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Engineered Niches and Naturalized Aesthetics

ABSTRACT

Recent scientific approaches to aesthetics include evolutionary theories about the origin of art behavior, psychological investigations into human aesthetic experience and preferences, and neurophysiological explorations of the mechanisms underlying art experience. Critics of these approaches argue that they are ultimately irrelevant to a philosophical aesthetics because they cannot help us understand the distinctive conceptual basis and normativity of our art experience. This criticism may seem plausible given the piecemeal nature of these scientific approaches, but a more comprehensive naturalistic framework can help us understand the conceptual basis and normativity of art. In particular, the ecology of art, an understanding of how individuals interact within particular environments, can help us understand the engineered art niches in which we create and experience art. Each niche is associated with a particular deme, or set of individuals that interact within that niche, and a set of cognitive, epistemic, and pedagogical technologies that form the conceptual basis of a niche-dependent normativity. This is to be contrasted with the niche-independent normativity revealed by many of the scientific approaches. This framework, and the conflicting streams of normativity it reveals, allows us to better understand conflicts in normativity and the implausibility of unequivocal and universal normative principles.

I. INTRODUCTION

Naturalism has a long tradition in philosophical aesthetics. Aristotle and Hume, for instance, both thought that the empirical investigation of human nature was relevant to understanding the practice and experience of the arts. More recently, philosophers have turned to evolutionary theory, psychology, and neurophysiology for an understanding of why and how humans engage in the arts. But this recent turn to the sciences has not been without its critics. Some argue that since these empirical approaches to aesthetics cannot answer the important philosophical questions about what constitutes the *proper* conception, experience, and value of artworks, the science is simply irrelevant to philosophical aesthetics properly construed.

This skepticism about the relevance of the science to the philosophy is understandable. So far the naturalization of aesthetics has generally been piecemeal. Some *particular* scientific claim is made about the evolution of the arts, human aesthetic preferences, or the neuropsychology of aesthetic experience and then applied to some *particular* aspect of art behavior or experience. This piecemeal approach leaves unclear the normative implications of the scientific claim. That we evolved to engage in certain behaviors does not *by itself* imply we *should* behave those ways. That we have certain aesthetic preferences does not *by itself* imply that we *should* have those preferences. And the neuropsychology of aesthetic appreciation only tells us the mechanisms that underlie our experience, not about the conceptual framework in which we create and experience art. What is needed is an approach based on the full framework of a naturalized aesthetics. Then we shall better see its significance and value. Of particular significance is the biological ecology of art and the role of engineered niches in the practice and experience of the arts. These engineered niches, as we shall see, provide the contexts for the expression of art behavior that in turn provide the conceptual and normative resources that allow us to address the philosophical questions about how we should conceive, experience, and evaluate artworks.

I first consider some prominent claims in empirical aesthetics about the evolution, psychology, and neurophysiology of art behaviors. Second, I look at a standard criticism that the science is irrelevant to philosophical analysis. Third is a brief sketch of a comprehensive naturalistic framework that extends beyond the usual evolutionary and neuropsychological approaches. Then I look more closely at what has recently been called "niche construction theory" and the engineering of art niches and what that implies about the practice and experience of art. What we shall find is that there are two streams of normativity: a *niche-dependent stream* partly based on cognitive and pedagogical technologies—the concepts and conventions in use within art niches—and a *niche-independent stream* based on common evolved human preferences and tendencies and individual variations in these preferences and tendencies. This fact has philosophical consequences. Most notably, the two streams of normativity will often have conflicting implications about the conception, experience, and evaluation of art. This explains why we seem to have ongoing, and apparently unresolvable, philosophical disputes. It also suggests that unequivocal and universal principles governing the conception, experience, and evaluation of art are unlikely. But more generally, we shall see how this naturalistic, scientific approach engages the normative issues in a complex, nuanced, and philosophically significant manner.

II. NATURALIZED AESTHETICS

The term 'aesthetics' has a complicated history, sometimes referring to the study of beauty and taste, other times to the experience of art or, more generally, to the philosophy of art (Saito 2015; Shelley 2015). For purposes here, 'aesthetics' will be used to refer to the philosophy of art and is therefore primarily concerned with philosophical questions associated with the arts. If so, a *naturalized aesthetics* is a naturalistic approach to the study of art objects, behavior, and experience. But just as there is no consensus about the term 'aesthetic' in philosophy, there is no consensus about the term 'naturalism.' On one usage, naturalism is associated simply with the rejection of supernatural entities—whatever that might involve. Sometimes, though, the term is associated with a turn to science and the scientific method for philosophical understanding (Papineau 2015). The attraction of such a naturalized approach is obvious. Whatever its problems, science seems to be the most successful approach to understanding the world. Scientists may have their own biases, and at any given time the accepted theories are likely to be flawed or even false; nonetheless, our scientific theories and methods have produced airplanes that fly, chemical compounds that cure diseases, devices that perform amazing feats of computation, and media that have transformed the world. Perhaps science can also tell us something philosophically significant about our experience of and appreciation for art.

