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## Creativity and Culture in Visual Art

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### Introduction: Art, Biology, and Culture

For many people, visual art is *the* paradigmatic domain of creativity. Sawyer (2006, p. 177) observes, “painting is always the first example that comes up in class discussion [of creativity]” and the popular image of the artist continues to pervade everyday notions of creative activity in contemporary Western society (see also Glăveanu 2014). Visual art is a ubiquitous outlet of creative expression, appearing in some form in every known human culture: witness Brown’s (1991) inclusion of decorative art as one of 67 human universals. Visual artistry in some form has likewise been identified as or closely associated with a basic domain of the human mind, as posited by several psychological theorists (e.g., Feist 2004; Gardner 1983; Karmiloff-Smith 1992).

One aspect of visual art’s cultural ubiquity is the fact that humans are to a great extent visual creatures. A large proportion of the brain is either dedicated to or involved in processing visual information. The visual system processes diverse types of information (including form, color, and motion) and in everyday situations must deal with efficiently establishing a stable, interpretable percept despite ambiguous, transient, or incomplete input (Palmer

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1999). Most visual art can be regarded as another kind of visual degradation; even highly ‘realistic’ artworks, which artists create in an attempt to mimic the visible world as closely as possible, entail a significant loss of information compared to perception of the real world, with a concomitant set of choices on the part of the artist about what to depict and how to depict it (Gombrich 1960). This point applies with even more force to more stylized or abstracted depictions. Throughout history, visual artists have exploited numerous technical devices to facilitate the visual system’s perception and recognition of the content of images, including means of rendering contours, depth cues, and illumination (Melcher and Cavanagh 2011). Thus, in visual terms, many different styles of artworks can be readily understood using basic principles of perceptual processing.

Art’s ubiquity, wedded to the potential—indeed, readily observable—variety of artistic styles across different times, places, and groups of people, suggests that it is an ideal domain for studying fundamental themes in cross-cultural creativity. The most prominent and pervasive theme in this context is a tension between aspects of artistic creativity that are cross-culturally variable versus consistent. One can make a biologically grounded argument that many aspects of art should be similar across cultures. Humans everywhere share a highly evolved visual system with a common neural architecture, which has been beautifully adapted by natural selection for processing electromagnetic radiation in order to arrive at an understanding of the structure and content of our surroundings. In this view, artistic productions that have any claim on the visual modality must be predicated on this underlying biological basis, and this process of ‘canalization’ (Waddington 1942) highly constrains the kinds of art that people are likely to find worth spending time creating or viewing (see also Wilson 1998).

Besides biology, culture is another factor impacting visual artistic creativity. Broadly speaking, one can define culture as “an historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which men [*sic*] communicate, perpetuate, and develop their knowledge about and attitudes toward life” (Geertz 1973, p. 89). The symbolic aspect of cultural transmission is perhaps most obvious in the case of language. Claims about the power of culture over cognition take strongest form in the Whorfian hypothesis of linguistic determinism, which states that individuals experience the world based on the structure of the language they habitually use (Whorf 1956). For instance, it is striking that a content analysis of 27 widely spoken African languages found no terms equivalent in meaning to ‘creativity’ with back translation (Mpofu et al. 2006)—a hint at significant cultural differences in basic conceptions about creativity.

Like language, visual art is another fundamental aspect of culture involving the transmission of meaning via symbols. Most visual artworks combine symbolic and perceptual elements; in any artistic tradition, artists employ a body of specialized knowledge relevant to the production of their work (Gombrich 1960; Kozbelt and Seeley 2007; Kozbelt and Ostrofsky 2013). The passing down of this body of knowledge from generation to generation constitutes an artistic tradition within a particular culture, and differences in this knowledge base undergird differences in style in different times and places. These differences, however, do not only concern stylistic variation among final artistic products. Many aspects of art vary across cultures: in the expectation and development of what artworks should be like in terms of particular media or subject matter; in how artists approach the creative process; in the social functions of an artwork and its relation to social status; and in how art is defined in the first place.

