

CHAPTER 14

Aesthetics

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Introduction

Aesthetics is commonly defined as the study of beauty, and its opposite, ugliness. Some philosophers conceive of aesthetics as applying solely to the arts or to artistic experience. However, most aesthetic philosophers construe the discipline as applying more broadly to beauty and ugliness in general. The term ‘aesthetics’ first appeared in a book by Alexander Baumgarten in 1735, yet philosophical discussions of beauty extend back thousands of years. Commentaries on ‘good’ and ‘bad’ music can be found in both ancient Greek and ancient Chinese sources.

Beginning in the 1960s, the field of cognitive science became increasingly influential in the philosophy of mind. While much of this influence relates to the nature of thought, reasoning, and consciousness, the impact of cognitive science has expanded to other areas of philosophy, including aesthetics. In this chapter, no effort will be made to provide a comprehensive survey of ideas related to musical aesthetics. Instead, it focuses more narrowly on how cognitive science has influenced—and continues to influence—modern thinking in musical aesthetics. This chapter concludes by arguing that cognitive neuroscience is poised to overtake philosophical aesthetics: rather than *influencing* aesthetic philosophy, aesthetic philosophy is receding to a sideline ‘advisory’ role, while cognitive science takes an unaccustomed leadership position.

Philosophical antecedents

In the West, the most influential writer on aesthetics has been the German philosopher Immanuel Kant (1724–1804). Kant laid out two pillars in

Western aesthetics. First, he distinguished aesthetic pleasure from other forms of pleasure. Aesthetic pleasure is not some other type of pleasure in disguise: for example, art is not the sublimation of food, sex, warmth, companionship, or some combination of other existing pleasures. Second, Kant argued that aesthetic emotions are ‘disinterested’; when we experience an aesthetic pleasure, there are no utilitarian or ulterior motives underlying this experience. A mother’s appreciation of the beauty of her daughter cannot be regarded as a purely aesthetic appreciation, since her experience is apt to be tainted by parental pride. Unlike garden-variety emotions, for Kant, aesthetic emotions serve no practical purpose.

In music, Kant’s ideas were developed and extended by the famed Austrian music critic Eduard Hanslick (1825–1904). In *Vom Musikalisch-Schönen* (On the beautiful in music) (1854) Hanslick proposed a highly influential view that would later prove to be compatible with a core concept in cognitive science. Hanslick challenged the (then) prevailing beliefs that music somehow represents or expresses feelings. He proposed that sensation is imaginatively interpreted by the listener, and that this aesthetic contemplative process then leads to possible emotions. In short, aesthetic judgement precedes and leads to aesthetic feelings. Until recently, Hanslick’s views have defined the principal parameters in debates concerning musical aesthetics. All major philosophers in the aesthetics of music have started by engaging with Hanslick’s ideas: see for example Susanne Langer (1942), Peter Kivy (1990), Roger Scruton (1997), Jerrold Levison (1990, 2003) and Stephen Davies (1994).

Experimental antecedents

Most aesthetics scholars have followed a rationalist approach that emphasizes exegesis of existing theories and critical philosophical discussion. Independent of this philosophical tradition, aesthetics questions have also been addressed by empirically oriented scholars pursuing various avenues of scientific experimentation. In fact, the advent of experimental aesthetics coincides with the start of modern experimental psychology. One of the founders of modern experimental psychology, Wilhelm Wundt (1832–1920) carried out a number of experiments related to aesthetic experience. Wundt (1863) showed that arousal is related to stimulus complexity and proposed that aesthetic pleasure is evoked when the art object is optimally complex—neither too simple nor too complicated.

Aesthetics experiments were similarly carried out by another early experimental psychologist, Gustav Fechner (1801–1887). In his *Vorschule der Ästhetik* (Elementary aesthetics) Fechner suggested that ‘half of aesthetics’ originates in learned associations (1876, pp. 89–90). A lullaby may evoke feelings of comfort solely because of a learned association between the tune and formative experiences of being comforted by a caregiver. A German émigré to the United States, Max Meyer (1873–1967), carried out a key experiment showing that listeners prefer familiar music over unfamiliar music. Meyer (1903) showed that repeated listening to a novel musical work tends to increase reported satisfaction. While the Gestalt psychologists carried out relatively few experiments, they did produce a number of empirical demonstrations of various perceptual principles and suggested that these principles can be observed in both visual art and music (see, e.g. Koffka 1935).

