

Worringer, Dewey, Goodman, and the Concept of Aesthetic Experience: A Biological Perspective

Fabio Tononi

tononifabio@gmail.com

Abstract: The purpose of this essay is to advocate the ideas of Wilhelm Worringer, John Dewey, and Nelson Goodman on the roles of perception, empathy, emotion, and enjoyment in aesthetic experience. I will attempt to do this by offering a novel interpretation of some of these thinkers' insights from a biological perspective. To this end, I will consider the following questions. What is an aesthetic experience? Does such a thing exist at all? If yes, is there a correlation between the concept of the aesthetic and perception? Is it possible, then, to find a biological basis for aesthetic experience? My argument is that a fresh analysis of the aesthetics of Worringer, Dewey, and Goodman, in light of some of the discoveries and theories of the cognitive neurosciences – such as the biological correlations of emotions, the “as-if-body-loop” theory, the discovery of mirror neurons, and the phenomenon of embodied simulation – may provide a contribution to longstanding philosophical problems relating to the nature of aesthetic experience.

Keywords: Aesthetic experience, Dewey, embodied simulation, emotion, empathy, enjoyment, Goodman, perception, sensation, Worringer

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Fabio Tononi

tononifabio@gmail.com

Introduction: The Relationship between Aesthetics and Perception

What is the relationship, if any, between the concept of the aesthetic and perception? Is it possible to grasp art through pure sensation? Can new epistemologies deriving from neuroscientific research cast new light on these issues? These are some of the fundamental and most timely questions in aesthetics today. It is the aim of this essay to tackle these problems from a philosophical and biological perspective, taking into consideration the works of Wilhelm Worringer (1881–1965), John Dewey (1859–1952), and Nelson Goodman (1906–1998) in connection with more recent neuroscientific discoveries and theories.

Before addressing issues regarding the nature of aesthetic experience, a definition of aesthetics ought to be given. In his *Greek Philosophical Terms: A Historical Lexicon*, Francis E. Peters suggests that the term “aesthetics” derives from the ancient Greek *aisthesis*, which is translated as “perception” or “sensation”, and should be understood in contrast to intellectual concepts or rational knowledge¹. Examining the origin of the word *aisthesis*, Peters states that «perception is a complex of problems rather than a single question. It enters philosophy [...] as an attempt [...] to explain the physiological processes involved in perceiving an object»². From this passage, we deduce that the word *aisthesis* was employed by ancient Greek philosophers to investigate the

¹ F. E. Peters, *Greek Philosophical Terms: A Historical Lexicon*, New York University Press, New York 1967, pp. 8-15.

² *Ibid.*, p. 8.

biological process underlying the perception of objects, or, better yet, sense perception³. In fact, as Peters asserts, for Aristotle (384–322 BC) «*aisthesis* became a philosophical question as well as a physiological one»⁴. For this reason, it seems advantageous to investigate the concept of aesthetics and the phenomenology of (sense) perception from a neuroscientific perspective.

In *On the Soul*, Aristotle provides his own definition of sensation or *aisthesis*. He states that «sense [*aistheseos*] is that which is receptive of the form of *sensible objects* [*aistheton*] without the matter» (424a)⁵. Thus, in Aristotle, *aisthesis* is something that deals with sense perception. In another passage, he maintains that «sense [*aisthesis*] is affected by that which has colour, or flavour, or sound, but by it, not *qua* having a particular identity, but *qua* having a certain quality» (424a)⁶. Therefore, the etymology of the word “aesthetics” suggests that aesthetic experience is essentially related to the sense perception of objects possessing certain kinds of qualities.

It was not until Alexander Gottlieb Baumgarten (1714–1762), however, that the word “aesthetic” gave rise to a distinct philosophical branch: aesthetics. In his 1735 thesis *Philosophical Meditations Pertaining to Some Matters Concerning Poetry* (*Meditationes philosophicae de nonnullis ad poema pertinentibus*), Baumgarten, in line with the ancient Greek meaning of the term, defines “aesthetic” as the science of perception:

As our definition is at hand, a precise designation can easily be devised. The Greek philosophers and the Church fathers have already carefully distinguished between *things perceived* [*αἰσθητά*] and *things known* [*νοητά*]. It is entirely evident that they did not equate *things known* with things of sense, since they honoured with this name things also removed from sense (therefore, images). Therefore, *things known* are to be known by the superior faculty as the object of logic; *things perceived* [are to be known by the inferior faculty, as the object] of the science of perception, or **aesthetic**⁷. (§116)

However, he does not specify how this new discipline might be a science of perception.

³ Sense perception is the understanding gained through the use of one (or more) of the senses – such as sight, taste, smell, touch, and hearing.

⁴ Peters, *Greek Philosophical Terms*, p. 8.

⁵ Aristotle, *On the Soul*, trans. by W. S. Hett, in id., *On the Soul. Parva naturalia. On Breath*, Harvard University Press, Cambridge, MA, and London 1957, pp. 1-203 (137). Emphasis added.

⁶ Ibid.

⁷ A. G. Baumgarten, *Reflections on Poetry*, trans. by K. Aschenbrenner, W. B. Holther, University of California Press, Berkeley-Los Angeles 1954, p. 78.

It is in his *Aesthetica* (1750) that Baumgarten develops these first intuitions. Continuing the idea he outlined in the *Meditations*, Baumgarten begins the “Prolegomena” of the *Aesthetica* with his own explanation of the concept of aesthetics: «Aesthetics (the theory of the liberal arts, the logic of the lower capacities of cognition [*gnoseologia inferior*], the art of thinking beautifully, the art of the *analogon rationis*) is the science of sensible cognition» (§1)⁸. Thus, by “aesthetics” Baumgarten meant what we today call philosophy of perception, that is, the study of sense perception. In a further section, he adds another important piece of information, that is, that the objective of aesthetics is beauty: «The aim of aesthetics is the perfection of sensible cognition as such, that is, beauty, while its imperfection as such, that is, ugliness, is to be avoided» (§14)⁹.

On the basis of what we have said so far, we can affirm that the concept of aesthetics refers to the ways people perceive the world sensorially; consequently, aesthetics should be connected to perception. But is this always the case? In this regard, Bence Nanay maintains that aesthetic experiences are not necessarily perceptual and that it is not «only perceivable entities [that] can be experienced aesthetically»¹⁰. It is therefore possible to have aesthetic experiences of entities that are not perceivable, such as ideas (for instance when dealing with conceptual art), ideologies, large-scale narrative structures, or mathematical proofs¹¹. From this assumption, we can derive that there are different kinds of aesthetic experiences: for instance, those that involve emotions, those

⁸ Baumgarten, *Aesthetica*, 2 vols, impens. I.C. Kleyb 1750, I, 1: «AESTHETICA (theoria liberalium artium, gnoseologia inferior, ars pulcre cogitandi, ars analogi rationis) est scientia cognitionis sensitivae». Translated in P. Guyer, *18th Century German Aesthetics*, in E. N. Zalta (ed.) *The Stanford Encyclopedia of Philosophy*, 2020, <https://plato.stanford.edu/archives/fall2020/entries/aesthetics-18th-german/> [accessed: 26 September 2020].

⁹ Baumgarten, *Aesthetica*, I, 6: «Aesthetices finis est perfectio cognitionis sensitivae, qua talis. Haec autem est pulcritudo, et cauenda eiusdem, qua talis, imperfectio. Haec autem est deformitas». Translated in Guyer, *18th Century German Aesthetics*.

¹⁰ B. Nanay, *Aesthetics as Philosophy of Perception*, Oxford University Press, Oxford 2016, p. 9.

¹¹ Ibid., pp. 9, 19. See also D. Costello, *Kant and the Problem of Strong Non-Perceptual Art*, in “British Journal of Aesthetics”, 53, 2013, pp. 277-298; P. Goldie, E. Schellekens (eds), *Philosophy and Conceptual Art*, Oxford University Press, Oxford 2007; J. Shelley, *The Problem of Non-Perceptual Art*, in “British Journal of Aesthetics”, 43, 2003, pp. 363-378; and R. G. Collingwood, *Principles of Art*, Clarendon, Oxford 1938.

that involve pleasure, those that are about beauty, those that are about the identification with a character, those that involve musical *frissons*, and so on¹².

