Contemporary Aesthetics (Journal Archive)

Volume 12 *Volume 12 (2014)* Article 9

2014

Brain and Aesthetic Attitude: How to Integrate "Old" and "New" Aesthetics

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Abstract

At present, various efforts are being put forward to naturalize aesthetics. One of the most controversial disciplines of aesthetics is neuroaesthetics. The first applications of neuroimaging of the aesthetic experience of paintings occurred ten years ago. Over this decade, neuroscientific findings have determined three common centers of visual aesthetic experience: top-down processing; reward and evaluation; and cortical sensory processing. Undoubtedly, these common centers require better identification and further investigation. However, the experimental data currently available make it possible to falsify or corroborate traditional philosophical theories of aesthetic perception and evaluation. Within an integrated approach to aesthetics, this selective function might constitute a future role for neuroaesthetics in humanities research.

Key Words

evaluation, naturalism, neuroimaging, reward, sensory processing, top-down processing, visual aesthetic experience

1. Aesthetic naturalism

Various efforts are currently underway to naturalize aesthetics, that is, to provide an explanation of its main topics in line with experimental results and with the theoretical frameworks derived from these results. The most well-known efforts are in experimental aesthetics, evolutionary aesthetics, neuroaesthetics, and cognitive aesthetics.[1] Taken together, these efforts constitute the so-called "psychological approach" to aesthetics, which seeks a scientific foundation for aesthetics.[2]

This naturalistic approach currently lacks appropriate interdisciplinary integration among the involved fields of study.[3] Psychologists have focused on stimuli and context. Neuroscientists have focused on brain systems. Evolutionists have focused on adaptive advantages. The disciplines in the humanities that have traditionally been concerned with aesthetic experience, such as philosophical aesthetics, have not interacted sufficiently.[4] Moreover, research is at an early stage in the different scientific fields, so it inevitably shows some conspicuous shortcomings.[5] Nonetheless, the attempt to naturalize aesthetics represents a stimulating and fascinating opportunity. Rather than arguing back and forth in an intuitive, a priori, and often inconclusive way, I will examine here what the available experimental evidence suggests about aesthetic "hard problems."

I will focus on neuroaesthetics, one of the most recent and controversial of these efforts. Broadly conceived, neuroaesthetics is the study of the neural, and also cognitive and evolutionary, basis for the production, perception,

cognition, and appreciation of artworks, as well as nonartistic objects and natural phenomena that evoke intense feeling, often of pleasure, because individuals take an aesthetic approach toward them. Thus defined, neuroaesthetics is not limited to a particular class of objects but focuses on a certain way in which objects can be experienced when individuals take something like an aesthetic attitude.[6]

Some might consider neuroaesthetics the least interesting of the naturalistic approaches. In particular, flimsy and often simple-minded and reductionist early efforts have contributed to a bad reputation. I will return to this issue in the concluding paragraph. However, the increasingly extensive and popular use of neuroimaging techniques makes neuroaesthetics quite promising for naturalism.

There has been much work in cognitive science that eschews imaging, but currently there is much interest in using this powerful new tool. It is often not possible to determine from behavioral variables alone whether a particular cognitive process is engaged, which leads to theoretical indeterminacy. Even if the so-called "reverse inference" (by which the engagement of a particular cognitive process is inferred from the activation of a particular brain region) is not deductively valid, this common practice can provide innovative and striking empirical evidence that is useful to distinguish and falsify competing cognitive theories.[7] Caution should be exercised, however, in cases where selectivity of activation in the region of interest is low. In particular, thanks to neuroimaging techniques, neuroaesthetics is not limited to single cases of brain lesions and neurological illnesses. On the contrary, scientists can explore theoretical hypothesis experimentally in controlled conditions with the participation of healthy subjects. Thus, they can correlate aesthetic experience with brain activity and arrive at general trends.

In the ten years since the first applications of neuroimaging of the aesthetic experience of paintings,[8] the collected data are somewhat divergent. The field is still young and heterogeneous; its scientists have different backgrounds, interests, and questions; and there are many differences in the stimuli, procedures, techniques, instructions, and tasks that are used.[9] However, it is important to highlight that these differences do not undermine the robustness of the findings. As scientists develop their research programs, they have strongly corroborated previously obtained results, even when they have modified the experimental settings to introduce new variables and features. Typical examples of robust findings are the experimental results on perception and aesthetic attitude realized by Cupchik and colleagues, Leder and colleagues' work on appreciation and aesthetic judgment, and Gallese and colleagues' work on mirror neurons and aesthetic experience.[10] Obviously, this robustness is not a fortuitous and casual fact. It derives from the use of rigorous methods already tested outside the field of aesthetics. For this reason, within neuroaesthetics there is a strong consensus on empirical data achieved with neuroimaging techniques.