A basic question about any observed cross-cultural variability is the extent to which it fundamentally transcends our human biological origins and predispositions. Indeed, the relation between and relative explanatory power of biological and cultural influences are thorny and pervasive issues in coming to an understanding of any complex human activity, including artistic creativity. Cole (1996), for instance, provided a comprehensive and historically sensitive discussion of the conceptual and methodological tensions between various disciplinary-based ways of understanding and culturally contextualizing human mentality and behavior. Cole's attempt at an integrative approach may be contrasted with other perspectives, which favor either the nature or the culture side of the debate. For instance, one widely held view, sometimes dubbed the 'Standard Social Sciences Model' (Tooby and Cosmides 1992), essentially holds that culture trumps biology, and that biology itself is relatively unimportant for understanding contemporary human behavior. Tenets of this model include the notions that people are born more or less a blank slate and that the brain is a malleable, general-purpose computer; these imply that socialization and culture (rather than biology) are the main influences on behavior, and that thus cultures are free to vary in any direction on any trait. The alternative proposed by Tooby and Cosmides, the so-called 'Integrated Model,' argues the opposite positions. It attempts to understand how cultural factors are themselves constrained by our evolutionary heritage and is consistent with the above characterization of biological canalization.

Applying these two perspectives to cross-cultural creativity in visual art yields a range of possible theoretical positions on the relative importance of biology and culture. Strong views on either side emphasize the explanatory role of either biology or culture, at the expense of the other. To put it

in somewhat caricatured terms: if biology trumps culture, then the practice and products of art should be cross-culturally quite similar; if culture trumps biology, then virtually anything (even an inverted urinal or a pickled shark) might count as ‘art’ in some context. The goal of this chapter is to examine the evidence and arguments for each of these perspectives and to discuss how one might move forward in better understanding the nature of creativity in visual art.

## Scope of Coverage

To gain traction on a topic as complex and diverse as cross-cultural artistic creativity, one must demarcate the scope and limits of how the topic will be treated. Here I focus primarily on two- and three-dimensional handmade artifacts involving depictions of recognizable subject matter: mainly drawings, wall and easel paintings, and sculptures. I am not concerned with contemporary ‘art’ that is purely conceptual or performative.

I also limit the cultures I examine to historical periods. Prehistoric art, most gloriously manifested in the cave paintings of Chauvet, Lascaux, and Altamira, should in principle figure into any discussion of biological and cultural aspects of visual art. However, we know next to nothing about the cultures of the individuals who produced the earliest artworks. Given the scant, entirely archeological evidence, it is difficult to articulate any cross-cultural implications. However, the long pre-history of art underscores the ubiquity of visual art among *Homo sapiens sapiens* and extends the range of known artistic styles beyond those found in historical eras. Moreover, quantitative analyses of depictions of animals in cave art have revealed several findings of interest, for instance, in the use of T-junction outlines to give a sense of three-dimensional form (Biederman and Kim 2008), or in the exaggeration of particular features to distinguish different species (Cheyne et al. 2009)—a clue that certain aspects of depiction may have a strong biological basis.

In examining cross-cultural data from historic periods, more kinds of evidence become available than just the artifacts themselves. For instance, studies of contemporary non-Western cultural groups (especially tribal populations) have largely taken the form of ethnographic case studies, detailing the cultural context and concepts for understanding the practice of art by a particular people. Studies of earlier historical periods (in the West, say) involve a range of sources, including literary accounts and, for contemporary industrialized cultures, the range increases still further, to include laboratory and historiometric studies.

With these points in mind, I next review the evidence in support of cross-cultural variability, followed by the evidence for cross-cultural consistency.

## Cross-Cultural Variability

Within the camp of those who advocate a predominant importance of culture in understanding creative activity, it is possible to demarcate a range of opinions, from a solipsistic post-modern denial of biology's relevance to more nuanced assessments based on various lines of evidence in anthropology and psychology.

### Literary, Cultural, and Sociological Studies

At one notorious extreme lie post-structuralist, post-modernist, and deconstructivist philosophers and literary critics, who have argued that 'the author is dead' (Barthes 1968/2001). This view is based on the assertion that everyone creates their own inner world by accepting or rejecting endlessly shifting linguistic signs, and what counts as 'art' is merely an arbitrary cultural convention with no external validity. Here I simply reject this viewpoint, noting in passing Wilson's (1998) comment that post-modernism "is blissfully free of existing information on how the mind works" (p. 234).

