
Darwinian Aesthetics Informs Traditional Aesthetics

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Introduction

This paper treats the topics that have been of long interest to aestheticians. Traditional aesthetics, i.e., aesthetics in philosophy, is broad and diverse, including such topics as the beauty of ideas as well as the beauty of body form, natural landscapes, scents, ideas and so on. Some colleagues have suggested that I provide a succinct definition of aesthetics. It is not possible, however, to provide an objective definition based on Darwinian theory. As D. Symons (pers. comm.) put it: "... [T]he whole notion of 'aesthetics,' as a 'natural' domain, i.e., as a domain that carves nature at a joint, is misguided.... All adaptations are aesthetic adaptations, because all adaptations interact in some way with the environment, external or internal, and prefer certain states to others. An adaptation that instantiates the rule, 'prefer productive habitats', is no more or less aesthetic than an adaptation that instantiates the rule, 'prefer a particular blood pressure'." Although there is no way to objectively define the aesthetic domain, there is value, I believe, in treating the various topics of traditional aesthetics in a modern, Darwinian/adaptationist framework.

The Darwinian theory of brain design, whether human or nonhuman, is that of many functionally specific psychological adaptations. Just as human blood pressure regulation and habitat selection are guided by different, functionally specific psychological adaptations, the traditional topics of aesthetics each arise from fundamentally different psychological adaptations. It is the many psychological adaptations that underlie the diversity of aesthetic experiences of interest to aestheticians that I address. Darwinian aesthetics has great promise for elucidating the design of the psychological adaptations involved in these experiences.

The starting point for the Darwinian theory of aesthetics I offer is as follows. Beauty experiences are unconsciously realized avenues to high fitness in human evolutionary history. Ugliness defines just the reverse. Greenough (1958), in reference to architectural structures, defined beauty as the promise of function. The Darwinian theory of human aesthetic value is that beauty is a promise of function in the environments in which humans evolved, i.e., of high likelihood of survival and reproductive suc-

cess in the environments of human evolutionary history. Ugliness is the promise of low survival and reproductive failure. Human aesthetic value is a scale of reproductive success and failure in human evolutionary history, i.e., over the last few million years.

First, I briefly list the experiential domain of interest to traditional academic aestheticians. I then discuss the adaptationist program and how it applies to these experiences in a general way. Next, I resolve some dilemmas in traditional aesthetics using the adaptationist perspective. Finally, I give a taxonomy of the psychological adaptations underlying the diverse experiences of interest to aestheticians.

Aesthetics: The Topics of Interest

The study of beauty is a major endeavor in academia. Intellectual beauty is the beauty scholars in all academic disciplines find in scholarship. Intellectual beauty is the most noble goal of academic pursuit, and is a sublime reward of the pursuit. In addition, the academic discipline of aesthetics, a part of philosophy, is concerned with the rhetorical meaning of beauty and ugliness. Aesthetics apparently first became a distinct discipline within philosophy with G. Baumgarten's *Aesthetica*, published in 1750, but as documented by the historical aesthetician Kovach (1974), speculation about aesthetics by scholars has been going on in the Western World at least since the sixth century B.C. in Greece. In addition, the arts, as well as other areas of the humanities, are fundamentally concerned with beauty. The humanities are focused on competition in heightening sensation in general, and in particular in generating beauty experiences in the minds of people. Beauty may be generated in the mind by poetry, literature, paintings, dance, oral or written rhetoric, etc. When humanists contemplate beauty and analyze its meaning, they present their views rhetorically, again striving to generate the effect of beauty.

Whereas the arts and humanities compete in creating the effect of beauty in human minds, scientific aestheticians use the scientific method to understand how the effect arises and why it exists. Scientific aestheticians, then, are concerned with proximate causes (the how; physiology, development, cues or stimuli, and information processing) and/or ultimate causes (the why; evolutionary history). Scientific aesthetics is a diverse discipline, which includes the study of aesthetic valuations by non-human animals.

Since Darwin and Wallace, biologists have studied natural beauty's meaning in terms of the evolved signal content of striking phenotypic features such as showy flowers, the peacock's tail, and elaborate courtship behavior. Hypotheses to explain the existence of these kinds of extravagant features, in ultimate or evolutionary functional terms, have ranged from

species or sexual identity to advertisement of phenotypic quality, i.e., an organism's advertisement of its ability to deal effectively with adverse environmental agents that impact survival and reproduction. This form of biological aesthetics has become a major research area in the last 25 years as a result of theoretical treatments validating the idea that elaborate features can evolve to honestly signal phenotypic quality, as first suggested for secondary sexual traits by A.R. Wallace (see Cronin 1991) and explicitly treated first by Zahavi (1975).

For extravagant sexual traits such as the peacock's tail, some biologists ally with Darwin's and R. Fisher's formulation about the evolution of beauty and aesthetic preference. This was that the beauty of the peacock's tail merely signals sexual attractiveness to females, not viability or phenotypic and underlying genotypic quality, and the preference for the elaborate tail evolved because it yields attractive and thus, sexually preferred sons, not offspring with high viability (for discussion of recent theory, see Cronin 1991; Ridley 1993). There is total agreement that sexual selection is the biological process that has made extravagant features such as the peacock's tail. Many sexual-selection aestheticians now are engaged in efforts to determine the exact nature of the process of sexual selection responsible for the features, i.e., advertisement of and preference for phenotypic quality, or for sexual attractiveness only. The general consensus is that mate choice is focused on phenotypic (and often genotypic) quality and sexual advertisement is basically about displaying phenotypic quality (for useful reviews, see Cronin 1991; Ridley 1993). This same conclusion seems to best fit the human data of mate choice and sexual display involving physical bodily features (reviewed in Thornhill and Gangestad 1993, 1999a, b; Symons 1995; Thornhill and Grammer 1999). Miller (2001) has persuasively argued that art production is analogous to the honest signal of quality conveyed by the peacock's tail. Accordingly, the psychology that motivates art production is sexually selected and art is then a signal to potential mates of the artist's general fitness. The scientific study of human sexual attraction and attractiveness is carried out by human sexual selection aestheticians.