I believe it is possible to accommodate the main findings from these data within a consistent framework if we do not overlook two general principles of ordinary brain functioning. First,

precisely like all other higher cognitive functions, visual aesthetic perception and appreciation are not based on a single, separate, and special module. On the contrary, aesthetic perception and appreciation reflect the dynamic interaction of several information-processing levels and stages: attention, perceptual analysis, memory integration, explicit classification, decision-making, evaluation, and emotion.[11] Second, the brain activity underlying aesthetic perception and appreciation occurs within varying time frames: the processing levels and stages are linked in sequence as well as through continuous feedback loops.[12]

Keeping in mind that aesthetic perception and appreciation emerge from various combinations of multiple responses, it is possible to suggest (a) how recent scientific results have successfully determined three core centers of the complex neural network that enables aesthetic perception and appreciation, (b) what the future challenges for neuroaesthetics are in terms of better identification of these crucial patterns, and (c) why these results are relevant for confirming or disconfirming traditional theories of aesthetic perception and evaluation in philosophical aesthetics.

I will focus, in particular, on empirical findings that concern the aesthetic attitude. As is well known, this notion stems from the Kantian concept of disinterest: when we judge an object aesthetically we are unconcerned with whether and how it may further our practical aims. According to influential aesthetic-attitude theories of the twentieth century, bearing an aesthetic attitude toward an object enables a richer experience of it because this attitude has no purpose beyond that of interpreting the object outside the context of our personal needs and ends.[13]

In line with naturalistic approaches,[14] the aesthetic attitude represents the specific mental disposition that gives unity to aesthetic experience conceived as a temporally extended episode that involves perceptual, cognitive, imaginative, and emotional processes. As a basic framework, the aesthetic attitude coordinates these multiple activities into an integrated experience. It also realizes this function of integration by virtue of a specific set of properties. It influences the global functioning of attention. Ordinary and automatic routines of perception and categorization are inhibited so that interpreters can identify with the aesthetic objects in a global effort involving different mental faculties. The aesthetic attitude influences the global functioning of consciousness, in particular increasing the focus/fringe, center/periphery, figure/ground dynamics of consciousness. During the aesthetic experience, subjects cannot collect all the relevant information immediately in a single act of consciousness. They explore the aesthetic object in a serial manner, with continuous feedback between bottom-up and top-down processes, so that attention is directed both analytically to the components of the aesthetic object and synthetically to the aesthetic object as a whole, with a tension that avoids repetition and boredom.

The aesthetic attitude influences the global functioning of belief dynamics. Whatever format they have— symbolic or sub-symbolic—the beliefs in the aesthetic attitude are not referentially constrained: like beliefs in playful pretense and

symbolic games, they are marked off and quarantined from the actual state of the world. The aesthetic attitude influences the global functioning of motivation. The epistemic goal (the goal of acquiring knowledge through the interaction with the aesthetic object) supports the specific goals activated by the exploratory activity. These specific goals are derived from the aesthetic object and are simulated off-line: pretending to adopt them, subjects feed the goals into their own decision mechanism without producing any effective decision or behavior.

According to both traditional philosophical theories and naturalistic approaches, the aesthetic attitude involves detachment from referential conditions, instrumental goals, and daily concerns, but not disengagement from knowing and learning. Subjects do not have personal goals, ordinary desires, or practical needs. Their mental activity develops freely, guided only by the structure and the properties of the aesthetic object. Some philosophers have doubted the existence of the aesthetic attitude so conceived, judging it a mere myth.[15] Others have considered it an ideology[16] or a status distinction.[17] Hard problems about the aesthetic attitude concern both the role of aesthetic appreciation[18] and the role of affect.[19]

As already mentioned, if we consider neuroaesthetics in a broad sense, this emerging field of study largely focuses on the aesthetic attitude, engaged in different domains (painting, design, architecture, dance, music, bodies, faces, and so on). I shall try to identify here the main neurological basis of the aesthetic attitude concerning paintings and what might be considered a kind of "case study" in what neuroaesthetics can do if it is not limited to a mere catalog of brain regions and if it successfully interacts with traditional, philosophical aesthetics.

