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Original Paper

Argue Position on Whether Aesthetic Experience can be Scientifically Measured

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Abstract

Whether aesthetic experience can be scientifically measured has always been a controversial topic. In the field of cognitive neuroscience, researchers are more convinced that aesthetic experience can be scientifically measured. This paper first analyses the view that aesthetic experience cannot be measured scientifically and presents arguments against it. Then it goes further to demonstrate why this paper argues that aesthetic experience can be measured scientifically by drawing on the theories and research methods of cognitive neuroscience.

Keywords

aesthetic experience, cognitive science, cognitive neuroscience, neuroaesthetics

Aesthetic experience, one of the blurriest and least well-defined ideas in the psychology of art, is considered to be a unique mental state that differs qualitatively from everyday experience (Marković, 2012). When people see something ugly, awful, or even horror, they can still have an aesthetic experience, which is different from art, not just when seeing something beautiful, glorious, or happy. Aesthetic experience is supposed to be subjective because different people will have different aesthetic experiences, while science is considered to be objective, and it can reasonably measure and calculate results (Palmer et al., 2013). Thus, whether aesthetic experience can be measured scientifically has always been a hot topic among researchers. It should be noted that whether aesthetic experience can or cannot be measured scientifically, researchers all agree that aesthetic science focuses on precisely articulating people's aesthetic perceptions and identifying the root causes or motivating factors behind them, rather than defining whether a specific thing is beautiful or not (Palmer et al., 2013). This paper holds the view that aesthetic experience can be measured scientifically. The opposing side's views will be elaborated first, followed by this paper's argument. Then the two points of view will be summarized, with a conclusion given on the point of view of this paper.

There are plenty of researchers who believe that aesthetic experience can not be measured scientifically. They argue that one of the primary problems with modern aesthetic science is that it can only evaluate people's cold preferences and that it is challenging to recreate people's hot emotions and reactions in the lab (Makin, 2017). Makin (2017) assumes hot emotions and reactions as special aesthetic emotions including aesthetic rapture and core human emotions. Aesthetic rapture means a strong fascination and affection for the objects of aesthetic appreciation in a uniquely transcendent experience (Marković, 2012). According to Ekman (1990), there are six core human emotions, including fear, anger, happiness, sadness, disgust, and surprise. Whether they are aesthetic rapture or core human emotions, none of these strong feelings can be accurately and smoothly reproduced in the laboratory. It is nearly impossible to arouse such strong emotions in participants by using a reductive psychophysical approach. It is because, in most of the time, the participants never ever feel even the slightest amount of aesthetic pleasure (Makin, 2017). Although there are some methods used in aesthetic science such as questionnaires and self-reports, these methods are not able to diagnose the reaction of participants completely and accurately. For example, when a participant smiles, it does not absolutely mean that he or she is happy, and vice versa (Makin, 2017). Instead, cold preference can be measured and evaluated successfully in the laboratory. Makin (2017) describes cold preference and evaluation as a general emotional reaction of people to something that is easy to judge. This kind of emotion can reappear in the laboratory without strong stimulation. For example, when Palmer and Schloss (2010) study people's preferences for colour, they find that compared with browns and olives, people prefer blues and cyans. It is because that people's opinions of colour are influenced by their opinions of the object that color corresponds to. People associate blues and cyans with the sky and water, while browns and olives conjure images of rotting food and excrement. Also, humans prefer things with smooth curves much more than things with sharp edges because sharp things are associated with danger, such as being stabbed by a knife (Bar & Neta, 2007). The limits of empirical aesthetics are considered that it is only thought to be useful for measuring these cold preferences.

In these experiments above, people only need to face one dimension like colour and shape, so it is less challenging to measure. However, people's aesthetic experiences in real life must be multi-dimensional. When one factor that people generally like is combined with other factors on an object, people may not continue to like the object. In today's popular empirical aesthetics, the reductive psychophysics method is commonly used. The reductive psychophysics method based on reductionism regards all dimensions in the experiment as isolated, and each dimension has an independent impact on the experimental results, which is not possible in real situations (Makin, 2017). Makin (2017) carries out an experiment to demonstrate the irrationality of the reductive psychophysics method. Three groups of dimensions are randomly combined in some patterns, which include blue and brown, curvy and angular, and symmetry and asymmetry. The results show that people's preferences are different from those when these dimensions appear alone. For example, people will prefer to see patterns that combine symmetrical elements with smooth curvy elements. But when seeing random patterns, people prefer to see sharp

elements combined with them. In a word, researchers who think that the aesthetic experience cannot be scientifically evaluated generally believe that, first of all, only cold preferences can be measured in a lab. There are still gaps in the study of hot emotions in aesthetic science. Also, the existing reductive psychophysics method cannot consider every dimension of cold preferences as a whole. And there is no better method to replace this method at present. But every factor which constitutes a thing should not be treated and analyzed in isolation. Because when people conduct aesthetic activities, the evaluation of whether things are beautiful is based on the entirety (Carbon, 2018). Thus, it is reasonable to draw the conclusion that aesthetic experience cannot be measured scientifically. However, there is no accurate and specific definition of hot emotion, nor does it clearly point out the neural activity process that produces hot emotion, which makes it not very convincing. Also, It does not consider the various cognitive neuroscience methods currently being developed but directly denies the existence of methods to measure aesthetic experience, which is too arbitrary.

