels of kinesthetic intelligence no longer have direct survival value, it remains crucially important to one's intuitive sense of well-being and hence to one's self-concept. Everyone needs this, not just musicians and dancers. And yet eurhythmics education hardly features in schooling except perhaps at the primary and preprimary level (where it indeed is most important) and it is infrequent that one finds music education philosophers pressing the case for it.

Returning to the issue of domain-specificity

It is now appropriate to consider further Elliott's claims that "each performing and nonperforming art is a specific kind of human practice that rests upon an independent form of situated thinking and knowing" and that "each kind of artistic knowing needs to be taught and learned in its own context through active involvement in artistic making." I do not know at what point in cultural evolution that music acquired independence as a specific kind of practice, but we can be sure that it was relatively recently. It would be interesting to consider how this came about, but it is not sufficiently relevant to the present discussion. Suffice to say here that so-called "absolute music" is very much the exception in the music that people know and cherish the world over, as is the mode of engagement it calls for in the way of dedicated venues (concert/recital halls) and characteristic audience "etiquette".

I certainly do *not* consider dancing and musicking to be "independent forms of situated thinking and knowing." Both share the same kinesthetic and proprioceptive capacities and both involve periodicity, entrainment and the need to attune one's inner metronome and kinesthetic sense to that of others. Moreover, the notion that they are independent is inconsistent with how they manifest in many cultural traditions. One of the important lessons John Miller Chernoff (1979) learned from his immersion in West African drumming traditions was that: "One who 'hears' the music 'understands' it with a dance." Hugh Tracey long ago observed that in African cultures

... the dancers themselves often provide an important part of the music ... This may be by audible means such as singing, clapping, stamping, making use of certain parts of the dance costume that are designed to sound; or by inaudible or visual means, by moving parts of the body in rhythmic patterns that add to the total musical expression, even if only on an individual level. (1969: 27)

I do not in any way suspect music education philosophers of being devious in their inattention to Eurhythmics and kinesthetic development; yet if such development was to become a real concern for education, this could significantly shift support away from programs that treat music as per Elliott's model toward ones that accord prominence to dance, Eurhythmics and forms of musicking that are more accessible and less demanding in relation those more specifically musical aptitudes such as pitch acuity and

tonal-harmonic sense. Dancing is musicking and fulfills all of the conditions that Elliott sets for music as a “multidimensional form of thinking” that is “procedural in essence” and that engages formal, informal, impressionistic and supervisory knowledge. It surely must have been a prominent if not the dominant mode of musicking for our ancestors. But in general education, dancing and Eurhythmics have been marginalized to a far greater degree than ‘Music’ and to some degree at least, part of the blame must lie with the territorialism that is endemic in schooling with its compartmentalization of knowledge and experience, something which philosophical positions such as Elliott’s might serve to perpetuate. Such compartmentalization is consistent with the world of work with its specializations and separate ‘fields’, a fragmented world of largely incapacitated citizens who are totally reliant on experts and easy prey to their whims and schemes. But it is totally inconsistent with the kind of world in which more than 99% of our evolution took place.

And what of song?

Music is universal and this is what makes it of interest to evolutionary psychologists, biomusicologists and Darwinian aestheticians. But when we consider different forms of musicking, what we find as most widespread and participatory are dancing and singing. I am not aware of any culture where instrument playing is something that everyone does. The norm is that it is something that specialists do as it is activity that does not come as naturally as dancing and singing, and which requires an apparatus and skill and knowledge in how to use it.

Emphasis was given in Chapter Two to the widely accepted theory that language and music share a common ancestor in some form of musilanguage such as Mithen styles as “HMMMM.”

[I]t was Holistic, multi-modal, manipulative, and musical. While each of these features is found in the communication systems of modern apes and monkeys, I believe that they became integrated together among the early hominids. The result was a communication system more complex than that found now among non-human primates, but one quite different from human language. (2005:138)

What better way to describe song? And given what Mithen argues so compellingly, it is not surprising that when I ask people about their favourite music, they almost invariably name songs, even many of my instrumentalist friends. I am an instrumentalist and not much of a singer and yet it is to vocal music that I most tend in my listening. I have of course derived deep aesthetic satisfaction from listening to music without words and my capacity and predilection for this have no doubt been greatly increased through what I have experienced praxially as a performing and improvising musician. But when I consider what has had the most profound impact on me in terms of my extra-musical life and my world-view generally, it has been songs with great lyrics.

When I consider the most influential songs of my youth, for example, Joni Mitchell’s “Both Sides Now,” I have no problem speaking to either the words, the music or the performance of it, but am unable to articulate that quality that is seemingly nameless and yet quintessential, a gestalt that has no equal in any other form of artistic expression, for me at least. It is not that music has been added to words or vice versa, where they constitute two independent perceptual streams. They have merged and

produced something that is far greater than the sum of its parts. It is expression in which form and content, syntax and semantics, are unified, made one and made memorable. As much as I love poetry, I find it far easier to remember song lyrics. I know hundreds while there are but a handful of poems that I can recite from heart.¹²⁰

I have not investigated the matter systematically, but from my own experiences and from what my students and other teachers have told me, songs get negligible attention in schooling as an artistic form that is *sui generis*. Developing musicianship is the primary concern of vocal music programs, not ‘songstership’, something that requires getting beyond the notes and the demands of vocal technique. And in the teaching of poetry, song lyrics hardly seem to feature even though they are far more memorable than the poems that do. Here the problem must in part lie with the ideology that regards readability as a defining characteristic of poetry; a poem must pass muster on the basis of what has been printed and that alone. It is remarkable that such an ideology ever emerged given poetry’s long history as a performance art.

Simon Frith argues that

To treat the distinction between poetry and lyric as a distinction between the written and the spoken word is aesthetically misleading. There is, to put this another way, a continuity between poetry and song, rather than a clear division. Between the two lie various sorts of —performed” language, whether —oral poetry” as technically defined by anthropologists, or public and formalized uses of words for special ends as in nursery and playground and advertising rhymes; whether in insult rituals like the dozens, or in poetry —acritals.” (1996: 178)

It is relevant to note that the majority of recognized music education philosophers are North American and come from an educational culture in which instrumental music programs have for long held the spotlight in music education. The results of this have been extraordinary and people are justifiably impressed by the level of proficiency achieved by high school bands and orchestras. I am the product of such a program, one that was ‘top-drawer’ as measured by prizes won and ‘Straight-A’ ratings for our ‘Wind Ensemble’ performing a ‘Grade 6’ repertoire (the highest). While I could elaborate at length at what was overlooked or marginalized in this route to the development of musicianship, I cannot but applaud its efficacy vis-à-vis specific skill areas (mastery of an instrument and a proficient level of music literacy) and I feel privileged to have been a beneficiary of such. The downside was that taking that route was a choice that precluded participation in vocal music education (or in ‘Fine Arts’ or ‘Drama’).¹²¹

Simon Frith makes a pertinent point regarding the voice as musical instrument, that it is —particularly expressive of the body; it gives the listener access to it without mediation” (1996: 191). This is for the obvious reason that we all have voices and have used them

¹²⁰ To my knowledge, neurocognitive research has not revealed whether the words and melodic characteristics of songs are stored separately in memory or in some integrated form (Mithen 2005: 53).

¹²¹ The biggest drawback of this for my musicianship was that while I became a proficient reader in the sense that I could accurately play written music on my instrument, I never developed genuine musical literacy where I could internally ‘hear’ what was written as I can with written words. I only later discovered that the only viable route to such a capacity is the voice, as Kodály well understood.

expressively even if we have shied away from publically using them as musical instruments.

The voice *is* the sound of the body in a direct sense. Certain physical experiences, particularly extreme feelings, are given vocal sounds beyond our conscious control – the sounds of pain, lust, ecstasy, fear, what one might call inarticulate articulacy: the sounds, for example, of tears and laughter; the sounds made by soul singers around and between their notes, vocal noises that seem expressive of their deepest feelings because we hear them as if they've escaped from a body that the mind – language – can no longer control. (192)

Frith also emphasizes the importance of the voice in conveying one's sense of personal identity and in evaluating the bona fides of others.

The voice ... may or may not be a key to someone's identity, but it is certainly a key to the ways in which we change identities, pretend to be something we're not, deceive people, lie. We use the voice, that is, not just to assess a person, but also, even more systematically, to assess that person's sincerity: the voice and how it is used (as well as words and how they are used) become a measure of someone's truthfulness.. (197)

And, of course, the voice reveals how one relates to and feels about the content of what is being spoken or sung, a point that Sparshott takes up.

The difference between saying and singing is like the difference between saying and whispering or shouting, only much more subtle. It [singing] conveys what you feel or want others to feel about what you are saying, your attitude to it (or the attitude you wish to evoke to it), or how you want it to be taken (ironically, quizzically, seriously); it is an elaborate form of using a special tone of voice.

The music of song, then conveys not so much what the text means as what one means by the text or the way one means it. It does not say this, but shows it; and the word conventionally used for this kind of showing is —~~x~~pression.” (1982: 85)

Hip Hop: a way forward for integrated arts education?