A long-standing preoccupation in experimental musical aesthetics relates to the perception of consonance and dissonance. The ancient Greeks observed that euphonious sonorities appear to involve component tones whose frequencies are related by simple integer ratios. Both Hermann von Helmholtz (1877) and Carl Stumpf (1883) speculated about possible physiological origins for consonance and dissonance. Robert Lundin (1947) proposed that consonance and dissonance preferences are cultural in origin and arise

primarily from the relative frequency of exposure to different sound combinations and the prevailing attitudes toward those sounds within a given social environment. By the 1970s, ample evidence pointing to both physiological and cultural factors influencing judgements of the euphoniousness of a sonority had accumulated. Regarding the physiological basis, a significant breakthrough occurred in the 1960s with the work of Donald Greenwood (1961) and Reinier Plomp and Willem Levelt (1965). These and subsequent researchers showed that at least some of the phenomenal experience musicians call ‘dissonance’ can be traced to mechanical interference within the organ of hearing. Regarding the influence of enculturation and familiarity on stimulus preference, mainstream psychology remained unaware of the pioneering work of Meyer and Lundin. Experimental research by Wilson (1975, 1979) and others unwittingly re-established what Zajonc (1980) later dubbed the ‘mere exposure effect’. Over the past century, over 200 experiments have shown that familiarity has a marked impact on preference—especially when the listener is unaware that the sounds are familiar.

Among several notable empirically grounded volumes on the science of aesthetics, perhaps the most comprehensive attempt is found in the work of the Canadian psychologist Daniel Berlyne. In his 1971 book, *Aesthetics and psychobiology*, Berlyne extended Wundt’s observations concerning the relationship between complexity, arousal, and pleasure. In particular, Berlyne linked Wundt’s observations with contemporary neurophysiological research on pleasure. Berlyne proposed how the phenomenal experience of pleasure might be related to arousal and complexity. He distinguished two pleasure-inducing effects: one source of pleasure arises from moderate increases in arousal, while a second source of pleasure arises from inhibition or reduction of arousal from an uncomfortably high level. Together, these sources result in an inverted-U function when hedonic value (pleasure) is plotted against arousal level.

More recent experimental investigations by Vladimir Konečni and his colleagues have tested the common assumption that large-scale formal structures contribute to the aesthetic experience. For example, scrambling the order of variations

in JS Bach's *Goldberg Variations* or the sections of a sonata-allegro movement by Mozart does not produce less aesthetically pleasing experiences for listeners (Gotlieb and Konečni 1985; Karno and Konečni 1992). Similarly, Nicholas Cook (1987) carried out an experiment suggesting that beginning and ending in the same key ('tonal closure') fails to evoke a greater sense of completion, coherence or pleasure for passages that are longer than roughly 2 minutes. Where Konečni and Cook have questioned existing ideas about form, other research has identified large-scale structures that occur cross-culturally. For example, Ollen and Huron (2004) carried out an analysis of patterns of musical repetition in music from 50 cultures, and found a cross-cultural preference for early repetition (e.g., AAABAABA rather than ABAABAAA). Huron (2006) noted that this pattern is consistent with the twin goals of pursuing increasing predictability while avoiding habituation.

Despite a long history, the experimental tradition in aesthetics has had comparatively little influence among aesthetic philosophers. This is especially true in the case of musical aesthetics, where the influence of empirical approaches has been negligible or irrelevant. Among many music scholars, empirical ideas regarding musical pleasure have been regarded as naive, and indeed, some of the claims justify this wary reception.

Cognitive revolution

In contrast to the limited impact of experimental aesthetics on mainstream musical aesthetics, the cognitive revolution has proved to be an inspiration to a number of aesthetic philosophers (e.g., Raffman 1993; Madell 2002; Butler 2004; Robinson 2005). Before discussing the relationship between cognitive science and aesthetics, it is useful to distinguish two different conceptions of cognitive science.