One standard naturalistic approach begins with evolutionary theory. This theory tells us that humans and their behaviors are products of the same evolutionary processes that produced other organisms. Human behaviors, including art-related behaviors, can therefore be explained on the same evolutionary grounds. One evolutionary approach asserts that art-related behaviors are products of natural selection. The idea is that the making and experiencing of art conferred a survival advantage for humans in the recent evolutionary past. Those individuals who engaged in the arts were more likely to survive to reproduce. Human aesthetic preferences for certain habitats that we see in landscape painting, for instance, might provide an advantage in habitat selection (Dutton 2010; Nadal and Gómez-Puerto 2014). Or the arts might facilitate the acquisition of knowledge. Literature might exercise the imagination and produce certain kinds of social understanding (Pinker 2009; Dutton 2010; J. Carroll 2011). Art might also function in the service of social control, cohesion, or cooperation. When we sing and dance together we are enhancing our sense of membership in a social group that helps us cooperate more effectively (McNeill 1995; N. Carroll 2014; Nadal and Gómez-Puerto 2014). The arts might also consist in a process of "making special" that result in the better creation of artifacts or performance of social rites (Dissanayake 1990).

But perhaps the arts are instead adaptations for reproduction. According to one prominent sexual selection hypothesis, art behaviors are ornamental displays that reveal fitness. Only big-brained, intelligent, healthy individuals can sing, dance, paint, and compose poetry. And the fittest of those will produce the best singing, dancing, painting, and poetry. So a mating preference for

these behaviors is, in effect, a mating preference for the fittest individuals. The offspring of a mating with those best at the arts will likely also be good at the arts, be the fittest, and have mating preferences for those who display their fitness through the arts. This produces, according to this theory, a runaway process that is responsible for many distinctly human behaviors associated with the arts (Miller 2001).

A third evolutionary explanation is based on the idea that art-making behaviors are not themselves adaptations but are instead by-products of adaptations. Steven Pinker has argued that much of our engagement with the arts is analogous to our taste for cheesecake. That preference was originally an adaptation that inclined our ancestors to search out foods high in sugar and fat. A taste for these foods would be advantageous in that it would—all else being equal—result in greater energy resources for the individuals with that taste. The taste for cheesecake itself is not adaptive though, according to Pinker, but is instead a by-product of the adaptive preference for fat and sugar. Similarly, our taste for music is a by-product of our language capacities and preferences, sensitivity to sound contours and emotional calls, auditory scene analysis, and the pleasure circuits these systems engage (Pinker 2009, 528).

Another prominent naturalistic approach does not rely on any specific evolutionary hypothesis and is broadly psychological. We might identify precursors here as Aristotle, who assumed that observed psychological tendencies in humans could help us better understand their preferences for certain kinds of theater, and David Hume, who assumed that an empirical study of the mind would help us understand human tastes (Dutton 2005). Modern psychology has gone far beyond the informal observations of Aristotle and Hume, though, into systematic observation and experimentation. Typically, the origin of the modern psychological approach is attributed to the work of Gustav Fechner with his *Vorschule der Aesthetik* (1876) and its description of a series of experiments to test the "golden section" hypothesis. According to this hypothesis, proportions approximately equal to 0.618 to 1 play a special role in the human perception of beauty. Fechner tested this hypothesis by asking subjects for their preferences of rectangles of various proportions (Vartanian 2014, 10).

This broad psychological approach tends to rely on three sources of information: first, the phenomenology or felt experience associated with the experience and creation of art; second, observational or experimental psychology that reveals tendencies and preferences relative to the arts; third, the neurophysiological investigations into the basis of art related experience and behaviors (Smith 2012). We might use these three sources of information in the service of three main projects: to determine artistic or aesthetic preferences, to identify the factors that operate in the formation of aesthetic judgments, or to uncover the psychological and neurophysiological mechanisms that operate in the experience and creation of artwork.

In a recent series of experiments in service of the first project, subjects have been asked for their preferences relative to different versions of grid-style geometric figures, based on Piet Mondrian's paintings with their solid colors and strong horizontal and vertical lines. Using figures similar to those that have appeared in Mondrian paintings, researchers have discovered that viewers seem to prefer, first, vertical and horizontal lines over oblique lines and, second, the spacing of the horizontal and vertical lines in Mondrian's paintings over experimental variations (Locher 2014, 222–224). Other studies have been conducted to determine preferences relative to pictorial complexity and compositional balance and melodic originality and contour in music and to determine the differences in preferences between novices and experts (Kozbelt and Kaufmann 2014). Advocates of a program known as "neuroaesthetics" engage in the project to find the universal laws governing aesthetic preferences. (See for instance Ramachandran and Hirstein 1999 and Zeki 2000.)