2. Top-down processing

Many findings show that the first common center of aesthetic perception and appreciation involves the engagement of top-down processing and cognitive control. In this mode, subjects suppress everyday concerns and adopt an aesthetic viewing orientation; many experiments show that the same object is apprehended and evaluated differently when it is viewed as artwork.[20]

Daily perception is pragmatic; that is, it is oriented towards the identification of objects in visual scenes. This inclination is so automatic that, in an experiment, naïve participants reported perceiving objects in pictorial compositions that were devoid of recognizable objects.[21] The neural systems underpinning aesthetic perception and appreciation are not limited to those involved in object recognition. In a crucial experiment, subjects without formal training in visual art were exposed to thirty-two representational paintings. Prior to entering the fMRI scanner, participants received two different sets of instructions in turn. For the pragmatic condition, they were instructed to apply an everyday informational criterion when viewing the paintings, approaching them in an objective and detached manner. For the aesthetic condition, they were instructed to approach the paintings in a subjective and engaged manner and to focus on the paintings' colors, tones,

composition, and shapes. The results revealed that activation in the lateral prefrontal cortex was higher in the aesthetic than in the pragmatic condition. In contrast, the structures known to mediate object recognition were more activated under the pragmatic condition.[22]

According to what is currently known, the lateral prefrontal cortex is typically associated with cognitive control (in this case, inhibiting the function of object recognition and orienting perception towards the aesthetic mode). It is essential in keeping the main goal active (in this case, the received instruction relative to the aesthetic condition) while the subject is realizing sub-goals (in this case, the processing of perceptual, structural, and stylistic properties). The lateral prefrontal cortex is correlated with self-related information (in this case, the internal set of subjective reactions and mental states prompted by the stimulus).[23]

In another crucial experiment, expertise was measured with knowledge questions about artistic styles, painters, and paintings. Self-reports and facial electromyography showed that, compared to non-experts, experts like more negative, provocative, and disturbing artworks (such as the works of Francis Bacon, Damien Hirst, Willem de Kooning, and Louise Bourgeois) and have attenuated reactions to them. These results suggest that the aesthetic orientation is emotionally distanced. Moreover, they indicate that experts, who are exposed to art more frequently and are more skilled at decoupling and "quarantining" the goal relevance of the stimulus, are less responsive to the artworks' direct affective valence than are nonexperts. Furthermore, their emotional response to valence is attenuated by their attention to other features, such as structural, stylistic, and formal properties.[24]

Finally, analyses of magnetoencephalographic data with time-frequency procedures reveal that the oscillation power associated with beautiful stimuli in all four frequency bands is significantly greater than the power associated with non-beautiful stimuli 400ms after stimulus onset and beyond. This greater synchronization might corroborate the hypothesis that the adoption of the aesthetic orientation establishes a global neuronal workspace, allowing the coordination of multiple brain areas.[25]

Within these results, the crucial issue concerns their ecological validity: almost all studies are performed in laboratories and utilize specially (often artificially) designed successions of simplified and decontextualized stimuli. Varying instructions (mere observation, objective and detached judgment, symmetrical judgment, explicit liking or preference ratings, and so on) are given to participants. Often studies do not include experimental control of general attention mechanisms and task-related efforts.[26]

However, it is important to stress that the ecological limits do not mean that empirical findings obtained in laboratory are not applicable to real life. On the contrary, controlled procedures in a simplified situation often allow better understanding of cognitive processes activated in daily elaboration that is intricate, multifaceted, and impure. This point is clearly indicated by two recent experiments concerning aesthetic

appreciation: for the first time these experiments empirically demonstrate the deep relationship between perceptual insights and aesthetic pleasure.

In the first study,[27] photographs of cubist artworks by Picasso, Braque, and Gris were shown to participants without expertise in cubist art. The study was structured in two blocks, each showing the stimuli in a randomized order. During the first block, subjects had to rate the pictures on liking. During the second block, subjects rated how well they could detect objects within the artwork. All ratings were chosen from a 7-point Likert scale from 1 ('not at all') to 7 ('very'). Data across participants revealed a strong relationship between the detectability of objects and liking, confirming that in aesthetic perception, form recognition is closely related to appreciation.

In the second study,[28] two-tone images either containing a hidden form (i.e. a face) or not were repeatedly presented for half a second to participants. Stimuli were shown in a randomized order blockwise 13 times. The tasks alternated blockwise between choosing from a 7-point scale from 1 ('not at all') to 7 ('very good') how much one liked the picture and a detecting block. The latter comprised two ratings on a 1 plus 7-point scale (0: 'no face recognized'; 7: 'very clear'). Insight was defined by the highest gain in clearness between two subsequent blocks per participant and stimulus. All liking ratings per participant and block were then shifted according to their temporal occurrence relative to the insight block. Data clearly demonstrated that liking significantly increased only after having an insight; the intensity of insight, defined as degrees of clearness ratings, showed direct influences on the degrees of liking.

