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Art is not special: an assault on the last lines of defense against the naturalization of the human mind

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Abstract: The assumption that human cognition requires exceptional explanations holds strong in some domains of behavioral and brain sciences. Scientific aesthetics in general, and neuroaesthetics in particular, abound with claims for art-specific cognitive or neural processes. This assumption fosters a conceptual structure disconnected from other fields and biases the sort of processes to be studied. More generally, assuming that art is special is to cling to the idea that some aspect of our species' mental constitution makes us unique, special, and meaningful. This assumption continues to relegate scientific aesthetics to the periphery of science and hampers a naturalized view of the human mind.

Keywords: art; neuroaesthetics; neuroscience; psychology; reward; scientific aesthetics.

Introduction

Humility does not come easy to humans. Accepting that our species is not the culmination of evolution, but only one among millions of living and extinct species, is a bitter pill to swallow, especially when our sophisticated cognition and behavioral repertoire seem to legitimize the view that there is a human essence that sets us apart from all other animals; that our species is unique, or special in some fundamental way, uncommon even among primates. However, the belief that we are endowed with some unparalleled set of cognitive or neural mechanisms is refuted by abundant scientific evidence. As a matter of

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fact, humans share with other primates common psychological and neural processes underlying many capacities and behaviors, such as speech perception and language learning (Weiss and Newport, 2006), economic decision-making (Santos and Rosati, 2015), acting based on others' false beliefs (Krupenye et al., 2016), assessing contextual information when making risky decisions (Heilbronner, 2017) and when requesting absent entities (Bohn et al., 2015), or the executive control and adjustment of behavior when faced with conflict (Mansouri et al., 2017). However, the assumption that explaining human cognition requires exceptional concepts or principles lingers still in some domains of the behavioral and brain sciences. In particular, by implicitly and explicitly upholding the idea that 'art is special', neuroaesthetics remains among the last lines of defense against the naturalization of the human mind.

The quest for art-specific psychological and neural processes

One of the major goals of scientific aesthetics, and of neuroaesthetics in particular, is to understand the mental and neurobiological processes underlying the appreciation of works of art (Changeux, 1994; Zeki, 1999). For example, using tools from cognitive neuroscience, researchers have shown that the activity in the human brain's visual and motor systems underpins the perception of dance (Calvo-Merino et al., 2005; Cross et al., 2006) and have linked this activity to its enjoyment (Kirsch et al., 2016). However, are these neural responses unique to the representation and enjoyment of dance? Or do they simply reflect the general experience of motion and body movement? Are the computational mechanisms that underlie the experience of art uniquely activated by art objects? Or are they also activated by non-artistic visual and auditory objects?

A majority of researchers in neuroaesthetics assume that cognitive or neural processes associated with experiences of art are art-specific (see Chatterjee, 2011; Pearce et al., 2016). Indeed, several recent psychological models of art experience (Pelowski et al., 2016, 2017; Menninghaus

et al., 2017) are explicitly grounded on the premise that it is possible to identify psychological and neurobiological processes and functions that are specific to art, and that set the experience of art apart from – or even above (Christensen, 2017) – non-art induced experiences, such as enjoying a beer or a game of chess. The functions that such models assume to be specific to art include, among others, ‘affect’, ‘physiology’, ‘appraisal’, ‘meaning’, ‘novelty’, ‘transcendence’, ‘epiphany’, ‘catharsis’, ‘awe’, ‘pleasure’, ‘insight’, ‘harmony’, or ‘thrills’ (all taken from Pelowski et al., 2017). Yet, it is obvious that any number of non-art objects can elicit all of these putatively art-specific functions. Clearly, none of them are unique to art.

