

OVERVIEW

Neuroaesthetics and art's diversity and universality

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There is a duality to art. It is enormously varied and culturally diverse, and yet it is also universal, common to all humans. Art's variability and distinctiveness seem to elude science, better equipped to account for constant or regular phenomena. We believe that art's cultural particularity can be reconciled with its biological universality. The emergence of variability and distinctiveness from common mechanisms is at the core of biological explanation; it is a basic fact of life, and a basic fact of brain function. The individual, cultural, and historical diversity of art, both in its production and its appreciation, owe to basic features of the organization and function of the human brain. Each encounter with an artwork engages flexible neural networks that are modulated by context, expectations, emotional states, goals, and experience. Because these factors change from one occasion to another, each encounter with art has its distinct flavor. Repeated encounters with art over the course of a lifetime lead people develop personal preferences for art, as the network connections become strengthened in unique ways. These flexible and adaptable networks evolved in humans as a consequence of the relaxation of genetic constraints on the development of brain regions involved in orchestrating network dynamics, enabling a greater impact of learning and experience. In sum, art is universal and common because it arises from neural systems that are common to all humans, and it is variable and diverse because those neural systems evolved to be flexible, attuned to momentary contexts and goals, and changing through a lifetime of experiences.

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1 | INTRODUCTION

Art seems paradoxical. On the one hand, it is an expression of human culture. It embodies meanings bound to particular times, places, collectives, and individuals. Artworks are among cultures' most valued and distinctive achievements: Songs, dances, adornments, tales, and so on, are basic building blocks of our cultural identities. In this sense, art is "[...] such a peculiar, and peculiarly cultural, phenomenon that there can be no 'natural', untutored set of reactions to art objects, or none at least that are reliably relevant to those objects' value as art" (Gopnik, 2012).

On the other hand, art is universal, common to all humans (Dutton, 2005; Silver, 1979). People everywhere produce and appreciate art in one form or another. Even the earliest members of our species adorned their bodies and utensils with

pigments and geometrical forms (Henshilwood et al., 2011; Henshilwood & d'Errico, 2011). Regardless of cultural background, thus, humans engage with art, and have done so since the very beginning. This observation suggests “the possibility of a deeply based, biological cause for aesthetic judgments” (Soueif & Eysenck, 1972). In this sense, art, both in its creation and appreciation, is an expression of a shared human nature (Dobzhansky, 1962; Lorblanchet, 2007).

So, is art “peculiarly cultural” or is it “biologically determined”? This tension between the cultural and biological aspects of art is a consequence of differences in the way humanists and scientists approach art. Those who regard art as a product of specific cultures often see no room for biological or scientific explanations (Dickie, 1962). To them, everything that makes art interesting, and artworks unique, is beyond the scope of science: “the crucially artistic aspects of artworks are the kind of painfully complex cultural and cognitive phenomena that are likely to escape experimental study, at least for the foreseeable future.” (Gopnik, 2012). Conversely, those who view art as a fundamental expression of human nature tend to look past its historical, cultural, and individual diversity. They focus on universal adaptations (Miller, 2001), psychological processes common to all humans (Ramachandran & Hirstein, 1999) and neural activity in circumscribed brain regions (Ishizu & Zeki, 2011, 2013).

Such fractured approaches are likely to lead to fruitless debates. Dichotomies, like nature versus nurture, or culture versus biology, can help us simplify and understand complex phenomena. When our object of study consists of many interlocking parts, or involves many interdependent processes, it is convenient to first classify those parts or processes into categories. We create categories and label them only as an aid to grasp the intricacies of the world. But when we treat these labels as denoting divisions that exist in reality, they become obstacles to understanding. Art is neither culture nor biology. Like any human activity, artistic creation and appreciation arise from the interweaving of inheritance and learning (Richerson & Boyd, 2005). But the fabric of art cannot be unwoven into genetic threads and environmental threads. Accounting for art's variability and universality requires a different focus: It requires understanding how the sense in which art is peculiarly cultural is related to the sense in which it is biologically determined. Resolving the misleading paradox begins by discarding the notion that variability, however vast and striking, contradicts biology. It begins by accepting that plasticity and variation, not rigidity and invariance, are fundamental features of functional biological organization (Laland et al., 2015).