Prior to the cognitive revolution, Anglo-American psychology was dominated by behaviourism, a perspective that emphasized sensation, motor behaviour, and learning. Influenced by linguistics and computer science, cognitive psychologists juxtaposed themselves against behaviourism by emphasizing the thoughtful and imaginative aspects of mental life. For example, rather than viewing emotions

as types of reflexes, cognitive psychologists tended to view emotions as originating in cognitive appraisals (Arnold 1960; Averill 1980). That is, emotions were evoked by conscious or unconscious evaluations that depend on underlying conceptualizations. According to this view, judgement precedes emotion.

Until the mid 1990s, cognitive science was typically regarded as opposed to more biological approaches to understanding the mind. Early cognitive science also excluded or sidelined the role of affect or emotion. However, over the past two decades, the sciences of the mind have been converging into what Joseph LeDoux has referred to as 'the united kingdom of cognition and emotion' (1996, p. 39). Cognitive science has moved away from a strictly cognitivist perspective to embrace insights from ethology, evolutionary psychology, psychophysiology, genetics, biochemistry, and neuroimaging. The cognitive perspective remains an important component of contemporary cognitive science, but it no longer occupies the core to the exclusion of other perspectives. In short, cognitive science has become increasingly less cognitive.

This transformation of the field has repercussions for understanding the cognitive science of aesthetics. We can talk about two schools: the first might be called the 'old school' or *cognitivist* approach, while the second might be called the 'new school' or *cognitive neuroscience* approach. This distinction is important because there are two contrasting aesthetic traditions that both claim to be influenced by cognitive science.

The old school, or cognitivist view, has been especially congenial with Hanslick's formalist aesthetics. The traditional cognitivist view has been that cognitive appraisal precedes emotion: conscious or unconscious evaluation is the immediate source of evoked emotion. This view is consistent with Hanslick's argument that sensations are imaginatively interpreted, and that a contemplative process subsequently leads to possible emotions. Music evokes emotion only after passing through a cognitive/interpretive filter. Musical meaning and aesthetic evaluation precede musical affect.

This cognitivist view has become especially popular in literary aesthetics. British literary scholar Christopher Butler (2004), for example,

has applied a cognitivist perspective in his compelling account of the pleasures evoked by narrative. However, such cognitivist approaches appear to be more useful in accounting for literature and representative art than for abstract art or instrumental music. For those art forms in which narrative content is foremost, the evoked pleasures do seem to align well with cognitive–appraisalist conceptions of emotion.

However, the cognitivist conception of emotion has been criticized by both psychologists and philosophers. Experimental studies have provided ample demonstrations that at least some emotions can be evoked without cognitive appraisals (Zajonc 1980; see Cornelius 1996, for review). Criticisms of a purely cognitivist perspective on emotions have been echoed by some music philosophers, notably Malcolm Budd (1985) and Geoffrey Madell (2002).

The existing experimental evidence suggests that emotions can be evoked with or without the involvement of cognitive appraisals. On the one hand, emotions can be evoked through conscious ruminations (as, for example, when jealousy is evoked by interpreting a telephone bill as suggesting that one's spouse has been talking to a former love-interest). However, emotions can also be evoked without the intervention of conscious thought (as in a startle response evoked by the slamming of a door or hearing a tone of voice suggestive of aggression).

Such unconscious/automatic responses can also be observed in behaviours that would normally be regarded as 'higher level' mental processes such as sympathy and empathy. Several philosophers (e.g. Roger Scruton) have argued that responding sympathetically to (say) grief is not the same as feeling grief. However, modern neuroscience appears to contradict this claim. Watching someone cut their finger can generate 'gut feelings' in the viewer that closely mimic the negative feelings experienced by the person whose finger is injured. The discovery of so-called 'mirror' neurons suggests that some complex emotions can be experienced with little or no cognitive mediation (Rizzolatti and Craighero 2004). In short, cognitive neuroscience implies that there exist both cognitive and non-cognitive pathways to the evoking of emotion.