I am confident that if Dalcroze and Orff (another proponent of Eurhythmics) were alive today, they would be thrilled by the extent to which the principles and methods they espoused have been superlatively actualized in contemporary popular performance genres. Two groups jump to mind in this regard: *Barbatuques*,¹²² a group from Brazil whose music is almost entirely comprised of body and mouth percussion; and *Stomp*,¹²³ the well-known British ensemble which combines percussion, movement and visual drama involving items not generally considered for their musical potential, for example: dustbin lids, match boxes, basketballs, kitchen utensils and Zippo lighters. Both of these provide paradigms of musical praxis that can be and are beginning to be realized in music education programs. What Dalcroze and Orff would also take heart in is the growing popularity of drum circles wherein participants not only acquire skill and confidence in making music collectively and more refined kinesthesia, but engage in what most agree to be a flow experience that is unexcelled. Note should also be made of

¹²² See Barbatuques online at <http://br.barbatuques.com.br/>

¹²³ See <http://www.stomponline.com/>

the Street-Carnival groups that have for long been popular in Latin American countries and in Cape Town, South Africa and that are on the increase in the U.K. where it has been recognized for its educative and social values and where Community Arts Education has become a university offering.¹²⁴ Where Dalcroze and Orff would lose heart is in the failure of music educators to bring these genres into their classrooms in any significant, hands-on way.

There are several dimensions to options such as these that make them viable and valuable in music education contexts. The most practical of these is that they afford opportunities for quality music education without the need for special facilities and technologies. But more important are the ways in which they involve students musically that do not require much if any theoretical understanding of music or skill in reading and writing it, but which nonetheless produce remarkable, conspicuously kinesthetic and highly engaging results. Indeed, it is in performance genres such as Barbatuques and Stomp exemplify that students can most accessibly experience music and art as praxis. It seems that the need for such praxial engagements is widely felt and is not adequately being provided for curricularly. Indeed, where I most encounter real musical praxis, as Regelski portrays it, is in the artistic lives of young adults who in more cases than not have had little if any formal training in music and other arts or, if they have, they derived little from it that feeds into their creative outputs. Indeed, the cultural movement wherein one can find the greatest concentration of such ‘reflective practitioners’ is Hip-Hop. And while one can distinguish each of its ‘elements’ as an ‘independent form of situated thinking and knowing’, every practitioner, whether an Emcee (performance poet), DJ (turntable-ist), Beat-boxer (vocal percussionist), B-boyer (breakdancer), or Graf artist (spray-paint artist), is intimately *au fait* with all elements as well as the ways they integrate and call upon common understandings and principles.

Hip-Hop and the performance genres discussed above also share what might be generalized as a counter-culture ethos that make them appropriate arenas for critical engagement with sociocultural statuses quo including those that dominate popular culture and the mass media. In various ways, Hip-Hop practices and productions can be considered as *gestures of deconstruction* in that they call into question the assumptions and beliefs that underpin and legitimize institutional forms of knowledge.

Deconstruction involves a passion for transgression. It is a call for heterogeneity, attempting to unsettle the comfortable assurances with which we surround ourselves. It is not a rejection of all that has gone before. Rather, it seeks to respect and in some ways conserve, while simultaneously demonstrating that present modes of thinking should not set absolute limits on the exercise of critical thought and practice. (Higgins 2007: 75)

Such gestures of deconstruction can even be directed inward to challenge developments within Hip-Hop culture such as Gangsta Rap with its seeming validation of criminality, violence, sexism, and misogyny (not to mention its profanity). Obvious targets are the ‘blingrappers’ with their heavy accent on gaudy materialism, opulent jewelry (bling) and sexual predation. South African Emcee, Creamy Ewok Baggends takes them on in one of his rhymes.

¹²⁴ Lee Higgins from the Liverpool Institute for Performing Arts has been instrumental in this regard and I highly recommend his excellent article: “The Impossible Future” (2007).

If ye lookin for the rapper don't look for the bling coz the bling isn't everything / and if ye lookin for the ice [diamonds] ye need to look twice coz the ice isn't why I'm shinin / If ye lookin for that crook-look / shoot-for-the-loot-look / pullin-out-a-checkbook-look too-cute-look / the video-flow with the gold gets sold to the weak-heart no-soul shoppin in the window / Oh no ye lookin at the wrong bro Yo! / *I be he*, the white Afro / *who you see* be the real one / not a gold tooth but a golden tongue / These Gangsta actors only in it for a minute; they just plastic wrappers in a minute they'll be finished / but with my super powers I can last for hours / I got the prowess on the mic spitting lyrical showers... (Baggends 2007)

Emceeing (MCing)

Having alluded to this Hip-Hop element above, let us consider further the art of emceeing as a form of situated knowing and thinking-in-action. Taken to mean either 'Master of Ceremonies' or 'Microphone Controller' ('MicChecka'), an MC (emcee) is essentially a performance poet. What he has to say is important, but no more so than how he is saying it, almost always against a strongly rhythmic groove provided by live musicians, programmed backing tracks or a combination of the two. Good rhyming is paramount but so also is the rhythmic placement of rhyming words and repeated consonants (alliteration) and vowel sounds (assonance). The best MCs, like good jazz instrumentalists, employ irregular phrase lengths and off-beat accentuation while maintaining an overall formal structure that jibes with that of the accompanying music (which is more than often grooves based on 4 bar phrases or multiples thereof). The extent to which the words combine into coherent discourses varies, but there always needs to be a clear sense of conceptual or thematic continuity as well as a creative use of metaphor, allusion, hyperbole and idiom. Coherence is also influenced by the extent to which the emcee is improvising (extemporising), what in Hip Hop terms is called 'freestyling'. Emcees put their freestyling skills to the test in 'Emcee battles' where they compete in rounds against randomly selected opponents. After a flip of a coin to see who goes first, one contestant is given a topic, theme or role and a fixed time, generally no more than a minute, to extemporize a rhyme that the opposing contestant has to respond to in the same amount of time.¹²⁵

Prosody: the musicality of language

In Chapter Two, I discussed non-verbal communication and, citing Mithen (2005), distinguished language from music on the basis that, while both are emotionally manipulative, language is also referential, predominantly so. What well could have been a strong impetus to the cultural evolution of musicking was the increasing degree to which language became referential as lexicons and grammars evolved allowing for more precise delineation of the content of what was being communicated. The proto-language communication capacity Mithen describes as HMMMM became less *holistic*, less *mult-modal*, and less emotionally *manipulative* as it became less and less *musical*.

¹²⁵ For a clearer picture of how this works rent the DVD or video of the 2002 film 'Eight Mile' starring Emcee 'Eminem'

In short, *content* came to supersede *form* as to what is most important in communication; and it is not difficult to understand why this happened, but this does not imply that form ceased to have crucial importance in the communicative act. The ability to share precise, reliable information about matters of importance was a boon to the survival and reproductive prospects of our ancestors for reasons that are obvious and have been discussed at various points in this dissertation. Such ability is probably more crucial in 2011 environments. Nonetheless, the nondiscursive elements of communication remain as vital and people are as much concerned (if not more so) with what others feel about what they (self and other) are saying and with what a speaker/author means by her words as we are with the words themselves.

Here I am making use of Sparshott's remark above about the difference between talking and singing. Again it seems clear that we are dealing with what is a quantitative, not qualitative difference. The prosodic elements in one's verbal exchanges (as well as one's body language and use of gesture) remain vital even where one's intention is the explicit communication of emotionally dry information. What Sparshott says of "the music of song" applies as much to the prosody of verbal discourse; it "conveys not so much what the text means as what one means by the text or the way one means it. It does not say this, but shows it; and the word conventionally used for this kind of showing is "expression." Song is often thought of as "enhanced/heightened language", but just as logically it can be considered enhanced/heightened music, and when we conceive it thusly, its value in general education becomes more apparent. It is in the multidimensional nature of musicking that Elliott finds its greatest value. The increase in multidimensionality is manifold when words are added to the mix.

Has music become too much a „pitch game“?

Prosodic capacity is not actively developed in schooling as far as I am aware and it can effectively be developed in ways that bring students to a deeper and more praxial understanding of music and its schemes for "making meaningful" through the temporal, tonal and timbral manipulation of sound. What is arguably a confounding factor in music education is the extent to which competence in handling pitch related demands have become dominant concerns, as they must be if the orientation of music education is toward the development of instrumental and choral ensembles capable of rendering music that is demanding in these ways. I do not for a moment question the value of developing the kinds of performance craft this calls for. What concerns me is the extent to which teaching for such development should be prioritized in general music education.

The myriad of ways in which western "art music" has explored and exploited tonal and harmonic possibilities is perhaps what most marks it as an extraordinary artistic achievement making possible aural experiences that are distinctive in how they manipulate and "play" with innate predispositions for particular pitch combinations and the tacit expectations they excite. The schemes of "common practice" music theory are found in popular genres the world over and have been developed and extended in a plethora of exciting ways by jazz improvisers, composers and arrangers giving rise, all of which have been codified in the complex and challenging field of Jazz Harmony. This is all well and good, but it has greatly upped the stakes regarding what counts as competence in jazz and has demanded a substantially increased allocation of curricular

time to its mastery, perhaps to the disadvantage of other dimensions of musicianship and artistry that are also important.

Two left feet!

One startling revelation that has come out of my work with students in Music Education has been a seeming ineptness on the part of many jazz students when attempting even some of the most basic eurhythmic activities I introduce them to, for example, stone-passing games that primary school children seem to handle with relative ease. These jazz students obviously are possessed of a fair measure of kinesthetic intelligence but it has been exercised in very specific ways as demanded by their craft and become a kind of *'dedicated kinesthesia'* as opposed to the holistic and integrated kinesthesia of a dancer. This is ultimately a limiting factor in their acquisition of multi-metric competence, even the ability to *'swing'* convincingly, a point well grasped by jazz educators like Peter Burman of the Academy of Music and Drama in Gothenburg, Sweden, who requires students to assiduously practice eurhythmic exercises that he gives them designed to develop multi-metrics as a whole-body experience.