These two experiments are based on typical laboratory situations: there are artificial successions of stimuli, Likert-scale ratings, and so on. However, it is precisely this poor ecological condition that enables a better understanding of aesthetic appreciation and its dynamics in real life cognition.[29] It is the presence of novelty, incongruity, unpredictability, and surprise that enables aesthetic pleasure, not repeated presentation or immediacy of recognition as such. The reduction of uncertainty, that is the transition from an initial state of uncertainty to a subsequent state of increased predictability, is rewarding, pleasurable, and enjoyable in itself. Whereas the initial discrepant condition is unpleasant and annoying, there is an immediate effect of the insight during form recognition on aesthetic appreciation: the increase in processing fluency amounts to an increase in positive affect. However, this effect may be temporally limited: fluency might not increase in a linearly progressive fashion, but it might decrease again in the course of elaboration.

Moreover, the data revealing that perceptual insights within difficult pictures increase appreciation also fit very well with the widespread appreciation of great modern artworks, like cubist ones, that show partial, ambiguous, and contrary clues; block ordinary sensory-motor operations; blatantly violate regular, clear, symmetrical forms; destroy familiarity and daily expectations; trigger open processes of categorization.[30]

So even with ecological limits, the data are very interesting, particularly in relation to controversial issues concerning the aesthetic attitude. In line with the Kantian notion of the aesthetic stance, the collected results indicate that the aesthetic attitude exists. When someone takes this kind of attitude, neuroimaging indicates that a specific neural and cognitive configuration is activated. This configuration requires high-level cognitive control; it is a top-down viewing orientation; it inhibits daily concerns; it is focused on internal subjective reactions; it is emotionally disinterested; and it allows for a great integration and blending of stimulus-driven contents and structural, formal, and stylistic properties. Thus, the available evidence explicitly falsifies all the perspectives that deny the existence, the specificity, or the relevance of the aesthetic attitude.

3. Reward and evaluation

The second common center of aesthetic perception and appreciation involves the engagement of both the reward circuit and the evaluative judgment process. In line with the hypothesis that the aesthetic orientation directs attention towards internally-generated and self-related information, several studies (in which participants are usually asked to explicitly judge a visual stimulus either as beautiful or ugly) have reported activation of cortical and subcortical areas that are considered to be part of affective, emotional, and evaluative processes—such as the ventral striatum, the caudate nucleus, the substantia nigra, the thalamus, the amygdalae, the insula, the anterior cingulate cortex, the ventromedial prefrontal cortex, and the orbitofrontal cortex.[31]

Three areas in particular seem to provide essential support for aesthetic perception and appreciation: the amygdalae, the insula, and the medial prefrontal cortices. It is well established that the amygdalae intervene in reward processing and correlate their activity with changes in predictability of stimuli. So, the amygdalae might signal the goodness of a solution found when interpreting the artworks in terms of their representational efficiency. Phenomenologically, this process might be experienced as positive.[32] The insula is typically associated with internal visceral perception, the feeling of emotion, and the subjective dimension of experience.[33] As noted above, the medial prefrontal cortices correlate with self-related mental processes, particularly with the introspective evaluation of internal mental states.[34]

Adopting the distinction between fast, automatic affective reactions and slow, analytical cognitive evaluations,[35] the aesthetic judgment, conceived not as an immediate appreciation but as an extended evaluation, can be considered to be the final result of the stratified and complex process of aesthetic perception and appreciation, wherein bottom-up construction of the stimulus is intimately linked with overall self-related information, made up of the multiple subjective responses prompted by the processing of the stimulus and its properties.[36]

For these results, the crucial issue concerns the limited temporal resolution of fMRI, a strongly limiting factor that might prevent making distinctions among stages that quickly

follow each other.[37] Taking this into account, it might be difficult to differentiate the neural activation related to emotions from the neural activation related to aesthetic appreciation as such.[38] From this point of view, psychological studies based on priming procedures indicate that while emotions are typically associated with the contents represented by an aesthetic object, aesthetic appreciation is a function of the perceiver's (fluent or disfluent) processing experiences which, in turn, are influenced by the properties of the aesthetic object—such as prototypicality, symmetry, clarity, and figural goodness, but also novelty, incongruity, unpredictability, and surprise.[39]