Other scholars in domains like art history and social theory have emphasized the importance of understanding how the concept of visual art is understood cross-culturally. A key motivation in much of this research is a cautionary check on one's own assumptions, that is, in not leaping to the conclusion that the way art is defined and practiced in the modern West is the only possible way. Indeed, even within the relatively narrow scope of the history of fine European art, some scholars have argued for significant change even in very basic concepts. For instance, Shiner (2001) contended that the current concept of 'fine art' was only invented in the West in the eighteenth century; prior to that, art was primarily defined in terms of skill (Greek: τέχνη) whereby an artist was a skilled maker, a work of art was the useful product of skilled work, and appreciation of the arts was integrally connected with their role in the rest of life (for similar arguments, see Becker 2000–2001; Lange-Eichbaum 1932). Others (e.g., Elkins 2002) have emphasized that any narrative of the history of art is bound to be biased and have explored alternative 'histories' as counterpoints to the archetypical Euro-centric triumph-of-realism account (e.g., Gombrich 1950/1995).

Among other notable cultural perspectives on art and aesthetics is Bourdieu's (1979/1984) famous sociological discussion of how judgments of taste are related to social position, and indeed are themselves acts of social positioning. Based on multiple lines of evidence, Bourdieu argued that individuals with a high volume of cultural capital (e.g., education) largely determine what constitutes taste within a culture, while those with lower volumes of capital accept this state of affairs, and the distinction between high and low culture, as legitimate and natural. Bourdieu's position suggests judgments about art involve a strong element of status and social class consciousness, rather than being based on purely aesthetic qualities.

## Anthropology

Anthropological studies of the indigenous artifacts produced by members of various cultural groups constitute an important line of evidence for cross-cultural variability, especially for understanding the creative process as well as the social functions and definitions of art. The case for the preeminent importance of culture in artistic matters is most memorably made in certain ethnographic case studies, which often detail the difficulties in translating artistic sensibilities and achievements across cultural boundaries. For instance, Bohannan (1966) famously described her failed attempts to relate the story of one of the West's supreme aesthetic achievements, Shakespeare's *Hamlet*, to the Tiv people in Nigeria.

Other ethnographic investigations of how art is practiced reinforce cross-cultural variability. Many of these studies are landmarks in the history of cultural anthropology, including Boas's (1927/1955) book, *Primitive Art*, and Lévi-Strauss's (1972/1982) book, *The Way of the Masks*, both of which examined the indigenous arts of Native Americans of the Northwest Pacific Coast. Another well-known ethnographic investigation, oft cited in the creativity literature, is Maduro's (1976) account of traditional Hindu painters in the Indian village of Nathdwara. These painters represent a distinct, strictly inherited caste whose members produce works in one or more of 18 established genres of religious painting. Their conception of their activity differs markedly from Western stereotypes: works are generally anonymous, the most important qualities of a painter are regarded as humility, self-effacement, and lack of self-assertion, and the artists speak of their activity in avowedly spiritual terms; only a small percent report experiencing a sense of individual psychological growth or personal struggle in their work (see also Hallman 1970).

Culture can also have a strong effect on the possible scope of creative activity. Many studies have documented specific aspects of artistic styles that do

or do not permit deviation from established norms. For instance, in figure carvings of the Yoruba people in Nigeria and Benin, the ear and face are given standardized treatment, but more creative opportunities pertain to objects held in the figure's hand, a figure's costume, and the arrangement of figures (Bascom 1969). In many such instances, religion and ritual are active deterrents to innovation. For example, among Indian Nathdwara painters, depiction of fundamental religious motifs is not open to change, but variation is permitted in subthemes or non-religious subject matter, like landscapes or calendar art (Maduro 1976). Similarly, among the Ashanti people in Ghana, creativity is encouraged in wood carvings of secular objects but not religious ones (Silver 1981). For the Lega people in the Democratic Republic of the Congo, it is essential that newly carved wooden animals used in rituals not depart from previous instances (Biebuyck 1973). And an extreme instance of strict adherence to convention involves Maori artists of New Zealand, in whose tradition "innovations were not permitted" and "mistakes were...evil omens" (Firth 1925, p. 283).<sup>1</sup>