I have already had much to say regarding my eurhythmic orientation and my holding up of kinesthesia as the capacity most fundamental to musicking as it is to physical well-being and psychomotor functioning. I have also argued that it was the kinesthetic demands of musicking (including dancing) that established such activity as something we are innately predisposed to. We are also predisposed to sounds of determinate pitch and to the proprioceptive effects of combining them, simultaneously and in sequences. But, I would argue, this dimension of musicianship is nowhere near as acute in our innate endowment as is our rhythmic sense; and I would argue further that the kind of pitch sense and comprehension that has come to be regarded as fundamental to meaningful musicking poses a challenge to many students that ultimately does not make worthwhile the effort and they tend to put aside any notions of ever being active musicians. Where the paradigm is education *through* music (as opposed to *in* or *for* it), it seems logical that there should be a stronger focus on the musical capacities that are more natural, organic and generic to our non-musical engagements.

Notwithstanding my sentiments in this regard, I am strong in the conviction that most children are capable of developing accurate pitch as well as relative pitch sense to levels that afford a greatly expanded range of musical involvements and satisfactions that are worthy of development. Kodály and his followers have provided ample evidence that this is the case and have come up with methods of achieving it with comparable ease provided that the process is started early enough.

I have already alluded to a condition that is endemic in instrumental music education programs such as I went through in my schooling, where high levels of performance and literacy skill are developed but without the relative pitch capacity that allows one to hear and understand pitch sequences and combinations internally. In this regard, I can frankly say that my level of relative pitch sense at the conclusion of my BMus studies should have precluded my being awarded the degree. It was only after coming to Africa and encountering the widespread use of Curwen's tonic-sol-fa (relative sol-fa with a moveable do) that I began to understand and appreciate what had been sorely lacking in my personal music education. This prompted a deeper and more serious consideration

of Kodály education which had not featured in any praxial way in my university Music Education courses. Like Dalcroze, Kodály gets but passing mention in Elliott's *Music Matters* with no consideration of what was authentically praxial in the principles and methods they developed. I soon began employing these principles and methods, not only in my teaching but, as importantly, in my personal praxis and with highly rewarding results. The kind of musical literacy I developed through my school and undergraduate years empowered me in not inconsiderable ways, but it was a critically impoverished and mechanistic literacy devoid of the inner pitch processing that now allows me to play *'by ear'* with comparable ease and is a boon to my composing and arranging.

As with our innate kinesthetic capacity, there are good reasons for believing that our distant ancestors were more innately endowed in their pitch acuity and processing capacity. Research has indicated as a strong likelihood that the neural mechanism underpinning *'absolute pitch'* (the ability to identify or reproduce a specific pitch without the benefit of an external reference) is one we are all born with but which remains functional for as few as one in ten thousand (Conner 2001).¹²⁶ Perhaps this was an ontogenetic trade-off that came with the evolution of our language capacity, where the ability to register pitch in this way became less and less of importance communication-wise. That it could be an attribute that is atrophying and being selected out seems entirely plausible in light of what Gene-Culture Coevolution Theory has revealed about culture as a selection pressure that can bring about changes in the genome with relative swiftness (as discussed in Chapter Three). This is speculative of course, but the research in question has also indicated that there is a significantly higher level of retention among children who begin learning a musical instrument early in life, as there also appears to be among people who speak *'tonal languages'* such as most dialects of Chinese or Vietnamese, where lexical meaning depends heavily on pitch variation across single words. The pertinent question is whether *'absolute pitch'* is a capacity that we should be concerned with helping children retain or regain through one or another of the practice regimes that are thought to achieve this. I certainly do not think so and would suggest that it makes difficult the acquisition of relative pitch which is of far greater value to music praxis generally.

More on the development of communicative capacity through music education

Most of my teaching experience as a music educator and music educationist has been with students for whom English is their second or third language and many if not most have been less than proficient in its use. And for many of these, what has been even more debilitating to their education is a deficient *common underlying proficiency* (CUP). This capacity was conceptualized by Cummins (2001) who believes that in learning a first language, children need to acquire an implicit metalinguistic knowledge and corresponding skill base if they are ever to be linguistically competent in another language and capable of different modes of cognition. In the ways in which so many of my university students have been taught both their mother tongue and their second or third languages, insufficient attention has been given to the development of CUP and the

¹²⁶ Conner reports on the research of Jenny Saffran, director of the Infant Learning Laboratory at the University of Wisconsin-Madison.

result of this presents what is the most formidable challenge to tertiary level teachers like myself who are expected to turn out students facile in propositional thought and higher order cognitive processes (analysis, synthesis, dialectical reasoning, and critical evaluation), processes that are dominantly language mediated.

In such situations, it seems appropriate to insist that the art that should be placed center-stage educationally is *word art*. Even where the teaching/learning medium is one's first language, performative skill in word art should be a curricular priority given the broad scope of what it is efficacious in developing and what it offers as a point of intersection where different artistic domains can be integrated in ways that can profoundly impact educational success in *non-artistic* domains (where cognition is predominantly language mediated). My use of inverted commas here is occasioned by the belief that such interdisciplinary activity cultivates a predisposition that is *aesthetic* in an enlarged sense of the word consistent with an epistemology that will be explored a bit further along and shown to be Darwinian in key respects. Where it characterizes one's awareness of the interconnectedness and interdependency of everything that can be experienced, learned and imagined, there are no cognitive domains wherein the aesthetic sense is not playing a key role. Gregory Bateson's entreaty to western education with its compartmentalization of learning domains is apropos: *"Break the pattern which connects the items of learning and you necessarily destroy all quality"* (1979 – online source).

Bateson's statement can be taken as a *regulatory ideal* in Hip-Hop philosophy. I have had the good fortune of being able, my age notwithstanding, to get to a meaningful degree on the inside of Hip-Hop culture, in particular the performance poetry of emcees and *slam* artists.¹²⁷ In my home city of Durban, there has been for some years now a frequently organized Hip-Hop event which originally went under the name *"Bling Free,"* later to become *"Life Check"*¹²⁸, in which competitions are staged in all four of Hip-Hop's *elements*: Emceeing, DJing, Graf Art, and Breakdancing. The levels of skill and creativity demonstrated are formidable in all, but what both elates and intrigues me the most is the level of verbal expressiveness and poignancy of content achieved by young kids from Durban's townships who most certainly cannot attribute their *emcee chops* to anything they learned at school, and many of whom are putting it out in a second language. They have found and been swept up by an expressive form in which they are able to *"manifest a relatedness"* (Chernoff 1979) as well as define an identity. For sure, status is a primary motivator, but they are nevertheless engaged in a real praxis of *"thinking-in-action"* that develops, refines and deepens their ability to use language optimally (their profanities notwithstanding), to use metaphor, hyperbole, alliteration, rhyming, allusion, punning, and *wit* generally. But such verbal and conceptual cleverness fails to convince if in its execution there is a lack of the *flow* that everyone is intuitively able to apprehend or sense the lack of, because it is intrinsically kinesthetic. At Life Check events, while competitions are being held or set up for at their various venues, there is invariably one or more *cyphers* going on outside. These are spontaneously formed circles where those wanting to test their

¹²⁷ These are poets who perform their creations in competitions called poetry slams, an event that shares some key features with the emcee battles mentioned above. A quick overview of how they typically work is given in the Wiki-article *"Poetry Slam."*

¹²⁸ http://www.lifecheckydi.com/?page_id=2

rhyming mettle take turns apping while others provide a backing mostly by beat-boxing, using vocal effects to replicate a kit drum putting down a beat. B-boying (breakdancing) can also go on in cyphers.

Thinking outside the box

My purpose in highlighting word art and songstership has not been to downplay the important value of engaging with music that is minimally mediated by referential, symbol-based cognition, this being the point of departure for a discussion to follow a bit further on. Part of my purpose has been to challenge the insularity of music education as is seemingly endorsed by music education philosophers like Elliott. And I have also attempted to highlight the incongruence of the inattention to verbal expressiveness in education when popular culture offers such obvious and useful paradigms. When I consider the majority of students I have worked with over my years of teaching in South African universities, it has been in those students who are praxially engaged in interdisciplinary pursuits extra-curricularly (or elsewhere in their studies) that shine brightest. My second and third level Music Education modules are electives for other majors and I have been lucky over the years to have had several students from the university's Drama and Performance Studies program who have almost invariably manifested a much higher level of interdisciplinary ness and critical consciousness compared to my Music majors who are conspicuously limited in this regard and not generally comfortable with having to [think outside the box](#).

I cannot help recalling here what Christopher Small (1998) has observed as common among rank-and-file symphony orchestra instrumentalists and how he calls into question the kind of praxis it informs, a kind of praxis that I fear is endemic in university music programs that are too insular and fixated on musical training at the expense of musical education and which show too little concern with how student's musical lives are connecting up with what is going on outside the program and in their extracurricular lives generally. The excerpts that follow are apropos.