This focus also shows why it is misguided to treat art as an exceptional human activity. Art is not unique in that it is both universal and culturally peculiar. In this sense, art making and reception have much in common with other cognitive skills, like language (Dehaene-Lambertz & Spelke, 2015). Humans are naturally prepared to acquire language: perceptual and cognitive biases orient human newborns and infants towards features of language, facilitating its acquisition (Mehler et al., 1988; Saffran, Aslin, & Newport, 1996). Although most humans are born with common perceptual and cognitive equipment to acquire language, there is an enormous variety of languages. Language is acquired within highly diverse cultural environments. Not only is linguistic exposure essential for normal language development, its diversity determines the surface features—syntax, lexicon, phonology, and so on—of individual languages. The biological systems underlying human language acquisition have evolved to be, within limits (Hartshorne, Tenenbaum, & Pinker, 2018), flexible and culturally permeable.

Likewise, natural selection endowed our species with neurobiological mechanisms that allow us to create and appreciate art, but these biological mechanisms are not fixed or isolated from cultural influence. On the contrary: they are attuned to the environment, and sensitive to our rich symbolic and material culture. We do not produce and appreciate art because it is in our culture, nor because it is in our nature. We produce and appreciate art because it is in our nature to develop artistic sensitivities and skills that are embedded within a cultural fabric. The flexibility of this system invites the possibility that each experience of art production or appreciation might be different and even unique.

2 | ART'S VARIABILITY OWES TO THE BRAIN'S FLEXIBILITY AND CONTEXTUAL SENSITIVITY

The cultural, historical, and individual variability in art production and expression arise from the organization and basic functions of the human brain. The human brain is versatile because of its modular and hierarchical structure. This structure is evident from neurology, neuroanatomy, and more recently functional neuroimaging (Damasio, 1989; Geschwind, 1965; Mesulam, 1998; Sporns, 2013a). Modules, or communities, are networks of short-range connections among neurons that perform specialized functional tasks, such as extracting basic visual features, or initiating movements for actions. These communities are at the base of a hierarchy of larger scale functional networks established through long-range connections (Figure 1). These broad networks link modules and instantiate different aspects of higher cognition. This multilevel structure enables the brain's most basic strategy for cognitive logistics: the segregation of specialized labor and the integration of the products of that labor for general operations (Sporns, 2013a).