A second empirical project is the identification of the factors that operate in the formation of aesthetic judgments. Contrary to what we might expect, experiments seem to show that aesthetic judgments are not simply straightforward reports of aesthetic preferences. A preference for one painting over another, for instance, does not always lead to a judgment that the preferred painting is better. Exposure effects seem to bias assessment. In one study, subjects who were merely exposed to some Impressionist artworks seemed to judge those artworks better—as long as they were unaware of the exposure. Change the exposure and change the assessment (Lopes 2014, 25–26; Kieran 2011, 35). Moreover, research has shown that asking subjects to reason about a critical judgment seems to affect that judgment,

making it correspond less with long-term preferences. The reasons given seem to serve other purposes related to social conformity and status and not as explanation for actual preferences (Kieran 2011, 36–37). Empirical research here tends to debunk some of our reasoning about artworks and suggests that, at least in some cases, it should be regarded as confabulation rather than as the reporting and explanation of actual preferences.

The third project is the determination of the neurophysiological mechanisms that operate in the creation and experience of art. Some recent research on the so-called mirror neuron systems has this goal. Research into human mirror neuron systems was stimulated by the discovery in other primates of specialized neurological circuits that were activated both when undertaking actions (such as reaching for a peanut) and when observing the actions of others (reaching for a peanut). Humans seem to have these same mirror neuron systems that operate when undertaking action and observing the same actions as well as when having an emotional reaction and when observing others having those same emotional reactions (Winerman 2005). Mirror systems therefore seem to be mechanisms of a kind of action and emotional empathy that may operate in the experience of the arts.

Mirror systems seem to function in the observation of dance. According to one experiment involving ballet dancers and capoeira practitioners, the former had greater activation in mirror neuron systems when viewing ballet dance actions than in viewing capoeira actions, and the latter were established to have great mirror neuron activation when viewing the capoeira actions than the ballet actions. This would be expected because the ballet dancers have learned the ballet but not the capoeira actions, while the capoeira practitioners have learned the capoeira but not the ballet actions (Calvo-Merino et al. 2005). In another experiment, male and female ballet dancers had equal mirror neuron activation in actions typically performed by both male and female dances, but greater activation in the actions typically performed by each. Female dancers had greater activation in viewing the typically female actions and the male dancers had greater activation in viewing the typically male actions (Calvo-Merino et al. 2006).

Barbara Montero has extended this insight, arguing that trained dancers may have an advantage in the observation of dance because they have learned dance movements and can therefore draw upon their own proprioception of these movements in a sort of kinesthetic empathy. The idea is that as dancers learn to make certain movements, they are aware of all the sensory input that tells them the positions, movements, and movement qualities of their limbs and body. They can therefore directly proprioceive the aesthetic properties of their own movements, and, through their mirror neuron activity that generates a kinesthetic empathy, they can also indirectly proprioceive the aesthetic qualities of other dancers' movements. This mirror neuron activity and its associated proprioception "can improve the aesthetic appreciation of beauty, grace, power, and other such qualities" (Montero 2013, 170). This suggests, according to Montero, dance training *might* make a critic better relative to the appreciation of aesthetic properties of the dance (174).

III. CRITICISMS OF NATURALIZED AESTHETICS

So what do we make of these scientific investigations into the arts? Surely knowing the evolutionary explanations (whatever they may be) provides insight into the ubiquity of arts-like behavior across human cultures. And surely we can gain insights from knowing the actual art preferences of humans, the factors affecting aesthetic judgments, and the mechanisms underlying our experience of art. We might, on the other hand, worry about whether the science is settled or correct (Davies 2013, 200–201). But some critics argue that even if the science is correct, what it tells us is irrelevant to the philosophy of art. Science may be able to tell us something about how we actually experience art, but it cannot tell us how we *should* conceive and experience art or what makes an artwork good or bad. George Dickie is one critic: "No matter how many data are collected, they still remain descriptions (the *is*) and no normative principles (the *ought*) can be derived from the descriptions alone" (Dickie 1997, 295; see also Dorsch 2014, 87). So research may tell us that viewers generally prefer the actual Mondrian figures over experimental variations. It may tell us that we typically prefer paintings to which we have had unconscious exposure. And it may tell us that we have heightened mirror neuron responses to actions we have practiced. But this research does

not tell us that we *should* prefer the actual Mondrian figures or paintings to which we have had unconscious exposure. Nor does it tell us that we *should* cultivate our experience of dance through practice to get these mirror neuron effects.

Similarly, suppose some of these evolutionary accounts are correct. Perhaps they can tell us *why* we have particular landscape preferences, *why* we dance, and *why* we write and read fiction, but they cannot tell us *that* we should do so or *how* we should do so. That a preference for a certain kind of landscape helped us in habitat choice in the past does not *by itself* imply that we should have this preference now. That dance may have helped us cohere socially in the past does not *by itself* imply that we should dance now. That we write and read fiction because in the past it helped us understand the social world that we live in does not *by itself* imply that we should write and read fiction and of a specific kind.

Alongside this normativity objection is another objection based on the idea that the creation and experience of art depends on the application of concepts. To make a dance or see something as a dance, for instance, requires the possession of the concept of dance (McFee 2011, 14). If so, this objection goes, then we might learn about perceptual preferences through observation and experiment, and we might learn about the neurophysiology underlying these preferences, but we would still know nothing of the *conceptual* preconditions of the creation and experience of art (McFee 2013, 190). If so, then insofar as philosophical aesthetics depends on the mastery of concepts that govern the creation and experience of art, the sciences have nothing to say.