The musical skills that are required of a professional orchestral musician are without question of a high order ... At the same time those skills are very specialized and fall within a limited range, consisting of technical dexterity, the ability to sight-read and to respond rapidly to the notations and to the conductor's gestures, as well as those of attuning one's playing to that of the ensemble. Skills that are prized in other traditions, such as those of improvising and memorizing, are of little use to orchestral musicians and tend to atrophy; naturally they form no part of their training. (69-70)

The last sentence is pertinent in relation to what I have observed as trends and tendencies in the relative strengths and weaknesses of the students that have gone through my Music Education courses. Improvisation features prominently in my Music Education modules and it is not surprising those of my students who are from the Jazz Studies program take to it more readily. And yet they can be remarkably limited when moved out of the comfort zones defined by their particular skill bases and are generally weaker when it comes to making extra-musical associations than are students from one of the classical streams, who tend to come from more privileged educational backgrounds and who are more widely read. What can be said of the way they differ is in the kinds of connections or conditions of relatedness they are disposed to apprehend based on what they have learned, those that stay within the strictly musical sphere and

those that are disposed to link the musical to the extra-musical. Many of our jazz students who are the most accomplished in what they can do as improvising musicians find themselves almost totally out of their depth in courses that move beyond the notes and structures of music to their historical and ideological contexts, an engagement with music that assumes a level of general knowledge (history, geography, literature) and language-mediated understanding that they have never been adequately assisted in acquiring.

That there needs to be such a strong focus on the development of performative chops is because the bar has been set so high by the virtuosi - the ‘stars’ - who students want to emulate and whose performances they can experience again and again on recordings. Some of our opera students are uncanny in how thoroughly they have developed their vocal apparatus and how closely they can approximate operatic virtuosi. But in many ways they seem little more than just proficient mimics, not unlike the Australian Lyrebird I referred to in Chapter Three who open their bills and issue what would be indistinguishable from a recording of the sound complexes that they have copied from their soundscapes: other bird calls, camera sounds and the cacophony of sounds produced by ‘foresters’ with their axes and chain saws. And because learning is predominantly by rote (through repeated listening to recordings), this necessitated by poor music literacy skills, their repertoire tends to be limited.

Let us consider another generalization that Small reached based on his experience of orchestral players. Although Small senses that “they do feel themselves generally to be heirs and guardians of a great tradition,” he finds that most “do not investigate their feelings about this very deeply.”

In my experience it is difficult to get them to talk about the art they practice with such skill. ... They resemble, in fact, the members of any other occupational group in that they will engage in any amount of shop talk, gossip, and locker-room humor. But rarely do they question the nature of the relationships within which they work. That certain kinds of relationships within the band are necessary for the performance of the music is an article of faith and scarcely discussed. This is due not to any deficiency in intelligence but to the fact that the training they received in music college or conservatory, like all professional training whether medical, legal, academic, military, or whatever, has been directed as much toward the acceptance of the profession’s assumptions and the maintenance of its esprit de corps as it has been toward the acquisition of the skills that are necessary to practice it, and like most professionals in any field whatsoever, most orchestral musicians have come to accept those assumptions unquestioningly. In general their attitude is more that of the craftsman than that of the autonomous artist. (67-68)

Music education as aesthetic education: developing responsiveness to „the pattern which connects’

In Chapter Two I described the evolution of linguistic capacity as a ‘double-edge sword’ and cited Graves’ “The Cool Web” to more cogently make the point that language acquisition engenders a consciousness “so greedy in its neurocognitive demands that it dulls us to - and impedes the direct apprehension of - qualities that are informationally rich and significant, or that at least ‘make special’ experience unmediated by language.” Music without words or choreography is the least mediated means of communication, where there is no clear referential meaning to disturb or

distort the direct apprehension of sonically embodied salience, which is not cognized consciously but intuited directly; it is felt. The fact that it does not engage language-mediated, conscious thought is taken to mean that it is not a cognitive experience. But this is anything but true when cognition is understood in the broader sense with which it has been employed in this dissertation, referring to any neural processing that has potential for behavioral expression, and remembering that such processing is computational in nature and algorithmic in essence. There is a great deal of neural reorganization going on, the importance and value of which is not well understood and needs to be. In this regard, I have argued for Tooby and Cosmides' hypothesis (2001a) on the adaptive value of aesthetic experience, suggesting it to be a strong theoretical support for Langer's (1953) philosophy of art as a means of educating' intuition, for modifying the tacit interpretive schemata' through which we perceive and make sense of the worlds we inhabit.

Looking to the East

Together, these theories present a compelling neuro-cognitive reason for undergoing, as often as possible, experiences that are dominantly if not purely aesthetic', ineffable, feelingful experiences wherein content' and context' are pretty much kept out of the picture. This is an ideal kind of experience that I genuinely believe to be beneficial precisely for the reasons these theories suggest, in sum, what it achieves neuro-cognitively that I intuitively sense to be life-enhancing or at least conducive to more positive, satisfying, and healthy emotional states. I have very much the same belief about transcendental meditation and regard the disinterested', aesthetic attitude I aspire to in particular listening scenarios as eminently meditative and at the same time edifying and occasionally illuminating. This is a belief entirely consonant with key Hindu and Buddhist precepts and the aesthetics they inform, a point which I have explored in some depth elsewhere (Robinson 1988). What I wrote over two decades ago has acquired greater poignancy for me when now considered from a Darwinian perspective and it is worth reconsidering some of my key points in this light.

Informing certain Eastern musical traditions is what I termed a *cosmological aesthetic of music* because of their common belief that there is ~~a~~ correlation between the tonal and temporal relationships of music and the patterns [essential forms, algorithms] that underpin reality but which cannot be consciously apprehended. ~~In~~ cosmological theory," according to Danielou (1996):

[T]he starting point of every form of being is harmony, a relation which is multiplied in more and more complex forms. When we recreate harmonies we rediscover the basic equations which are at the origin of the forms of being, where thought, sensation and form have not yet become separated. These are the patterns, the harmonies which, on the level of form, will constitute beauty, in the realm of feeling, emotion, and in the sphere of the mind, thought. (18)

As does Langer in her tonal analogue' theory, Danielou suggests that the significance of music, according to this cosmological aesthetic, is unrelated to anything contextual or informational in a discursive sense, but lies in what it *recreates*. For Langer what music recreates is ~~the~~ pattern, or logical form, of sentience" (1953: 27); in the cosmological aesthetic it is the harmonies' that connect all that exists and that are given forms that are isomorphic or homologous in some significant way. In both cases, what is called for

is —the immediate, intuitive apprehension of sound patterns through the adoption of a contemplative, learned yet ‘disinterested’ attitude” and in both cases, arguably, the goal is —inner realization on a level where the different states of being are not differentiated, where we become aware that form and matter, emotion and intellect, pleasure and joy are but expressions of the same codes manifested on various levels,¹²⁹ where one approaches —the state of perfection ... where being, perception and joy (*sat-cit-ananda*) form an indivisible whole” (Danielou 1976: 22).

The Hindu cosmology of which Danielou speaks holds to the belief that the seemingly infinite range and variety of phenomena are reducible to a limited set of relationships, each with a ‘genetic code’ (informational kernel) that can find expression variously. They are believed to be instantiated in the musical patterns built up by accomplished instrumentalists out of established tonal and temporal systems, the ragas on which Gandharva Veda music is based. According to Ayurvedic tradition, ancient Vedic sages or rishis worked out the realization of these codes musically, and when experienced at appropriate times of day, these ragas can induce a beneficial homeostatic state, a ‘balancing of the doshas’ – the metabolic processes that inform one’s state of mind and sense of wellbeing (Chopra 1990: 154-158). In Chapter Two I argued that we are genetically predisposed to tonality and harmonic consonance as we also are for rhythmic periodicity and metrical organization and there seems little doubt that particular schemes are going to resonate more successfully with inbuilt expectations and predilections.

That the Vedic sages may indeed have been on to something seems entirely plausible in light of some of the theories of mind that have been discussed in this dissertation. What evolutionary psychologists and cognitive neuroscientists would necessarily seek clarity on are the cognitive mechanisms involved and why natural selection would have equipped us with such. Here we should recall Imberty’s explication of ‘post-Chomskian cognitivism’ and its refutation of Behaviorism’s position that a ‘subject’s response to a stimulus is a reaction determined by the nature of the stimulus.” The cognitivist position is that there can be no response without “the triggering of an adapted program,

a response to an internal perturbation of a competence system that is provoked by *information in a format that does not conform to the system*. The program’s effect is to render the object consistent with its own characteristics and to modify atypical variables: thus, it is not the traits of the object that provoke the subject’s response, but rather the mere fact that it is not consistent with the competence system. (2000: 452)

At root, learning is this process of ‘rendering consistent’ (what Piaget termed ‘accommodation’).¹²⁹ But learning cannot take place when there is *nothing* in the presented information or how it is formatted that conforms to what is in the system. There must be some kind of pattern or relationship that one ‘connects’ with because it is isomorphic or homologous with what is already inscribed neurally, either by one’s genes or through learning. Moreover, the level of nonconformity may be slight. Stimuli

¹²⁹ This is not a process exclusive to human brains. The weaver birds that nest in my garden are genetically equipped with an inbuilt ‘competence system’ for the construction of their intricately woven nests, but the weaving and knot-tying abilities needed to build a nest that will pass muster with a potential mate require fine-tuning through trial-and-error drawing upon knowledge imprinted while still chicks regarding appropriate nesting sites and available materials.

can be contrived whose characteristics – the patterns and forms they present – *are* consistent with one or another competence system or complex of systems. This I would argue is what artists accomplish. The levels to which the stimuli they contrive (the art they produce) are consistent with existing competence systems depend on the artist's aesthetic intentions (witting or unwitting). Some art is created to be deliberately *inconsistent* in ways that challenge the perceiver and that even subvert innate and/or conditioned expectations. But there is also art that attempts to be optimally consistent with what is neurally inscribed and which with varying degrees of success induce homeostatic neural states, perhaps through some form of entrainment, a synchronizing of disparate neural activations in the brain. This kind of *'tuning in'* or *'harmonization'* of neural activity brings proprioception to the fore while conscious thought processing recedes and perhaps even ceases for a while. We are thus afforded an experience however transient where we *–apprehend* the point of intersection of the timeless with time." I have quoted here from the third of T. S. Eliot's *Four Quartets* (1943), poetic words that are clearly consonant with that perfect state Danielou describes, where *–being, perception and joy (sat-cit-ananda) form an indivisible whole.*" It is a *here-and-now* experience that is almost always fleeting but which is more effortlessly sustained when what is being presented to perception, a raga for example, induces the afore-mentioned entrainment and the music is *–heard* so deeply that it is not heard at all" and you actually *–are* the music while the music lasts."