In any case, the collected results are very interesting in relation to the controversial question concerning aesthetic value. They certainly do not show that there is a cognitively necessary way to engage with works of art and other aesthetic objects. However, the experimental results undoubtedly indicate that, when an individual is asked to take something like an aesthetic stance, the resulting aesthetic experience always constitutes an evaluative experience based on different kinds and stages of evaluation, whatever the stimulus, even an abstract painting without any figurative contents and familiar meanings. Each processing stage is permanently linked to appreciation, and this appreciation guides subsequent aesthetic processing, ultimately leading to a satisfying understanding being successfully revealed.[40]

The experimental results are also relevant to the controversial question concerning the role of affect. They undoubtedly show that with stimuli as varied as computer-generated, geometrical, or meaningless patterns, the resulting aesthetic engagement constitutes an affective experience. This does not mean that every engagement with a work of art and other aesthetic objects must have this feature. However, when someone looks at things aesthetically, each processing stage can increase or decrease the positive or negative affective state until a final (more or less) satisfactory state is achieved. More precisely and in line with the Kantian idea of disinterestedness, the aesthetic experience constitutes a self-contained affective experience. It does not go beyond itself towards an external goal, practical utility, or functional problem solving. It is a self-reinforced and self-rewarding experience that is its own source of pleasure and satisfaction.[41]

4. Cortical sensory processing

The third common center of aesthetic perception and appreciation involves the activation of low-level and high-level cortical sensory processing. Engaging the visual properties of paintings enhances both category-specific activation (for instance, paintings of landscapes activate the parahippocampus whereas portraits activate the fusiform gyrus) and general increased activity within the ventral occipito-temporal visual cortices.[42]

Several findings suggest that the same mechanisms that enable our interaction with non-artworks are co-opted for aesthetic perception and appreciation. For instance, symmetry judgment and aesthetic judgment tasks enhance the activation of parietal regions and pre-motor areas which typically

subserve visuospatial coding and motor mapping.[43] More specifically, areas in the medial orbitofrontal cortex that respond to beauty in faces also respond to beauty in paintings.[44]

Several fMRI studies show that the widely distributed network of aesthetic perception and appreciation is sensitive to expertise and source information. Medial orbitofrontal and prefrontal activation in particular correlate with expertise: compared to non-experts, experts show a greater activation in these areas when they like images.[45] In the same vein, activation in these areas correlates with contextual expectations. For example, subjects in the fMRI scanner were presented with artworks that were randomly labeled as being either sourced from a gallery or computer-generated. As expected, aesthetic ratings were significantly higher for stimuli believed to be sourced from a gallery. This contextual manipulation moderated activity in the medial orbitofrontal and prefrontal cortices. Most interestingly, when naïve participants were told that computer-generated images belonged to a museum, the activation of these areas was greater.[46] In line with these data, other experiments confirm that people's appreciation of artworks is enhanced when supplemented by explanatory information such as titles, artists' names, biographies, and so on. For instance, aesthetic ratings for photographs increased when elaborate titles were added.[47] Aesthetic perception and appreciation thus reflect not only their proximal neural processes but also their distal developmental and educational histories, together with the contextual histories of artworks.[48]

The crucial issue in these results concerns domain-specificity.[49] Aesthetic perception and appreciation re-purpose already available general mechanisms and activate brain regions involved in a multiplicity of cognitive activities completely unrelated to aesthetics and art. At issue is the extent to which the activation of these mechanisms and areas is specifically relevant to aesthetic perception and appreciation. The observation of Classical and Renaissance sculptures, for example, elicited activation of the ventral premotor cortex and the posterior parietal cortex, suggesting motor resonance congruent with the implied movements portrayed in the sculptures.[50] However, if mirror systems represent a necessary condition of perception, does their activation really distinguish aesthetic perception and appreciation from ordinary perception?

If we tie the evidence concerning sensory processing together with the evidence concerning cognitive control and evaluation, it is possible to obtain a revealing perspective. Taken together, all the data I have collected suggest that neuroaesthetics aligns with hermeneutics. In line with the hermeneutic circle, all the empirical results of neuroimaging indicate that aesthetic perception and appreciation, conceived as a gestalt-like experience, involve all of the following: a complex and multi-level integration and coordination of high-order and low-order dynamics; specific and general processing; top-down attitude and knowledge and bottom-up construction of stimuli; constructive and stimulus-driven receptive attitudes; global attention toward the stimulus as a whole and focal attention to the details of the stimulus;

analytical and synthetic orientations; backward-loops and forward anticipations; interpretation and meaning assignment based on more or less extensive historical knowledge; more or less informative contextual information, appropriate expectations, and highly specialized skills; and both early and late, immediate and extensive evaluative processes.