Does this mean that all experiences are aesthetic? If we consider, for instance, the existence of religious experience¹³, perceptual experience¹⁴, and emotional experience, we deduce that there are different types of experiences, and that only some of them are aesthetic experiences. This may be clarified by addressing another question: what is the object of an aesthetic experience? To put it another way, are aesthetic experiences confined to the perception of works of art, or can they be extended to the experience of other things? In this sense, Nanay states: «We can experience works of art in a non-aesthetic manner and we can experience objects other than works of art in an aesthetic manner»¹⁵. In fact, people may have aesthetic experiences of natural scenes and of ordinary objects. In these cases, the concept of aesthetic experience is not necessarily connected with art: «some, but not all, of our aesthetic experiences are of artworks and some, but not all, our experiences of artworks are aesthetic experiences»¹⁶.

Although I do not conceive of aesthetic experiences as being exclusively perceptual experiences, in this essay I will deal solely with perceptual aesthetic experiences. But what is an aesthetic experience? Or, better yet, what makes an experience aesthetic? To discern what it is like to have aesthetic or non-aesthetic experiences is not an easy task. This is further complicated by the fact that – probably for this reason – many, sometimes contradictory definitions have been proposed. To answer this question, I will focus on the formulations provided by Worringer, Dewey, and Goodman, who outlined from different perspectives the phenomenal characters that they consider to be proprietary to aesthetic experiences. Their definitions of aesthetic experience are certainly not comprehensive, but taken together they may provide the foundation for further investigations into the subject. Following this, the second aim of this essay is to

¹² See Nanay, *Aesthetics as Philosophy of Perception*, p. 12.

¹³ See J. Mouroux, *On the Notion of Religious Experience*, in “The Downside Review”, 66, 1948, pp. 246-259; and W. James, *The Varieties of Religious Experience: A Study in Human Nature*, Longmans, Green, New York 1922.

¹⁴ See J. J. Gibson, *The Senses Considered as Perceptual Systems*, Allen & Unwin, London 1968.

¹⁵ Nanay, *Aesthetics as Philosophy of Perception*, p. 19.

¹⁶ *Ibid.*

examine how the brain-body system may work when humans have aesthetic experiences of the kinds described by Worringer, Dewey, and Goodman. To accomplish this goal, I will focus on specific neuroscientific data – including those on the biological correlations of emotions, empathy, embodied simulation, and interoception – obtained from published experiments. This, I hope, will help us to better understand the relationship between the aesthetic and perception, and to propose an updated definition of perceptual aesthetic experience.

1. Worringer and the Theory of Empathy

In his 1907 work *Abstraction and Empathy: A Contribution to Psychology of Style*, Wilhelm Worringer investigates the phenomenon of aesthetic experience by focusing on «the behaviour of the contemplating subject»¹⁷. He does so by applying Theodor Lipps' theory of empathy and discussing the role of enjoyment in art contemplation.

Worringer defines aesthetic experience with the following formula: «Aesthetic enjoyment is objectified self-enjoyment»¹⁸. Put differently, he argues that «to enjoy aesthetically means to enjoy myself in a sensuous object diverse from myself, to empathise myself into it»¹⁹. Therefore, according to Worringer, aesthetic experience consists of an empathic relationship between the subject and the contemplated object. Empathy, in its turn, produces a joyful sensation in the experiencer. In his own words, Worringer maintains that the role played by «the inner motion, the inner life, the inner self-activation» in aesthetic experience is critical²⁰. In this sense, he stresses the importance of sensation in art contemplation.

¹⁷ W. Worringer, *Abstraction and Empathy: A Contribution to the Psychology of Style*, ed. by H. F. Mallgrave, E. Ikonomou, Routledge and Kegan Paul, London 1953, p. 4.

¹⁸ *Ibid.*, p. 5.

¹⁹ *Ibid.*

²⁰ *Ibid.*

Worringer also describes a type of aesthetic experience that results from the attentive perception (or apperception) formulated by Lipps²¹; that is, the perception of an object accompanied by the awareness of perceiving that same object²²:

Each simple line demands apperceptive activity from me, in order that I shall apprehend it as what it is. I have to expand my inner vision till it embraces the whole line; I have inwardly to delimit what I have thus apprehended and extract it, as an entity, from its surroundings. Thus every line already demands of me that inner motion which includes the two impulses: expansion and delimitation. In addition, however, every line, by virtue of its direction and shape, makes all sorts of special demands on me²³.

In emphasising the role of sensation and perception in aesthetic experience, Worringer is in line with the ancient Greek meaning of the word *aisthesis*. What he adds in his definition is the assumption that aesthetic experience depends both on the aesthetic value of the object and «the urge to empathy», which is natural in the subject²⁴. He states: «The value of a work of art, what we call its beauty, lies, generally speaking, in its power to bestow happiness. The values of this power naturally stand in a causal relation to the psychic needs which they satisfy»²⁵. Thus, an object has aesthetic value insofar as it satisfies the need for empathy in the contemplating subject, affording happiness and enjoyment.

Worringer identifies aesthetic experience as a form of immersion of the perceiver in the perceived object – an immersion that produces a feeling of enjoyment in the perceiving subject:

In the forms of the work of art we enjoy ourselves. Aesthetic enjoyment is objectified self-enjoyment. The value of a line, of a form consists for us in the value of the life that it holds for us. It holds its beauty only through our own vital feeling, which, in some mysterious manner, we project into it²⁶.

What Worringer describes is a sort of extended body that projects itself «into the things of the outer world», enjoying itself in them²⁷. Precisely here lies his definition of

²¹ See T. Lipps, *Vom Fuehlen, Wollen und Denken*, Verlag von Johann Ambrosius Barth, Leipzig 1902, pp. 6-7.

²² On Lipps' concept of apperception, see W. M. Martin, *Theodor Lipps and the Psycho-Logical Theory of Judgement*, in M. Textor (ed.) *Judgement and Truth in Early Analytic Philosophy and Phenomenology*, Palgrave Macmillan, London 2013, pp. 9-35 (18).

²³ Worringer, *Abstraction and Empathy*, p. 5.

²⁴ *Ibid.*, p. 23.

²⁵ *Ibid.*, p. 13.

²⁶ *Ibid.*, p. 14.

²⁷ *Ibid.*, p. 16.

experience. In fact, in another passage he says: «We are delivered from our individual being as long as we are absorbed into an external object, an external form, with our inner urge to experience»; hence, «the deepest and ultimate essence of all aesthetic experience: this is the need for self-alienation»²⁸.

Worringer links the concept of self-alienation to the phenomenon of empathy, inasmuch as empathy, in his reasoning, is the result of an impulse to momentarily distance oneself from one's own feelings or activities:

The fact that the need for empathy as a point of departure for aesthetic experience also represents, fundamentally, an impulse of self-alienation is all the less likely to dawn upon us the more clearly the formula rings in our ears: "Aesthetic enjoyment is objectified self-enjoyment". For this implies that the process of empathy represents a self-affirmation, an affirmation of the general will to activity that is in us²⁹.

Thus we arrive at the following formula: «In this self-objectification lies a self-alienation»³⁰. That is, in order to experience the sensations of others (empathy), I need to forget myself (which contains my sensations).

In sum, Worringer defines aesthetic experience as a consequence of the human urge to experience and empathise, with the aim to enjoy oneself in an external object. In this regard, he attributes «all aesthetic enjoyment – and perhaps even every aspect of the human sensation of happiness – to the impulse of self-alienation as its most profound and ultimate essence»³¹. Furthermore, in his definition of aesthetic experience, he also includes the classical concepts linked to the term *aisthesis*, that is, perception and sensation, which must be understood at a physiological level.