How should we respond to these objections based on normativity and the conceptual basis of art experience? In some sense they are both plausible. Surely evolutionary theories and preference studies by themselves do not automatically tell us what counts as good art or experience, only what we take or think to be good art or experience. And, just as surely, knowledge of the neurological mechanisms involved in art experience does not tell us about the concepts used in that experience. We might respond to these objections about the relevance of the science to philosophical aesthetics by arguing that it is based on a too narrow conception of philosophy (N. Carroll and Seeley 2013, 183). While I am sympathetic to this response, there is yet another response worth considering: the objections rely on a too narrow understanding of the relevant science. If we think that the relevant science consists only in the evolutionary theorizing and the psychological experimentation and observation, then we will likely miss the robust implications for normativity and the conceptual preconditions of the arts. What we need is a turn to the full scientific framework and the ecology of art in particular.

IV. THE NATURALIZED FRAMEWORK

Suppose the critics of a naturalized aesthetics are right in the limited way acknowledged above. The evolutionary accounts and psychological theories of art do not provide the resources to make normative claims about art or to understand the conceptual preconditions of art. But that does not imply that a naturalistic approach to aesthetics *properly* construed cannot provide these resources. There is more to the science than the evolutionary and psychological theories. To see what resources there are, we need to consider the framework in full, in particular the neglected *ecology* of art.

We might begin filling out this full scientific framework with the evolutionary theories of art briefly summarized above. Art behavior could have been favored by survival selection or sexual selection, or it could have been a byproduct of one of these selection processes. But that is only part of a full naturalistic account that must also include development and genetics. The biological evolution of art presupposes some heritable basis that guides development. Perhaps there is some genetic basis for dancing, singing, painting, and so on. And as part of this framework we might also include epigenetics—factors that influence the expression of genes and development. A third component of this framework would include the psychological and neurophysiological factors that we have looked at and that underlie the creation and experience of art. These factors will surely have some genetic and epigenetic basis and perhaps an evolutionary story. Finally, all development occurs within specific environments that generate the selection pressures that guide evolution. Art behaviors develop within particular environments and through the mechanisms studied by cognitive psychologists and neurophysiologists. We can then also study

the art-related interactions among individuals and within an environment in the "ecology" of art.

An adequate naturalized aesthetics or philosophy of art must take into account the full scientific framework because each part of the framework has implications for the others. Evolutionary thinking, for instance, asks us to think about individual organisms as members of variable populations. The genes that govern development vary within a population, likely resulting in variable aesthetic preferences and neurophysiology. So we should not expect that everyone experiences art in the same way or has precisely the same preferences. Second, genetics and epigenetics tell us that development occurs in environments and is always relative to the environment. So *how* the genes get expressed depends on the environment in which they get expressed. If there is a genetic basis for some type of preference, for instance, how that preference develops in any particular case depends on the environment in which it develops. That suggests we need to consider ecology—how individual organisms interact with each other and the environment and how selection processes operate in the various environments in which the traits develop. A trait may be favored by selection in one environment but not another.

V. THE ECOLOGY OF ART

This role of ecology deserves emphasis. One of the difficulties of the evolutionary theories of the arts is accounting for the varying ways humans participate in the arts. The dancing, singing, and painting we observe is very different in different environments. And these differences make the selection hypotheses seem more problematic. We might say, for instance, that dance functions to enhance social cohesion. But people dance in so many ways, and in so many different contexts, that it is not clear that dancing always or even mostly enhances cohesion. We may dance in social contexts with other folk dancers and in tango and salsa clubs, but we also dance on stage, in film, and for YouTube videos. There are couples dances, group dances, and solos performed on stage for audiences. Dance may be to music most of the time, but sometimes it is not. This type of variability has long bedeviled those philosophers who look for universal evaluative principles. Because dance is so highly variable in expression, it is hard to see how there can be any universal principles that tell us what makes a dance good or bad. Rather, what makes a dance—or any artwork—good or bad seems to depend on the context (Richards 2004). As we shall see, this dependence on context has a powerful foundation in the ecology of art and in the engineering of art niches.

Ecological thinking has been around for a very long time, extending at least back to Aristotle and Theophrastus, who had keen interest in how organisms function in particular environments. The interactions of organisms with each other and the environment acquired new significance with Darwin's theory of evolution though. Darwin regarded these interactions as fundamental to the operation of natural selection. The term 'ecology' was coined by Ernst Haeckel to refer to this kind of thinking, a decade after the publication of Darwin's *Origin*, in 1870 (Stauffer 1957, 138). But ecology only became a distinct discipline in the second half of the twentieth century (McIntosh 1988, 1). One recent development has striking implications for our concerns here. Naturalists have long been aware that organisms systematically change their environments. They engineer them. Organisms from fungus and bacteria to birds, elephants, and humans systematically modify their environments to better suit their lifestyle. But only recently has there been explicit theorizing about this phenomenon.