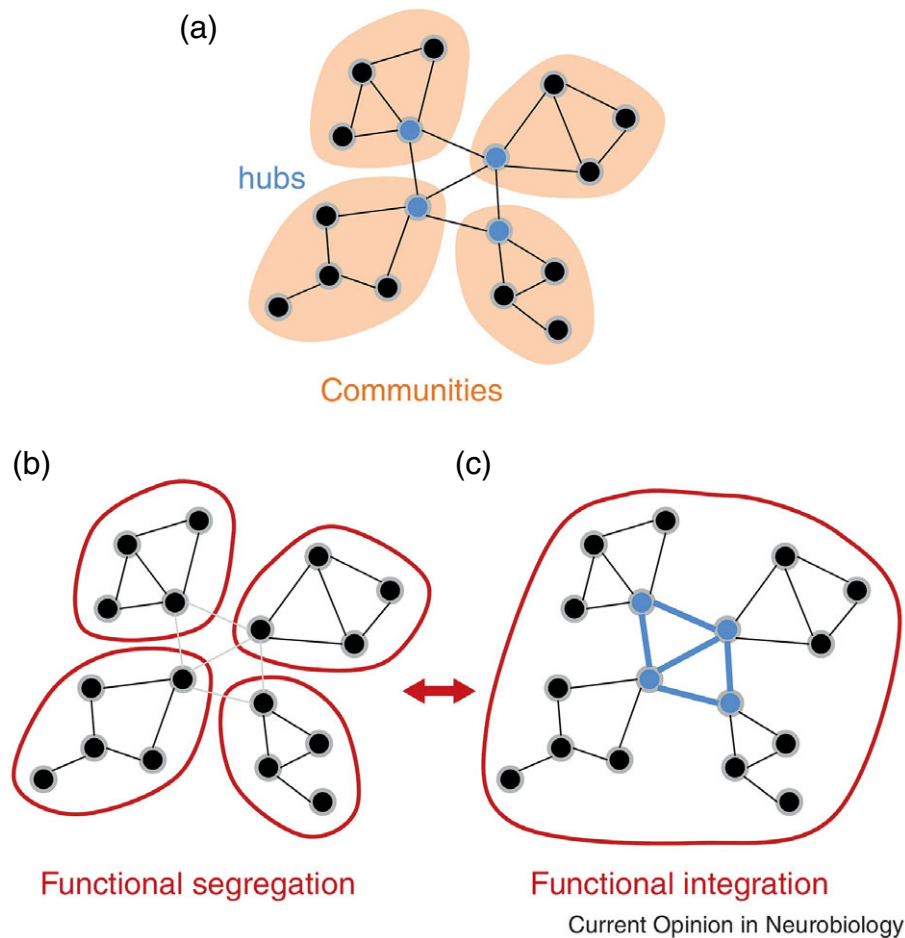


FIGURE 1 Simplified representation of the modular structure of the brain. (a) Illustration of four different modules (in orange) with specialized functions. High-level hubs that constitute the centralized core linking the modules are shown in blue. (b) Functional segregation is achieved by coupling neural activity within modules, with little information shared across modules. (c) Functional integration is achieved by global coupling with information flow across modules, shown in blue. (Reprinted with permission from Sporns (2013a) Copyright 2013 Elsevier)

Densely interconnected high-level hubs, sometimes called centralized cores or convergence zones, are the highest level within this network hierarchy (van den Heuvel & Sporns, 2011). The centralized core balances segregation and integration functions by gathering distributed information and combining it to generate cognitive and emotional functions (Harriger, van den Heuvel, & Sporns, 2012). Most brain regions integrated by this core are multimodal areas. This core can flexibly link several neural networks that implement different functions. These networks include those that implement sensation and movement, deploy attention and determine the salience of objects, exercise executive control, make evaluations, or simply operate in a default mode in which people orient inward and let their minds wander. These large-scale functional networks come together transiently. They configure and reconfigure over short-time scales, from milliseconds to seconds, in a manner that is flexible and influenced by the environment and the task in which a person is engaged. Thus, these networks underpin people's quick reactions to momentary circumstances and local conditions (Park & Friston, 2013).

Functional and structural networks change over milliseconds and seconds to match goals and task demands. They also change over the broader time scale of a person's life. Cognitive capacities develop as the long-distance connections are set throughout childhood and adulthood (Bullmore & Sporns, 2012). Differences in the speed and extent of this development lead to individual differences in long-range connectivity, which underlie differences in learning, motor, perceptual, and attentional performance in many domains, including social cognition, music and language (Baldassarre et al., 2012; Kanai & Rees, 2011; Zatorre, 2013).

In sum, the versatility of human cognition owes to a modular and hierarchical brain structure that evolved to allow moment-to-moment flexible configuration of functional networks that are sensitive to the context in which people find themselves and the goals they set. These structures are modified by experience, learning, and lifelong practice. Such principles apply to all domains of cognition, and art is no exception.

The experience of art emerges not from fixed operations of specialized brain regions, but from flexible configurations of functional networks over at least three time spans (Figure 2). First, engaging with an artwork involves rapid configuration of functional networks over milliseconds to seconds. These networks are sensitive to momentary experiences that are shaped by

