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Art and human adaptation

The narrow line that separates a genuinely fruitful and powerful theory from its sterile caricature is crossed over and over again by vulgarizers who seize upon the powerful explanatory element and, by using it indiscriminately, destroy its usefulness… In Darwinism the element that is both central to the evolutionary world view and yet so powerful that it can destroy Darwinism as a testable theory is adaptation.

Levins and Levontin, „Adaptation“ from *Dialectical Biologist*

This schematism of our understanding with regard to appearances and their mere form is a hidden art in the depths of the human soul, whose true operations we can divine from nature and lay unveiled before our eyes only with difficulty.
Kant pure reason 273

Introduction

Recently, I was thinking about evolutionary explanations of art, wondering whether there were any satisfactory ones. And of course, I found a number of more-or-less ambitious explanations and research programs which incorporated art into an overall evolutionary paradigm. It soon turned out, however, some more ambitious works which I shall cite briefly, have presented a number of problems and errors which have played a significant role in the development of biological and sociological thought in the past 40 years. Inquiry into the evolutionary meaning of art, led me therefore to the more fundamental question, about *adaptation*.

After a review of some notable evolutionary explanations of art, in this paper I shall show that the most dominant, and the most *radical* evolutionary explanation of art, the explanation via sexual selection theory, or so called *display theory*, suffers from some well known biological and theoretical illnesses related to the standard issues of sociobiology and evolutionary psychology – issues concerning ascription of an adaptive character to a phenotypic trait, behaviour or behavioural outcomes. In short, I shall endorse the thesis that sexual selection theory as an explanation of art grants itself a great leeway for such an ascription, making all sorts of made-up stories into viable explanations.

Basic types of evolutionary explanation of art

Let me first divide evolutionary explanations of art into two groups – internal and external. I shall call an explanation ***external*** if it uses evolution and its various ramifications as a source of artistic *content*. For instance, *Madame Bovary's Ovaries*, a book by… uses contents of literary works like Shakespeare's Otello, or Jane Austin's works, to show (or to prove) statistically or otherwise that certain evolutionary

mechanisms present humans with a natural source of problems to which we provide more-or-less satisfying virtual or real answers. Statistics which would show for instance that a predominant number of lyrics or poems in the history of poetry and music were written about love and sex would prove that such issues were, the most important evolutionary and artistic topics, and that there is a very essential connection or correlation between human evolutionary problems and their artistic formulations.

To such extrinsic (external) explanations belong also tentative proofs that humans love some pictures and sceneries better than others, namely that they prefer pictures that mimic some evolutionary formative sceneries (for instance those that mimic savanna-like environment) to artificial surroundings of towns or desert or icy wastelands in which it is much more difficult to survive (see for instance: (Carroll 2004; Dutton 2009)).

A number of the most prominent scholars in the field (Dissanayake 1995; Carroll 2004; Dutton 2009) use this kind of explanation as a side-proof, or a confirmation for a more general thesis about entrenchment of art in the evolutionary world.

Joseph Carroll, in his book *Literary Darwinism. Evolution, Human Nature and Literature* (2004) makes a similar distinction when he describes the so called "non-adaptationist forms of evolutionary criticism" (p. xi-xiv). All sorts of literary criticisms that use evolution as a metaphor of some alleged cosmic evolution, or that use evolution just as analogy for some other kind of evolution (in literary theory, for instance), or that use evolution for some kind of normative value, like Dawkins's *meme* theory, belong to my extrinsic (or external) explanations.

Unlike extrinsic evolutionary theories, ***intrinsic*** *(or internal) ones*, however, do not use evolution as a source material which somehow transforms itself into artistic content, but purport to show how and why artistic modes evolved along with other human capabilities. But the more ambitious evolutionary theories of art try to prove even more, viz. that art or types of behaviour which produced art were more adaptive than others, and this is allegedly a reason why art plays such a big role in the present human society. Such explanations consider art as a favourable human adaptation to present and past environments.

Although some extrinsic modes of explanation might prove to be very fruitful, for the present purposes I shall consider just the intrinsic ones. The discussion on the intrinsic evolutionary explanation of art will lead us to the basic issue of evolutionary explanations of human behaviour – the problem of adaptation.