In their 2003 book *Niche Construction*, John Odling-Smee, Kevin Laland, and Marcus Feldman lay out the basic ideas of niche construction theory. The fundamental idea is that there are two ways organisms can become adapted to an environment. First, organisms can be modified by natural selection to better fit the environment. Long fur and thick blubber, for instance, evolved to deal with extreme cold. But, second, organisms can also be adapted to an environment by changing the environment to better suit their physiology, lifestyle, or behavior. Beavers and the dams they build might be the first example of niche construction that comes to mind, but ecological engineering is ubiquitous in nature. Birds build nests. Badgers excavate elaborate undergrounds nests with a system of tunnels that link nurseries, latrines, and sleeping chambers. Earthworms modify the soil they live in to better suit their physiology. Ants and bees build nests that regulate temperature and humidity. Plants and trees modify the soil around them to prevent

other plants from growing. Bacteria create biofilms that chemically alter their environment. Termites have engineered their niches in dramatic ways, building giant nests with ventilating systems driven by the fungus that they cultivate and where they can live in comfort and raise offspring (Odling-Smee, Laland, and Feldman 2003, 80–84).

A second fundamental idea here is that engineered environments can be passed on to offspring. Niche construction introduces environmental inheritance as well as genetic (Odling-Smee, Laland, and Feldman 2003, 3). So while organisms become adapted to their environment by natural selection and pass on those adaptations to offspring genetically, they also modify or adapt their environments to their own needs and preferences and pass on those environmental modifications to their offspring. These two inheritance processes are intertwined. The genes for niche modifier traits are subject to natural selection, like other traits, and the fitter modifier traits will be passed on to offspring. But the modifications themselves are also passed on to offspring.

Humans are undoubtedly the most striking of niche engineers. This is not just due to niche construction tendencies but also the distinctively high levels of human cooperation and extreme human phenotypic plasticity (Sterelney 2003). Humans cooperate in a variety of complex ways in the construction of niches, which then influence their development and behavior. Most obviously, we build and live in houses in villages and towns and in apartment complexes in cities. But we have also created highly engineered niches with our farming, domestic breeding, and food storage. We eat bread made of engineered grain. We make butter and cheese from the milk of organisms that we have modified over time through artificial selection. And we store and sell all of this engineered food in supermarkets. We go to schools and work in factories, offices, and businesses that we have created and play with each other in games and sports that take place in gyms, courts, and on fields. Niche construction has extended to the arts as well. We dance in clubs, on stages, and in ballrooms. We paint in studios and exhibit those paintings in galleries and museums. We sing in churches, at sporting events, in nightclubs, and on the opera stage. In each of these cases, and many more, art behaviors take place in highly engineered environments that affect the expression of the behavior.

Human niche construction is unique in that it is much more variable than what we see in other organisms. We construct different niches for different kinds of activity. But humans do not interact in all niches equally. This is a general point about human niche construction, but we can see this in the art niches. The people who interact in the dance niches, for instance, are typically not the same people who interact in the visual art or music niches. And the people who interact within the dance subniches, ballet for instance, are typically not the same people who interact within the modern dance, Argentine tango, ballroom, or hip-hop niches. Biologists call groups of interacting organisms "demes," and we can follow their lead here. If so, there is a hierarchical, demic structure to engineered art niches.

This demic structure might also have some specialization or division of labor. Ants and termites have a division of labor, where some individuals perform one task for the nest, working in the nursery perhaps, other individuals tend to the fungus gardens or function as guards. Similarly, within human-engineered art niches, there are also different tasks to be performed, often by different groups of people. Some individuals may be solely practitioners of an art—dancers, artists, actors, and so on—but others may be teachers of that art. Some may serve a technical function, such as stage manager or museum curator. But some individuals within a deme may also be critics, explaining to those outside the deme what counts as good or bad activity within the art niche. Yet others may simply be part of the audience.

Besides this demic structure and distinctive patterns of interaction, there are also the ways that niches get engineered. It is natural to think of these as *technologies*. First and most obviously there are the architectural technologies—the buildings, structures, and spaces in which we practice the arts. These are the theaters, studios, and rehearsal halls we see in concert dance niches. They are the ballrooms and tango clubs in which these sorts of dance take place. They are the art studios, galleries, and museums in which the visual arts get made and exhibited. They are the practice rooms, concert halls, jazz clubs, and amphitheaters in which music is played for audiences. Alongside and within these architectural technologies are the artifactual technologies—the objects we make to help us engage in our arts behaviors. For dance, that may mean different kinds of shoes.

For the visual arts, the various paints, brushes, papers, and canvases. For music, there are the musical instruments, amplification tools, and recording instruments.

Within each niche there are also the concepts used to guide actions within the niches—the cognitive technologies. There are the more general concepts such as *dance, painting, music, film,* and *sculpture* that seem to play regulatory roles in what counts as a proper kind of activity for more art general niches. To count as *dance* in some niche, for instance, an activity may need to satisfy some condition or set of conditions associated with the concept of dance in that niche. There may also be more specific dance concepts—*ballet, modern dance, hip hop, ballroom,* and *Argentine tango*—that must be satisfied within the narrower niches. To function within a ballet niche, for instance, one must typically be doing what those in that niche regard as ballet, and that will be determined relative to some general concept of ballet. Within these niches there are also the concepts that govern specific actions. In ballet niches, there are *tendu, pirouette, coupé jeté, fouetté,* and so on. These concepts govern the actions that one would find and be expected to execute in a ballet niche, but not in a ballroom or hip-hop niche (although there might be some borrowing of technologies). Recognition of these concepts, with their regulatory functions, leads to conventions. By convention ballet dancers do particular sorts of actions, but these conventions are not arbitrary; they are products of the conceptual technologies within those niches.