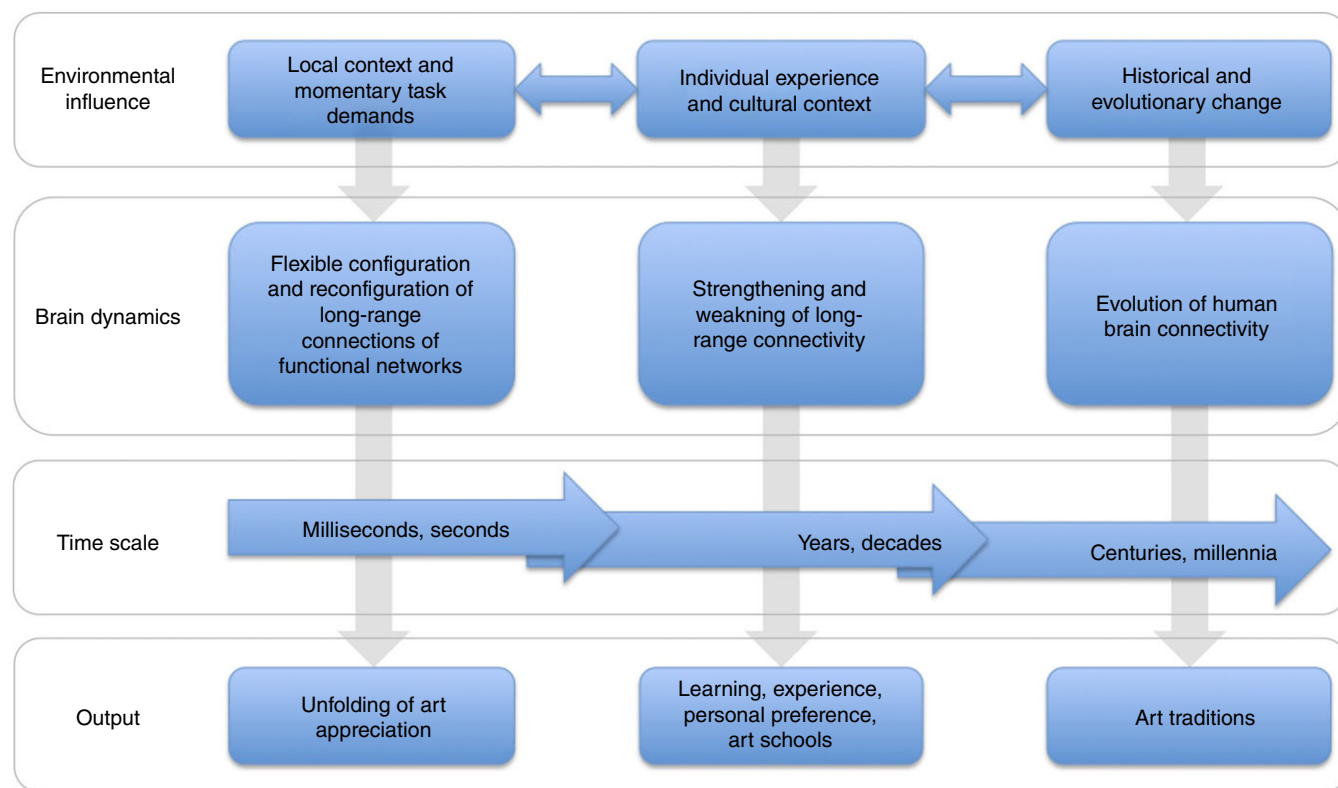


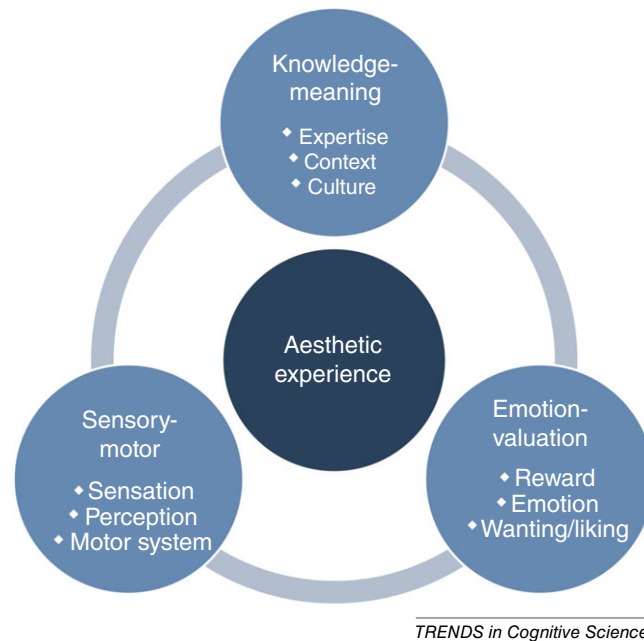
FIGURE 2 Illustration of the flexible biological mechanisms that give rise to unique experiences of art appreciation or creation, distinct personal preferences or styles, and diverse art traditions

expectations, emotional states, and goals. Second, personal preferences and individual styles arise from the modulation of the strength of long-range neural connections over years and decades. The strength of this connectivity and its modulation is formed by individuals' lifetimes of encounters with art and aesthetic objects. Finally, and at the broadest time span, the very emergence of art production and appreciation relates to the evolution over millennia of human brain features that enable art experiences. The evolutionary time span of art experiences select properties that are common and universal to humans, which can be modulated by individual experiences, which, in turn, are further shaped by the context of momentary art encounters.

3 | IN WHAT SENSE IS EACH EXPERIENCE OF ART UNIQUE?