Men's curiosity searches past and future
And clings to that dimension. But to apprehend
The point of intersection of the timeless
With time, is an occupation for the saint—
No occupation either, but something given
And taken, in a lifetime's death in love,
Ardour and selflessness and self-surrender.
For most of us, there is only the unattended
Moment, the moment in and out of time,
The distraction fit, lost in a shaft of sunlight,
The wild thyme unseen, or the winter lightning
Or the waterfall, or music heard so deeply
That it is not heard at all, but you are the music
While the music lasts. These are only hints and guesses,
Hints followed by guesses; and the rest
Is prayer, observance, discipline, thought and action.
The hint half guessed, the gift half understood, is Incarnation.
Here the impossible union
Of spheres of existence is actual,
Here the past and future
Are conquered, and reconciled ...

(from *–The Dry Salvages*¹³⁰,” No. 3 of *Four Quartets*)

There is in Eliot's verse the clear suggestion that such glimpses of *'Incarnation'* are esoteric, available only to an initiated few and perhaps only realized through *'a lifetime's death in love, ardour and selflessness and self-surrender'*. So why bother

¹³⁰ available online at <http://www.tristan.icom43.net/quartets/salvages.html> (12 January 2011)

getting into such esoteria in a dissertation concerned with the education of the rank-and-file of humanity? It may well be that such rarefied experiences are beyond the ken of most, that they require competence systems quantitatively more efficacious and rare. Even if they are not, does this make them worth the prayer, observance, discipline, thought and action they seem to demand? What this might be seen to come down to is a question of the value that one ascribes to experiences and states alluded to with nouns such as awe, veneration, exaltation, flow and ecstasy, and with adjectives like sublime, profound, peak and transcendent. In formal education, there seems but a modicum of concern with whether or not students acquire the capacities and dispositions for such experiences.

Again I return to what is perhaps now less outrageous an assertion, that education's purpose is to make us more successful in our pleasure-seeking pursuits. This can be easily misread to mean nothing more than that we should come get to experience pleasure more frequently, but it is really about the kinds of pleasure, satisfaction or gratification one is after. An experience has no significant developmental value if the pleasure it affords is merely the short-lived satisfaction of a base need (one of the Four Fs). Such satisfactions are important and students should be helped to understand such needs and appetites for what they are, evolved adaptations common to us all and to which we are all in various ways and degrees beholden. Understanding our genetic imperatives is an important step toward the transcendence of them. Enabling and guiding this transcendence is what I have argued to be the *raison d'être* of education. This, as Maslow well understood, requires that higher-order needs supplant lower-order ones as motivators of interest and effort. Educational success in this view is less about what one has learned as it is about what motivates one in one's pursuits; and educational progress is most saliently marked by the kinds of pleasures or satisfactions that are evinced in student's activities and what psychosocial needs are accordingly being gratified.

Buddhist praxis?

What needs to be pursued further here is what the preceding discussion suggests as a kind of praxis that deserves further consideration because of its potential educational value. I have repeatedly argued that what is now needed more urgently than ever is a world citizenry of critically aware and ecologically committed individuals. And I have attempted to develop an understanding of critical consciousness that takes account of the capacities, aptitudes, and predispositions that constitute our evolved, universal nature. What I perhaps have not emphasized enough is the importance of *self-knowledge*. What is meant by this becomes a more complex and challenging question when one understands that self and consciousness are illusions. In light of what we have come to understand about the adapted mind as a massively parallel computational system without any central control unit, self-knowledge becomes something of an oxymoronic concept; what is *it* that the knowledge is of and who is it that acquires or constructs such knowledge? These are not intractable problems, but it perhaps might be better to use Gardiner's formulation – *intrapersonal intelligence* – even if I am not convinced by key assertions of his Multiple Intelligences theory as I intimated in Chapter Two. When we consider the more specific traits that characterize intrapersonal intelligence, its importance to critical consciousness becomes more apparent. People who are strong in intrapersonal intelligence are able to reflect dispassionately and

honestly on *what they are* and what is at play internally that gives rise to their sense of self and the psychosocial states that attend it. They are able and inclined to more deeply and realistically analyze their strengths and weaknesses as well as the motivations and feelings that cause them to think and act in the ways that they do. This assists them in establishing goals and gives breadth and objectivity to their consideration of ideas, theories, and beliefs. Such intrapersonal intelligence is characteristic of self-actualizers who Maslow typified as being resistant to enculturation and confident in the transcendence of any particular culture. For the self-actualizer *‘my culture’* is what the individual has constructed for her/himself, not an ideational preset that has constructed her.

With intrapersonal intelligence, as with any aptitude or capacity, people vary quantitatively in terms of how they have been endowed genetically; but how their potential unfolds and becomes productively functional is critically dependent on what opportunities are afforded them in life. Taking intrapersonal intelligence to the level of *‘inner realization’* or *‘enlightenment’* is the goal of Buddhists and the path that leads to enlightenment is one that anyone can take but on which little progress can be expected if certain understandings are not internally realized and if one does not engage in practices (*‘dharma practice’*) that assist the cessation of craving and clinging that keeps us stuck in our ways and modes of thought. Buddhism shares with Hinduism the belief that human suffering (*dukkha*) is a symptom of an inability to stop clinging to what is ultimately transitory and illusory, in particular one’s notion of self. The opposite of *dukkha* is *nirvana*, the ineffable and ultimate reality which lies beyond the illusory world of phenomena and which can only be realized through meditation, yoga and other forms of dharma practice.¹³¹ Such practices must become constants in one’s life praxis such that the *‘glimpses of Incarnation’* they afford come to inform one’s thoughts and perceptions in day to day life.

We may recall from the last chapter Blackmore’s position regarding the liberating effect that comes with a realization that self and consciousness are illusions built up of memes and memplexes. It did not come as any surprise to discover that Blackmore is a practicing Buddhist and has been one for over two decades. In a 2006 *Point of Inquiry*¹³² interview, she speaks to the compatibility of a scientific understanding of how brains create minds with the Buddhist doctrine of *anatta* or *‘no self’*, which is:

that there is nobody in there; there is just stuff happening; everything is caused by something else and things just happen. ... The idea of a self is recreated every moment as soon as you think of yourself as a self ... Oh, there it is; and then it kind of goes away and ... Oh, there it is again. There is not a continuing self. That is what comes out of both

¹³¹ In his influential novel *Siddhartha*, Hermanne Hesse (1957: 110-111) tells of the young Buddha’s self-realization through meditation on the bank of a river. —When Siddhartha listened attentively to this river, to this song of a thousand voices; when he did not listen to the sorrow or laughter, when he did not bind his soul to any one particular voice and absorb it in his Self, but heard them all, the whole, the unity; then the great song of a thousand voices consisted of one word: Om - perfection ... From that hour Siddhartha ceased to fight against his destiny. There shone in his face the serenity of knowledge, of one who is no longer confronted with conflict of desires, who has found salvation, who is in harmony with the stream of events, with the stream of life, full of sympathy and compassion, surrendering himself to the stream, belonging to the unity of all things.”

¹³² <http://www.pointofinquiry.org/>

Buddhism and science and ... that is one of the main reasons why I find both of them helping the other. (Blackmore 2006)

In *The Meme Machine* (1999), Blackmore tells of a famous speech in which the Buddha, Siddhartha Gautama, told his followers “actions do exist, and also their consequences, but the person that acts does not.”

He taught that because we have the wrong idea about our self, we think that we will be happy if we gain more material things, or status or power. In fact it is wanting some things and being averse to others that makes us unhappy. If only we could realize our true nature then we would be free of suffering because we would know there is no ‘me’ to suffer. (230)

But is Buddhist praxis something that we should be teaching for in public education? Most definitely, I would argue, even though I am well aware of the kind of resistance that such an idea would likely run up against, mostly based on the erroneous assumption that such praxis demands the adoption of some religious dogma. Blackmore is an atheist and cites as one of her favorite books Stephen Batchelor’s *Buddhism Without Beliefs* (1997) (which as it turns out is also a favorite of mine). In it, Batchelor claims that “the Buddha was not a mystic and his awakening was not a shattering insight into a transcendent Truth that revealed to him the mysteries of God” (5).