There are also epistemic and pedagogical technologies that function in teaching the activities associated with a particular niche. In classical ballet, for instance, there are syllabi that govern what actions are learned and when. And there are books and videos to teach *what* the actions are in each syllabus and *how* to learn them. Other pedagogical technologies include exercises, classes, and procedures for how the classes will be conducted. In classical ballet, for instance, there is "barre work," in which practitioners rely on support from a ballet barre, and "centre work," in which they do not. Drawing drills, painting exercises, and musical scales are pedagogical technologies in this sense.

Finally, there are the institutional technologies, the constructed socially recognized organizations that function as agents in a variety of ways and that often have explicit legal status. Universities, for instance, play important roles in how the arts are learned, what kind of arts are learned, and what kind of art is made. And by conferring degrees, they establish social status for the members of each niche. Alongside the universities are the art academies and music and dance conservatories. There are professional organizations as well, many that confer special status on members and regulate activities. In dance, for instance, there is the Imperial Society of Teachers of Dancing that has divisions for ballet and ballroom and through its systems of examinations confers credentials on its members. These institutional technologies may in general harden the niches by making the boundaries more distinct, both in terms of who is recognized as working within the niche and what cognitive, epistemic, and pedagogical technologies are part of that niche.

VI. NICHE-DEPENDENT NORMATIVITY

The normativity criticism of the scientific approaches to art is that even if science could tell us how art behavior evolved, how we actually experience art, and what our preferences are, it cannot tell us how we *should* conceive, experience, and evaluate art. The general response offered here is that this criticism relies on an overly narrow understanding of the science and that we need to look at the ecology of art and how art behaviors are expressed in the engineered art niches that contain cognitive, epistemic, pedagogical, and institutional technologies. We are now in a position to address this normativity criticism and will do so by adopting some of John Searle's (2010) analysis in his *Making the Social World*.

Normativity is generated in part by the cognitive technologies—the concepts that govern and regulate the activities—as well as the epistemic and pedagogical technologies—practices, conventions, and rules that assist in teaching and learning the activities. When we learn the concept of ballet—what ballet is, for instance—we learn what counts as the proper kind of activity for a ballet niche. But to fully understand ballet, we need to learn a framework of concepts that govern particular actions—*pirouettes*, *tendus*, *jetés,* and so on. These we may learn with help from the epistemic and pedagogical technologies—books and videos or ballet class and its exercises. As we are learning the concepts that regulate our activities in niches,

we are also in effect "recognizing" them. *Recognition* here is not just the ability to identify the cognitive, epistemic, and pedagogical technologies that govern activities but also to *accept* them as regulating ways of doing things. This acceptance may not always involve approval, but is rather, at minimum, acknowledgment of their status as regulating the relevant activities (Searle 2010, 8). So, for instance, I may disagree with a particular way of doing things in the Cecchetti ballet syllabus, preferring some other way, but I might still recognize that it is a legitimate way of doing things.

If those who interact within a niche generally recognize and accept these cognitive, epistemic, and pedagogical technologies in this sense, and in the same way, and they also recognize that others recognize these technologies similarly, then there is *collective recognition*. Each individual recognizes and accepts the concepts and conventions *on the belief and assumption that are others will do so as well*. This makes possible a *collective intentionality,* where individuals can engage in and contribute to the activities within a niche based on the assumptions that others will similarly engage and contribute. This collective intentionality is sometimes expressed in the first person plural: "*we* are performing *Swan Lake*," or "*we* are playing Beethoven." Ballet companies have collective intentionality in performing ballets on stage, and symphony members have collective intentionality in playing symphonies. But this collective intentionality is deeper and more pervasive than these two examples might suggest. There is collective intentionality when we recognize concepts, values, conventions, and practices and act on the assumption that others do so as well. Practitioners in the classical ballet niche, for instance, recognize that dancers should point their feet and move their arms in a particular way if they are doing classical ballet. Each person recognizes these regulatory conventions (even if they personally disapprove) but also assumes that others recognize it and so acts in conformity with them on that basis (Searle 2010, 42–60).

The collective recognition of cognitive and pedagogical technologies, along with collective intentionality, generates what Searle calls "deontic powers"—"rights, duties, obligations, requirements, permissions, authorizations, entitlements, and so on" (Searle 2010, 9). These powers tell us what we must or must not do and what we can or should do. Collective recognition of these deontic powers also generates an enforcement mechanism, what Searle calls "background power"—the social pressure to conform: "a set of Background presuppositions, attitudes, dispositions, capacities, and practices of any community that set *normative* constraints on the members of the community in such a way that violations of those constraints are subject to the negative imposition of sanctions by *any member* of the community" (Searle 2010, 160).