2. Dewey and Art as Experience

To provide an explanation of the process involved in aesthetic experience, in 1934, John Dewey coined and developed the locution "art as experience". First, he provides a definition of experience in general:

²⁸ Ibid., pp. 23-24.

²⁹ Ibid., p. 24.

³⁰ Ibid.

³¹ Ibid., p. 25.

experience occurs continuously, because the interaction of live creature and environing conditions is involved in the very process of living. Under conditions of resistance and conflict, aspects and elements of the self and the world that are implicated in this interaction qualify experience with emotions and ideas so that conscious intent emerges³².

From this passage, it emerges that experience is continuous and may involve emotions. Further on, Dewey adds: «the experience itself has a satisfying emotional quality because it possesses internal integration and fulfilment reached through ordered and organised movement. This artistic structure may be immediately felt. In so far, it is esthetic»³³. For this reason, Dewey states that «experience is emotional» and that «emotions are attached to events and objects in their movement»³⁴.

He then indicates the existence of essential conditions for an experience to take place:

There are, therefore, common patterns in various experiences, no matter how unlike they are to one another in the details of their subject matter. There are conditions to be met without which an experience cannot come to be. The outline of the common pattern is set by the fact that every experience is the result of interaction between a live creature and some aspect of the world in which he lives³⁵.

In this excerpt, Dewey identifies the existence of patterns that are shared by different experiences. The identification of these common patterns derives from the assumption that an experience is always the consequence of an *interaction* between a subject and aspects of another subject or object.

Dewey points to another important element in aesthetic experience, that is, perception:

An experience has pattern and structure, because it is not just doing and undergoing in alternation, but consists of them in relationship. To put one's hand in the fire that consumes it is not necessarily to have an experience. The action and its consequence must be joined in perception. This relationship is what gives meaning³⁶.

Thus, perception is what links the action with the consequence of that action, inasmuch as these cannot be disconnected if experience is to occur. In other words, without

³² J. Dewey, *Art as Experience*, Perigee, New York 2005, p. 35.

³³ *Ibid.*, p. 38.

³⁴ *Ibid.*, p. 42.

³⁵ *Ibid.*, pp. 43-44.

³⁶ *Ibid.*, p. 44.

perception there cannot be any experience. Dewey, like Worringer, is therefore in line with the original meaning of the word *aisthesis*, that is, perception and sensation.

In this sense, Dewey distinguishes the notion of “artistic” from that of “aesthetic”, to then indicate a link between the two:

We have no word in the English language that unambiguously includes what is signified by the two words “artistic” and “esthetic”. Since “artistic” refers primarily to the act of production and “esthetic” to that of perception and enjoyment, the absence of a term designating the two processes taken together is unfortunate³⁷.

As this extract shows, Dewey claims the necessity for an English word that could combine the concept of “artistic” with that of “aesthetic”, that is, the concept of *doing* with that of *perceiving* and *enjoying*. This passage also reveals Dewey’s definition of “aesthetic”, that is, a kind of experience that consists of perception, appreciation, and enjoyment. This is confirmed in the following passage: «The word “esthetic” refers [...] to experience as appreciative, perceiving, and enjoying»³⁸.

Dewey’s aim in his essay is «to show how the conception of conscious experience as a perceived relation between doing and undergoing enables us to understand the connection that art as production and perception and appreciation as enjoyment sustain to each other»³⁹. In this passage, Dewey condenses his idea of aesthetic experience: that is, a kind of perception and appreciation of a work of art that produces enjoyment in the viewer. In this sense, the term “aesthetic” denotes «the consumer’s rather than the producer’s standpoint»⁴⁰. This is reiterated in the following sentence: «Perfection in execution cannot be measured or defined in terms of execution; it implies those who perceive and enjoy the product that is executed»⁴¹.

Tellingly, Dewey talks about different types of perception, including «organic perception» and «direct perception»⁴²:

The process of art in production is related to the esthetic in perception organically [...] The making comes to an end when its result is experienced as good – and that

³⁷ Ibid., p. 46.

³⁸ Ibid., p. 47.

³⁹ Ibid., pp. 46-47.

⁴⁰ Ibid., p. 47.

⁴¹ Ibid.

⁴² Ibid., p. 49.

experience comes not by mere intellectual and outside judgment but in direct perception⁴³.

Dewey's concepts of «organic perception» and «direct perception» may refer to what Worringer called empathy, which is the result of a (cognitive, emotional, or somatic) link established between the perceiver and the object or subject perceived. In fact, in a crucial passage Dewey states: «In an emphatic artistic-esthetic experience, the relation is so close that it controls simultaneously both the doing and the perception. Such vital intimacy of connection cannot be had if only hand and eye are engaged»⁴⁴. Then he adds: «Hand and eye, when the experience is esthetic, are but instruments through which the entire live creature, moved and active throughout, operates. Hence the expression is emotional and guided by purpose»⁴⁵.

Thus, Dewey stresses the implications of the organism in perception: «An act of perception proceeds by waves that extend serially throughout the entire organism»⁴⁶. It is in this respect that Dewey talks about immersion:

To steep ourselves in a subject-matter we have first to plunge into it. When we are only passive to a scene, it overwhelms us and, for lack of answering activity, we do not perceive that which bears us down. We must summon energy and pitch it at a responsive key in order to *take* in⁴⁷.

Therefore, according to Dewey, perception involves an «interaction between the total organism and the objects»⁴⁸. In this sense, Dewey's definition of "aesthetic" is not only in line with the original meaning of the term *aisthesis* – the one provided by ancient Greek philosophers first and by Baumgarten thereafter (i.e. perception and sensation) – but also contains some of the concepts that Worringer associated with the term, that is, perception, experience, enjoyment, and empathy.

Dewey then reaches another important point: that is, that the work of art is the result of both the labour of the artist and the perceptual experience of the viewer: «There is work done on the part of the percipient as there is on the part of the artist»⁴⁹. This is

⁴³ Ibid.

⁴⁴ Ibid., p. 50.

⁴⁵ Ibid.

⁴⁶ Ibid., p. 53.

⁴⁷ Ibid.

⁴⁸ Ibid., p. 54.

⁴⁹ Ibid.

because «to perceive, a beholder must *create* his own experience. And his creation must include relations comparable to those which the original producer underwent»⁵⁰. It follows that in order for the work observed to be understood, what the artist creates must be recreated (or imagined) by the beholder's mind:

Without an act of recreation the object is not perceived as a work of art. The artist selected, simplified, clarified, abridged and condensed according to his interest. The beholder must go through these operations according to his point of view and interest⁵¹.

Hence the physiological involvement of the viewer, who is called to experience the work of art with his or her own brain-body system: «Without external embodiment, an experience remains incomplete; physiologically and functionally, sense organs are motor organs and are connected, by means of distribution of energies in the human body and not merely anatomically, with other motor organs»⁵². According to Dewey, then, art can be apprehended through the senses, at a visceral and emotional level. It is in the physiological dimension of the experience and the role attributed to the senses in perception that Dewey establishes another link between his idea of aesthetic experience and the concept of *aisthesis* coined by ancient Greek philosophers.

3. Goodman and the Function of Emotion in Aesthetic Experience

In his 1968 work *Languages of Art: An Approach to a Theory of Symbols*, subsequently revised in 1976, Nelson Goodman tackles the function of emotion in art contemplation and understanding, and proposes his own idea about the nature of aesthetic experience⁵³.

⁵⁰ Ibid.

⁵¹ Ibid.

⁵² Ibid., p. 51.

⁵³ For a review of Goodman's *Languages of Art*, see W. J. T. Mitchell, *Realism, Irrealism, and Ideology: A Critique of Nelson Goodman*, in "Journal of Aesthetic Education", 25, 1991, pp. 21-35; R. Wollheim, *The Core of Aesthetics*, in "Journal of Aesthetic Education", 25(1), 1991, pp. 37-45; M. Beardsley, *Languages of Art and Art Criticism*, in "Erkenntnis: An International Journal of Analytic Philosophy", 12, 1978, pp. 95-118; K. Walton, *Are Representations Symbols?*, in "Monist: An International Quarterly Journal of General Philosophical Inquiry", 58, 1974, pp. 236-254; Beardsley, *Semiotic Aesthetics and Aesthetic Education*, in "Philosophic Exchange: Annual Proceedings", 1, 1973, pp. 155-171; Walton, *Languages of Art: An Emendation*, in "Philosophical Studies: An International Journal for Philosophy in the Analytic Tradition", 22, 1971, pp. 82-85; and Wollheim, *Nelson Goodman's Languages of Art*, in "Journal of Philosophy", 67, 1970, pp. 531-539.