The human brain actively generates flexible and varying representations of the inner and outer environment (Dinstein, Heeger, & Behrmann, 2015). This variability owes to the noisy and stochastic nature of many neurobiological processes, from molecular signaling to the responsiveness of cell assemblies: noise in sensory receptor responsiveness (Schneeweis & Schnapf, 1999), the inherent randomness of synaptic transmission (Ribault, Sekimoto, & Triller, 2011), the effects of arousal, attention, and experience on neural activity (Fontanini & Katz, 2008), and the modulation of network dynamics by signaling molecules (Marder, 2012), among others. As a result, neural systems generate different responses even to the same stimulus presented successively. From the brain's perspective, thus, no two experiences are ever perfectly identical. Not even when the same person encounters the same object in the same place twice. Read this sentence again, and the experience will not be the same as when it was read the first time. We use past experience to generate expectations and predictions about current and future experiences, and make meaning of these encounters. This is not to say that the brain is unable to represent stable aspects of perceptual experience consistently. What it means is that perceptual experience in the present is affected by past perception through experience, and by future perception through expectation.

What is true about experiences in general is also true about art experiences in particular: The variability of art experiences follows naturally from the way the brain functions. Like all experiences, the experience of art is constructed actively and relies on changing sources of information to be processed and integrated. Aesthetic experiences emerge from the integration of information from large-scale sensory-motor processing, emotion-valuation, and semantic-meaning networks (Chatterjee & Vartanian, 2014; Figure 3). The perception of artwork features, like hues, color, and shapes, take place within an internal and external context (Maren, Phan, & Liberzon, 2013). Even object identification and recognition are influenced by context (Bar, 2004; Oliva & Torralba, 2007). An artwork's perceptual information is intertwined with information retrieved from semantics,



TRENDS in Cognitive Sciences

FIGURE 3 The aesthetic triad: Neural systems contributing to emergent aesthetic experience. Aesthetic experiences are emergent states, arising from interactions between sensory-motor, emotion-valuation, and meaning-knowledge neural systems. (Reprinted with permission from Chatterjee and Vartanian (2014) Copyright 2014 Elsevier)

including past experiences with similar or different works, autobiographic memories, and declarative knowledge about the world. Knowledge of the artwork title (Leder, Carbon, & Ripsas, 2006; Millis, 2001), historical facts (Swami, 2013), or of its authenticity (Locher, Krupinski, & Schaefer, 2015; Newman & Bloom, 2012) changes how people appreciate and look at art. The physical and social context of viewing art also has an effect. For instance, people like art in a museum more, and find them more interesting, arousing and positive, and worth spending more time with than when they encounter them in a laboratory (Brieber, Nadal, & Leder, 2015; Brieber, Nadal, Leder, & Rosenberg, 2014). There are a myriad possible experiences of art, many of them unique and unrepeatable, because there are many possible ways in which different people at different times and places, with different expectations, motivations, knowledge and experience, integrate art's perceptual features, emotional value, and meaning to construct an experience.

Thus, encounters with art can differ because the information that is combined to produce the experience of art varies. Many of the brain regions identified by neuroimaging studies of art appreciation play a key role in integrating information derived from the diverse transient functional networks (Cela-Conde et al., 2013; Vessel, Starr, & Rubin, 2012), including the default mode network, the salience network, the executive network, and motor and sensory networks (Park & Friston, 2013; Sporns, 2013b).

A notable feature of these large-scale networks is their modulation by local and transient task demands and contextual factors. Cupchik, Vartanian, Crawley, and Mikulis (2009), for instance, demonstrated that people's orientation towards paintings modulated brain activity associated with aesthetic preference. They asked participants to focus on art while paying attention to their own aesthetic experiences and the works' aesthetic qualities, or to view them to obtain information and note the depicted content. The aesthetic orientation led to greater activity in the left dorsolateral prefrontal cortex, a region involved in the supervision and integration of cognitive and affective processes. The pragmatic orientation, in contrast, produced greater activity in regions related to visual processing. Thus, brain regions that compute aesthetic preferences are modulated by the attitude with which we approach objects. Kirk, Skov, Hulme, Christensen, and Zeki (2009) showed that different semantic contexts, which prompt different expectations in participants when looking at art, also modulate neural activity. Participants viewed abstract images while in a functional magnetic resonance imaging (fMRI) scanner. They were told that some of images, which were accompanied by the label "gallery," were reproductions of artworks exhibited in a renowned gallery and others, presented with the label "computer," were created by an image editing software. Participants preferred the images they believed were from the gallery to those they believed were generated by a computer. Moreover, activity of the medial orbitofrontal cortex, a brain region known to play a key role in establishing reward values, increased when participants viewed images with the gallery label. These studies show that beliefs and expectations generated by simple words, such as "gallery" or "computer," influence neural processes involved in aesthetic preference.

4 | WHY DOES THE WAY WE EXPERIENCE ART CHANGE OVER LIFETIMES?