Neo-hedonism

The idea that the principal appeal of art is the evoking of pleasure (hedonism) has not been a popular idea among Western aesthetics philosophers. However, recent cognitive neuroscience has given new life to this old idea. Perhaps the most important achievement of cognitive science has been the discovery that the mind, like the body generally, holds a series of specialized structures (Fodor 1983). A popular metaphor is that the mind is structured like a Swiss army knife. Many of the debates that have preoccupied aesthetics philosophers arise from the empirically incorrect assumption that the mind is unitary and homogeneous (see also Griffiths 1997). Since the mind is capable of propositional thinking, it is easy to suppose therefore that musical experience must arise from propositional thought; since the mind forms associations, musical experience must arise from deciphering associations, and so on.

In modern cognitive neuroscience, such claims are regarded as *cumulative* rather than mutually exclusive. For any given stimulus, the modular mind applies propositional, associational, representational, empathetic, narrative, and other mental processes simultaneously. While the experience of beauty and ugliness can involve cognitive appraisals, not all such experiences *require* cognitive appraisal. In short, the cognitive appraisals of the sort envisioned by Hanslick's followers are sufficient though not necessary conditions for the experience of musical beauty.

Plural pleasures

The idea of concurrent parallel mental processes has transformed our understanding of the phenomenon of pleasure. There are many behaviours that can evoke pleasure, such as scratching an itch, quenching a thirst, solving a puzzle, successfully predicting a future event, feeling virtuous, emptying one's bladder, conversing with a friend, receiving praise, putting cold hands in warm water, and so on. Physiologists have begun to trace the unique neurological pathways associated with different pleasures, from the pleasure of eating chocolate to the 'runner's high'.

Pleasure centres in the brain were discovered accidentally half a century ago by James Olds and Peter Milner (1954). In addition to these neuro-anatomical discoveries, a number of endogenous molecules have been implicated in the experience of pleasure. These include dopamine, oxytocin, serotonin, alpha-, beta-, and gamma-endorphins, alpha-, and beta-neoendorphin, dynorphin A and B, big dynorphin, methionine enkaphalin, leucine enkaphalin, and others (e.g. Pert 1997). Each endogenous molecule evokes a subtly different form of pleasure, and each is released under a number of unique circumstances. For example, oxytocin is released in various interpersonal situations associated with pleasure, including hugging, romantic eye contact, breast feeding, and sex.

In crafting a pleasurable event, people rarely confine themselves to evoking one form of pleasure. The most common pattern of behaviour is to combine several pleasures into a single experience: a person might drink a beer *and* smoke a cigarette *and* converse with friends *and* watch a football game—all at the same time. Current neuroscience indicates that the pleasures evoked by imbibing alcohol, inhaling nicotine, reinforcing social bonds, and prevailing over a perceived enemy have different neurological origins. Yet all may be evoked concurrently in the environment of the sports bar.

A useful metaphor for this hedonic pluralism is the dinner party. You might decide to cook an especially nice meal, but it is unlikely that you will stand alone at the kitchen counter feasting on your carefully prepared Coquille Saint Jacques. Instead, you will probably invite a friend to share in the meal (social pleasure), purchase flowers to embellish the table setting (visual pleasure), light scented candles (olfactory pleasure), put on recorded music (auditory pleasure), and so on. What begins as the crafting of a gustatory pleasure quickly expands into a multifaceted hedonic experience. When given the opportunity, we heap pleasure upon pleasure upon pleasure.

The discovery of multiple pleasure pathways has repercussions for philosophical debates concerning hedonism. Among aesthetic philosophers, the standard rebuttal of hedonism is that it suggests that all pleasurable experiences can be reduced to a single value (see e.g. Kagan 1998).

Hedonism implies that pleasures are interchangeable—implying, for example, that a sexual orgasm is equivalent to so many chocolate cookies. The most common argument against hedonism is that the positive emotions evoked by feeling virtuous are simply incommensurate with a sensory pleasure, such as viewing a flower. Geoffrey Madell summarizes this anti-hedonic argument by noting that the pleasure of listening to good music is phenomenologically different from the pleasure of gorging on junk food (2002 p. 89). However, two discoveries have given new life to the hedonic argument: (1) evolutionary psychologists have offered compelling arguments that all emotions (including jealousy, shame, pride, etc.) are evolutionary adaptations that promote survival and procreation, and (2) neurophysiologists have assembled evidence that the brain contains multiple pleasure systems. The neo-hedonic rejoinder to the classic objection to hedonism is that the biology of pleasure is not unidimensional and has multiple independent sources. Pleasures can be equated only when they engage the same endocrine or neurotransmitter pathways.