The starting point of Goodman's investigation is the assumption that aesthetic experience, rather than being a passive process, is a dynamic engagement of the subject with the work of art observed, be it a painting, a poem, or any other piece of art⁵⁴. Contrary to what Worringer and Dewey claimed, he then argues that aesthetic experience cannot be characterised by pleasure:

Attempts are often made to distinguish the aesthetic in terms of immediate pleasure; but troubles arise and multiply here. Obviously, sheer quantity or intensity of pleasure cannot be the criterion. That a picture or poem provides more pleasure than does a proof is by no means clear⁵⁵.

Even though Goodman argues that pleasure in aesthetics is nevertheless important – «what counts is not pleasure yielded but pleasure “objectified”, pleasure read into the object as a property thereof» – he prefers to talk about satisfaction: «Some of these difficulties are diminished and other obscured if we speak of satisfaction rather than pleasure»⁵⁶.

However, satisfaction is not, and cannot be, the element that distinguishes an aesthetic experience from a non-aesthetic one; this would be too simplistic an explanation for such a complex phenomenon: «Satisfaction pretty plainly fails to distinguish aesthetic from nonaesthetic objects and experiences»⁵⁷. For these reasons, Goodman operates a «shift from pleasure or satisfaction to emotion-in-general»⁵⁸. In this sense, he states that «the aesthetic is characteristically emotive»⁵⁹. Thus, according to Goodman, aesthetic experience involves emotions, both perceived and felt in response:

Often the emotions involved in aesthetic experience are not only somewhat tempered but also reversed in polarity. We welcome some works that arouse emotions we normally shun. Negative emotions of fear, hatred, disgust may become positive when occasioned by a play or painting⁶⁰.

The fact that aesthetic experience is regulated by emotions produces a positive, sometimes therapeutic effect on the beholder:

⁵⁴ N. Goodman, *Languages of Art: An Approach to a Theory of Symbols*, Hackett, Indianapolis 1976, p. 241.

⁵⁵ *Ibid.*, p. 242.

⁵⁶ *Ibid.*, p. 243.

⁵⁷ *Ibid.*

⁵⁸ *Ibid.*, p. 245.

⁵⁹ *Ibid.*

⁶⁰ *Ibid.*, p. 246.

Tragedy is said to have the effect of purging us of pent-up and hidden negative emotions, or of administering measured doses of the killed virus to prevent or mitigate the ravages of an actual attack. Art becomes not only palliative but therapeutic, providing both a substitute for good reality and a safeguard against bad reality. Theatres and museums function as adjuncts to Departments of Public Health⁶¹.

Despite assigning such a pivotal role to emotion in aesthetic experience, Goodman contrasts the notion of the emotive with that of the cognitive, arguing that only the latter is associated with aesthetic experience⁶². He then explains the difference between the two concepts: «sensation, perception, inference, conjecture, all nerveless inspection and investigation, fact, and truth» refer to the cognitive; whereas «pleasure, pain, interest, satisfaction, disappointment, all brainless affective response, liking, and loathing» refer to the emotive⁶³. It is worth noting that in the category of the cognitive – the one Goodman supports – he includes the concepts of sensation and perception, which define the Greek term *aisthesis*. In so doing, he follows the original meaning of the concept of aesthetic, as well as the definition provided by Baumgarten. At the same time, he distances himself from Worringer's and Dewey's ideas of aesthetic experience, inasmuch as he excludes the role of pleasure, enjoyment, and satisfaction as its distinctive features.

The dichotomy between the emotive and the cognitive allows Goodman to contend that «in aesthetic experience the *emotions function cognitively*» and that, therefore, «the work of art is apprehended through the feelings as well as through the senses»⁶⁴. The cognitive function of emotions «involves discriminating and relating them in order to gauge and grasp the work and integrate it with the rest of our experience and the world»⁶⁵. However, Goodman states, to explore the emotional content of a work of art, feelings are not sufficient, because «we may feel how a painting looks as we may see how it feels»⁶⁶.

⁶¹ Ibid.

⁶² Ibid., p. 247.

⁶³ Ibid., pp. 247-248.

⁶⁴ Ibid., p. 248.

⁶⁵ Ibid.

⁶⁶ Ibid.

Goodman says that the function of emotions in aesthetic experience «is a means of discerning what properties a work has and expresses»⁶⁷. Therefore, emotions are a reliable means for the comprehension of the observed work of art. Feeling emotions – whether positive or negative, pleasant or unpleasant – while contemplating works of art is a way to perceive and understand the work itself. Feeling sadness while seeing a painting, for instance, may be a way to perceive pictorial features of the work. Hence, the emotions serve the understanding.

In this regard, Goodman explains that the viewer can either mirror the emotions observed or respond to an emotion by feeling a diverse emotion than that observed: «the frequent disparity between the emotion felt and the emotive content thereby discovered in the object is now readily understood. Pity on the stage may induce pity in the spectator; but greed may arouse disgust, and courage admiration»⁶⁸. It follows that there is a connection between the viewer's response to an object and the properties possessed by that specific object: «Sensory and emotive experiences are related in complex ways to the properties of objects»⁶⁹. Furthermore, Goodman argues, emotions are not separated from each other; rather, they are related to one another and also linked to knowledge: «emotions function cognitively not as separate items but in combination with one another and with other means of knowing»⁷⁰. Therefore, «perception, conception, and feeling intermingle and interact»⁷¹. This position must be read in opposition to Worringer's idea on the role of empathy in art, which supports the view that artworks can be understood viscerally.

Even though Goodman succeeds in explaining the role of emotion in aesthetic experience and art perception, he is aware of the fact that this is not enough to identify how and where an aesthetic experience differs from other types of experiences:

Although many puzzles are thus resolved and the role of emotion in aesthetic experience clarified, we are still left without a way of distinguishing aesthetic from all other experience. Cognitive employment of the emotions is neither present in every aesthetic nor absent from every nonaesthetic experience. We have already noted that

⁶⁷ Ibid.

⁶⁸ Ibid., p. 249.

⁶⁹ Ibid.

⁷⁰ Ibid.

⁷¹ Ibid.

some works of art have little or no emotive content, and that even where the emotive content is appreciable, it may sometimes be apprehended by nonemotive means⁷².

For this reason, according to Goodman, what distinguishes aesthetic experiences from other types of experiences remains an open question in philosophy. However, I argue that a neuroaesthetic approach to the study of aesthetic experience can provide at least a partial solution to this critical and unresolved issue.

4. The Biology of Art: Common Neural Correlates of Emotion Perception, Embodied Simulation, and the Interoceptive Mind

Worringer's, Dewey's, and Goodman's definitions of aesthetic experience, together with the classical meaning of the word *aisthesis* and Baumgarten's definition of the concept of aesthetics, allow us an insight into the phenomenal character that is proprietary to aesthetic experiences. On this basis, we may propose that aesthetic experiences are those experiences that involve a series of (universal) features, including: *sense perception* (ancient Greek philosophers, Baumgarten, Worringer, Dewey, and Goodman), *empathy* (Worringer and, to a certain extent, Dewey), *emotion* (Dewey and Goodman), and *enjoyment* or *satisfaction* (Worringer, Dewey, and Goodman).