As we outlined earlier, the neural underpinnings of art appreciation changes over individual lifetimes. The effects of education and expertise demonstrate this level of change. People generally prefer representational over abstract artworks (Kettlewell, Lipscomb, Evans, & Rosston, 1990). However, people who are more knowledgeable about art, more prone to engage in art-related activities, and are generally more open to experience, value and enjoy abstract art more than people who are relatively naïve to art (McManus & Furnham, 2006). Educational experiences shape people's attitudes towards art and enrich their knowledge about art forms, movements, and artists (Cupchik & Gebotys, 1988), which enhances their appreciation and enjoyment of abstract art (Silvia, 2006).

The brain changes physically over time in response to environmental experiences (Pascual-Leone, Amedi, Fregni, & Merabet, 2005; Zatorre, Fields, & Johansen-Berg, 2012). The acquisition of expertise is one reflection of the brain's inherent plasticity. Studies on expertise in art and aesthetics yield three main findings. First, when making judgments about objects of their expertise, experts show greater neural activity than nonexperts in brain regions related to semantic associations and memory retrieval (Pang, Nadal, Müller, Rosenberg, & Klein, 2013; Wiesmann & Ishai, 2010). This neural activity reflects experts' greater reliance on stored knowledge than nonexperts, who rely more on momentary impressions. Second, experts filter out less relevant information for the task at hand. For instance, when evaluating dance, expert dancers rely less than nonexperts on visual information, and more on proprioceptive information about the position of the body (Jola, Davis, & Haggard, 2011). Likewise, when evaluating objects within their own expertise, musicians, architects and art experts can ignore irrelevant contextual information (Harvey, Kirk, Denfield, & Montague, 2010; Kirk, Harvey, & Montague, 2011; Müller, Höfel, Brattico, & Jacobsen, 2010). Finally, experts sometimes outperform nonexperts in tasks that are related to but not precisely within their domain of expertise. Musicians, for instance, can detect small local deviations in foreign language pitch better and earlier, and such ability is related to underlying neural processes engaged in categorizing pitch contours. Musicians are also better than nonmusicians at learning linguistic structures (Francois & Schön, 2011; Marques, Moreno, Castro, & Besson, 2007).

5 | HOW DID OUR EXPERIENCE WITH ART EVOLVE?

The evolution of humans and the history of human civilization constitute the longest time-span relevant to the appreciation of art. Natural selection and cultural evolution mutually influence each other to shape the neural foundations of art. At this level, art traditions emerge, are learned and practiced, creating peculiar artistic environments that exert their influence over the subsequent generation's developing brains.

Over this broad time frame, evolution selects functional brain networks that are themselves sensitive to cultural evolution (Boyd, Richerson, & Henrich, 2011; Henrich, 2015) and underlie the appreciation of art. This flexibility arises from several innovations in the human brain. These include enlarged association cortices, changes in long-distance connectivity among cortical brain regions and in the small-scale structure of modules in most brain regions (Preuss, 2017; Sousa, Meyer, Santpere, Gulden, & Sestan, 2017), an extended period of brain maturation coupled with an increased developmental plasticity that makes the networks more sensitive to the internal and external contexts (Gómez-Robles, Hopkins, & Sherwood, 2013; Hublin, Neubauer, & Gunz, 2015), an increased synaptic plasticity and elaboration of dendritic branching, leading to greater flexibility and complexity of network dynamics (Bianchi et al., 2013; Verendeev & Sherwood, 2017), and an increased interconnectivity among core hubs, enabling parallel functional networks (Buckner & Krienen, 2013).

It is common to consider the selective pressures that drove biological features that underpin aesthetic experiences. The evidence, however, suggests that relaxation of selective pressures may have also played an important role in these changes. In humans, the development of cortical anatomy, especially in association cortices, is less constrained by genes than in chimpanzees. The evolution of the human lineage involved a gradual release of genetic regulation of anatomical development of higher levels of the network hierarchy (Gómez-Robles, Hopkins, Schapiro, & Sherwood, 2015). In turn, this seems to have allowed for a greater influence of environment and culture. It seems, therefore, that the evolution of human complex cognition and behavior arose from a relaxation of genetic reins on the development of brain regions involved in orchestrating network dynamics. Furthermore, cultural developments themselves created new selective pressures on our biological evolution (Laland, 2017). The consequence of this social and cultural mediation of brain development was the greater role of learning and experience in the development of these networks, with concomitant greater cognitive and behavioral flexibility (Gómez-Robles et al., 2015).