## Psychology

In psychological research on creativity, as in anthropological studies, to the extent that issues of culture and visual art have been directly addressed, researchers have often emphasized cross-cultural variability (Lubart 1990, 1999, 2010; Ludwig 1992; Niu and Sternberg 2002; Rudowicz 2003; Westwood and Low 2003). Indeed, some well-developed theoretical psychological perspectives on creativity have implicitly or explicitly endorsed a very strong view of the primacy of culture. One prominent example is Csikszentmihalyi's (1988, 1999) influential systems view of creativity, which reformulates the question of 'What is creativity?' to the question, 'Where is creativity?' The systems view proposes that creativity is not an inherent property of any object; rather, judgments of creativity emerge from the interaction between the current body of knowledge constituting a *domain*, individual *creators* producing variations on that knowledge, and individuals constituting the *field*, who are in a position to decide which of those variations are worth preserving as part of the domain for the next generation of creators. Along the lines of Bourdieu's (1979/1984) discussion of taste, Csikszentmihalyi's model gives great scope for a wide range of social judgments and definitions of creativity.

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<sup>1</sup> For additional examples of cross-cultural variability in aesthetics and artistic creativity, see, e.g., Anderson (1989), Attenborough (1976), Biebuyck (1969), Forge (1967, 1973), Jopling (1971), and Sawyer (2006).

Likewise, Sawyer's (2006) book-length treatment of the modern science of creativity repeatedly emphasizes the inadequacy of individualist (e.g., psychological, biological, and computational) approaches, arguing instead for the necessity of a socio-cultural perspective. To cite one representative passage (p. 113) echoing many themes described above:

...psychological theories of creativity are based on our cultural conception of creativity as an individual trait. This individualist conception of creativity is dominant in Western cultures, but anthropological research has discovered that it's not universal (cf. Purser and Montuori 2003). And historical research has discovered that the individualist conception of creativity is relatively recent, and wasn't common 500 years ago. These disciplines show that to fully explain creativity, we need to move beyond individualist perspectives.

Outside the realm of studies of creativity, considerable psychological research on general inter-cultural differences has reinforced the importance of cultural differences. Perhaps the most notable such contribution is Nisbett's (2003) book, *The Geography of Thought: How Asians and Westerners Think Differently...and Why*. Reviewing evidence from a number of empirical studies, Nisbett concluded that culture powerfully influences cognition, in that people actually think about and perceive the world differently in different cultures because of differing ecologies, social structures, philosophies, and educational systems. While Nisbett does not discuss creativity directly, Baer and Kaufman (2006), in a chapter in *The International Handbook of Creativity*, cite his argument and claim that Nisbett's "general conclusions are probably as true for creativity as they are for the kinds of cognition he does discuss" (p. 10). This may yet be an open question, perhaps especially as it pertains to creativity in visual art, but in any case it again demonstrates the willingness of many psychological researchers to entertain a likely strong influence of culture on creativity (see also Cole 1996).

The distinction between East Asian (Chinese, Japanese, and Korean) and Western (European and North American) modes of creativity is the most commonly discussed cross-cultural comparison in the psychology of creativity. Studies in this vein have yielded several basic points of contrast, which are also reflected in their respective artistic traditions. The key distinctions tend to be that Western creativity emphasizes novelty and innovation, and is product-oriented and more individualistic, while Eastern creativity emphasizes adaptive value and continuity with tradition, and is process-oriented and often



more collective in nature (Lubart 1999, 2010). Additionally, the Eastern view of creativity often includes a state of personal fulfillment or expressing an inner essence or ultimate reality, as well as emphasizing emotional, personal, and intrapsychic factors (Chu 1970; Kuo 1996; Maduro 1976; Mathur 1982). Along these lines, Li (1997) contrasted Chinese ink-brush painting and modern Western painting, characterizing the former as a 'vertical' domain in which some elements are essential and others are modifiable, and the latter as a 'horizontal' domain in which novelty is supposedly allowed in virtually every aspect.

This issue has also been investigated from the perspective of historiometric studies of creativity, which use quantitative archival measures to address psychological questions. While much research in this tradition has focused on cross-cultural commonalities, direct cross-cultural comparisons have also occasionally been made. One example is Kozbelt and Durmysheva's (2007) study of Japanese *ukiyo-e* printmaking (c. 1670–1865), which is almost certainly the best-documented non-Western artistic tradition. Almost 2000 illustrations of datable prints by 44 artists were found in 36 art books and used to examine a number of questions about lifespan creativity. While *ukiyo-e* artists showed some similar trends as their Western counterparts (such as an average career peak around age 40), some differences emerged, specifically with Japanese artists showing a more positive relation between career peak and eminence, and older artists creating the most iconic prints (such as Hokusai's *Great Wave* and *Red Fuji*, both done in the artist's seventies). A quote by Hokusai (cited in Dormandy 2000, p. 105) nicely summarizes the essence of East Asian artistic creativity:

From the age of six I was in the habit of drawing all kinds of things. Although I had produced numerous designs by my fiftieth year, none of my work done before my seventieth is really worth counting. At the age of seventy-three I have come to understand the true forms of animals, insects and fish and the nature of plants and trees. Consequently, by the age of eighty-six I will have made more and more progress, and at ninety I will have got significantly closer to the essence of art. At the age of one hundred I will have reached a magnificent level and at one hundred and ten each dot and each line will be alive.

Hokusai's remarks reinforce key aspects of the Eastern sensibility. This great creative genius does not even mention innovation or departures from tradition, in stark contrast to the typical Western view, in which originality is the *sine qua non* of creativity.

## Cross-Cultural Commonalities

The preceding discussion of cross-cultural variability has raised a number of issues suggesting the importance of cultural factors in determining the particulars of how artistic creativity occurs within a given social group. One might interpret this evidence to mean that one should not expect the artistic practices or products of one culture to be really understandable or appreciated by a very different culture—as in Bohannan’s (1966) experience with *Hamlet*.

However, for every instance of such failure, there are cases to the contrary suggesting that significant creative achievements can transcend their culture of origin and become universally relevant and inspiring. Dürer expressed astonishment at Aztec artifacts freshly brought from the New World. Goethe was famously enraptured upon encountering the work of the great Sanskrit poet Kālidāsa, written some 14 centuries earlier. The aesthetic response of nineteenth-century French artists like Degas, Monet, and van Gogh to Japanese *ukiyo-e* woodblock prints by artists like Hokusai and Hiroshige, or of early twentieth-century artists like Picasso and Matisse to the art of sub-Saharan Africa speaks to this same point. Such instances echo the nineteenth-century ‘rediscovery’ of earlier creators within European artistic traditions, like that of J.S. Bach by Felix Mendelssohn and others, or Sandro Botticelli by John Ruskin and Walter Pater, or Jan Vermeer by Théophile Thoré. I suspect that every aesthetically sensitive person can recall a personal encounter of some work from an unfamiliar tradition that provoked a strong aesthetic response.

Such examples suggest that creative art is not completely culturally specific, but that there may be meaningful aesthetic universals that transcend particular traditions. Along these lines, foreshadowing the following section, Currie (2012, p. 113) noted, “A number of careful and sensitive studies indicate that while the aesthetic conversations of traditional, small-scale societies are carried on in ways very different from our own, respect for skill and attention to the aesthetic effects skill can achieve – effects, that is, we recognize as aesthetic – are generally present.” I now examine some of this evidence.

## Empirical Studies of Cross-Cultural Aesthetic Preferences

A foundational point in arguing for the possibility of cross-culturally shared aesthetics involves careful empirical tests of that proposition. A number of pioneering studies by Child and colleagues (e.g., Child and Siroto 1965; Ford et al. 1966; Iwao and Child 1966), as well as some later investigations (e.g.,

Chen et al. 2002), have investigated this issue directly, generally finding statistically reliable positive correlations among raters from different cultural groups. As Chen et al. (2002, p. 171) noted, such “results run counter to the belief that there are wide cultural variations in the evaluation of and attitudes toward creativity.” This conclusion begs the question of possible explanations for such effects, to which I now turn.

## Evolutionary Explanations

The most direct explanation for cross-cultural universals in visual aesthetics and creativity is grounded in evolutionary biology (e.g., Wilson 1998). The capacity for artistry ultimately arises out of a backdrop of evolutionary pressures promoting the survival and reproduction of organisms, which provides a strong perceptual and information-processing basis on which to seek universals relevant to aesthetics and artistic creativity.<sup>2</sup>