If pleasures are multidimensional, it is likely that musically evoked pleasure is itself multifaceted. Consider some of the ways by which sounds are thought to evoke pleasure:

- ◆ Listeners prefer stereo reproduction over monaural reproduction.
- ◆ Familiar sounds are preferred over unfamiliar sounds (Meyer 1903; Zajonc 1980).
- ◆ Novelty-seeking is a rewarded behaviour in many circumstances (Berlyne 1971).
- ◆ Infant-directed singing has many features in common with infant-directed speech and these features are known to be preferred by infants (Unyk *et al.* 1992).
- ◆ The traditional practice of voice-leading is thought to capitalize on brain rewards for successful parsing of auditory scenes (Huron 2001).
- ◆ People experience pleasure from displays of extraordinary musical skill or virtuosity (Kubovy 1999).
- ◆ Experienced listeners regularly take pleasure in recognizing musical quotations or allusions to other works.

- ◆ Musically induced ‘shivers’ or frisson is reported by listeners as distinctly pleasurable (Sloboda 1991; Panksepp 1995; Gabrielsson and Lindstrom 1993; and others). Huron (2006) has suggested how such experiences might evoke pleasure.
- ◆ Listeners are consoled by and take pride in music whose style or genre is consistent with a sense of self-identity or social belonging.

This list represents only a partial catalogue of plausible pleasures that might be evoked (in various combinations) by music. As with studies investigating the specific pleasures involved in chocolate consumption or the ‘runner’s high’, it seems likely that future research will trace the particular neurological pathways involved in each of the various forms of musically evoked pleasure. It appears that musical sounds are capable of activating multiple pleasure pathways in the brain. In the manner of the dinner party, musicians can assemble a unique mixture of pleasures into a single musical experience.

Indirect evidence in support of this ‘plural pleasures’ hypothesis can be found in an experiment by Avram Goldstein (1980). Goldstein exposed listeners to frisson-inducing musical passages and had them rate the pleasantness of the experience. Half of the listeners received an injection of an inert saline solution while the remaining listeners received injections of naloxone, an opiate receptor antagonist. Goldstein’s results suggest a reduction in musically induced pleasantness for the naloxone-injected listeners compared with the control group. However, the pleasantness of the musical experience was not entirely eliminated, suggesting that musically induced pleasure is not restricted to neural mechanisms that result in the release of endogenous opiates. The implication is that there may be more than one way for music to evoke pleasure.

Evolutionary aesthetics

For Hanslick, the principal problem in musical aesthetics is explaining musical beauty rather than explaining musical feeling. For the psychologist, however, Hanslick’s views imply an ‘essentialist’ conception of music. For Hanslick, the beauty is somehow *in* the music, rather than

evoked *by* the music. For most psychologists, there is nothing in the world that is objectively ugly or beautiful. Humans find darkness threatening and sunshine pleasant, but a bat will have the reverse experience. We enjoy the smell of roses more than the smell of a dead carcass, and are disgusted to discover that our pet dog has the opposite experience. In the words of Donald Symons (1992), ‘Beauty is in the adaptations of the beholder.’

Feelings have a deep structure in evolution by natural selection. The feelings evoked on any given occasion can be traced to proximal causes; but the feelings themselves are generated by brain mechanisms that evolved so as to improve the organism’s adaptive fitness. We love life and fear death because these feelings contribute to our survival. We fall in love and protect our children because these feelings contribute to reproductive success. According to current orthodoxy in biology and evolutionary psychology, the feelings evoked by art ought to be traceable to one or more underlying evolutionary mechanisms. This logic has led a number of scholars to offer evolutionary accounts of aesthetic experience (see Chapter 1).

Charles Darwin himself launched a history of speculation regarding the possible evolutionary benefits of music and art. In the past half century, new evolutionary aesthetics theories have appeared almost monthly. Evolutionary theories of art are both speculative and controversial. Part of the controversy arises from the ease of ‘storytelling’. As Paul Griffiths has noted, ‘adaptive hypotheses are too easy to form and too difficult to test’ (1997, p. 71). While evolutionary theorizing appears to be an open invitation to unbridled speculation, as Jon Elster has noted, ‘The first step toward finding a positive answer is telling a plausible story’ (1989, p. 8).