Intrinsic explanations of art

Among intrinsic explanations of art, two strands dominate. First, notably by Steven Pinker, claims that **art is a *by-product* of evolution**. In his books *How the mind works*, *and Blank Slate*, Pinker elaborates his "cheese-cake" theory of art, and dedicates last chapters of the books to the topic.

The second, the most radical explanation of art comes from Geoffrey Miller. In his book *Mating Mind*, he articulates a grand theory which purports to show that sexual selection is a far more dominant selection criterion than usually thought. In his view, previous generation of biologists dismissed Darwin's sexual selection as an important evolutionary explanation. This is true. There is a growing number of studies that show the overall importance of sexual selection in evolution (most notably by Helena Cronin), and that negligence of sexual selection by previous generation of biologists is not justified. Female choice, runaway effect and Zahavi's handicap principle are already well established explanations for a number of biological phenomena.

But, Miller goes a step further. If previous generation of biologists considered sexual selection a sub-class of natural selection, Miller reverses the relation and claims that (at least in sexual species) natural selection becomes a sub-class of sexual selection. Sexual selection thus inadvertently overshadows natural selection and becomes a dominant evolutionary explanation. It is not my present intention to counter this opinion, but rather to show that the outcome of such a grand thesis is rather meagre, explanatory unsatisfactory, and the most dangerous outcome of all, puts evolutionary psychology again into a rather difficult position – to fight a battle it has already won, and to doubt whether the explanatory power of the discipline stands on the firm empirical grounds.

Examples and alleged proofs Miller provides, and his conjectural extension of evolutionary explanations to all sorts of human products justifiably reintroduces age old criticisms towards sociobiology and evolutionary psychology – namely a criticism that it uses just-so-stories as a form of explanation.

Sexual selection as an explanation of phenotype traits

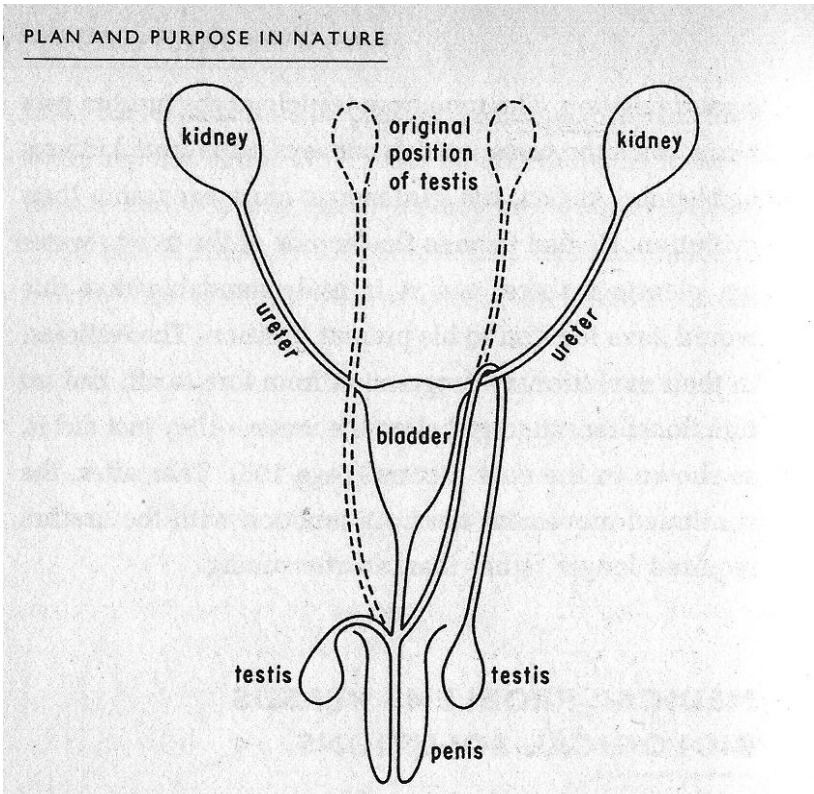
In his book *Mating Mind*, Geoffrey Miller claims that there were no reasons natural selection might have favoured the growth of human brain. It is costly, it

Penis as a spandrel or an adaptation?

"So, why did picky female hominids start selecting for larger penises? Perhaps upright walking gave females a better view of male genitals. Anthropologist Maxine Sheets-Johnstone has argued that bipedalism may have evolved in part because it makes penile display more effective. She observed that in other primates, bipedalism standing and walking are most often done by males displaying their penises to potential mates… Likewise, the male open-legged sitting position, still universal across cultures, resembles open-legged penile displays by chimpanzees… Here is another example of an evolutionary innovation originating through sexual selection and later proving useful for survival.