Numerous hypotheses about the purposes and functions of art have been advanced, which imply different specific evolutionary mechanisms (see Dissanayake 2007). One candidate is that art represents a genuine direct adaptation, whereby the human aesthetic sense is an inevitable outcome of our sense of safety, order, and well-being, in that we respond to visual patterns associated with survival (e.g., Bradshaw 2001; Lohr and Pearson-Mims 2006; Orians 2001; Orians and Heerwagen 1992). An alternative view is that artistic skill arose through a Darwinian process of sexual selection (e.g., Dutton 2009; Miller 2000, 2001), whereby artistic virtuosity functions as an honest signal of good genes. This perspective posits a somewhat different point of origin for our aesthetic sensibilities—that “aesthetic judgement evolved as a functional part of social and sexual cognition, not as a side-effect of perceptual psychology” (Miller 2001, p. 20)—but it again affirms the idea that humans have systematic, canalized aesthetic preferences that are the result of evolutionary processes. Yet another perspective views human artistry as a by-product of other adaptations, rather than an adaptation in its own right. This view of aesthetics as evolutionary ‘cheesecake’ (Pinker 1997) or ‘spandrels’ (Gould and Lewontin 1979) suggests a greater degree of intercultural flexibility in human aesthetics, as well as a greater methodological emphasis on studying aesthetics via popular works, rather than esoteric, if revered, masterpieces.

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<sup>2</sup> Indeed, I have argued that the scientific study of aesthetics and creativity would benefit from considering which aspects of these phenomena might be comprehensible not just cross-culturally but across different intelligent species throughout the universe (Kozbelt 2014).

## Psychological Response to Features of Artworks

With the possible exception of the by-product view, evolutionary explanations for the phylogenetic development of the human capacity for visual aesthetics are typically construed as having canalized particular universal aesthetic preferences. The laboratory investigation of these preferences is the second oldest branch of experimental psychology, empirical aesthetics (Fechner 1876). Fechner examined issues such as preference for rectangles of different proportions, along the lines of famous Golden section, which has since been the subject of an enormous amount of empirical research (e.g., Green 1995; Höge 1995; Konečni 2003). Almost a century later, research on empirical aesthetics reached a climax with Berlyne's (1971) book, *Aesthetics and Psychobiology*, which emphasized basic psychological and biological principles like hedonic selection, habituation, and peak shift as explanations for human aesthetic preferences. Berlyne attempted to articulate a laboratory-based, falsifiable, data-driven 'aesthetics from below,' in which basic features of a visual stimulus were studied in terms of their aesthetic impact.

The goal of finding objective ways to characterize features of artworks, with an eye to understanding their aesthetic potency, has been pursued in a variety of ways. For instance, Hatcher (1967) developed a by-hand coding system for analyzing, describing, and comparing art forms regardless of content, style, or medium. Other scholars have developed theoretical accounts that can aid image analysis cross-culturally, such as Willats's (1997) distinction between drawing systems (perspective, oblique projection, and orthogonal projection) versus denotation systems (silhouettes, line drawings, and optical denotation).

More recently, computing-intensive analyses of the objective statistical properties of artworks have yielded some notable findings. For instance, the principle of compositional balance in artworks, related to Arnheim's (1988) notion of 'the power of the center,' has been examined by computing—for each point on the surface of a painting—a color 'weight' representing a vector from the center of a three-dimensional red-green-blue color space and then applying physical mechanics formulas (Firstov et al. 2007). This analysis yields the position of the overall colorimetric barycenter of the image (essentially its chromatic center of gravity), which, interestingly, is typically very close to the image's geometric center. Other research (reviewed by Graham and Redies 2010) has examined statistical regularities of artworks, particularly the overall distribution of fine- versus coarse spatial frequencies in images. Notably, in artworks spanning different cultures and styles, this distribution tends to be scale-invariant and fractal-like, just like natural scenes; this is true even for artistic depictions of faces, despite the fact that photographs of faces do *not*

show scale-invariance. In the aesthetic realm of color, studies have revealed that average preferences reflect the statistics of how much people in general like objects that are characteristically those colors (see Palmer et al. 2012)—a finding consistent with explanations stressing aesthetic evolutionary response as a non-arbitrary evolutionary adaptation.

## Neuroaesthetics

An underlying assumption of evolutionary models and many psychological studies is that the human aesthetic faculty is essentially a property and result of brain activity. In the last 20 years, with the advent of non-invasive neuro-imaging techniques, the field of ‘neuroaesthetics’ has emerged, with the goal of understanding the neural substrate of aesthetic experience, preference, and judgment (Cela-Conde et al. 2011; Chatterjee and Vartanian 2014; Skov and Vartanian 2009; Zeki 1999). Theoretical approaches in neuroaesthetics often echo psychobiological principles, as in Ramachandran and Hirstein’s (1999) ten universal principles of art: peak shift; perceptual grouping and binding; contrast; isolation; perceptual problem solving; symmetry; abhorrence of coincidence/generic viewpoints; repetition, rhythm and orderliness; balance; and metaphor.