In recent decades, many evolutionary stories regarding art have been proposed. Eibl-Eibesfeldt (1989), for example, has argued that people tend to prefer landscapes that resemble the primordial savanna environments of hominid evolution. Cross-cultural studies suggest that aesthetic preferences favour environmental conditions that have been conducive to survival, not in the contemporary world, but in the Pleistocene world of human evolution. Other theories have been proposed by Ellen Dissanayake (1988),

Nancy Aiken (1998) and others. In the case of music, possible evolutionary origins for music have been discussed by Geoffrey Miller (2000), Ian Cross (2001/2003), David Huron (2001/2003), and Steven Mithen (2006).

Most of the evolutionary accounts that have been offered regarding the origin of music propose a single function (such as sexual selection). This makes sense. If music does indeed have an evolutionary origin, it would have begun by conferring a single pre-eminent adaptive advantage. However, as we have seen above, there is a tendency to amalgamate multiple pleasures into a single human experience. Modern music-making is apt to engage a plethora of pleasure-evoking mechanisms and so it may prove difficult to untangle any presumed original purpose from the agglomerated mix of hedonic mechanisms assembled in modern music-making.

From a life sciences perspective, there are a limited number of stories that can be told that will reconcile art with biology. One story is that music and art might have originated as adaptive pleasures, where the art-related activity increased adaptive fitness in some (non-obvious) way. For example, music might have played an adaptive role through social bonding, sexual selection, or by facilitating language learning. In this case, we would have to conclude that Kant was wrong: aesthetic pleasures are indeed utilitarian. A second alternative story is that music-related behaviours might be non-adaptive forms of pleasure-seeking. Music might simply commandeer a pleasure pathway that is intended to serve some other purpose. In this case, music would be akin to nicotine or heroin addiction. Art is just a fancy way of tickling pleasure mechanisms that exist to reward other behaviors. A third alternative story is that music-related behaviours are biological 'spandrels'. That is, they are incidental artefacts that necessarily accompany other adaptive behaviours. Music might be akin to a benevolent form of sickle-cell anaemia (which is an artifact of a heterozygotic genetic strategy to protect against malaria infection). Music, for example, might simply be a non-functional artefact of brain mechanisms whose purpose is to promote language development.

For many people, none of these ideas is especially appealing. The idea that music is biologically ordained seems far-fetched and

problematic. Similarly, the idea that music is a non-adaptive form of pleasure-seeking (like cocaine use) is equally unsavoury. Finally, the idea that music is a physiological accident (like the non-functioning appendix) is anti-climactic. While these ideas invite opinion, the origin or purpose of music is ultimately an empirical question that will be resolved only through future scientific research.

Conclusion

Cognitive science has brought into relief what appears to be a fundamental disagreement between modern psychology and traditional Western aesthetics. The bedrock of conventional Western aesthetics has been the notion, promulgated by Kant, that there are unique aesthetic pleasures that exist aside from utilitarian pleasures. Evolutionary psychologists and biologists argue that the brain mechanisms that generate emotions represent evolved adaptations.

Over the past two decades, a number of aesthetics philosophers have been inspired by the 'old school' cognitive revolution. In particular, early cognitive science lent credence to the contemplative–appraisalist view of musical aesthetics advocated by Hanslick. However, the subsequent development of cognitive science is raising significant challenges for aesthetic philosophy in general. From the perspective of modern cognitive neuroscience, the disembodied, non-utilitarian notion of aesthetic pleasure posited by Kant cannot easily be reconciled with biology (see also Huron 2006).

Over the course of history, many of the problems addressed under the rubric 'philosophy' have been ceded to newly emerging scientific disciplines. Questions formerly considered part of 'natural philosophy' have shifted to the realm of biology and geology. Cosmology was taken over by physics and astronomy, and questions regarding human behaviour passed to the domains of the social and behavioural sciences. If evolutionary psychologists are correct, then questions concerning the experience of beauty and ugliness may soon slip from the grasp of philosophy. Only time will tell whether we are witnessing the passing of the aesthetics baton from philosophy to empirical science.

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