Against the visual display idea, however, is the fact that human penises are a rather sorry spectacle… The male human penis does not appear to be especially well adapted for producing auditory, olfactory or gustatory stimulation. That leaves the sense of touch as the medium for female choice.

With primates it is not so common for male rivals to swarm over females knocking each other off. This allows couples a bit more copulatory leisure… favoring simpler penis designs. The human penis is especially streamlined because ancestral females apparently favored whole-body copulatiory movement over the flagellar vibrations favored by female insects… Since male human penises become erect with blood rather than muscle and bone, this gives them more flexibility, and permits a greater range of copulatory positions… Human penises evolved as tactile stimulators for use in copulatory courtship.



The testis (on the right) draped over the ureter shows the present human male configuration. It is the result of the gradual movement (in evolution and individual development) of the testicles from deep inside the body (the dotted lines) to the scrotum. The testis on the left shows what might have been if evolution could anticipate future needs or correct past mistakes.

Physical organs shaped by sexual choice can also be seen as metaphors for mental organs shaped by sexual choice. Just as human penis has been misunderstood as nothing more than plumbing for delivering sperm, the human mind has been misunderstood as wiring for processing information… Ancestral females did not apparently favour penises directly as visual ornaments, but favored them indirectly for the copulatory pleasure that they afforded, so they came back for more. Perhaps our ancestors did not favour intelligence and creativity directly, but indirectly… If the penis really did evolve through female choice as a copulatory stimulator, then it should be considered not just a physical organ that reaches inside the body, but a psychological organ designed to reach inside the pleasure systems of another individual.

Vagina as a spandrel or an adaptation?

"The human clitoris could easily have evolved to be much more conspicuous if males had preferred sexual partners with larger, brighter clitorises. Its inconspicuous design combined with the exquisite sensitivity suggests that the clitoris is important not as an object of male mate choice, but as a mechanism of female choice. It helps to select for males who provide pleasurable foreplay, copulation and orgasms. Yet this has led to all sorts of confusion among evolutionists.

These men (Steven Jay Gould and Donald Symons) seem to have overlooked the possibility that clitoral organ is a mechanism for female choice rather than pair-bonding… It is possible for a woman's vagina to become lubricated during unwanted sex to avoid injury, but women under such conditions practically never have orgasms. This is strong evidence of clitoral orgasm's role in female choice. From a sexual selection viewpoint, clitorises should respond only to men who demonstrate high fitness, including the

physical fitness necessary for long, energetic sex, and the mental fitness necessary to understand what women want.

> (George Williams Plan and Purpose of Nature p. 146.) Take a close look at the next human skeleton you encounter. Note the bony circle of left and right pubis in front and left and right ischium and their vertebral connection behind. Babies have to sqeeze through a narrower space than that, because the ring is crowded by vaginal wall and rectum and other structures. Birth is more difficult for a woman than for most other mammals – it's such a tight squeeze. Now look at the space between the pelvis and the ribs and sternum: a great wide, boneless gap. Why not give birth through that ample opening? In fact many women do, those in caesarean deliveries… it can be of the most convenient size so that no mechanical problems need arise in getting the baby through. In all other respects it is less desirable than the vaginal passage through that tight pelvis. This general vaginal superiority does not alter the fact of it serious design flaw… Any sane engineer would have provided the vagina with a natural opening in the lower abdomen that would be superior both to the one provided by evolution and to that provided by a surgeon.

(Miller) The sex difference between penis and clitoris can be viewed as a physical manifestation of Fisher's runaway process: a highly developed male trait (the penis) designed to stimulate, and a highly discerning female preference (the clitoral orgasm) designed to respond selectively to skilful stimulation. If this runaway model is right, then there was a sort of stimulatory arms race between the human penis and the human clitoris. The penis evolved to deliver more and more stimulation, while the clitoris evolved to demand more and more.

If the function of orgasm were simply to reinforce monogamous pair-bonds, why should evolution make female orgasm so difficult and male orgasm so easy during vaginal intercourse? If female orgasm is a side-effect of male orgasm, why does it just happen to work when an attractive man provides a lot of foreplay…? Surely, sexual selection theory offers insight into this ancient human mystery. Female orgasm seems poorly designed as a pair-bonding mechanism, but it is perfectly designed as a discriminatory system that separates the men from the boys.