Worringer, Dewey, and Goodman grounded their aesthetic investigations on the classical assumption that aesthetic experience consists of perception and sensation (or sense perception), but they then developed other aspects, some of which are partly in contrast with one another. For instance, whereas Worringer and Dewey argue that aesthetic experiences are those that, among other things, provoke enjoyment in the experiencer, Goodman states that though pleasure or satisfaction may be involved in aesthetic experience, they are not the distinguishing features that make an experience an aesthetic one. And whereas Worringer (and, to a certain extent, Dewey), applying the theory of empathy, supports the view that art can be experienced and understood viscerally, Goodman maintains that in art emotions function only cognitively, and therefore that only the brain is involved.

⁷² Ibid., p. 251.

Despite these differences, I argue that we can provide a physiological explanation for the basic experiences and sensations involved in aesthetic experiences – at least those that have been described by Worringer, Dewey, and Goodman – because they all have a biological root. My contention is also grounded in the meaning of the Greek term *aisthesis*, which was employed by ancient philosophers to explain the *physiological* processes underpinning the *perception* of objects. It is precisely here that the connection between aesthetics and the philosophy of perception – which is part of philosophy of mind and bases some of its arguments on the achievements of experimental psychology and cognitive neuroscience – lies.

Though I do not maintain that aesthetic experiences are exclusively those which involve the contemplation of artworks, in this section I will deal only with aesthetic experiences of works of art. In so doing, I will address the following questions. What does it mean to perceive and comprehend art sensorially? What are the physiological implications of the observation of emotionally charged works of art? Is it possible to prove, with the aid of science, the existence of empathy in art contemplation? And finally, where does aesthetic enjoyment come from? I will propose an answer to each of these questions by relying on some of the leading neuroscientific and psychological studies on emotion, empathy, and interoception.

In his *Emotions Revealed: Understanding Faces and Feelings* (2003), Paul Ekman addresses the problem of whether emotions are universal or determined by cultural factors. He does so by reading and measuring the facial expressions of emotions. The results of his research led him to advocate Charles Darwin's theory of emotion, according to which facial expressions are the product of human evolution and are therefore universal⁷³. He achieved this conclusion after carrying out a number of «cross-cultural studies of facial expression» which aimed to understand what is universal and what is culturally variable in emotion expression and perception⁷⁴.

⁷³ C. Darwin, *The Expression of the Emotions in Man and Animals*, J. Murray, London 1921. See also P. Ekman, *Emotion in the Human Face*, Cambridge University Press, Cambridge 1982; and Ekman, W. V. Friesen, *Unmasking the Face. A Guide to Recognizing Emotions from Facial Clues*, Prentice-Hall, Englewood Cliffs-London 1975.

⁷⁴ Ekman, *Emotions Revealed: Recognizing Faces and Feelings to Improve Communication and Emotional Life*, Weidenfeld and Nicolson, London 2003, p. 1.

For example, in his first study, Ekman showed photographs of facial expressions «to people in five cultures – Chile, Argentina, Brazil, Japan, and the United States – and asked them to judge what emotion was shown in each facial expression»⁷⁵. The majority of people in each culture gave the same answers, «suggesting that expressions might really be universal»⁷⁶. Ekman’s conclusion is corroborated by a number of studies of a different type – including those involving blind people – which also support Darwin’s assertion that facial expressions are universal⁷⁷. The results of this research show that people who were born congenitally blind manifest similar expressions to those of sighted individuals. It follows that expressions do not need to be learned.

Another scholar, Antonio Damasio, has tackled the neural correlates of emotion by investigating how viewers become bodily involved with pictures of things and assessing the emotional implications of such involvement⁷⁸. He distinguishes two categories of emotions: primary and secondary. Primary, or universal, emotions – such as happiness, sadness, fear, anger, surprise, and disgust – are innate and preorganised, and depend on circuits in the limbic system, which includes the amygdala and anterior cingulate⁷⁹. Secondary, or social, emotions – such as embarrassment, jealousy, guilt, and pride – occur when subjects «begin experiencing feelings and forming *systematic connections between categories of objects and situations, on the one hand, and primary emotions, on the other*», and are processed in the limbic system and the prefrontal and

⁷⁵ Ekman, *Emotions Revealed*, p. 3. See also Ekman, E. R. Sorenson, Friesen, *Pan-Cultural Elements in Facial Displays of Emotions*, in “Science”, 164, 1969, pp. 86-88.

⁷⁶ Ekman, *Emotions Revealed*, p. 3.

⁷⁷ See D. Galati, K. R. Scherer, P. E. Ricci-Bitti, *Voluntary Facial Expression of Emotion: Comparing Congenitally Blind with Normally Sighted Encoders*, in “Journal of Personality and Social Psychology”, 73, 1997, pp. 1363-1379; I. Eibl-Eibesfeldt, *Ethology: The Biology of Behavior*, Holt, Reinhart and Winston, New York 1970; J. S. Fulcher, “Voluntary” Facial Expression in Blind and Seeing Children, in “Archives of Psychology”, 272, 1942; and J. Thompson, *Development of Facial Expression of Emotion in Blind and Seeing Children*, in “Archives of Psychology”, 264, 1941.

⁷⁸ A. Damasio, *Looking for Spinoza: Joy, Sorrow and the Feeling Brain*, Vintage Books, London 2004; Damasio, *Descartes’ Error: Emotion, Reason, and the Human Brain*, Quill, New York 2000; and Damasio, *The Feeling of What Happens: Body, Emotion and the Making of Consciousness*, Vintage Books, London 2000.

⁷⁹ Damasio, *Descartes’ Error*, p. 133. See also Damasio, *The Feeling of What Happens*, pp. 50-51; and J. LeDoux, *Emotion and the Amygdala*, in J. P. Aggleton (ed.) *The Amygdala: Neurobiological Aspects of Emotion, Memory, and Mental Dysfunction*, Wiley-Liss, New York 1992, pp. 339-351.

somatosensory cortices⁸⁰. These two categories of emotions, according to Damasio, «describe the full range of emotional behaviours»⁸¹.

Emotions have two main biological functions. The first is to produce «a specific reaction to the inducing situation»⁸². The second is to regulate «the internal state of the organism such that it can be prepared for the specific reaction»⁸³. This is why, Damasio claims, «we can predict with some success that certain stimuli will produce certain emotions»⁸⁴.

At this point we shall ask: what does it mean to experience an emotion, as may happen during an aesthetic experience, for instance? First, there is a change in the body state of the experiencer, due to a number of modifications in different body regions⁸⁵. Depending on the situation, the heart may race, the skin may flush, or the face's muscles may change around the mouth and eyes to create a happy or sad expression⁸⁶. In all cases,

there are changes in a number of parameters in the function of viscera (heart, lungs, gut, skin), skeletal muscles (those that are attached to your bones), and endocrine glands (such as the pituitary and adrenals). A number of peptide modulators are released from the brain into the bloodstream. The immune system also is modified rapidly⁸⁷.

In other words, in a hypothetical experience of emotion, several parts of the body enter a new state.

On this basis, Damasio describes another important situation: that is, the sensation that occurs when the brain mirrors the emotional body states of others: «the brain can simulate certain emotional body states internally, as happens in the process of turning the emotion sympathy into a feeling of empathy»⁸⁸. This sensation may occur both in

⁸⁰ Damasio, *Descartes' Error*, p. 134. See also Damasio, *The Feeling of What Happens*, p. 51.

⁸¹ Damasio, *Descartes' Error*, p. 134.

⁸² Damasio, *The Feeling of What Happens*, p. 53.

⁸³ *Ibid.*, p. 54.

⁸⁴ *Ibid.*

⁸⁵ Damasio, *Descartes' Error*, p. 134.

⁸⁶ *Ibid.*

⁸⁷ *Ibid.*, p. 135.

⁸⁸ Damasio, *Looking for Spinoza*, p. 115.

real life and in art contemplation⁸⁹. Damasio calls this process of simulation the “as-if-body-loop” mechanism, which «involves an internal brain simulation that consists of a rapid modification of ongoing body maps. This is achieved when certain brain regions, such as the prefrontal/premotor cortices, directly signal the body-sensing brain regions»⁹⁰. This explains, in biological terms, the theory of empathy described by Worringer.