The idea that art elicits a set of neural processes exclusive to art experience must be laid to rest once and for all. Why? Because the belief that explaining the experience of art requires special, or especially dedicated, cognitive or neural mechanisms has no empirical basis. The 140 years of research since Fechner’s (1876) foundational work on scientific aesthetics has failed to produce any evidence whatsoever of mental or neural processes specific to the experience of art. The notion that scientific aesthetics should seek out certain art-specific processes, and that it therefore makes sense to develop psychological models of art experience containing art-unique mechanisms, rests on a single assumption. This assumption, inherited from philosophy and the humanities, is that ‘art’ and ‘the experience of art’ constitute kinds of objects and experiences that share a certain inherent quality or essence that make them different from commonplace objects and experiences (Kivy, 2012). Rarely examined or questioned, this assumption has, over time, enabled scientific aesthetics to replace the unfounded doctrines that “art cannot be explained” and that “there is no accounting for taste” with the equally unfounded – although more palatable – doctrine that “art can only be explained, and taste accounted for, by special models that rely on specifically dedicated psychological and brain processes”.

Aesthetic valuation is a form of reward processing

This doctrine has created two major obstacles for scientific aesthetics that have relegated the field to the periphery of psychology and neuroscience. The first obstacle, the aforementioned assumption that the end-goal of scientific aesthetics must be the identification of distinctive art-exclusive psychological or neurobiological mechanisms, has promoted a conceptual edifice that is entirely

detached from other areas of neuroscience. We find good examples of this among otherwise worthy efforts invested in understanding how the human mind constructs aesthetic preferences. Most studies in neuroaesthetics regard art-induced pleasure as different from, or even unrelated to, general sensory valuation. They are conceived as part of a totally different enterprise to research on the workings of the human reward system taking place in the rest of neuroscience. For instance, in a 2011 functional magnetic resonance imaging study, Ishizu and Zeki (2011) showed that neural activity in a part of the orbitofrontal cortex was directly related to participants’ beauty ratings of music and visual art. The voxels in question are squarely centered within a part of the brain’s reward system commonly thought to underlie pleasure (Berridge and Kringelbach, 2015). However, Ishizu and Zeki (2011) saw no need to experimentally distinguish beauty from pleasure, or otherwise place their findings within the broader context of reward research. They simply proceeded to brand the particular area found in their study with a new name and declared it to be specialized for the computation of beauty.

In contrast, most neuroscientists now agree that a common neural network – of which the anterior orbitofrontal cortex is a key node – represents the reward value of diverse objects, situations, or events as a single neural currency, enabling a direct assessment and comparison of the value and motivational relevance of different kinds of options (Levy and Glimcher, 2012). This common network computes the affective value that feeds into our assessment of whether a drink tastes good, whether something smells nice, or whether a product is worth \$100 or \$1000 (Brown et al., 2011; Bartra et al., 2013; Sescousse et al., 2013). It also computes the affective value of a Mark Rothko painting, of Stockhausen’s serial compositions, or of any other work of art. The implication is plain: There is much to be learned about the psychological and neural processes underpinning the valuation of art from studies that use non-art stimuli, even objects as conceptually removed from art as money.

The second obstacle arises from the neglect of crucial aspects of affective processing that take place during the experience of art, owing to the prevailing view in scientific aesthetics that general research on reward is of little consequence to understanding the valuation of art. Noteworthy among these neglected aspects is the reward system’s function of associating sensory cues with expectations of reward outcomes. Neuroscience has thoroughly investigated how reward prediction motivates behavior, and modulates reward outcomes (Schultz, 2015; O’Doherty et al., 2017). Yet, it is extremely rare to see this aspect of sensory valuation play a role in scientific

aesthetics. This neglect has led the field to conceptualize aesthetic preference and judgment mainly as an experiential outcome state, that is to say, as a feeling induced by art that remains disconnected from the reward system's motivational role, inspired by the Kantian notion of 'disinterested interest' (Chatterjee and Vartanian, 2016). The idea that the experience of art may be qualitatively different from non-art experiences can be entertained in scientific aesthetics only by ignoring developments in the study of reward prediction, or 'wanting' processes (Berridge et al., 2009). However, there is much more value in opening psychological and neuroscientific research up to the possibility that art, just as any other object, functions as a motivator of behavior through the modulation of the reward system.