Over a hundred million clitorises were cut out of African girls by village women precisely so that the girls would not be tempted to exercise their powers of sexual choice.

The high level of milk production does not itself explain why female human breasts are so much larger than those of other apes… So we have to distinguish between mammary glands, which evolved for milk production, and enlarged human breasts, which must have evolved for something else. It seems likely that sexual selection played a role. But how? (for cues of sexual maturity)… It seems likely that male choice shaped breasts not to distinguish girls from women, but to distinguish young women from older women… Male preference for size and pertness would spread at the expense of male preferences for droopiness and flatness… (i)t takes a bit of thought to see why females should evolve youth indicators… Females tend to be more fertile in youth, produce fewer birth defects… and are more likely to have living sisters and mothers to help with childcare. Also, fast breeders produce more generations per century, so can increase their population numbers faster than slow breeders. For these reasons an attractiveness benefit in youth can often outweigh an unattractiveness cost in older age. This is why it can be in the interest of females to evolve youth indicators such as large breasts… This is one of the most counter-intuitive applications of Zahavi's handicap principle.

Once men started paying attention to the symmetry of breast development, high-fitness women could better display that symmetry by evolving large breasts. The larger the breasts, the easier it is to notice asymmetries… It has sometimes been argued that men's preferences for larger-than-average breasts must be an artefact of modern culture, because, if it were ancient, all women would have already have evolved large breasts. This argument is wrong if breasts evolved as fitness indicators. Bra manufacturers offer a range from A-cups to D-cups because evolution amplifies the variation in each fitness indicator rather than using it up.

If males had not been picky about their sexual partners, female humans would be as flat-chested as chimpanzees. The clitoris does not yield evidence of male mate choice, but breasts do. This opens the door to the possibility of male mate choice influencing the evolution of female brains as well as bodies.

Females evolved larger deposits of fat on the buttocks, hips and upper thighs. Like breasts, these probably evolved through male mate choice as indicators of youth, adequate fat, and perhaps developmental stability.

Buttock size and protuberance normally peaks in young adulthood, around the time of peak female fertility and then gradually diminishes relative to the rest of the body's fat reserves… Women's breasts and buttocks did not evolve because hominid men happened to develop some arbitrary fixation on hemispheres as Platonic ideals of beauty… Buttocks, like breasts, reveal the importance of male mate choice in human evolution. (Miller 2000) (236-248)

(Pinker 2002)

Pushing the pleasure buttons – arts as by-products of genuine adaptations

***the evolutionist*:** There are other things in your last chapter that you don't think are adaptations. Could you say why?

Pinker: Music, art, most narrative, religion. It's often been suggested that music, art, and religion adaptations because they bring the community together or they enhance happiness or allow us to experience the sublime or see the world in new ways. I don't accept those explanations because they are close to being circular. They assume that music has the ability to bring a social group together, or that religion does. That aspect of human psychology -- the tendency of people to enjoy music, or to be brought together by religion -- is as much of a puzzle as the question of why we have music and religion and art to begin with. If there is a beneficial effect, it's as much of a puzzle why it has that beneficial effect, as why it exists. Why a series of noises in harmonic relations should cause people to feel that they're more in touch with their fellows is part of the same mystery as why a single individual puts on a record for his own amusement. The direct physical effect of noises in harmonic do not include "bonding within the group," so we cannot invoke such an effect as an explanation of why music evolved.

With genuine adaptations, the ability in question causes some effect that we can antecedently argue enhances fitness. An adaptation is a mechanism that brings about effects that would have increased the number of genes *building that mechanism* in the environment in which it evolved. Stereo vision has the effect that you have accurate information about where the edge of the cliff is. Language allows you to

share information. Sexual desire increases the probability that one's genes will make it into the next generation, and so on. But the direct effect of music is sheer, pointless pleasure.

Instead of being adaptations, most of the arts may arise because we have acquired technologies to excite our pleasure circuitry. The pleasure circuitry has an adaptive explanation. The intelligence that manipulates the world to bring about certain effects has an adaptive explanation. But you put them together and you get a species that in a biologist's sense, misapplies its intelligence to infiltrate motivational circuitry and short-circuit it. We have figured out how to amuse or titillate ourselves with artificial stimuli that don't themselves enhance fitness.