[W]hat the Buddha taught was not something to believe in, but something to do. Buddha challenged people to understand the nature of anguish, let go of its origins, realize its cessation and create a certain way of life and awakening. (from cover note)

The Buddha woke up to the nature of the human dilemma and a way to its resolution. The first two truths (anguish and its origins) describe the dilemma, the second two (cessation and the path) its resolution. He awoke to a set of interrelated truths rooted in the immediacy of experience here and now. (6)

I am perhaps not alone as a music education philosopher that sees Buddhist praxis as a sorely needed ‘way forward’ for human kind. —“Who’s Asking? (Who’s Answering?)” is the title of an insightful editorial by Wayne Bowman (2008) introducing an issue of the Mayday Group’s *Action, Criticism, and Theory for Music Education* entitled “Theorizing Social Justice in Music Education.” In it, Bowman offers Buddhism as an alternative way of “imagining just practices and societies.” As to the problem of pinning down what ‘social justice’ actually means, Bowman makes a suggestion that jibes well with what I suggested at the very beginning of this dissertation concerning how we should conceive ‘society.’ In both cases — and the same could be said of ‘culture’ — people tend to commit “fairly basic category mistake” by treating the term as the name of “some kind of *thing*, when it’s more properly conceived of as a kind of process — an ethical process, reliant on our capacities for reflexivity and reciprocity.” Social justice relies on “our abilities to put ourselves in the place of the other.” Bowman points to another grounding idea of Buddhist thought that it shares with the Hindu cosmology described by Danielou as it does with Berry’s ecozoic vision (1996), “the idea of the organic interdependency of all beings” (Bowman 2008: 9). Implicit in Buddhist praxis is a commitment to “honoring and preserving that interdependency” which requires that “all beings be extended the opportunity to live in accord with principles of interdependency.”

At issue here are things like integration, balance, reciprocity, and mutual reliance. The point of departure – the foundational consideration, if you will – is not an individual whose rights and freedoms are sacrosanct and inviolable, but rather the integrity of the bond between self and Other. ... —Being,” on this view, is never simply a question of self-existence: —To be” is necessarily and always —to be in relationship.” The notion of an autonomous, independent self—a frequently pivotal consideration in Western appeals to social justice—is an illusion, a source of sickness, suffering, and worse. From these foundational beliefs it follows that authentic —being” requires that one both contribute to and receive from the whole without which no being exists. This represents quite a contrast to concerns about —self-determination” or —individual agency,” the pillars on which Western theories so often rest. Where selfhood is something to be —gotten over” rather than protected at all costs, the question —What’s in it for me?” takes on decidedly different dimensions. Indeed, to ask what’s-in-it-for-me can only be answered by addressing what’s-in-it-for-others. ... To be selfless is to be Other-full. And to that extent, enlightenment (nirvana) requires full social engagement—an ecologically-oriented attitude of *care*, grounded in awareness that being is always relational, and in the realization that a crucial part of selfhood IS other-hood. (9-10)

That Buddhism and other cosmologies have developed practices providing a path to enlightenment does not mean that they are alone in grasping life’s essential condition of interdependency. It is well captured in the African philosophy of Ubuntu, which I have often heard encapsulated as "I am what I am because of who we all are." Nobel laureate Archbishop Desmond Tutu’s perspective on this is especially salient here.

A person with Ubuntu is open and available to others, affirming of others, does not feel threatened that others are able and good, for he or she has a proper self-assurance that comes from knowing that he or she belongs in a greater whole and is diminished when others are humiliated or diminished, when others are tortured or oppressed. (1999: quoted in [Ubuntu Philosophy](#)” on Wikipedia)

Bowman takes us to what is, or at least should be, the issue that is core, which is fundamental to social justice as authentic praxis as opposed to a philosophy to rationalize and espouse.

The notion of justice is often a rational and calculative one, one that is reasonably (forgive the pun) well suited to certain aims and circumstances. But justice is often not enough, and —doing the right thing” cannot always be assured by the pursuit of —just” solutions. The missing dimension involves such crucial concerns as *empathy, compassion, and care*—concerns that take us well beyond the measured, formulaic, tit-for-tat realm of justice, crucial though that may be. The dimension to which I am alluding here is one that is grounded not so much in obligation to as *unconditional responsibility to and for the other*. ... Social justice is reasoned and reasonable, and to that extent something often argued and pursued at arm’s-length: it requires *care* to —give it legs.” (2008: 11 - my emphases)

I am reminded here of the words of Shelly from his —A Defence of Poetry.”

The great secret of morals is love; or a going out of our nature, and an identification of ourselves with the beautiful which exists in thought, action, or person, not our own. A man, to be greatly good, must imagine intensely and comprehensively; he must put himself in the place of another and of many others; the pains and pleasure of his species must become his own. The great instrument of moral good is the imagination. (1819/1962: 233-234)

What Shelly is inadvertently suggesting is that the core issue pedagogically is *imagination*, for without it, empathy, care, love, compassion and moral good are empty

concepts. In concluding Chapter Two, I tried to get to the root of what imagination is and to explain why it is the most distinguishing and essential characteristic of art. What I see as most salient from that discussion is the understanding that imagination is a fundamental human capacity without which people would not be able to make sense of the world or to learn. But while we all have imaginative capacity, we do not employ it as a matter of course in our relationships with others and, for the most part, we do not use it to break the bonds of the illusions that bind us and prevent us from apprehending “the pattern which connects” (Bateson 1979) and fully realizing that “a crucial part of selfhood IS other-hood” (Bowman 2008: 10). The illusions that bind us are not only those of self, consciousness and free-will but also the ‘selfish memes of our indoctrination’ that Nietzsche alluded to in his 1873 unpublished essay, “On Truth and Lies in a Nonmoral Sense” (“Über Wahrheit und Lüge im außermoralischen Sinn”).

What then is truth? A mobile army of metaphors, metonyms, and anthropomorphisms: in short, a sum of human relations which have been poetically and rhetorically intensified, transferred, and embellished, and which, after long usage, seem to a people to be fixed, canonical, and binding. Truths are illusions which we have forgotten are illusions — they are metaphors that have become worn out and have been drained of sensuous force, coins which have lost their embossing and are now considered as metal and no longer as coins. (quoted in “On Truth and Lies in an Extramoral Sense”: on Wikipedia)

„The pattern which connects’

“The pattern which connects” is the concept that Gregory Bateson advanced in *Mind and Nature: A Necessary Unity* (1979) as a way of bringing into focus the condition of “phylogenetic homology” that is everywhere to be found for eyes, ears and brains that are disposed to find it and, in it, to find deep significance as it reveals the interconnectedness and interdependency that integrates and unifies not only biological life, but *everything*. Here it seems apropos to think back to my discussion in Chapter Three around the question of what information is, where I made use of Pinker’s definition: “a correlation between two things that is produced by a lawful process (as opposed to coming about by sheer chance)” (1997: 65). It is a correspondence that manifests in some kind of organization, a pattern that, potentially at least, can influence the formation of other patterns. Such patterns do not manifest in material things only; they are found in how matter and energy behaves *in time*, for example, in the patterned compression and rarefaction of air molecules that we hear as sound, in the flight of a bird, or in the eddying of currents of water or air. Information inheres in matter and processes but is not ‘fixed’ by them and the same informational patterns can be realized in any number of substrates. The informational correlations are ultimately “mathematical and logical” relationships that can not be “defined in terms of the stuff that the correlated entities are made of” (1997: 65). Here we may recall the example of this *syntactic mutability* that I gave in Chapter Three: the sequence of transductions of a pattern of energy from one medium to another as happens when music is performed, recorded (encoded in an analog or digital form in some physical substrate), decoded and re-encoded in the movements of speaker cones and the sympathetic vibrations of ear drums, and then transduced into electro-chemical data streams in brains that we process into a coherent and meaningful aural experience. Bateson’s definition of ‘aesthetic’ is simple and perfectly consonant with both the Eastern cosmological aesthetic characterized by Danielou and Langer’s thesis of ‘isomorphism’. “By *aesthetic*, Bateson wrote, “I mean responsive to *the pattern which connects*. ”

Universalism vs. contextualism in the Philosophy of Music Education

Where Darwinian perspective might most be expected to weigh in is on the question of how much is universal in music and how much is contextual or socially contingent. This has important implications for what we teach and how; and music education philosophers are divided on the issue in key respects.

Elliott, Regelski and many of the MayDay Group philosophers are strongly contextualist, believing, as Swanwick (1998) expresses it, ~~that~~ the reality, meaning and value of music can never be intrinsic or universal but lies in what is socially situated and culturally mediated (Elliott, 1995; Walker, 1996). Musical value resides in its specific cultural uses, in what it is 'good for' in the lives of people." Elliott acknowledges that there is a generalized kind of human practice that we can call music, but that there is nothing that could be considered archetypal. Instead:

Worldwide, there are many musical practices, or ~~Musics~~." Each musical practice pivots on the shared understandings and efforts of musicians who are practitioners (amateur or professional) of that practice. As a result, each musical practice produces music in the sense of specific kinds of musical products, musical works, or listenables. These products are identifiable as the outcomes of particular musical practices because they evince (manifest or demonstrate) the shared principles and standards of (44) the musical practitioners who make them. (1995: 44-45)

Elliott, I suggest, would be in agreement with the position taken decades ago by composer Harry Partch:

Music ... has only two ingredients that might be called God-given – the capacity of a body to vibrate and produce sound and the mechanisms of the human ear that registers it ... All else in the art of music, which may be studied and analysed, was created by man or is implicit in human acts and is therefore subject to fiercest scrutiny.¹³³

Considering that music and language share a common ancestor (or so I have argued), it seems logical that what Elliott and Partch have said regarding music should be true of language. Let us reword Elliott's position to see what sense it makes where language is the communication mode in question.

Worldwide, there are many languages, each of which pivots on the shared understandings and efforts of users (amateur or professional) of that language. As a result, the use of each language produces specific kinds of linguistic products. These products are identifiable as the outcomes of particular linguistic practices because they evince (manifest or demonstrate) the shared principles and standards of (44) the language practitioners who make them.

Regelski (1998) also eschews any attempt to ~~define~~ "music" as a singular "thing" or process, or similar attempts to define an aesthetic essence for all music."