The mechanism described by Damasio is made possible by the existence of a specific class of visuomotor neurons: the so-called mirror neurons present in the frontal cortex of monkeys⁹¹ and humans⁹². Mirror neurons have the task of representing, in the

⁸⁹ See F. Tononi, *The Night of Michelangelo: Animism, Empathy, and Imagination*, in “Journal of Comparative Literature and Aesthetics”, 45(4), 2022, pp. 178-192; Tononi, *Aby Warburg, Edgar Wind, and the Concept of Kulturwissenschaft: Reflections on Imagery, Symbols, and Expression*, in “The Edgar Wind Journal”, 2, 2022, pp. 38-74; Tononi, *The Aesthetics of Freud: Movement, Embodiment and Imagination*, in “Reti, saperi, linguaggi: Italian Journal of Cognitive Sciences”, 8(1), 2021, pp. 125-154; V. Gallese, D. Freedberg, M. A. Umiltà, *Embodiment and the Aesthetic Experience of Images*, in A. Chatterjee, E. R. Cardillo (eds) *Brain, Beauty, & Art*, Oxford University Press, Oxford 2021, pp. 88-92; Tononi, *Aesthetic Response to the Unfinished: Empathy, Imagination and Imitation Learning*, in “Aisthesis: Pratiche, linguaggi e saperi dell'estetico”, 13(1), 2020, pp. 135-153; Tononi, *Intermediality and Immersion in Gaudenzio Ferrari's Adoration of the Magi in Chapel V of the Sacred Mountain of Varallo*, in “PsicoArt: Rivista di Arte e Psicologia”, 10, 2020, pp. 1-18; Tononi, *Andrea Mantegna and the Iconography of Mourners: Aby Warburg's Notion of Pathosformeln and the Theory of Aesthetic Response*, in “IKON: Journal of Iconographic Studies”, 13, 2020, pp. 79-94; Freedberg, A. Pennisi, *The Body in the Picture: The Lesson of Phantom Limbs and the Origins of the BIID*, in “Reti, saperi, linguaggi: Italian Journal of Cognitive Sciences”, 7(1), 2020, pp. 5-50; Freedberg, *From Absorption to Judgment: Empathy in Aesthetic Response*, in V. Lux, S. Weigel (eds) *Empathy: Epistemic Problems and Cultural-Historical Perspectives of a Cross-Disciplinary Concept*, Palgrave MacMillan, New York 2017, pp. 139-180; Freedberg, *Feelings on Faces. From Physiognomics to Neuroscience*, in R. Campe, J. Weber (eds) *Rethinking Emotion. Interiority and Exteriority in Premodern, Modern, and Contemporary Thought*, Walter de Gruyter, Berlin 2014, pp. 289-324; Freedberg, *Memory in Art: History and the Neuroscience of Response*, in S. Nalbantian et al. (eds) *The Memory Process: Neuroscientific and Humanistic Perspectives*, MIT Press, Cambridge, MA 2011, pp. 337-358; Freedberg, *Choirs of Praise: Some Aspects of Action Understanding in Fifteenth Century Painting and Sculpture*, in D. Levine, J. Freiberg (eds) *Medieval Renaissance Baroque: A Cat's Cradle for Marilyn Aronberg*, Italcia Press, New York 2010, pp. 65-81; Freedberg, *Movement, Embodiment, Emotion*, in T. Dufrêne, A.C. Taylor (eds) *Cannibalismes Disciplinaires. Quand l'histoire de l'art et l'anthropologie se rencontrent*, Musée du quai Branly, Paris 2010, pp. 37-61; Freedberg, *Empathy, Motion and Emotion*, in K. Herding, A. Krause-Wahl (eds) *Wie sich Gefühle Ausdruck verschaffen: Emotionen in Nahsicht*, Driesen, Berlin 2008, pp. 17-51; and Freedberg, Gallese, *Motion, Emotion and Empathy in Aesthetic Experience*, in “Trends in Cognitive Sciences”, 11, 2007, pp. 197-203.

⁹⁰ Damasio, *Looking for Spinoza*, p. 115.

⁹¹ See Gallese, et al., *Action Recognition in the Premotor Cortex*, in “Brain”, 119, 1996, pp. 593-609; and G. Rizzolatti, et al., *Premotor Cortex and the Recognition of Motor Actions*, in “Cognitive Brain Research”, 3, 1996, pp. 131-141.

⁹² See Gallese, *Embodied Simulation and Its Role in Cognition*, in “Reti, saperi, linguaggi: Italian Journal of Cognitive Sciences”, 5(1), 2018, pp. 31-46; Gallese, *Bodily Selves in Relation: Embodied Simulation as Second-Person Perspective on Intersubjectivity*, in “Philosophical Transactions of the Royal Society B”, 369(1644), 2014, pp. 1-10; Gallese, *Before and Below Theory of Mind: Embodied Simulation and the Neural Correlates of Social Cognition*, in “Philosophical Transactions of the Royal Society of London B”, 362(1480), 2007, pp. 659-669; and Gallese, C. Keysers, Rizzolatti, *A Unifying View of the Basis of Social Cognition*, in “Trends in Cognitive Sciences”, 8, 2004, pp. 396-403.

subject's brain, the goal-directed movements seen in another subject, and transmitting signals to sensorimotor structures such that these movements are either "previewed", in simulation mode, or actually executed. Mirror neurons become active not only during the observation of actions, but also during their execution. Furthermore, empirical evidence suggests that other mirroring mechanisms are at the base of the human ability to share the emotions and sensations of others: «the very same nervous structures involved in the subjective experience of emotions and sensations are also active when such emotions and sensations are recognised in others»⁹³. Therefore, seeing someone expressing an emotion (e.g. anguish) or feeling a sensation (e.g. pain) activates some of the same visceromotor (e.g. anterior insula) and sensorimotor (e.g. secondary somatosensory cortex and ventral premotor cortex) brain areas, both in the observer and in the person observed.

On the basis of these mirroring mechanisms, Vittorio Gallese proposed the theory of embodied simulation⁹⁴. Gallese states that «Embodied simulation theory uses a notion of embodiment according to which mental states or processes are embodied because of their bodily format»⁹⁵. Thus, Gallese stresses the role of the physical body during observation (as Worringer and Dewey did from a philosophical perspective), and sees visual perception as the capacity for "feeling-into" the motion or emotion observed:

The bodily format of a mental representation constrains what such mental representation can represent because of the bodily constraints posed by the specific nature of the human body. Similar constraints apply both to the representations of one's own actions, emotions or sensations and to those of others. Hence, embodied simulation is the reuse of mental states and processes involving representations that have a bodily format⁹⁶.

⁹³ Gallese, *Embodied Simulation. Its Bearing on Aesthetic Experience and the Dialogue between Neuroscience and the Humanities*, in "Gestalt Theory", 41(2), 2019, pp. 113-128 (115). See also Gallese, M. Guerra (eds), *The Empathic Screen: Cinema and Neuroscience*, Oxford University Press, Oxford 2019; and Gallese, V. Cuccio, *The Paradigmatic Body. Embodied Simulation, Intersubjectivity and the Bodily Self*, in T. Metzinger, J. M. Windt (eds.) *Open MIND*, MIND Group, Frankfurt 2015, pp. 1-23.

⁹⁴ See Gallese, *Embodied Simulation. Its Bearing on Aesthetic Experience and the Dialogue between Neuroscience and the Humanities*; Gallese, *Bodily Selves in Relation*; Gallese, *Embodied Simulation: From Neurons to Phenomenal Experience*, in "Phenomenology and the Cognitive Sciences", 4(1), 2005, pp. 23-48; and Gallese, *The Manifold Nature of Interpersonal Relations: The Quest for a Common Mechanism*, in "Philosophical Transactions of the Royal Society of London B", 358(1431), 2003, pp. 517-528.

⁹⁵ Gallese, *Embodied Simulation. Its Bearing on Aesthetic Experience and the Dialogue between Neuroscience and the Humanities*, p. 115.