But it is not just individual members that can impose sanctions based on collective background power; there is also a more explicit *institutional power*—the power that institutions have to enforce rules and regulate behavior. (Searle 2010, 141–142). Institutions confer status that can legitimize one activity or way of doing things and not another and give one person a status of legitimacy and not another. They can sanction some activities or ways of doing things and discourage others.

There are then at least three sources of normativity within a niche: first, the collective recognition and intentionality that generate deontic force; second, the background social pressure; and third, institutional power. This normative framework gives us *niche-dependent reasons* to act in certain ways within each art niche.

We can now see how this niche-dependent normativity informs the evaluation of specific artworks. The first thing to notice is that typically there are multiple conventions or norms within each niche relating to a particular artwork. Consequently, an artwork may be "good" in that it satisfies one norm, but be "bad" in that it does not satisfy a different norm. In classical ballet for instance, there are norms associated with the technique and expression of the dancers, and there are norms associated with the choreography and staging of a work. So a particular production of *Swan Lake* may be good with respect to how the dancers execute the choreography relative to conventions about the use of the feet, arms, timing, or musicality. But it may not be good—not satisfy the norms—relative to the choreography and staging. In order to arrive at an overall evaluation, then, the reasons to regard that production as good—the execution of the actions—may need to be weighed against norms related to the conventions of choreography and production that were not satisfied.

Second, some of the norms may tend to conflict with others. Satisfying one norm may make the

satisfaction of another norm more difficult. Even in ballet innovation is valued, but it may often conflict with other established conventions. The innovative use of turned-in feet and legs in Nijinksy's 1913 production of *Rite of Spring*, for instance, violated well-entrenched norms related to classical ballet turnout and foot point. Such a production may still be good, though, depending on how it satisfies other norms related to composition, staging, and innovation. There may, in some cases, also be conventions that give guidance about how to evaluate works relative to multiple norms and conventions. In choreography festivals, for instance, there may be informal and unstated conventions to weigh choreographic norms more heavily than technical dance norms. There may also be explicit practices that tell us how to weigh multiple norms. In competitive ballroom dance, for instance, the World DanceSport Federation treats four basic norms equally: "technical qualities," "movement to music," "partnering skill," and "choreography and presentation." In this case there is an institutional technology that tells us how to weigh competing norms. Typically, though, the weighing of multiple niche-dependent norms may instead depend on another source of normativity, our niche-*in*dependent, individual preferences and tastes.

VII. NICHE-INDEPENDENT NORMATIVITY

Alongside this niche-dependent normativity is a *niche-independent normativity* that generates reasons to conceive, experience, interpret, and evaluate art in various ways, independently of the collective recognition and background and institutional power within a niche. This normativity is generated in our actual creation and experience of artworks based on our tendencies in conceiving and experiencing artwork, our preferences for art, and the pleasure, enjoyment, or satisfaction we get, or might get, with this experience. Unlike the socially grounded niche-dependent normativity, this normativity is personal and individual. Much of the psychological investigation into the arts is engaged in exploration of this niche-independent normativity. This is perhaps easiest to see in the preference studies. The Mondrian figure studies were designed to determine individual preferences relative to the kind of grid style geometric figures that are distinctive to Mondrian's paintings. Individual preferences here can surely give us reasons to engage in the arts in particular ways—independent of any niche-dependent normativity. That I prefer art of a certain kind and that it gives me a particular kind of pleasure is surely a reason to engage that kind of art in a particular way—whether or not there is any relevant niche-dependent normativity.

The scientific investigations into the underlying mechanisms of art behavior and experience are indirect studies of this niche-independent normativity. As we learn more about how our mirror systems function in the experience of dance and other arts, we learn more about the niche-independent reasons we *might* have to engage these systems in particular ways. If mirror systems activate more strongly to dance actions we have learned and we get some additional satisfaction from this activation, then perhaps there is a reason to learn dance to better appreciate it visually. That may generate new and more satisfying preferences. An empirical investigation of how we engage with the arts personally and individually need not be limited to the determination of how we *actually* experience and value artwork but can potentially give us information on how to engage with the arts in better and more satisfying ways.

The studies of the factors that affect aesthetic judgment are similarly explorations of niche-independent normativity. If we learn, for instance, that being asked to justify our aesthetic judgments tends to make them less reliable, then perhaps we should treat these judgments with some skepticism. We have a good reason to not rely too strongly on these rationalized judgments for guiding our aesthetic choices.

There may be common, evolved tendencies for all or nearly all humans, based on common neurophysiology, but there are also individual variations within all populations (as evolutionary theory leads us to expect) that affect normativity. Perhaps not all people have the same preferences relative to Mondrian style geometric figures. If so, then the general preferences here will be countered by individual, idiosyncratic preferences. And anyone with these idiosyncratic preferences would have reason to accommodate them rather than the general preferences. Just as scientific investigations can reveal commonalities, they can reveal individual variations in preferences, pleasure and satisfaction, and the resulting variations in normativity.

