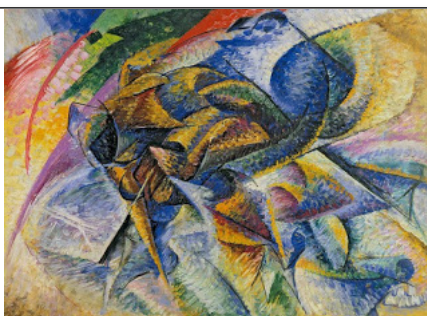


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Art meets science: the limits and ethics of neuroaesthetics



The aesthetic value of Umberto Boccioni's "Dynamism of a Cyclist" shaped the Futurist movement. It was an admiration of science and technology. The constant movement of the perceived world reveals how our minds conceive such speed and motion.

Beauty is truth, truth beauty, — that is all

Ye know on earth, and all ye need to know - John Keats, "Ode to a Grecian Urn"

To some, beauty may be only in the eye of the beholder. But if there were an objective basis for it, researchers have only begun to uncover what it is and what it means. To find a philosophical and scientific basis of art, we can study how our brains respond to aesthetics itself. The humanities and sciences seek different approaches. The humanities are speculative while science is empirical. But both can understand art. We may compare both methods to reveal how our brains process art, aesthetics, and, in some ways, morality. There remains debate among philosophers about Kant's theories of aesthetics. We can reveal the connection of beauty with epistemology and ethics - from neuroscience, too. The potential for this area of research could hold benefits for art-based therapeutic treatments. It may also help determine art's relationships to morality and justice and the neuroscientific basis for what it means to be human.

Neuroaesthetics, or an empirical, scientific approach to the aesthetics of art, seems appealing. This way, we can argue the way the brain responds to art represents the value of art. Reducing what makes us who we are down to the brain, though, raises issues, as [my friend Adam Kruchten wrote](#). Any sort of experience of art may be nothing except for the way neurons fire and chemical reactions occur. It's this external stimulus of looking at a painting or listening to music that triggers these bodily responses. But this neuroaesthetics approach has limits. Scientific studies reveal that the neuroscientific, bodily response doesn't correlate exactly with aesthetic experiences. The truth is that the research reveals those experiences as much more complicated than our empirical evidence can show.

Given these limits of the brain, it's not clear how art itself is relevant to neuroaesthetics. If neuroscience relies on the workings of the brain itself, then how we can create neural representations of works of art? We must subject ourselves, not

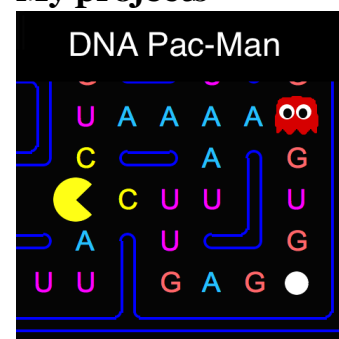
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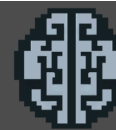
to a work of art itself, but to pictures of art that from which we can determine how neurons fire. This gives us a neural correlate of these forms of art. We may determine an epistemic path, or the limits of knowledge itself, to create this reduction. It forces us to abandon our encounters of artwork. Instead, we create direct depictions of art through which we study. It explains why my work on [re-creating neural responses using external stimuli](#) is so limited in how well I can "read someone's mind."

We need to describe the limits of the ways our bodies respond to works of art such as paintings or pieces of music. I cite beauty as one method of how art moves us on physical and intellectual levels as a way of determining this bodily response. This comparison has its limits because a bodily movement doesn't guarantee one finds a work beautiful. Perceiving a work of art as beautiful comes from a harmony among our faculties of cognition. It includes our senses such as auditory and visual parts of the nervous system. Like my previous posts on [symmetry](#) and [rhythm](#), this harmony is "purposive without purpose", according to Kant. This means that the harmony of art has a purpose intended by the artist. But, as we experience the artwork, they should only affect us as if they had purposes even while we don't find the purpose. This is what makes a work of art "beautiful" and explains how we perceive pleasure from it.