This combination, a gradual decoupling from some selective pressures and the introduction of new pressures rendered by cultural innovation, resembles domestication. In animal domestication, humans intentionally or unintentionally alter the selective factors influencing other animals. Some new pressures can arise from their association with humans. But some crucial pre-existing selective pressures become relaxed because humans feed, protect, and selectively breed the animals. This relaxation

of selective pressures can lead to the expression of behavioral and morphological variants that were previously selected against, or kept in check (Zeder, 2012): natural selection no longer weeds out prosocial and tame, dwarf and giant, colorful and musical varieties. Some of these new traits surely appealed to people. Thus, after a stage of relaxed selection, humans become the agents of positive selection of appealing traits (Larson & Fuller, 2014).

The increasingly fast and cumulative cultural growth since the Late Pleistocene (starting about 126,000 years ago) was a major cause of releasing our species from prior selective pressures. As technology advanced, our ancestors were better able to protect themselves from environmental hazards, predators, and develop increasingly efficient ways of exploiting resources. As with domesticated breeds, the relaxation of selective pressures allowed neural or adaptive genetic changes, and led to a remarkably quick rate of evolution in our species during the last 40,000 years (Hawks, Wang, Cochran, Harpending, & Moyzis, 2007).

Thus, many of humans' complex cognitive abilities, including language (Deacon, 2010), cooperative communication (Hare, 2017) but also the production and appreciation of art (Chatterjee, 2014), might not be adaptations driven by specific selective pressures. They might actually be the product of relaxation from such selective constraints, the product of self-domestication (Theofanopoulou et al., 2017).

An example analog to art might be the song of the Bengalese Finch. The Bengalese Finch is a domestic bird bred in Japan, descendant of the wild White Rumped Munia (Figure 4). Japanese bird breeders mated the Munias for their white plumage (Soma, Hasegawa, & Okanoya, 2005). Through this artificial selection, the wild Munia evolved into the domestic Bengalese Finch, a tamer and gentler strain, which made them popular as cage birds and foster parents (Honda & Okanoya, 1999). Bengalese Finches were not selected for the quality of their song (Takahasi & Okanoya, 2010). But through domestication their songs became more complex, variable, unpredictable, and responsive to their learning environment than the Munia's (Soma et al., 2005; Takahasi & Okanoya, 2010).

In their natural environments, many aspects of bird song are influenced by complex interactions among natural selection, sexual selection, and learning (Takahasi & Okanoya, 2010). Natural selection pressures tend to constrain song length and complexity. Male birds are at a risk of being predated while singing, and longer and more complex songs are riskier than shorter and simpler songs. Acquiring and performing a varied repertoire of long and complex songs is also costlier in physiological terms (Honda & Okanoya, 1999). Conversely, sexual selection pressures tend to increase song length and complexity. White Rumped Munia females prefer males that perform longer and more complex songs, because they signal a male's quality. Only high quality males are capable of producing long and complex songs despite their costs.

Domestication altered this balance between natural and sexual selection pressures, between the costs and benefits of complex songs. On the one hand, song complexity can still influence mating behavior in Bengalese Finches, although only indirectly: females are quicker to mate with males that produce longer and more complex songs. On the other hand, natural selection pressures have been relaxed: male–male competition, predation risk, and foraging costs, and other constraints that kept sexual selection in check, have been reduced greatly. Under these conditions, Bengalese Finch females' preference for long, varied, and complex songs, inherited from their Munia ancestors, is free to drive the evolution of Bengalese Finch male song to limits that would be too costly in their natural habitat (Okanoya, 2004).

Thus, rather than withering, the Finch's songs became more complex, variable, unpredictable, and responsive to their social environment. Given that the song no longer served its usual adaptive functions of identifying same species individuals, defending territories, avoiding predators and attracting mates, it became less constrained by selection. The loosening of genetic