⁹⁶ Ibid.

Another important line of research that has recently received special attention from philosophers of mind, experimental psychologists, and neuroscientists is that on interoception⁹⁷. Interoception is the sensing of automatic changes in the body⁹⁸. This can be either conscious or non-conscious. Often, these bodily changes occur during the experiencing of emotions in response to involvement in certain situations, or in response to images⁹⁹. Interoception involves different classes and channels (e.g. cardiovascular or gastric) of information that share neural substrates. In this regard,

Changes in bodily states and their interoceptive signalling can be constitutive of emotional feelings, leading to the possibility that the affective style (e.g. the intensity of emotions) of a person reflects differences in conscious and unconscious processing of interoceptive information¹⁰⁰.

Specific cortical regions, such as the anterior insular cortex, respond to individuals' attention to their own internal bodily changes of states¹⁰¹. The insular cortex is also relevant for the experience of emotion. This suggests the existence of a common network for interoceptive and emotional processing that has the anterior insular cortex and, as scientific data demonstrates, the anterior cingulate cortex at its centre¹⁰². Further imaging studies support the view that emotions are mediated by a number of subcortical and cortical structures, the activity of which is also correlated to changes in internal bodily states¹⁰³. In detail, structures such as the ventral prefrontal, anterior cingulate, and insular cortices, the amygdala, the ventral striatum, and the dorsal brainstem play a

⁹⁷ See M. Tsakiris, H. De Preester (eds), *The Interoceptive Mind: From Homeostasis to Awareness*, Oxford University Press, Oxford 2019.

⁹⁸ See L. Quadt, H. D. Critchley, S. N. Garfinkel, *Interoception and Emotion: Shared Mechanisms and Clinical Implications*, in Tsakiris, De Preester (eds) *The Interoceptive Mind*, pp. 123-143.

⁹⁹ See A. Sel, et al., *The Somatotopy of Observed Emotions*, in "Cortex", 129, 2020, pp. 11-22; E. Ambrosini, et al., *Seeing Myself Through my Heart: Cortical Processing of a Single Heartbeat Speeds up Self-Face Recognition*, in "Biological Psychology", 144, 2019, pp. 64-73; and Quadt, Critchley, Garfinkel, *Interoception and Emotion*.

¹⁰⁰ Quadt, Critchley, Garfinkel, *Interoception and Emotion*, p. 123.

¹⁰¹ See Critchley, *The Human Cortex Responds to an Interoceptive Challenge*, in "Proceedings of the National Academy of Sciences USA", 101, 2004, pp. 6333-6334; R. Peyron, B. Laurent, L. Garcia-Larrea, *Functional Imaging of Brain Responses to Pain. A Review and Meta-Analysis*, in "Clinical Neurophysiology", 30, 2000, pp. 263-288; and L. M. Williams, et al., *The Neural Correlates of Orienting: An Integration of fMRI and Skin Conductance Orienting*, in "Neuroreport", 11, 2000, pp. 3011-3015.

¹⁰² See Quadt, Critchley, Garfinkel, *Interoception and Emotion*.

¹⁰³ See K. L. Phan, et al., *Functional Neuroanatomy of Emotion: A Meta-Analysis of Emotion Activation Studies in PET and fMRI*, in "NeuroImage", 16, 2002, pp. 331-348.

critical role in emotion processing and changes in heart rate¹⁰⁴, temperature¹⁰⁵, and blood pressure¹⁰⁶.

Hence the biological underpinning of emotion in aesthetic experience – which may occur cognitively or emotively according to the situation – as described in philosophical terms by Dewey and Goodman. These brain-body activities may generate in the viewer of a work of art that sense of enjoyment or satisfaction that Worringer, Dewey, and Goodman referred to in their dealings with the phenomenology of aesthetic experience – though as Goodman pointed out, this may not be what distinguishes aesthetic experience.

Neuroscientific studies on emotion, empathy, sense perception, and interoception have had a considerable impact on the neuroaesthetic investigations into viewers' aesthetic responses to images in general, and to visual works of art in particular. The aim of most of these neuroaesthetic studies is to interrogate the connection between the formal features of images and the emotive responses they provoke in viewers. This includes the ways viewers respond to phenomena such as emotions¹⁰⁷, movements¹⁰⁸,

¹⁰⁴ See Critchley, et al., *Activity in the Human Brain Predicting Differential Heart Rate Responses to Emotional Facial Expressions*, in "NeuroImage", 24, 2005, pp. 751-762.

¹⁰⁵ See L. Nummenmaa, et al., *Bodily Maps of Emotions*, in "Proceedings of the National Academy of Sciences USA", 111, 2014, pp. 646-651.

¹⁰⁶ See Critchley, et al., *Cerebral Correlates of Autonomic Cardiovascular Arousal: A Functional Neuroimaging Investigation in Humans*, in "Journal of Psychology", 523, 2000, pp. 259-270.

¹⁰⁷ See Tononi, *Andrea Mantegna and the Iconography of Mourners*; Tononi, *Intermediality and Immersion in Gaudenzio Ferrari's Adoration of the Magi in Chapel V of the Sacred Mountain of Varallo*; Freedberg, *From Absorption to Judgment*; Freedberg, *Feelings on Faces*; Freedberg, *Memory in Art*; Freedberg, *Choirs of Praise*; Freedberg, *Movement, Embodiment, Emotion*; Freedberg, *Empathy, Motion and Emotion*; E. R. Kandel, *The Age of Insight: The Quest to Understand the Unconscious in Art, Mind, and Brain, from Vienna 1900 to the Present*, Random House, New York 2012; Freedberg, Gallese, *Motion, Emotion and Empathy in Aesthetic Experience*; and J. Montagu, *The Expression of the Passions: The Origin and Influence of Charles Le Brun's 'Conférence sur l'expression générale et particulière'*, Yale University Press, New Haven, CT, 1994.

¹⁰⁸ See Tononi, *The Night of Michelangelo*; Tononi, *The Aesthetics of Freud*; L. Mineo, et al., *Motor Facilitation during Observation of Implied Motion: Evidence for a Role of the Left Dorsolateral Prefrontal Cortex*, in "International Journal of Psychophysiology", 128, 2018, pp. 47-51; Freedberg, *From Absorption to Judgment*; Freedberg, *Movement, Embodiment, Emotion*; Freedberg, *Empathy, Motion and Emotion*; C. Concerto, et al., *Observation of Implied Motion in a Work of Art Modulates Cortical Connectivity and Plasticity*, in "Journal of Exercise Rehabilitation", 12, 2016, pp. 417-423; Concerto, et al., *Neural Circuits Underlying Motor Facilitation during Observation of Implied Motion*, in "Somatosensory & Motor Research", 32(4), 2015, pp. 1-4; C. Di Dio, et al., *Human, Nature, Dynamism: The Effects of Content and Movement Perception on Brain Activations during the Aesthetic Judgment of Representational Paintings*, in "Frontiers in Human Neuroscience", 9, 2015, pp. 1-19; and Freedberg, Gallese, *Motion, Emotion and Empathy in Aesthetic Experience*.

gestures and postures¹⁰⁹, abstract art¹¹⁰, and the unfinished¹¹¹ in painting, sculpture, and drawing; phenomena which, most of the time, trigger an empathic engagement between the viewer and the observed work of art. At the core of these neuroaesthetic studies – as well as of Worringer’s, Dewey’s, and Goodman’s aesthetic investigations – lies a profound concern with the ways in which viewers become mentally and corporeally involved in works of art. They thus confirm the physiological implications of *aisthesis*, or sense perception, pointed out by ancient Greek philosophers such as Aristotle.