***the evolutionist*:** What do you think of psychologist Geoffrey Miller's theory that the vast difference between the sexes in terms of cultural production, and the peak for males being at an age when you might expect most male-male competition for status and mates is good grounds for believing that cultural production is an adaptation in the sense that it is a courtship display?

Pinker: *The data that I saw don't really show that as much as Geoffrey would like.* For a lot of art forms, the peaks are in the 30s and 40s rather than in the late teens and 20s. I think there is something to what he says but that *he pushes it too far*. *Anything a person can do, can be used as a courtship display -- athletic ability, beautiful language, beautiful works of art, wit, intelligence, and so on.* So it is true that one use of our mental faculties is to impress the opposite sex. But *art, music and language and intelligence don't follow the pattern of sexual selection particularly well*. A 70 year old woman playing Mozart on the piano for her own pleasure is not of the appropriate age or sex or circumstance for an explanation in terms of sexual selection.

***the evolutionist*:** But then she wouldn't be very representative of people playing the piano?

Pinker: She certainly wouldn't be unrepresentative of people who enjoy listening to music. Likewise for art, music, narrative and so on. You don't find it appreciated only by females of reproductive age, or produced by males of reproductive age. It seems to give pleasure too broadly and symmetrically between the sexes to meet the criteria of a sexually selected trait. One can easily argue that fighting to enhance reputation and status is a sexually selected trait, because it is strongly concentrated in the early reproductive years and highly sexually asymmetric. *Language, art, music, intelligence and so on, seem to be appreciated too uniformly across the sexes and lifespan to be sexually-selected traits in and of themselves. I don't deny that, as with every feature of the body and mind, these features can be used for courtship, but I don't think courtship is a reason for its existence.*

***the evolutionist*:** If you're happy to claim that appreciation of the arts is a by-product of other faculties, could the fact that it's widespread be a by product of this sexually selected trait?

Pinker: Only in part. I distinguish between a component of the arts that's purely aesthetic and a component that's tied to status, and I think a lot of virtuosity -- the avant garde, the cutting edge, inaccessible art, sheer sumptuosity -- may be in the service of the pursuit of status. And of course the pursuit of status is in part a kind of courtship -- although probably not exclusively for courtship, because people pursue status to help out their family and to have networks of allies to preserve their physical well-being in the presence of enemies. (Pinker 1998) *Of course, ultimately everything is in the service of gene-level reproduction if you're an evolutionist. But when we talk about what particular traits are engineered for, there are intervening links between reproductive success and the operation of those traits. The component of the arts that is primarily status-seeking is more closely tied to Miller's hypothesis, but it still may be a link or two removed from courtship per se.*

(Dutton 2009)

What is adaptation?

Adaptive peaks: Immunological reactions as adaptations?

a. Illness (from Williams)

b. Maternal-fetal conflict as immunological warfare (from Williams) and as strategies

Optimality and adaptation?

Proximate and ultimate causes? (from Mayr)

Table 1.1. A Comparison of Statements by Tinbergen (1968) and Mayr (1976) on the Forms of Explanation in Biology

Tinbergen	*Mayr*
I. Ultimate analysis in terms of Neo-Darwinian process	
1. In what ways does this phenomenon (behavior) influence the survival, the success of the animal?	1. An ecological cause. The warbler must migrate, because it would starve to death if it should try to winter in New Hampshire.
II. Proximate analysis in terms of mechanism	
2. What makes behavior happen at any given moment? How does its "machinery" work?	3. An intrinsic physiological cause. The warbler flew south because its migration is tied in with photoperiodicity. It responds to decrease in day length. 4. An extrinsic physiological cause . . on the 25th . . . the sudden drop in temperature and the drop in temperature and the associated weather conditions affected the bird . . . so that it actually took off
III. Proximate analysis in terms of ontogeny	
3. How does the behavior machinery develop as the individual grows up?	
IV. Ultimate analysis in terms of evolutionary history	
4. How have the behavior systems of each species evolved until they became what they are now?	2. A genetic cause. The warbler has acquired a genetic constitution in the course of the evolutionary history of its species which induces it to respond appropriately to the proper stimuli from the environment.

Conclusion

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