5. The (possible) heuristic role of neuroaesthetics

Neuroaesthetics is an emerging field: at present it is difficult to predict its future status and function. However, what is clear is that neuroaesthetics cannot have either an inflationary role or a deflationary one.

In contrast to the classical perspectives of the most well-known theorists of neuroaesthetics—namely Zeki, Ramachandran, and Changeux[51]—this new field cannot constitute the foundation of aesthetics. On the contrary, it requires the conceptual mediation of traditional philosophical aesthetics to define its conceptual framework (for instance, to precisely define the concepts of aesthetic experience and art) and to determine the multiple artistic and aesthetic phenomena it investigates with experimental tools: Western or non-Western artworks, different art genres (paintings, sculpture, music, and so on), different levels of artworks (high-level art versus ordinary, popular, mass art),[52] aesthetic objects such as designs or decorations, natural phenomena such as landscapes or faces, beautiful versus not-beautiful manifestations, and so on. Furthermore, the conceptual mediation of philosophical aesthetics is essential because the field of study is even more complex than previously stated: a given aesthetic object often serves a multiplicity of purposes for different people with different skills, in different contexts, and at different times.[53]

On the other hand, neuroaesthetics does not fit with all the perspectives that completely deny its value and interest, judging it to be inevitably and negatively reductionist. Various critics argue that neuroaesthetics cannot grasp the "why" and the "what for" of aesthetic processes; cannot offer any basis for the evaluation of art as great, good, or bad; that it investigates only general conditions of aesthetic perception and appreciation, maximizing the commonalities among people but losing what makes a particular experience unique; and so on.[54]

First, many of these criticisms do not concern only neuroaesthetics but can also be applied to neuroscience and cognitive science in general. As is true regarding those who make general criticisms of neurocognitive sciences, these critics are, from a methodological point of view, paradoxically reductionist. In fact, they deny the opportunity to investigate different levels of explanation and understanding. According to "explicatory pluralism," one of the methodological conceptions most accepted in neurocognitive sciences, the ordinary functioning of research requires simultaneous investigations of the same *explicandum* at different levels to enhance the development of each level.[55] From this point of view, at present it is very difficult to find a neuroscientist who thinks to explain the single and irreducible *qualia* of the subjective experience or, in the same vein, a researcher in the field of neuroaesthetics who projects and realizes experiments with

the goal of substituting them for art criticism.[56]

Second, over the last two decades, under pressure from neurophenomenology,[57] neurocognitive sciences have increasingly integrated the phenomenal experience, in the form of extended subjective reports, into the construction and validation of theories, thus overcoming in large measure the opposition between first-person descriptions and third-person explanations. Along these lines, neuroaesthetics could modify its typical approach based on severe quantification and decomposition. Hitherto experiments have usually required participants to use some sort of rating scale to quantify some dimension of their reaction to the presented stimuli under the (unproven) presupposition that aesthetic experience can be meaningfully decomposed and quantified.[58]

Third, and most importantly, it is absolutely untrue that the scientific psychological approach to aesthetics and the traditional philosophical approach to aesthetics are by definition two completely unrelated kinds of thinking without any possible mediation. On the contrary, as I have sketched out here, it is critical to acknowledge that, even in its current and deeply limited version, neuroaesthetics can provide crucial evidence to falsify or corroborate relevant theories of philosophical aesthetics. Obviously, the currently available evidence is far from exhaustive or conclusive. However, if critics (and leading theorists)[59] avoid stultifying neuroaesthetics, thus reducing it to a mere straw man, it has the potential to become more than a mere catalog of brain regions whose activity is related with aesthetic experience. It could gain an essential heuristic and selective role, contributing to questions raised about the arts and aesthetics in humanities research.

Whatever the future role of neuroaesthetics, the vast majority of researchers in the field know very well and explicitly affirm that in its present, very limited form, the effort to determine the neural underpinnings of the cognitive and affective processing that underlies aesthetic perception and appreciation represents only the beginning of their enterprise, not the end. Above all, they know very well that it is a part of the story, not the whole story.[60]

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Published on September 27, 2014.

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I would like to thank the anonymous reviewer for *Contemporary Aesthetics* for very helpful comments on earlier drafts of this paper.