Empirical studies within neuroaesthetics vary considerably. For instance, in one pioneering study, Smets (1973) found a sharp peak in brain alpha wave desynchronization when persons viewed abstract designs with 20 percent repetitiveness of elements—the equivalent amount of order found in simple mazes, pictographs in numerous Asian languages, and Mondrian paintings; Wilson (1998) claimed that “the 20 percent redundancy effect appears to be innate” (p. 230). Many more recent neuroaesthetics studies have attempted to identify brain regions associated with various aspects of aesthetic experience—for instance, in identifying an alleged ‘beauty’ center in the medial orbito-frontal cortex (Ishizu and Zeki 2011), or finding activation of the default mode network during intense aesthetic experiences (Vessel et al. 2012). Given its inherent reductionism, it is unsurprising that neuroaesthetics is often viewed with suspicion by scholars interested in cross-cultural variability (see Dissanayake 2007; Sawyer 2006).

## Other Psychological Aspects

Attempts to find cross-cultural commonalities have also taken other psychological forms, emphasizing basic mental processes that are broadly applicable to aesthetic and creative cognition. Mechanisms that have been

posited to undergird aesthetic cognition include conceptual blending, categorization, cross-domain mapping, metaphor, image and force-dynamic schemas, and others (Turner 2006). Along similar lines, Martindale (2007) proposed a theory of aesthetics accounting for some 25 fundamental aesthetic effects with reference to basic properties of neural networks. Emblematic of this basic-mechanisms approach, Martindale argued that the principles of psychological aesthetics are mostly “principles of general psychology rather than principles of aesthetics per se” (p. 181).

More recently, the principle of psychological essentialism has also been applied to aesthetics. Psychological essentialism posits that humans tend to assume that individuals have underlying invisible essences that determine the categories they fall into (Bloom 2010). In art, aspects of psychological essentialism like contagion—the degree of physical contact of an object with the original object—appear to be important determinants of aesthetic—and monetary—value (Newman and Bloom 2012). One might be tempted to interpret the aura surrounding artistic geniuses and masterpieces in the contemporary West as a corollary of the advent of the concept of ‘fine art’ (as in in Shiner 2001) and thus purely a culture-specific tendency. On the contrary, however, psychological essentialism appears to be culturally ubiquitous and widespread in ritualistic behavior and magical thinking (e.g., Biebuyck 1973), as in the process of selecting the 14th Dalai Lama (Bloom and Gelman 2008).

## The Creative Process

Potential cross-cultural commonalities apply to not only the visual aesthetic properties of finished artistic productions, but also to the creative process itself. Several strong theoretical claims have been made about universal aspects of the creative process. For instance, Campbell (1960) posited that *any* ultimately creative idea necessarily arises from a blind variation and selective retention model of creativity (see also Simonton 2011). A related notion is Dawkins’s (1983) ‘universal Darwinism,’ which argues that *any* life in the universe will have evolved through the process of Darwinian natural selection, and which seeks to explain evolution across a range of natural and social science domains. Other, non-Darwinian interpretations of the creative process have also been advanced (e.g., Gabora 2005), as have views of the creative process involving changes of timing as a means of introducing novelty (e.g., Kozbelt 2009).

## Historiometric Studies

Another point of cross-cultural commonality is rooted in historiometric studies that use archival metrics like citation indices to address questions about high-level creative achievement across many domains. For instance, some studies (e.g., Simonton 1997) have examined how creativity unfolds over the lifespan, typically finding a career peak around age 40, which also appears to be consistent across many cultures. Murray (2003) found that the statistical distributions of eminence in both Western and various non-Western cultures are uniformly highly positively skewed, indicating that a small number of great creators tend to dominate their respective domains. Murray's investigation also revealed extremely high reliability among sources used to catalog the contributions of individual creators, even when the sources span cultures.