Biophilia is another branch of scientific aesthetics. Wilson (1984) coined the term "biophilia" to describe the innately emotional affiliation of human beings to natural phenomena such as animals, plants and habitats. Wilson (1984) emphasized that aesthetic judgments are central to biophilia. Considerable recent and current research is clarifying human aesthetic feelings toward habitats, animals and plants (see review in Kellert and Wilson 1993).

The final branch of scientific aesthetics has been called experimental aesthetics by those in this field. Experimental aesthetics is a branch of experimental psychology dating to about the mid-nineteenth century. It focuses on the aesthetic value of shapes and patterns (for reviews, see Berlyne 1971; Solso 1994).

When a scientific aesthetician discovers the scientific meaning of beauty, he or she may generate beauty in the same way that the artist or other humanist does. Any significant scientific discovery may generate the effect of beauty in the mind of the discoverer and the minds of scientists in general.

Adaptationism

In this paper, and in theoretical (evolutionary) biology in general, adaptation refers to goal-directed, i.e., functionally designed, phenotypic features (e.g., Thornhill 1990, 1997; Symons 1992; Williams 1992). As Williams (1992) put it, an adaptation is the material effect of response to selection. Four natural processes are known to cause evolution or changes in gene frequencies of populations, but selection is the only one that can create an adaptation. The other three – mutation, drift, and gene flow – lack the necessary creativity because their action is random relative to individuals' environmental problems. Selection is not a random process. It consists of differential survival and reproduction by individuals because of differences in their phenotypic design for the environment. Thus, selection is defined concisely as nonrandom differential reproduction of individuals. The nonrandomness of selection is a result of individual differences in fitness, i.e., ability to cope with environmental problems. This nonrandomness has differential reproductive consequences. When design differences among individuals reflect genetic differences, selection accumulates genes in subsequent generations that (through the gene-environment interactions that constitute ontogeny) lead to increased fit of individuals to their environment. An adaptation, then, is a phenotypic solution to a past environmental problem that persistently impinged on individuals for long periods of evolutionary time and thereby caused cumulative directional selection, which, in turn, caused cumulative directional change in the gene pool. Evolution by selection is not a purposeful process, but gradually incorporates ever more refined and focused purpose into its products (adaptations) by persistent effects.

Each adaptation is the archive of data of the selection that made it. These data are in the functional design of the adaptation. Said differently, to discover the purposeful design of an adaptation is to discover the kind of selection that made the adaptation. This is why the study of adaptation is fundamental to understanding the evolution of life. Adaptations are our *sole* source of information about the forces of selection that actually were effective in designing phenotypes over the course of evolutionary history.

Note that the data encoded in the design of an adaptation concern the environmental features that caused differences in individual reproductive success during the evolution of the adaptation. This is just another way of

putting the fact that adaptations have stamped in their functional designs the selective forces that made them. Thus, *the way* to discover the environmental forces, i.e., the selective forces that made *human* adaptations, is by deciphering the functional design of *human* adaptations. Contrary to the belief of some, the selective forces that designed humans cannot be elucidated directly by the study of nonhuman primates (see Thornhill 1997).

The aim of the adaptationist program is to identify adaptations and characterize their functional designs. An adaptation is a phenotypic feature that is so precisely organized for some apparent purpose that chance cannot be the explanation for the feature's existence. Thus, the feature cannot merely be the chance by-product or incidental effect of an adaptation or the product of random genetic drift. The feature has to be the product of long-term evolution by directional selection. Once a true adaptation is recognized and its apparent purpose perceived, the next step is to examine in detail and fully characterize the functional design of the adaptation to determine the adaptation's actual evolutionary purpose. To discover an adaptation's evolutionary purpose entails describing specifically how the adaptation contributed to reproduction of individuals during its evolution or, put differently, detailing the precise relationship between a phenotypic trait and selection during the trait's evolution into an adaptation (for further discussion of the study of adaptation, see Thornhill and Gangestad, this Vol.).

Adaptationist studies do not typically include analysis of the evolutionary origin of adaptations – that is, the phenotypic precursors that were modified by directional selection over long-term evolution into complex features with identifiable purposeful designs. Instead, the focus is on the understanding of phenotypic design and thus the forces of selection responsible for adaptation. Both the origin and selection history of an adaptation are useful to understand, but origin and selection history are different questions; the two types of questions deal with different historical causes. Thus, the evolutionary purpose/function of an adaptation can be studied productively without any reference to or understanding of the adaptation's origin.

Evolutionary psychology is the discipline of applying the adaptationist program to discover psychological design of animals. Psychological adaptation causally underlies *all* human feelings, emotion, arousal, creativity, learning and behavior (Cosmides and Tooby 1987; Symons 1987); this is indisputable. Behavior and psychological change are each the product of the processing of environmental information by psychological adaptation. Thus, aesthetic judgments are manifestations of psychological adaptation. As Symons (1995, p. 80) put it, “[P]leasure, like all experiences, is the product of brain mechanisms, and brain mechanisms are the products of evolution by selection. The question is not whether this view of pleasure is *correct* – as there is no known or suspected scientific alternative – but whether it is useful.” Symons meant *scientifically* useful. That is, can



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