Conclusion: Aesthetic Judgement, Aesthetic Appreciation, and the Biology of Aesthetic Experience

In this essay, I have proposed a definition of aesthetic experience based on a series of philosophical investigations, and suggested a biological explanation of what may be involved in aesthetic experience. The concept of aesthetic experience on which I have based my analysis refers to the definitions offered by ancient Greek philosophers, who shaped the meaning of the word *aisthesis*; by Baumgarten, who redefined the concept of aesthetics and put it on a new basis; and by three thinkers of the twentieth century – Worringer, Dewey, and Goodman – who gave a traditional and convincing (though partial) explanation of this phenomenon. The possibility of investigating aesthetic experiences from a biological perspective is suggested by clues such as: (i) the meaning of the Greek word *aisthesis* (from which the term aesthetics derives), that is, perception

¹⁰⁹ See Tononi, *The Night of Michelangelo*; Tononi, *Aby Warburg, Edgar Wind, and the Concept of Kulturwissenschaft*; Tononi, *The Aesthetics of Freud*; Tononi, *Andrea Mantegna and the Iconography of Mourners*; Freedberg, *Memory in Art*; and F. Battaglia, et al., *Corticomotor Excitability during Observation and Imagination of a Work of Art*, in “Frontiers in Human Neuroscience”, 5, 2011, pp. 1-6.

¹¹⁰ See B. Sbriscia-Fioretto, et al., *ERP Modulation during Observation of Abstract Paintings by Franz Kline*, in “PLoS ONE”, 8, 2013, pp. 1-12; and M. A. Umiltà, et al., *Abstract Art and Cortical Motor Activation: An EEG Study*, in “Frontiers in Human Neuroscience”, 6, 2012, pp. 1-9.

¹¹¹ See Tononi, *The Problem of the Unfinished and the Shaping of the Canon of Finiteness in the Italian Renaissance*, in “The Edgar Wind Journal”, 1, 2021, pp. 86-127; Tononi, *Aesthetic Response to the Unfinished*; Gallese, Di Dio, *Neuroaesthetics: The Body in Esthetic Experience*, in V. S. Ramachandran (ed.) *The Encyclopedia of Human Behavior*, 3 vols, Elsevier Academic Press, London, II, 2012, pp. 687-693; Freedberg, Gallese, *Motion, Emotion and Empathy in Aesthetic Experience*; S. Zeki, *The Neurology of Ambiguity*, in “Consciousness and Cognition”, 13, 2004, pp. 173-196 (190); Zeki, *Neural Concept Formation & Art: Dante, Michelangelo, Wagner*, in “Journal of Consciousness Studies”, 9, 2002, pp. 53-76 (65-67); and Zeki, *Inner Vision: An Exploration of Art and the Brain*, Oxford University Press, Oxford 1999, pp. 22-36.

and sensation; (ii) the way ancient Greek philosophers employed the term *aisthesis*, that is, to explain the physiological processes underlying the perception of objects; (iii) the concepts employed by Worringer, Dewey, and Goodman – empathy and emotion – to explain aesthetic experience, both of which have a biological root; and (iv) the universalistic character of all these philosophical discussions.

In this light, research in the field of contemporary neuroscience allows us to understand the brain-body mechanisms behind the phenomena linked to aesthetic experience – sense perception, empathy, and emotion – from which a sense of enjoyment may derive. In fact, these are the concepts at the base of Worringer's, Dewey's, and Goodman's discussions of aesthetic experience.

The primary aim of this study has therefore been to answer the following question: what is the biological basis of aesthetic experience? According to my investigation, the answer is as follows: the biological basis of aesthetic experience (if such a thing exists at all) is structured by the activity of certain brain networks which respond to the empathic engagement with works of art and felt emotions, and which in their turn activate specific bodily sensations such as embodiment and interoception, in response to determinate stimuli – such as figures expressing motions or emotions, gestures or postures, abstract forms or unfinished forms.

These considerations also have further implications. They help to distinguish aesthetic experiences from other approaches to works of art, such as aesthetic judgements and aesthetic appreciations. This is suggested by Ludwig Wittgenstein (1889–1951), who, in his *Lectures on Aesthetics*, touches on important aspects of aesthetic response¹¹². Wittgenstein reflects on the role that aesthetic judgements, expressed with adjectives, play in defining the aesthetic experiences that one may have: «It is remarkable that in real life, when aesthetic judgments are made, aesthetic adjectives such as “beautiful”, “fine”, etc., play hardly any role at all»¹¹³. As

¹¹² Wittgenstein's lectures on aesthetics – which he gave to a small group of students in private rooms in Cambridge in the summer of 1938 – were published in 1966 as a collection of notes taken down by his students. However, he neither saw nor checked these notes. See L. Wittgenstein, *Lectures on Aesthetics*, in C. Barrett (ed.) *Ludwig Wittgenstein: Lectures & Conversations on Aesthetics, Psychology and Religious Belief*, Blackwell, Oxford 2007, pp. 1-40.

¹¹³ *Ibid.*, p. 3.

Wittgenstein contends, these adjectives are not reliable indicators of an aesthetic experience. He continues:

In what we call the Arts a person who has judgment develops. (A person who has a judgment doesn't mean a person who says "Marvellous!" at certain things). If we talk of aesthetic judgments, we think, among a thousand things, of the Arts. When we make an aesthetic judgment about a thing, we do not just gape at it and say: "Oh! How marvellous!" We distinguish between a person who knows what he is talking about and a person who doesn't. If a person is to admire English poetry, he must know English¹¹⁴.

Wittgenstein thus operates a shift from aesthetic judgement to aesthetic appreciation, asking the following question: «What does appreciation consist in?»¹¹⁵. According to Wittgenstein, appreciation is the individual's focus on certain qualities:

If a man goes through an endless number of patterns in a tailor's, [and] says: "No. This is slightly too dark. This is slightly too loud", etc., he is what we call an appreciator of material. That he is an appreciator is not shown by the interjections he uses, but by the way he chooses, selects, etc. Similarly in music: "Does this harmonize? No. The bass is not quite loud enough. Here I just want something different ..." This is what we call an appreciation¹¹⁶.

Wittgenstein then expresses another important feature of aesthetic appreciation, that is, that it is not necessarily determined by conditions such as education, expertise, and so on:

There are lots of people, well-offish, who have been to good schools, who can afford to travel about and see the Louvre, etc., and who know a lot about and can talk fluently about dozens of painters. There is another person who has seen very few paintings, but who looks intensely at one or two paintings which make a profound impression on him. Another person who is broad, neither deep nor wide. Another person who is very narrow, concentrated and circumscribed. Are these different kinds of appreciation? They may all be called "appreciation"¹¹⁷.

This clarification allows Wittgenstein to define aesthetic experience as follows: «one is thinking of their organic feelings – tension of the muscles in their chest, etc. This would obviously be an experience»¹¹⁸. Therefore, this last passage seems to confirm, once again, that investigating the nature of aesthetic experience from a biological perspective is essential to shedding light on this complex and long-standing *philosophical* and *physiological* issue.

¹¹⁴ Ibid., p. 6.

¹¹⁵ Ibid., p. 7.

¹¹⁶ Ibid.

¹¹⁷ Ibid., p. 9.

¹¹⁸ Ibid., p. 33.

In these passages, Wittgenstein marks the distinction between aesthetic judgement, on one hand, and aesthetic appreciation and aesthetic experience on the other. Whereas the former is determined by factors such as education, expertise, knowledge, and cultural context, the latter is largely determined by nature. In fact, as Damasio states: «Notwithstanding the reality that learning and culture alter the expression of emotions and give emotions new meanings, emotions are biologically determined processes»¹¹⁹. It follows that, as Wittgenstein pointed out, a theory of aesthetic judgements is not appropriate to explain aesthetic experiences.

However, since a biological perspective cannot be sufficient to explain what is involved in aesthetic experience in its entirety and in its different situations, other aspects remain to be addressed. These include: the lingering effect of aesthetic experience, that is, the sense that one may have of seeing the world differently even after having left a cinema or an exhibition; the sensation that may follow the experiencing of the beauty of a certain thing; the particular sensation of seeing things that we are used to seeing everyday in a new way; and the experience of the styles of works of art, perceivable for instance in the particular way artists apply their brushstrokes on the canvas, or outline the drawing of their figures.

¹¹⁹ Damasio, *The Feeling of What Happens*, p. 51.