Due to the loopholes in the above views, this paper is more inclined to think that aesthetic experience can be measured scientifically. As a matter of fact, there are many researchers that have hope for scientific measurement of aesthetic experience. And neuroscience is introduced into the study of aesthetics, which can be used to measure aesthetic experience (Skov & Nadal, 2021). The counter argument holds the view that methods in aesthetic science are not able to show the implicit response of participants in the experimental results completely and precisely, because they think that aesthetic experience based on empirical aesthetics is considered a particular and unique state of experience, and aesthetic experience is only based on the attributes of objects, which means the aesthetic experience is subjectivity. It is owing to the implicitness and subjectivity of aesthetic experience that they believe that aesthetic experience cannot be measured. However, this is only an inference, which needs more evidence to prove this view. With the progress of science and technology, non-invasive neuroimaging technology, a kind of study method in neuroscience, has been used in the study of empirical aesthetics. Chatterjee et al. (2009) use fMRI to study the expression of facial attraction in the nervous system of the human brain. The result shows that, first of all, the identification of facial beauty involves a diffuse neural network including perception, decision and reward circle. Also, fMRI can still detect the nerve response of the ventral occipital area to the facial attractiveness even if the individual does not subjectively and deliberately assess whether the face is beautiful to him but simply evaluates the facial attributes. And the fusiform face area (FFA) and the lateral occipital cortex (LOC) can also make sensitive judgments about facial attractiveness without being asked to judge beauty. This result strongly refutes the view that current methods and technologies are difficult to truly reflect the potential neural processes of the human brain. The reason why the opposing viewpoint asserts that the human brain's implicit reaction is challenging to evaluate is that they do not use appropriate measurement technology to measure human brain neural activity. Also, when the counter argument considers aesthetic as an untouchable and hard-to-detect thing, it ignores the fact that in addition to aesthetics, there are many more subjective fields of psychology that use neuroscience for research, such as emotion (Pearce et al.,

2016). The implicitness and subjectivity of aesthetics cannot be the reason why it cannot be measured scientifically.

Cognitive neuroscience further indicates that aesthetic experience can be measured. It has studied three neural mechanisms of the human brain processing aesthetic experience, including the reward system, common currency, and contextual regulation (Skov & Nadal, 2021). The reward system is a system used to calculate the hedonic response of the human brain to stimulation. And a more limited number of hedonic hot spots in limbic circuitry are responsible for the production of liking or pleasure (Berridge & Kringelbach, 2015). Contrary to what the counter argument thinks, the aesthetic process is actually a complex process in which neurons in the reward circuit generate activity after sensory information is introduced into the reward circuit (Skov & Nadal, 2021). The second mechanism, common currency, will refute the opposition's view that aesthetics is a special nerve activity in the human brain. The neural systems that control many forms of rewards share a lot of similarities. Due to subjective differences in experience, many researchers underestimated how broad the area of overlap actually is. Very varied pleasures will activate surprisingly comparable pathways, which indicates that everyone has a common currency in their neural systems (Berridge & Kringelbach, 2015). In other words, people's feelings of happiness are derived from the same neurological system whether they are engaging in aesthetic or other forms of perceptual activity. What is more, contextual regulation means that the response of the human brain nervous system to happiness will be affected by specific situations (Skov & Nadal, 2021). For example, when the participants eat a liquid food until they are full, the human orbitofrontal cortex will show that the participants are less happy to continue to eat this food (Kringelbach et al., 2003). On the contrary, the counter argument did not consider the impact of this particular context on human aesthetic experience. These three systems above deny the counter argument's view that aesthetic activities are simply a process of generating preferences through stimulation and prove that aesthetics involves sophisticated neurological systems whose activities can be observed scientifically (Skov & Nadal, 2021).

In all conclusion, this paper holds the point of view that aesthetic experience can be measured scientifically. Although researchers who think aesthetic experience cannot be measured give some arguments and evidence, such as it is hard to reproduce or measure hot emotion in the lab, and the current reductive psychophysics approach cannot take into account all aspects of cold preferences simultaneously, these pieces of evidence are not enough to prove that aesthetic experience cannot be measured scientifically. In fact, the development of cognitive neuroscience and the use of non-invasive neuroimaging technology make it possible to measure aesthetic experience scientifically, which also enrich empirical aesthetics. The reward system, common currency, and contextual regulation prove that human aesthetic activities are not different from other neurobiological activities. Aesthetics is closely related to the reward circuit and neural activity in the human brain, so it is not illusory and difficult to measure. Future research on aesthetic perception should not abandon empirical aesthetics but rather incorporate techniques from cognitive neuroscience, psychology, and biology. By using

interdisciplinary methods, neuroaesthetics can develop more and more mature (Pearce et al., 2016). And researchers' measurement of aesthetic experience will also become more and more scientific.

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