¹³³ Partch, Harry (1973) Sleeve note to recording of *The Bewitched*, CRI SD 304. Quoted in Small (1977: 8).

[S]uch singular, universal or essentialist definitions of "music" simply no longer obtain when the pluralism of postmodern musics is properly recognized. These musics, each a separate praxis with its own unique characteristic qualities and criteria of musicianship and artistry, thus give lie to the pretense that any aesthetic theory of musical essentialism can rationalize either the value of such musics or can serve to guide them in praxis. (online source)

Again, let us consider the result when we substitute language for music.

[S]uch singular, universal or essentialist definitions of "language" simply no longer obtain when the pluralism of contemporary languages is properly recognized. These languages, each a separate praxis with its own unique characteristic qualities and criteria of linguistic skill and artistry, thus give lie to the pretense that any single theory of linguistic essentialism can rationalize either the value of such languages or can serve to guide them in praxis.

This simply does not hold water. Chomsky's 'universal grammar' is a 'single theory of linguistic essentialism'. Just as we have a 'language instinct' so too do we have a 'music instinct' and Biomusicology has gone far in helping us understand why all humans come equipped with it notwithstanding how multifaceted it is and must be given music's diverse temporal, timbral and tonal possibilities. Similarly, Darwinian Aesthetics does not presume to offer a 'single theory of artistic essentialism'. Instead it offers several theories. No single theory could ever suffice given that various biological adaptations are involved that have different evolutionary origins and explanations, i.e. they evolved at different times in response to different selection pressures in different environments of evolutionary adaptedness (EEAs). However, to again quote Dutton: "the arts in all their glory are no more remote from evolved features of the human mind and personality than an oak is remote from the soil and subterranean waters that nourish and sustain it" (Dutton 2009: 2).

As to Partch's quote above, Chapter Two exposed such a position as a kind of musical 'blank slate-ism' that no longer can be taken seriously. We are not innately neutral to the tonal, timbral and rhythmic patterns that music presents, a point that was argued in Chapter Two. It simply is not true that we are as innately open to Schoenberg's music as we are to Mozart's. It was in Small's 1977 *Music-Society-Education* that I came across Partch's statement and it is clear that Small endorsed this extreme form of musical relativism *at the time*. In *Musicking* (1998), Small does not speak directly to universals of music, but it is clear that he by this point no longer embraces a blank slate epistemology. Indeed, it is in Bateson's evolutionary epistemology that he roots many of his assertions about music and relationship.¹³⁴

¹³⁴ In an interview by Robert Christgau (2000), Small had the following to share regarding how he has moved epistemologically during his writing career. "Yeah, there was a time when I thought of myself as an anarchist, that's true. ... I don't know where I stand anymore. ... The whole issue of sociobiology, for example; I try to tell myself that I don't believe a word of it. Nevertheless, it's unsettling." (Christgau) *Which would suggest to you that the anarchist model isn't altogether appropriate to what human beings actually are.* (Small) Yes, I don't see that we can actually do it, lovely idea though it is."

Elliott and Regelski are both Mayday Group philosophers and it is apropos to consider the group's second 'regulatory ideal' given that it is the one most germane to the present discussion. I include below it the qualifying text as it is given on the group's website.

The social and cultural contexts of musical actions are integral to musical meaning and cannot be ignored or minimized in music education.

Aesthetic theories, with their claims that musical meaning and value transcend time, place, context and human purpose and usefulness, fail to account for the fullest range of meanings inherent in individual and collective musical actions. Such theories fall short of providing an adequate rationale for music-making or music teaching. Instead, all music must be seen as intimately tied to social and cultural contexts and conditions. The theory and practice of music education must account for this situatedness of music and music-making. Music educators must have, therefore, a theoretical foundation that unites the actions of producing music with the various contexts of those actions, so that musical meaning appropriately includes all of music's humanizing and concrete functions. (www.maydaygroup.org)

Such 'aesthetic theories' (and we can assume that Reimer's MEAE would head the list) may fail to account for many of the "meanings inherent in individual and collective musical actions," but what they do account for is anything but insignificant. I would argue that they more than amply provide a rationale both for music-making and music teaching. The Mayday Group 'ideal' does not categorically deny that there are musical meanings and values that transcend time, place and context, but neither does it make much allowance for such. Indeed, none of the regulatory ideals make accommodation for them or for the capacities and predilections that are part of our universal human nature and which inform the countless cross-cultural cross-fertilizations and 'fusions' that one comes across in the world of music.¹³⁵

Swanwick on „music as culture'

Keith Swanwick is a prominent music education philosopher who, like Reimer, is more universalist in his philosophizing even though, as with Reimer, there is little if anything in his philosophizing that is expressly Darwinian.¹³⁶ In 1998, Swanwick was requested to produce a monograph on the Mayday Group Ideal No. 2 excerpted above which he entitled 'Music as Culture'. In it he uses as a point of departure, Alan Merriam's well-known "Functions of Music" (Merriam, 1964: 219-227) which posit functions that music plays in many if not all cultures and which can be regarded as a cluster concept such as was formulated by Dutton to define what 'art' is (see Chapter Two).

Merriam's Functions of Music

- Emotional expression

¹³⁵ One need only consider the catalogue of 'World Music' CDs produced and put out by [Putumayo World Music](#).

¹³⁶ I regard his *Music, Mind, and Education* (1988) as one of the most important texts in the Philosophy of Music Education.

- Aesthetic enjoyment
- Entertainment
- Communication
- Symbolic representation
- Physical response
- Enforcing conformity to social norms
- Validation of social institutions
- Contribution to the continuity and stability of culture
- Preservation social integration

Swanwick agrees that these are functions one finds music performing in cultures the world over and recognizes their value for discussions concerning music in education; but he warns against seeing the functions of music as being the same as the functions of music education. He then takes Merriam's list and separates them into two categories according to their potential for cultural *transformation*. All of Merriam's functions involve cultural *transmission*, but some of these are limited to this and Swanwick hence describes them as tending to be tied in to more or less closed systems."

The purpose of these is to support cultural reproduction: enforcing conformity to social norms, the validation of social institutions, supporting religious rituals and making a contribution to the continuity and stability of culture and to the integration of society. These functional settings tend not to create or encourage the creation of new meaning, to develop what Mead calls 'new human values'. (1998 – online source)

As important as these functions may be in particular social contexts, Swanwick argues that it would be inappropriate to limit music education to such functions concerned with cultural preservation and reproduction and which are negligibly open to —the possibility of metaphor, of generating new meaning." On the other hand, emotional expression, aesthetic enjoyment, communication and symbolic representation are functions that Swanwick regards as having —potential both for cultural transmission and for cultural transformation" as they more directly speak to music as a kind of discourse that is not culturally fixed, but for which culture provides sources of material for engendering something new.

[T]o some extent they all involve elements of internal representation: the manipulation of images, the production of relationships between these images, the creation and development of shared vocabularies and the negotiation and exchange of ideas with others. (Ibid)

The key question that Swanwick poses is: —"to what extent and in what situations is musical discourse specific to certain cultural practices?" His position is one that several discussions in this dissertation have argued for, that music and the arts are —symbolic forms [that are] in some way and to some degree culturally free-standing, universal." What has so often been evident in intercultural music making that I have personally been involved in is how remarkably unproblematic has been the finding of common ground musically and the fusing of elements from one another's musical traditions. Where tensions have occasionally arisen has mostly been because of differences in aesthetic and creative intentions *at the individual level* that may have reflected different cultural backgrounds but which could not be regarded as culturally or socially —embedded'. Swanwick agrees with Elliott, Regelski and others that —"music is culturally rooted, or —situated', " but adds the caveat that this statement of the obvious

should not be taken to mean that each and every instance of musicking is ~~un~~iquely reflective and expressive of a culture.”

We have ... to abandon the idea that music stands in a direct relationship with some kind of socially independent reality, as though it were a kind of mirror. Of course there are often strong connections between the music of particular groups and their life style and social position. But this is not to say that music simply embodies these social worlds. Musical discourse is inherently social, not in the deterministic sense of representing or 'reflecting' society but because any form of discourse depends upon negotiating within systems of shared meanings. Distinctive musical styles are maintained and developed through give-and-take in interpretive communities. Music thus takes place in a cultural context without necessarily being culturally determined. (Ibid)

In the contextualist position that Elliott, Regelski and others appear to endorse, Swanwick detects ~~the~~ lingering shadows of old fashioned referentialism, where music is seen as symptomatic of cultural and political values or of the personal biography of the musician.” A Marxian take would have it that music is more than just symptomatic of social reality, ~~social~~ structures crystallize in musical structures; ... in various ways and with varying degrees of critical awareness, the musical microcosm replicates the social macrocosm” (Ballantine 1984: 5). While I would agree with this to a point, it is clear to me, based on my Darwinian understanding of the human mind, that much of what crystallizes in musical structures are archetypal relationships that are neurally inscribed in our brains, which in Chapter Two I spoke of as the innate concepts of space, time, causation, containment, etc. which are the ~~metaphors~~ we live by” (Lakoff & Johnson 1980), neural representations that constitute the language of mentalese - the ~~level~~ of fine-grained conceptual structure which we automatically and unconsciously compute every time we produce or utter a sentence” or tune, or dance, or mime, or rhyme. I would suggest that it is the phylogenetic homologies⁴ that connect such innate metaphors with the sonic patterns of music that accounts for what we perceive as inherent meanings⁴ or what Lucy Green calls ~~the~~ virtual aspect of musical meaning” or what Bateson would call patterns that connect” or what Langer would call significant import⁴. Swanwick draws on Green (1997) and Finnegan (1989) in the following excerpts that I find apropos as a way of concluding what has been another stab at nature vs. nurture⁴ (a dichotomy that I argued to be a *non sequitur* at the beginning of Chapter Two).