In terms of art-specific findings, surely the most provocative and well-developed theoretical model is Martindale's (1990) quantitative, psychobiological-inspired model of trans-historical stylistic evolution in the arts. In this theory, artistic creators seek critical attention for their productions, and must therefore produce work that is ever more attention-grabbing. Martindale argued that the most effective way to meet this goal is to strive for novelty, either by producing more unusual combinations of ideas (i.e., engaging in more 'primordial cognition') within an artistic style, or developing a new style altogether. His theory predicts that over the generations within an artistic tradition, arousal potential increases, while primordial cognition and stylistic change oscillate in an inverse relation to each other—since only one or the other method of introducing novelty is necessary to increase arousal potential. Importantly, Martindale documented precisely these trends across a wide range of art forms and cultural traditions (including 18th dynasty Egyptian and ancient Greek visual art, as well as in East Asian traditions). This again underscores commonalities across cultures and historical periods in the creative arts. Poignantly, in one of his last papers, Martindale (2009) also argued that creative dynamic leads inexorably to the exhaustion and death of artistic traditions: "The high arts were defined in a way that guaranteed that they would evolve in a specific way and die in a specific way" (p. 139).

## Future Directions

What to make of these multidisciplinary lines of evidence that on the one hand suggest important cross-cultural variability in the practice and conception of artistic creativity and on the other hand suggest strong commonalities



in the way these varied practices play out? These latter lines of evidence bear on aesthetic evaluation, possible evolutionary mechanisms for the origin of our aesthetic faculty, common features and statistical properties of artworks, neural substrates and psychological mechanisms of art-related cognition, and how artistic styles evolve over time. In my view, at least in the domain of visual art, perspectives emphasizing cross-cultural consistencies appear to be better supported than those emphasizing cross-cultural differences. But both points of view have much of value to add to the ongoing development of a science of creativity. The main challenge moving forward is to find ways to productively integrate these two sometimes antagonistic perspectives, in the service of understanding how biology and culture interact and potentially co-evolve, in order to answer basic questions about the nature of artistic creativity.

The exercise of overtly comparing biological versus cultural influences, either in opposed isolation or as part of a more integrative endeavor (see Cole 1996), raises fundamental questions about creativity. As in any scientific endeavor, making progress entails a need for careful measurement assessment of creative and aesthetic constructs (Kozbelt and Kaufman 2014) to address basic questions about the relative contribution of biological versus cultural influences on creativity, as well as their interaction. For instance, what is the scope for cross-cultural variety in a domain like visual art? In creators' ceaseless quest to innovate, how far against the grain of canalized aesthetic preferences can novelty go before works become incomprehensible? Is there scope for the co-evolution of creators and audiences in this dynamic? What is the psychobiological distinction between attention-grabbing (as in Berlyne 1971; Martindale 1990) and attention-keeping aspects of artworks, that would, for instance, feed into the process of the creation of aesthetic canons?

A final point concerns the role of the individual. Broad characterizations of cultural differences (e.g., East versus West) overlook the great individual variability in methods and approaches within any culture. For instance, Galenson (2001) documented tremendous differences among modern Western artists' approaches to creativity (highly pre-planned versus trial-and-error) that are associated with differences in career trajectories (early- versus late-peaking, respectively). This pattern was also found for Japanese printmakers (Kozbelt and Durmysheva 2007), and it would not be surprising to find strong individual variability in any complex artistic tradition. Biebuyck (1969, p. 6) speaks to this point, which encompasses many themes throughout this chapter:

Some authors speculate about the absence of the concept "artist" in most primitive societies. There is no equivalent for "art" either, yet nobody doubts that primitive societies have produced objects that are pleasing and that strike one as



beautiful...Undoubtedly, whatever the stringencies and conventions of style, purpose, and expectation, the individual element is a powerful factor in explaining differences. Artists necessarily differ in training, in skill and technical proficiency, in maturity and social position, and in personality. Society can impose upon its artists a certain objective matter and style but the artist himself has his [*sic*] own personal conception of the subject matter, a particular feeling for the style, and a certain technique in executing the form.

These thoughts serve as a valuable reminder of the importance of the individual in any balanced discussion of creativity and culture. In the archetypical theoretical agon between impersonal evolutionary biological canalization and impersonal socio-cultural forces, the role of the individual can become lost. With apologies to socio-culturally minded apologists for cross-cultural variability and creative collaboration, it is ultimately the masterworks created by individuals of genius, that make visual art (and its sister domains like music and literature) worthy of our lasting, enthralled, and grateful attention, regardless of their culture of origin.

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