Using beauty to show aesthetic value has its limits. If neuroaesthetics were to gauge beauty of artworks, it should use objective, universalizable methods. We must be careful to universalize our own subjective experience in a way that all people experience. Beauty itself can vary between cultures and groups of people. Art can move the individual without being beautiful, as argued by [scientists Bevil R. Conway and Alexander Rehding](#). There are ways to avoid these issues, though. While the subjective experience itself varies, it has universalizable, objective methods of arguments. Two people may dispute that one work of painting is more beautiful than another. But their methods of deduction rely on objective, nuanced, justified arguments. This could be arguing that there is a certain balance of colors or that the rhythmic symmetry of painting in one is superior to that of another. It's within these methods of reasoning that beauty emerges, not the subjective eye of the beholder. These methods of reasoning could help neuroaesthetics find a neuroscientific, empirical basis for art. It also explains how we draw moral and ethical judgements from works of art. We may have different movements. Some of us express more shock of pupils dilating at the sight of a sensationalist news headline. But our methods of reasoning provide a fundamental, shared way of communicating. Through this, we draw meaning from such an artistic move. Indeed, scholars have found success in these methods of inquiry. Neuroscientist V.S. Ramachandran and philosopher William Hirstein studied practical rules that connect features of artwork to beauty itself. They described "eight laws of artistic expression." They include peak shift principle, which is the stronger response to stronger representations of desirable features. The scientists also described grouping, that is, discriminating a figure from the background. The other laws include problem solving, the way we favor the detection of objects through struggle. One may also use symmetry, or complementary objects revealing more information easily.

Kant went deeper in characterizing aesthetic judgments in such ways to address these problems. For Kant, deep aesthetic encounters are states of "disinterested interest." This means that our judgements of beauty create pleasure, not the other way around. Many have attacked this claim. German philosopher Friedrich Nietzsche and psychologist Sigmund Freud believed art must relate to will. Political theorist Karl Marx believed all art must be political. The philosophical notion of expressionism views art as a subjective response to the world around us. Still, Kant's ideas describe a method of how aesthetics is much more concerned with our judgements. We form these judgements in response to art alongside the bodily response we experience. As Kant theorized, art is argument, criticism, and persuasion.

This makes the question of determining neural correlates all the more confusing. Neuroscience, as it seems this way, is far too limited in capturing art. In fact, it might be the case that art itself sets the foundation for understanding neuroscience, rather than the other way around. We describe the beauty and elegance of mathematics,



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physics, and physiology of the processes of the nervous system. From there, those features can be used to explain phenomena that emerge from them.

Kant's notion of the sublime provides a way of determining a connection between aesthetics and morality. Before the eighteenth century, philosophers claimed the sublime was beauty that left us awe-struck in such a way we couldn't even measure it. Kant later wrote that sublime even goes beyond form and purpose in a way that we can speak of morality in its terms. The sublime power of Beethoven's music could describe how it moves audiences to a type of ecstasy. This is beyond the comprehension of their senses. It incites feelings of wonder and romanticism that can only music itself can explain. The sublime also relates to expressions of fear, uncertainty, and terror in art. Kant grounded his moral theory in reason. He described a "moral culture" emerges when our moral faculties of reason create the limits of experiencing the sublime.



"Beauty is nothing other than the promise of happiness." - French writer Stendhal, similar but not the same as Kant's notion of beauty.

To find the neural correlates of art, we probe our senses. Particularly, understanding the sublime gives us greater meaning. I finish with a discussion of the sublime among philosophers Amir Aczel and Sandra Shapshay, English professors Paul Fry and Alan Richardson, and conductor James Judd. In the YouTube video *The Sublime Experience*, they discussed how the sublime through all forms of art and religion provide the grounds for differentiating between pleasure. The scholars debated notions of beauty, greatness, picturesque, infinity and other features of art. These ideas relate to our arguments in religion and philosophy.

Shapshay emphasized the distinction between the mathematical and dynamical forms of sublime. The mathematical is size overwhelming us, such as staring into the sheer immensity of the universe. For the dynamical, the force overwhelms us, as in how the horrors of war shape a country. Philosopher Robert Clewis argued there's even a third form, the moral. He described this in his book *The Kantian Sublime and the Revelation of Freedom*. Neuroscientists Tomohiro Ishizi and Semir Zeki argued these sublime and beautiful features have brain activity patterns. Despite the limits of the relationship of neuroscience and art, this empirical evidence shows how we surpass our senses. We can reveal the deeper connection between neuroscience and art. We may study these empirical phenomena alongside speculative rhetoric of art and ethics hand in hand. It provides a more nuanced, inquiry of what makes us human.



at [11/11/2018](#)

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