These niche-independent reasons to engage in art in various ways may often be operating in

the weighing of niche-dependent norms. An individual preference for innovation in choreography may be a good reason to weigh niche-dependent innovation norms over technical dance action norms. For those with this preference, that a version of *Swan Lake* is innovative may outweigh the fact that its dancers do not skillfully use their feet, legs, and arms as prescribed by relevant norms. On the other hand, for those with the training-based and mirror-system-mediated kinesthetic empathy for the dance actions, the skillful use of the feet, legs, and arms that satisfies niche-dependent norms may produce additional appreciation, and the dance action norms here may be more important than the innovation and choreography norms. If so, then perhaps what makes a particular production of *Swan Lake* "good" or "bad" and what makes it "better" or "worse" than another depends not just on the multiple niche-dependent norms but also on the niche-independent reasons to weigh competing norms.

VIII. CONCLUSION

The primary purpose here is to show how a naturalistic, scientific approach to the arts can lend insights into the normativity and conceptual basis of our experience of the arts. The normativity criticism is that science cannot tell us how we should conceive, experience, and evaluate art. But if an ecology of art can tell us what the cognitive, pedagogical, and institutional technologies are in a particular engineered niche, then it can tell us what the concepts and conventions are that give us niche-dependent reasons to conceive, experience, and evaluate arts in particular ways. And if the neuropsychological investigations can tell us something about how our individual experience of the art can give us satisfaction and pleasure, then they tell us something about our niche-independent reasons to experience art in particular ways.

It may be objected that on this account, the normativity is revealed by a philosophical analysis that has just been subsumed into the scientific and that the important analysis is not itself an empirical, scientific activity. It is not the science that is doing the work. The insight into the role of institutions in generating normativity, for instance, has already been recognized by George Dickie (1997) and others. There are at least three responses to this. First, to repeat, this is a too narrow conception of science. To understand the niche-dependent normativity, we might use the methods and assumptions of a variety of scientific disciplines: cognitive, social, and evolutionary psychologies; anthropology; political science; economics; and more. That philosophical analysis is required here is not surprising; philosophical analysis is also required in much of the work we find within these sciences. Cognitive science, for instance, relies on extensive philosophical thinking about the nature of concepts, and anthropology, political science, and economics all rely on fundamental philosophical assumptions about the nature of social causation, value, and meaning.

Second, placing the philosophical analysis within the scientific framework has important consequences for that analysis. Most obviously, it requires that we take into consideration both streams of normativity: the niche dependent that is based on the socially grounded cognitive, pedagogical, and institutional technologies and the niche independent that is based on the evolved neuropsychology, tendencies, and preferences of individuals. This has several important philosophical consequences. First, there will typically be multiple and conflicting reasons to conceive experience and evaluate artworks in particular ways. We would not expect that the niche-dependent stream of normativity would coincide exactly with the niche independent. This suggests, second, that there cannot be universal critical principles vindicated by both streams of normativity. The details of this normative discordance are beyond the scope of this article and require a careful analysis of particular niches, but the naturalistic, scientific approach reveals its general nature.

Third, by placing this niche analysis into a scientific framework, we are forced to take into account the full implications of the framework. One insight already mentioned is illustrative. Evolutionary theory requires that we think about humans as members of variable populations. This requires that we recognize there is variability in the experience, preference, and pleasure among individuals. We should not expect that all people engage with the arts in the same way and for the same reasons. Again, this suggests that general critical principles are problematic. It also suggests that aesthetic value may be highly dependent on variable subjective factors. What has value will depend on the

nature of the subject and the context (Richards 2004, 2005). Finally, the scientific framework leads to other areas of investigation. It tells us that development occurs within particular environments and that the environment affects this development. It affects how genes get expressed and the epigenetic factors that determine expression. Perhaps we can learn how visual development is affected by the visual environment, for instance, and that influences normativity in the visual arts.

There are also many questions, complications, and details that await future analysis. First, niches are messy to varying degrees, with changing demes and technologies and porous boundaries. Our best understanding of these niches must take this into account. Second, the normativity generated by a niche may also be messy. Collective acceptance of cognitive technologies, for instance, may be to varying degrees. If so, then the normativity within a niche may be strong, weak, or even equivocal—if there are competing cognitive technologies. Third, niches change over time as new architectural, artifactual, social, cognitive, pedagogical, and institutional technologies get introduced, change, or are eliminated. How does this work and how does this produce a change in the collective intentionality and the resulting normativity? Finally, how can we evaluate the niches themselves? Should we regard the niche-independent normativity as fundamental and judge niches on how well they satisfy and conform to human desires, preferences, and tendencies? If niches and their technologies can satisfy human needs, preferences, and desires to different degrees, should we favor those that give us the most pleasure and satisfaction? Finally, what implications does this account have for the general nature of aesthetic judgment and value? No simple claims of objectivity or subjectivity seem plausible. Regardless of how these questions are answered and how the details are worked out, this naturalistic, scientific framework, with its attention to the engineered niches in which we engage the arts, can surely help us better understand that engagement.[1]

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