Metaphorical 'likeness' - in the sense of music being 'like' or replicating society - has to be seen in the context of music's suggestive dissimilarities - allowing an element of free play, of speculative diaphor, what Lucy Green calls a 'chink of light'. 'It is through the experience of inherent meanings that we countenance that virtual aspect of musical meaning which is in itself free of symbolic content, free of gendered delineation' (Green, 1997: 250). ... [I]n musical experience the possibility of *breaking out into the light* exists at three levels: at the point where we accept the illusion that sound is expressively shaped, when these shapes are perceived in new relationships and when we ourselves are to some extent changed by musical insights into what Langer called the life of feeling.

Far from being merely a mirror then, a copy of other forms of cultural activity, musical discourse, by virtue of its metaphorical power, can also be a window through which we can glimpse a different world. As with all forms of discourse, music bridges the space between individuals and between different cultural groups. There is some support here from social anthropology and ethnomusicology. Following a long and detailed study of music-making in one city, Ruth Finnegan notes that although musical enactment indeed arises in a social

context it is also 'a unique and distinctive mode through which people both realise and transcend their social existence' (Finnegan, 1989: 339). Along with this goes an acknowledgment of the diversity of perspectives among individuals, even within the most tightly bound cultural practices. I too am not afraid of the word 'transcend'. (1998 – online source)

Education for praxis through the musical arts

As a way of concluding this dissertation, I feel it appropriate to bring the discussion back into the realm of education generally remembering that what motivates the philosophical inquiry I chose to embark on is my despair with the inertia of consumerism that is costing our planet so dearly and which education seems to be doing so little to challenge.

[W]e're in the middle of a mass extinction. We happen to be in that moment when the worst thing that's happened to the earth in sixty-five million years is happening now. That's number one. Number two, *we* are causing it. Number three, we're not aware of it. There's only a little splinter of humanity that's aware of it. The numbers are this: At the minimum, twenty-five thousand species are going extinct every year. And if humans' activity were otherwise, or if humans weren't here, there would be one species going extinct every five years. We've pushed up the natural extinction rate by the order of something like a hundred thousand times. (Swimme 2001 – online source)

In the face of what seems an inevitable collapse of the biosphere that sustains us, concerns with how well people are being empowered musically seem beside the point and perhaps even indulgent. However, if such empowerment is achieved in an integrated and optimally interdisciplinary education where the *pattern* which connects⁴ is as important as the phenomena it connects, it can contribute significantly to a creative and critical consciousness such as is needed if enough people are to break free of the consumerist mindset that has such a tenacious hold on the rank and file of humanity, as well the selfish and vain anthropocentrism that keeps us disconnected from the rest of life even though we are genetically related to every one of the millions of species that cohabit the thin *coat of varnish*⁵ that is Earth's biosphere. The Darwinian perspective I have argued for keeps this fact in the foreground and makes clear that we have no transcendent entitlement that can justify the degradation and destruction of the biosphere we are guilty of and the driving to extinction of increasing numbers of its life forms.

The critical consciousness to which I have devoted considerable discussion is one where there is a clear and well informed awareness of what it is that causes us to think, feel and act in the ways we do as it is based on an understanding and appreciation of the adapted mind for *what it is* and *what it makes possible*. What is extraordinary about the human mind is its capacity to apprehend and make sense of relationships, connections, patterns, and correspondences, which, as we have seen, are what *information* ultimately is and which are substrate neutral and capable of being transduced from one physical manifestation to another, thus crystallizing in innumerable ways and forms.

Aesthetic education *should* be regarded as music education's overarching purpose if the aesthetic sense is understood to be this very capacity for apprehending and internally realizing relationships and patterns that have meaning beyond what is practical in

immediate, utilitarian and self-serving ways. Apprehending and valuing the relationships that imbue musical patterns with expressiveness allow for a deeper experiencing of music, especially when one is active in their realization as a performer, composer, or improviser, but the experience becomes more profound when connections are made with what lies beyond the notes. Expressiveness and significance are not inherent qualities of the sounds themselves but the achievement of perception, a complex process that makes sense of what is incoming in terms of what is already within the body-brain-meme complex. Connections are apprehended and become expressive and significant because of what they excite neurally that has been inscribed in the brain as the result of the interplay of replicators - genes and memes - such being the interplay through which individual humans unfold ontogenetically and where education needs most to achieve its purpose. Our brains, like all brains, are modular, but what is distinctive about human brains is their level of intermodularity and capacity for cross-modal transductions of information, with different brain systems contributing information vital to cognition and making every form of perceptual engagement multidimensional and multimodal. Education is what should be the 'strong force' in memetic evolution, developing in people the capacity and disposition for critically evaluating the memes that compete for selection in the environments of evolutionary adaptedness which their brains provide, too often unwittingly.

Without the somatic tagging of cognitions and sense data, we would not be able to learn and exercise our powers of reason. Better understanding the neurocognitive processes involved give substance to the cliché that music is the language of emotions and make more apparent the neurocognitive value of particular forms of musicking including those that are not purely musical. Music's uncanny capacity for 'making meaningful' requires processing in what are the oldest parts of our brain and is what makes abundantly clear that *sentience* is by no means an exclusively human attribute. Indeed, it could be argued that the sentience of some of our fellow Earthlings is more genuinely *aesthetic* in that their perception is more direct, unmediated, and undifferentiated - more in tune with "the feeling of what happens when [one's] being is modified by the acts of apprehending something" (Damasio 1999: 10). In humans there is the "cool web of language [which] winds us in" such that we "retreat from too much joy or too much fear [and] grow sea-green at last and coldly die in brininess and volubility." Music and the arts make it to some degree possible for "our tongues [to] lose self-possession, throwing off language and its watery clasp" (Graves 1927). In song and performance poetry, the tongue remains active but what it conveys nondiscursively makes it a medium through which we are drawn to 'the joy or fear' that language otherwise inclines us to 'retreat from'.

Sadly, our 'cleverness' has created a world where willy-nilly education has become a tool for sustaining what is ultimately unsustainable but which we participate in without sensing that there is something wrong in it all - that it locks us into ways of thinking and acting that keep us from becoming enlightened, critically conscious self-actualizers who can see the madness for what it is and become active in overthrowing it. Illich's call for the 'deschooling' of society was not a demand that we discontinue the enterprise of schooling, but that we re-conceive what schools are or should be - most certainly not "reproductive organs" for consumerism. One of the ways that I have argued for education to be conceptualized is as a progressive 'transcendence of our genetic imperatives'; but such transcendence should not be taken to mean the denial or devaluing of our evolved nature; indeed, there is so much in this nature that we should

esteem and celebrate but which education is characteristically inattentive to because it is so caught up with meeting the demands of the Market.

As I write these concluding remarks, many South Africans are celebrating what ostensibly appears to be a turnaround in the country's educational fortunes - an increase of 7% in the Matric pass rate. No doubt it is the matriculants themselves who are most ecstatic as they have successfully undergone a rite of passage admitting them entry into a world of enhanced vocational prospects and opportunities for the good life.¹³⁷ Detractors challenge this increase on the grounds of the dubious employability of matriculants and jump on the fact that while there was a ~~margin~~ marginal improvement in the number of pupils who passed mathematics with at least 30% ... the number of pupils who wrote maths dropped over 20% in the past two years." (Parker 2011) Concern with employability is well understandable in a country with an unemployment rate of over 25%, but what is unacceptable is the extent to which it has become the be-all and end-all of education, reflecting a false consciousness that finds nothing inherently wrong with the system provided everyone is reaping its benefits and contributing to its maintenance and growth. Matric results may give an indication of who are most likely to be successful and instrumental in this regard (e.g., those who crack it in Mathematics and Science) but what do they reveal about critical consciousness and preparedness for challenging the consumerist status quo?

The following are what come to mind as essential constituents of the critical consciousness I have argued for.

- Creative problem solving ability
- Ecological intelligence
- Capacity for hierarchical, inductive and propositional reasoning
- Intercultural awareness and competence
- Social conscience
- Intrapersonal intelligence
- An inquiring disposition
- Capacity for ideology critique
- Political awareness and attentiveness to matters of global concern
- Capacity for moral reasoning
- Communicative capacity that is cross-modal and that allows for competence in a range of social and cultural discourses
- Cosmological perspective

Frankly, if such capacities and dispositions were to become the key indicators of educational achievement, it seems evident that those who made it through to Matric (whether they passed or not) should actually be pitied as unwitting victims of a monumental educational fraud perpetrated over - and occupying them for - the most important years of their lives. They have not been helped in any significant way to acquire an ecozoic, cosmological, and Darwinian grasp of humankind's privileged

¹³⁷ Whatever satisfaction may be derived from this should be tempered by the acknowledgment that students now need only ~~pass~~ pass three subjects with a mark of at least 40% and another three subjects with at least 30%." (Parker 2011).

status as the only known manifestation of *the universe becoming conscious of itself*, the only concatenation of *stardust* that natural selection has come up with capable of comprehending and appreciating the most amazing of *truths*: that if you ~~take~~ hydrogen gas, and you leave it alone, ... it turns into rosebushes, giraffes, and humans.” While it may have no ultimate purpose or reason, at least we humans can find inspiration and significance in the wonders of unfolding creativity that make the Universe ~~a~~ continuous, radiant, numinous revelation” (Swimme 2001).

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