Re-engaging with psychology and neuroscience

There is no doubt that, as scientific disciplines, psychological aesthetics and neuroaesthetics continue to suffer from this self-imposed isolation from the rest of psychology and neuroscience. On the one hand, research remains focused on illusive concepts and topics – 'beauty', 'disinterested interest', 'aesthetic primitives', etc. – with little chance of contributing knowledge to the rest of psychology and neuroscience. On the other hand, the insistence on art's uniqueness and specialness makes scientific aesthetics seem exotic, even obscure, to researchers in other areas of these fields. In this sense, it is telling that music research has become the most visible form of neuroaesthetics research in the modern neurosciences by almost religiously avoiding the terms 'aesthetics' and 'art' in its publications.

To be clear, we are not arguing that the experience of art and aesthetics are unworthy of scientific study, or that scientific aesthetics is a senseless pursuit, or even that models of the experience of art have been worthless. On the contrary: we believe that art's individual, social, cultural and evolutionary relevance warrant a solid scientific explanation of the underlying psychological and neural mechanisms, that scientific aesthetics in general and neuroaesthetics in particular have made substantial contributions toward explanation, and that models have been instrumental in systematizing the basic elements of those explanations. Scientific explanations, however, are only as solid as the evidence supporting them. A wealth of evidence produced in many domains of the behavioral and brain sciences has direct bearing on explaining of

how humans produce and appreciate art. Disregarding this evidence because the experience of art is assumed to rest on special affective, cognitive or perceptual processes leads to limited and weak explanations of the experience of art. Pretending otherwise, as we have argued above, only alienates scientific aesthetics from other fields and unjustifiably promotes a view of the experience of art that excludes its motivational aspect.

Thus, the end-goal of scientific aesthetics cannot be the search for psychological and neurobiological mechanisms that separate the experience of art from all other experiences. Scientific aesthetics needs to sink its foundations deep into the general psychology and neuroscience of reward, perception and meaning and extract knowledge, concepts, methods and models that are relevant to understanding the experience of art and aesthetics. By doing so, it will also produce knowledge that is relevant to neighboring fields and hopefully turn psychological aesthetics and neuroaesthetics into *bona fide* members of psychology and neuroscience.

Similar points have been made for over a century by key figures in scientific aesthetics. Santayana (1904) realized that 'there is no single agency in nature, no specific organ in sense, and no separable task in spirit, to which the aesthetic quality can be attributed' (p. 322), and that, therefore, 'A single and complete aesthetic science, natural or ideal, is an idol of the cave and a scholastic chimera' (p. 327). Thirty years later, Dewey (1934) was still tackling the main problem brought about by the pursuit of such an aesthetic science: 'That of recovering the continuity of esthetic experience with normal processes of living' (p. 9). However, the problem had not been resolved when Berlyne (1971) felt the need to stress that 'There can be no understanding of art without bringing art into relation with nonartistic forms of behavior' (p. 26), and the problem persists still today.

Why has the belief that the experience of art is a special experience requiring special explanatory mechanisms endured so stubbornly in scientific aesthetics? Humans have slowly and painfully come to accept that our planet is not the center of the universe and that we are not Earth's ruling species. In fact, the more we understand nature, the more we realize how common our place in it really is. Yet, we cling on to the idea that there might be some aspect of our mind's constitution that makes us special, unique, meaningful. This idea is deep-seated and not given up easily. Past candidates for the special trait defining our human uniqueness include tool use, rational decision-making, theory of mind, enlarged frontal lobes and many others. All of these have been debunked by plenty of evidence showing that the human brain and

human cognition are remarkable, but not special or unique (Herculano-Houzel, 2016).

With the large amount of psychological and neuroscientific evidence on art and aesthetics that accumulated in the last 20 years, now is the time to definitively do away with the myth that “Sensitivity to beauty and making or doing things that are perceived as ‘beautiful’ are among the traits that elevate man above the brutes” (Dobzhansky, 1962, p. 214). This notion and its corollaries stand in the way of a comprehensive understanding of the human mind and its evolutionary origins in natural terms. This is, in fact, the last line of defense against the naturalization of the human mind. Scientific aesthetics and neuroaesthetics cannot move forward unless they desert these lines by relinquishing the unfounded doctrine that the experience of art is special and committing to a fully naturalized view of the creation and appreciation of art.

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