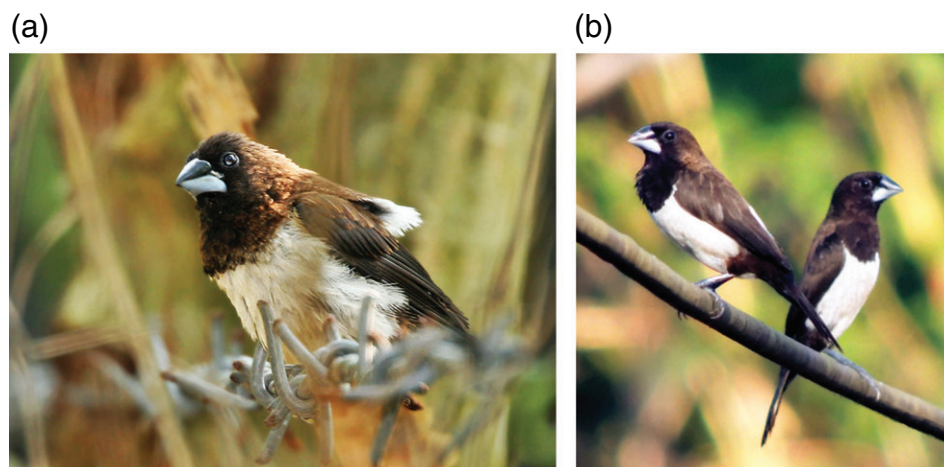


FIGURE 4 White Rumped Munia (a) and Bengalese Finch (b). Images from Wikimedia Commons and under the Creative Commons license

control over the Bengalese Finch's brain function led to a more flexible network organization. The neural pathways for the Bengalese Finch's songs are more widely distributed and engage with greater flexibility, giving rise to a more varied and contextually sensitive singing behavior (Okanoya, 2004; Takahasi & Okanoya, 2010).

Art is like the Finch's song, both in its biology and in many of its behavioral features (Chatterjee, 2014). In the same way as there is no specific song module in the Finch's brain (Okanoya, 2004), there is no single art module in the human brain. Like the different brain structures that flexibly coordinate the Finch's song, there are widely distributed neural ensembles underpinning our art experiences. When we create or appreciate art we use systems that are dedicated to movement, sensations, emotions and meaning in other contexts (Chatterjee & Vartanian, 2014). The specific systems engaged in any encounter vary depending on the kind of art we perceive or create, and the many factors each of us bring to that encounter.

Art is also like the Finch's song in its evolutionary trajectory. The Bengalese Finch song started as an adaptation, but evolved into its current form as constraints imposed by natural selection were released through domestication. Art surely has adaptive roots. Imagination, the use of symbols, pleasure from beauty, social cohesion, may very well be preconditions for art production and appreciation. However, these roots only loosely relate to many current encounters with art, especially contemporary art. Released from initial adaptive constraints, art became more variable and versatile. Art can still exploit its adaptive roots, but its present power comes from its flexible and ever changing nature. Rather than being controlled tightly by an adaptive instinct, art blossomed into a multitude of individual, cultural, and historical forms precisely because it is untethered from these instincts.

6 | CONCLUSION

Understanding the universality of art over time and space, and its diversity with individual styles, schools, cultural variants and historical trends, is within the reach of scientific accounts. Art's universality is the product of our common evolution and shared experiences. Art's diversity is the product of our complex, culturally permeable, and flexible brain responding to different environments. Our brains have no dedicated art receptor, sense, or module that parses object features to produce stereotypical responses. There is no specific aesthetic emotion, analogous to emotions of fear, anxiety or happiness, which is elicited by art objects or aesthetic features. There is no specifically dedicated aesthetic cognitive subsystem like memory, language, or action. Rather, the production and appreciation of art arise from the engagement of broadly distributed sensory motor, emotional, and cognitive systems. The configuration of these networks, broadly shaped by evolution, is flexible, and sensitive to individuals' desires, expectations, goals, mood, context, and the accumulated lifetime of experiences with art. The flexibility and sensitivity built into these ensembles is what makes art and aesthetic experiences vary. The accumulation of such experiences produces singular lifetimes of art encounters. And the accumulation of singular lifetimes contributes to the diverse art traditions and art histories that marvel us.

Natural selection did not endow us with an art instinct. Rather, the relaxation of instinctual control enabled the evolution of the flexible and context-sensitive neural networks underlying the experience of art. The evolution of the human brain is a story of breaking free from genetic determination and the decisive force of selective pressures. It is a story of the many possibilities that arise when brains are exposed to and influenced by a rich and symbolic culture. It is in our human nature to be drawn to the expressions of our local culture, in the form of language and customs, but also in the form of the skillful use of materials, forms, colors, textures, images, sounds, and movements to embody objects, words, places, occasions, and human bodies with fundamental meaning beyond themselves. Art is universal. But its content and manner are accidental mixtures born of time and place, and culture and personality.

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CONFLICT OF INTEREST

The authors have declared no conflicts of interest for this article.

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